Mobility and Recovery in Europe
Impacts of the Covid-19 crisis

09 08 2021

A European comparative benchmark

FIEC

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EUROPEAN COMPARATIVE STUDY

Part I: Introduction

Executive Summary

The global epidemic of COVID-19 is a major historical event of our time. Governments around the world have had to take drastic measures to contain, slow down and control the epidemic. As of 8 June 2021, 1,160,099 people have died in Europe from COVID-19 according to the World Health Organisation.

The health crisis that began in March 2020 has caused extremely heavy economic and social damage worldwide and in Europe. Here too, European governments and the European Union have taken emergency economic measures and put in place support measures for activity and employment that have not been seen since the Second World War. According to the European Commission, the European Union's GDP will fall by more than 6% by 2020. UK GDP has fallen by almost 10% in 2020, the largest fall for three centuries.

The pandemic has caused a major upheaval for all populations: **reduced mobility and social interaction, the practice of barrier gestures, partial unemployment, teleworking**. Our daily lives have been transformed and certain habits and practices will continue to change once the health crisis has passed.

The development of vaccines and the acceleration in 2021 of the massive vaccination campaigns give us hope that the epidemic will end in the near future and that **we will return to a more normal life.** As of 8 June, more than 48% of the population of the European Union and more than 60% of the UK population has received at least a first dose of vaccine.

The COVID-19 crisis also represents a great opportunity for the years to come. It has sharply accelerated the awareness of all actors in society of **the need to deploy more ambitious climate policies to counter the effects of climate change**. It has also highlighted the flexibility of our economies through digital tools, which have made it possible to lessen the impact of health restrictions and ensure economic activity for a very large part of society. The digitalisation of our societies will go faster and is a priority objective for European countries.

The announced recovery and investments are likely to remain one's confident in the future and in the ability of Europeans to overcome this crisis from above. The world of transport was profoundly affected during the COVID-19 crisis, and here too, sustainable developments and trends are to be studied. This report is a new contribution to understanding the impact of the crisis on the world of mobility in Europe and how the recovery actions allow us to imagine the future for road infrastructure and public works. The analysis performed in this report covers the pandemic period from September 2020 to April 2021, and it measures the impact on the mobility and transport sectors in relation to the pre-pandemic situation.

Jean-Baptiste de Prémare
Chairman of the Committee

Acknowledgments

This benchmark was carried out with the contribution and exchanges of various stakeholders in Europe, professional associations, research centres and public actors. Those who agreed to be quoted are included in the report. They have enabled us to enrich our work in each of the countries concerned and to give a better quality to our work. We would like to thank them warmly for their contribution.

In particular, we would like to thank the **Observatory of Transport Policies and Strategies in Europe (OPSTE)** for their support in carrying out this work.

Foreword

The **European Union Road Federation (ERF)**, the **Confederation of International Contractors' Associations (CICA)**, the **French Federation for Public Works (Fédération Nationale des Travaux Publics -FNTP)**, the **European Construction Industry Federation (FIEC)** and **Routes de France** have joined forces to produce this benchmark entitled "Mobility and Recovery in Europe: Impacts of the Covid-19 crisis".

This group of professionals **published a first international comparative benchmark in 2020**. It covers 20 countries and takes stock, before the Covid-19 crisis, of new mobility habits and their impact on road infrastructures and their equipment. This work has been presented at various events such as the 2019 World Road Congress, the ATEC ITS France 2020 or via a digital event under the patronage of MEP Dominique Riquet in October 2020.

The exceptional period opened in 2020 has offered new reflections on mobility such as the generalisation of teleworking and the prolonged absence of car traffic in urban centres. It also confirms trends observed before the crisis: the rise of digital technologies, the growing importance of climate issues and the resulting paradigm shift in the world of transport.

On this basis, the group has decided to launch a second phase of its work through this new study. The aim is to reflect **on the future of mobility and transport in a post-COVID environment in Europe**, and to offer useful insights for public works companies and public decision-makers, particularly from the point of view of road infrastructure.

About us

This report was produced jointly by this committee, under the chairmanship of Jean-Baptiste de Prémare:

Jean-Baptiste De Prémare, General Delegate (Routes de France)

Christophe Nicodème, General Director (ERF)

Nicolas Gaubert, Deputy Director for European Affairs (FNTP) and rapporteur of the Infrastructure Working Group (FIEC)

Christine Leroy, Director of Technical Affairs (Routes de France)

Amélie Schäfer, Policy Officer for European and International Affairs (FNTP/CICA)

Simon Gianordoli, Policy and Project Officer (ERF/Routes de France

Jean-Claude Roffé, ERF Ambassador

Giulia Cibrario, EU Intern at the French Federation for Public Works (FNTP)

Motivations & Methodology

The COVID-19 crisis started in March 2020. By then, most European countries had taken restrictive measures to slow the spread of the virus, including local or national containment. There have been different periods where the epidemic has ebbed and flowed throughout 2020 up to the present day. These restriction measures have led to a change in mobility behaviour, both voluntary and involuntary.

This has had a major impact on transport operators in European countries, who have faced an unprecedented crisis. In addition, European countries have put in place measures to support these operators and have coordinated at EU level to propose new tools to deal with the crisis and propose a common recovery plan. From these observations, our working group aimed to answer two questions:

- What are the general impacts of the COVID-19 crisis on mobility and its infrastructures?
- What are the prospects for land transport and public works operators and on what time scales?

These issues are addressed in the context of the 4 criteria below:

1. Impacts of the COVID crisis on mobility:
   - Comparison of mobility before and after the crisis
   - Evolution of the car fleet
   - Mobility perspectives and scenarios
   - Economic situation of transport actors

2. National Recovery strategy:
   - Presentation and analysis of the national recovery plan
   - Share devoted to transport, mobility and road infrastructure
   - Outlook for the construction and public works sector

3. Previous national and European strategies:
    - Existing transport and mobility policies before the COVID-19 crisis
    - Climate plans and long-term strategy before the COVID-19 crisis (European framework)

4. European recovery strategy
    - European recovery framework: Recovery and Resilience Facility (RRF), Multiannual Financial Framework (MFF)
    - Articulation of the national recovery plan with the European framework
    - Development of the national recovery and resilience plan

These are developed in an individual country sheet, in 11 countries:

<table>
<tr><td rowspan="5">EU countries
EU</td><td>Spain ES</td><td>Netherlands NL</td></tr>
<tr><td>France FR</td><td>Sweden SE</td></tr>
<tr><td>Italy IT</td><td>Poland PL</td></tr>
<tr><td>Germany DE</td><td>Czech Republic CZ</td></tr>
<tr><td>Belgium BE</td><td>Croatia HR</td></tr>
<tr><td colspan="3">+ United Kingdom UK</td></tr>
</table>

The countries were chosen to represent a balanced view of the European continent: geographical location, economic weight, presence in the European Union and impact of the Covid-19 crisis. Each country sheet is developed in **Part 2** through extensive research and exchanges with national experts and partners. It follows the following general outline:

- General economic context
- Mobility before the crisis
- Mobility after the crisis
- Mobility scenarios and prospects
- National and European recovery plans
- Pre-existing policies
- Prospects for the construction sector

The titles and the information provided may vary according to the research and elements discovered in each country. A comparative analysis of the country profiles is then proposed in order to identify elements for assessment in **Part 3**, in addition to proposed insights of the main impacts of COVID-19 outbreak on transport and the Recovery and Resilience Facility (RFF). Final conclusions and recommendations can be found at the end of the report.

Part II: Country profiles

Belgium

Economic context: Covid-19

While Belgium had a 1.7% growth rate in 2019, the European Commission[1] expects **a fall of 6.3% in 2020**. Belgium is in the EU average, where the GDP growth is expected to fall by 6.1%. A rebound is forecasted for 2021 (4.5%) and 2022 (3.7%). Economic activity has been severely impacted by the first lockdown period in spring where the economic activity felt by respectively 3.4% and 11.8 % during the first and second quarters and by 11.4% in the EU [2]**.** According to the Commission, "…E*conomic growth in Belgium is set to rebound in 2021 after a historic plunge in 2020 following the onset of the COVID-19 crisis. The easing of restrictions that is expected to follow as a large share of Belgians are vaccinated should allow private consumption to gradually recover. After rebounding in the second half of 2020, investment is forecast to continue growing in 2021, with the help of the Recovery and Resilience Facility*….".

1. Impact of Covid-19 on mobility

Mobility trends in Belgium (before Covid-19)

According to the 'Monitor' survey conducted by the Belgium Mobility and Transports Department[3] , Belgium modal share of transport can be drawn by **division of number of trips per transport mode (see Table 1)** and **division of distance travelled per transport mode (see Table 2)**.

Table 1 - Division of number of trips per transport mode[4]

Division of number of trips per transport mode (2017)	
Car as driver	45%
Car as passenger	16%
Train	4%
Bus/Metro/Tram	7%
Bicycle	12%
Walking	14%
Other	2%

Source : Service Public Fédéral Mobilité et Transports

Table 2 - Division of distance travelled per transport mode[5]

Division of distance travelled per transport mode (2017)	
Car as driver	55%
Car as passenger	19%
Train	12%
Bus/Metro/Tram	4%
Bicycle	5%
Walking	2%
Other	3%

[1] European Commission, "Spring 2021 European Economic Forecast", May 2021.
[2] Eurostat, News Release Euro Indicators 121/221, 31 July 2020.
[3] Service Public Fédéral Mobilité et Transports, « Enquête Monitor sur la mobilité des belges », December 2019.
[4] See note *iii.*
[5] See note *iii.*

Source : Service Public Fédéral Mobilité et Transports

Cars use still remains dominant by accounting 61% of trips and 74% of distance travelled. Cycling and walking are rising and represent 36% of trips, to 47% if public transport is added. Collective transport is not very used by Belgium people even if train represents longer distances than cycling or walking. The Belgium population very much relies on cars for a large majority of their trips. The report confirms it later, car use remains prominent and active modes of mobility are rising up to larger shares from 1999 to 2017. According to Dagmara Wrzesinska, transport engineer, the provision of company cars for a private use has been incentivized, which entails often zero cost incurred for the trips taken (gasoline and all maintenance cost are covered by the company). The report indicates transport modal shares as well per region in Belgium:

Figure 1 – Transport modal shares per region (2017)

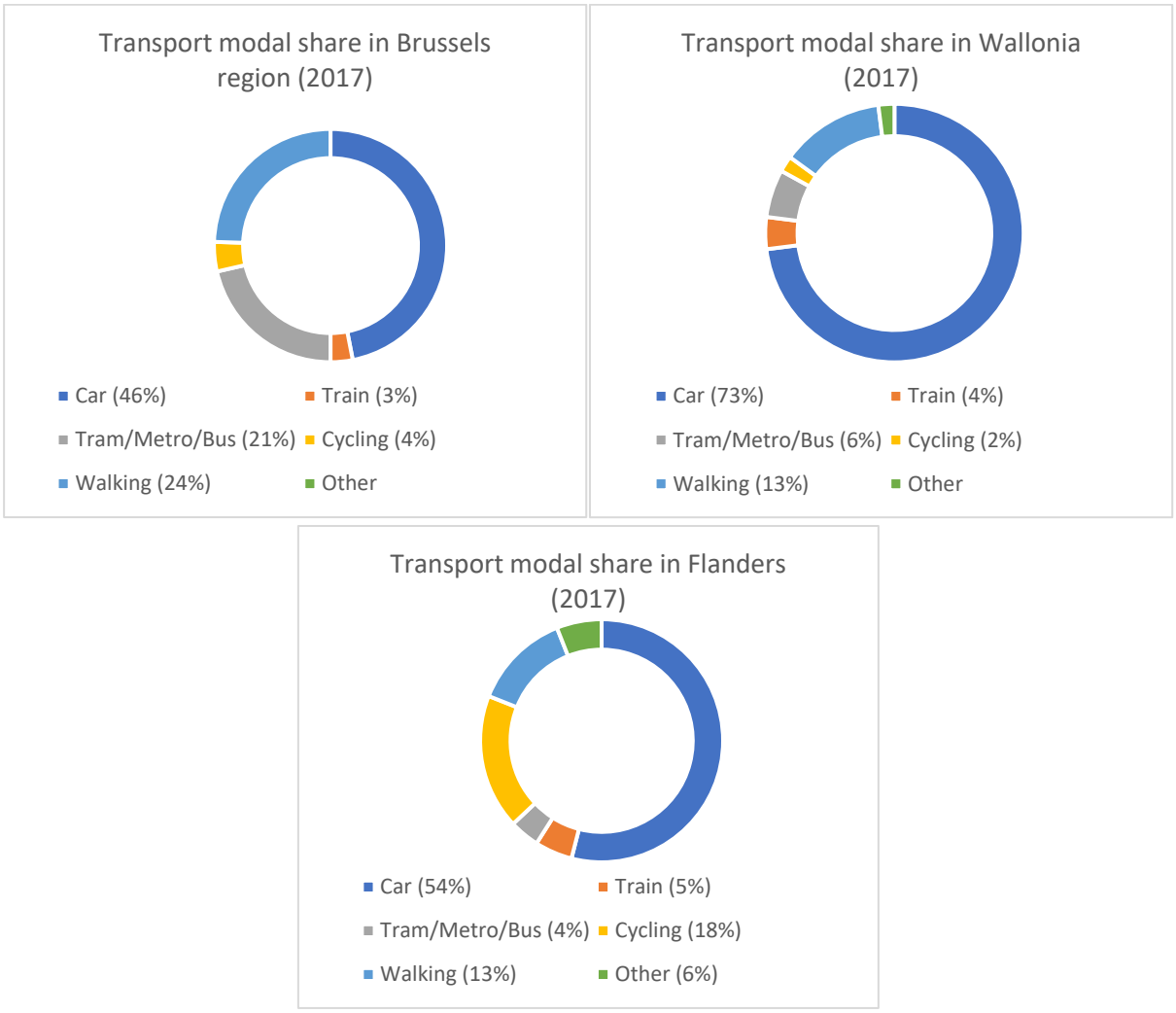


**Illustration of the figures made by the author of report*
Source: Service Public Fédéral Mobilité et Transports

Car use stays very high in Wallonia (73%) and above 50% in Flanders. The Brussels region is more characterised by an important use of public transport (21%) and walking habit (24%). Cycling is much higher in Flanders than other parts of the country (18%).

Looking now on freight transport, the National Statistics Belgium Institute STATBEL indicates that "*...in 2009, 298 million tonnes of goods were still transported by road. Over a period of 10*

years, both the tonnage transported (-4.7%) and the tonne-kilometres transported (-3.7%) have fallen…."[6].

The Institute explains it through "*…the decrease in transport for third parties (transport companies) between 2009 and 2019; own-account transport has slightly increased by 4 million tonnes during the same period.* ***Both domestic (-6.6%) and international (-13.5%) transport showed a downward trend during this period as far as transport for third parties is concerned****; the increase in own-account transport is due to an increase in the volume of goods transported within Belgium's borders (+6.8 million tonnes) …*".

Road infrastructure

In 2017, Belgium spent more than €650 million in its road infrastructure[7]. In 2016, its road network was 155.210km of which 1.763km of highways and 13.2295km of main roads.

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2019, the car fleet was 5.78 millions of passenger cars[8] and **549,632 passengers' cars were registered in 2018**[9]. In 2017, with 587 cars for 1.000 inhabitants, the Belgium motorisation rate (numbers of cars for 1.000 inhabitants) is below the average in the EU.

Alternative powered vehicles

In 2019, according to European Automobile Manufacturers Association[10]:

- Hybrid Electric Vehicles represented 0.3% of the Belgium car fleet,
- Electrically Chargeable Vehicles represented 1.0% and
- Alternative Fuels Vehicles 0.5 %

In total, alternatively powered passenger cars made up 1.8% of the total Belgium car fleet against 4.1% in the EU.

Cycling

As previously seen, cycling modal share represented 12% of trips made in 2017 and 5% of the travelled distance in Belgium. The modal shares differ from a Region to another, especially in Flanders, with a higher share (18%).

[6] Stabel, Transports routiers de marchandises, « Diminution du transport routier de marchandises pour compte de tiers en dix ans », 29 octobre 2020.
[7] Consortium (ERF, FIEC, Routes de France, FNTP, CICA), "New mobility and road infrastructure - International benchmark 2020", 08 September 2020.
[8] European Alternative Fuels Observatory, Belgium, 2020.
[9] European Automobile Manufacturers Association (ACEA), "The Automotive Industry Pocket Guide 2019-2020", 2020.
[10] European Automobile Manufacturers Association (ACEA), "Passenger car fleet by fuel type", 2018.

Mobility behaviours considering the COVID-19 pandemic

General data

A recent study conducted by the Belgium Mobility and Transport Departments shows the Belgium mobility evolutions in light with the COVID-19 pandemic[11].

*Table 3 - Changes in transport modes for travel to work or study**

	Before the pandemic	Lockdown period (18th March- 03rd May)	Deconfinement period	After the pandemic (prevision)	After the pandemic (intention)
Car as driver	53%	62%	60%	53%	52%
Car as passenger	2%	2%	2%	2%	3%
Motorcycle	1%	1%	2%	1%	2%
Car + Motorcycle	**56%**	**65%**	**64%**	**56%**	**55%**
Train + car/motorcycle + cycling	1%	1%	1%	1%	1%
Train + car/motorcycle + metro/bus/tram (MTB)	1%	0%	0%	1%	1%
Train + cycling + MTB	1%	1%	1%	1%	1%
Train + car/motorcycle	2%	0%	1%	2%	2%
Train + MTB	4%	1%	2%	3%	4%
Train + cycling	3%	1%	1%	3%	2%
Train only	2%	1%	1%	3%	3%
Train and combinations	**15%**	**6%**	**8%**	**15%**	**14%**
MTB + cycling	2%	0%	1%	1%	2%
MTB + car/motorcycle	1%	1%	1%	1%	0%
MTB only	7%	3%	5%	7%	5%
MTB and combinations	**10%**	**5%**	**6%**	**9%**	**7%**
Cycling	11%	13%	13%	12%	15%
Walking	5%	9%	7%	6%	6%
Other	2%	3%	2%	2%	2%

*Source: Service Public Fédéral Mobilité et Transports -*Table reproduced by the author*

[11] Service Public Fédéral Mobilité et Transports, « Enquête BMOB : Impact du COVID-19 sur les habitudes de mobilité des Belges », Juillet 2020.

Some highlights can be extracted:

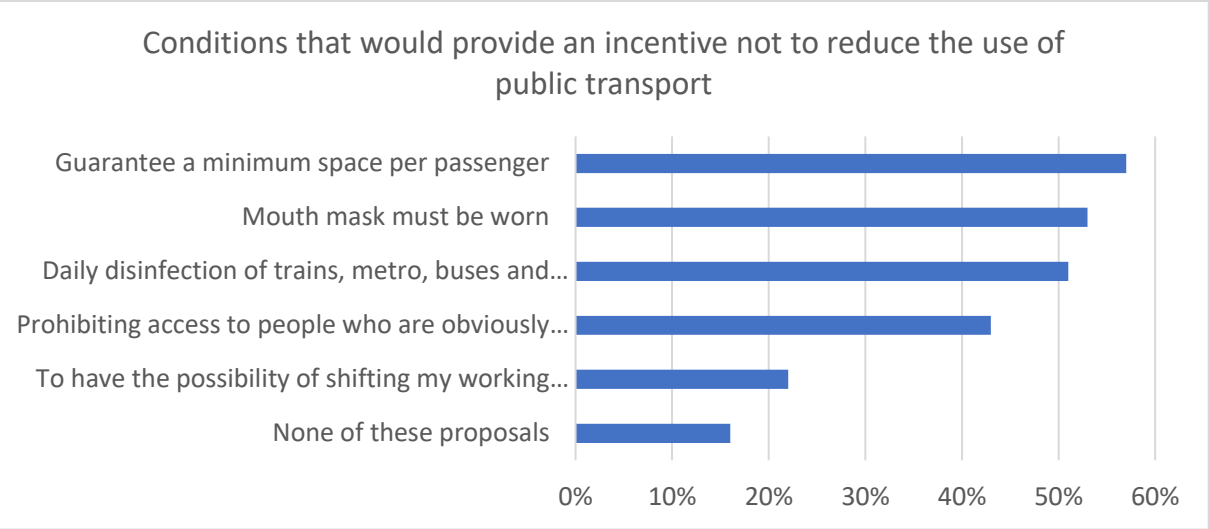
- **Car remains the #1 transport mode in all cases**, with no modal share evolution (52-53%) after the pandemic. According to Dagmara Wrzesinska, car will remain dominant in the modal split in terms of km travelled, but in terms of number of trips it is decreasing. This is mostly due to a large urban sprawl that induces long drives.
- All public transport expect MTB (3%) went down near 0% during the lockdown period and did not recover their before-crisis levels at the deconfinement period
- Train will see no modal share evolution (3%); similarly, transport intermodality with train will not see any changes after the pandemic
- Public transport (MTB) is supposed to lose modal share (from 7%=to 5% in intentions) after the pandemic. According to Dagmara Wrzesinska, the share of public transport in the modal split will be back to usual or close to usual after the pandemic. The slight drop may occur to the advantage of walking advantage of walking by choosing to walk instead of taking subway for 1-2 stops, but that will not play a major role in the distribution of km travelled.
- Cycling will continue to rise after the pandemic (12-15%)
- Walking was temporarily trendy during lockdown period and is expected to increase marginally (5-6%)
- **Mobility habits will not change that much in Belgium for going to work and study**
- Belgian people will use public transport a bit less for cycling and walking, indicating that individual mobility is preferred.

It can be added from Dagmara Wrzesinska that teleworking will remain substantial after the pandemic and will have an impact on transport demand in the coming years. In addition, some of the unnecessary trips will decrease, as well. Combined and multimodal transport will be the main target of transport policies, as well as providing alternatives to car. Reducing in a swift and organized way the share of private car is the very core challenge of Belgium mobility.

According to the respondents that indicated to have increased walking and cycling uses, **adapting the infrastructure is the best solution to avoid conflicts with motorized traffic (62%)** before avoiding pedestrians and cyclists' conflicts (42%). A large minority considers that increasing the available space for walking and cycling is a preferred assumption (52%).

For those who indicated their intention to less public transport use (MTB), they have been asked to choose among proposed measures that would make them continue to use public transport. Avoiding contacts as much as possible is the common ground for respondents looking at the preferred answers.

Figure 2 – Conditions that would provide an incentive not to reduce the use of public transport



Source: Service Public Fédéral Mobilité et Transports
**Table reproduced by the author*

Alternative fuel vehicles

Alternative fuel vehicles registrations knew some changes in 2020 in Belgium[12]:

- **Electrically Chargeable Vehicles** registrations went from 17.737 in 2019 to 46.337 in 2020 (+161%), following the EU dynamic (+169%)
- **Hybrid Electric Vehicles** registrations went from 17.242 in 2019 to 15.828 in 2020 (-8.2%), contrary to the European trend (+59.4%)
- **Other alternative fuels vehicles** registrations went from 3.618 in 2019 to 3.864 in 2020 (+6.7%), contrary to the European skim (-18.1%)

Alternative fuels vehicles were more registered in 2020 indeed than in 2019. According to the Belgium and Luxembourg Automobile and Cycle Federation[13], all alternative vehicles represented 15.3% of the new registrations in 2020 against 6.9% in 2019. The COVID-19 pandemic could be seen as an accelerator of this trend, considering the take-off of alternative vehicles registrations between the two years.

Table 4 – New car registrations by engine type (Belgium)

New passengers' cars registration per type of engine (%)					
	Petrol	Diesel	Hybrid	Electric	Other
2019	61.6	31.4	4.7	1.6	0.66
2020	51.8	33	10.9	3.5	0.9

Source: FEBIAC

The electrification and "greening" of the car fleet seem to be launched. However, the Belgium charging infrastructure deployment is lagging in Europe. According to FEBIAC[14], Belgium counted approximately **8.500 publicly available charging points**, of which less than 500 could

[12] European Automobile Manufacturers Association (ACEA), "Fuel types of new cars: electric 10.5%, hybrid 11.9%, petrol 47.5% market share full-year 2020", 04 February 2021.
[13] FEBIAC, « Analyse du marché automobile belge en 2020 », 08 January 2021.
[14] FEBIAC, « Alors que l'évolution vers la conduite électrique ne fait que débuter, le réseau belge d'infrastructures de recharge paraît déjà insuffisant », 05 March 2021.

be considered as fast charging points at the end of 2020. It represents 29 fast charging points per 100km on average.

In 2020, there were **224.538 publicly available charging points in the EU**, of which 25,288 are considered as fast charging points[15]. Belgium represented then **3.78% of the EU network**. The Belgium automobile sector called in March 2021 "*…the federal government and the 3 regions to take their responsibilities during this legislature to develop together a coherent plan with concrete targets for the deployment of an adequate network of publicly accessible semi-fast (11/22kW), fast (50kW) and ultra-fast (150kW) chargers throughout the territory, so that consumers can drive on electricity without fear…*".

Collective mobility

Collective mobility suffered from the COVID-19 pandemic. For sanitary reasons first, as collective means of transport such as **Belgium consider MTB, train and airplane as the more unsafe modes of transports** (15-25% as "very unsafe", approximately 25% as "rather unsafe")[16].

The more visible impact was noticed on the aviation sector. **The national company Brussels Airlines has been saved by the federal government and its mother-company Lufthansa with a €460 million plan in July 2020, approved by the European Commission**[17]. In August 2020, a €287 million loan and a €3 million injection in direct capital have been granted to the company. Brussels Airlines registered a €293 million loss in 2020 and a 72% drop in turnover[18].

The CEO of STIB, the public transport operator in the Brussels area, indicated that STIB would lose around €100 million in 2020[19], of which a large amount is due to the drop of tickets sales during the first lockdown period. Public authorities provided financial support to transport operators. The Walloon Region granted for example €37 million to the regional transport operator OTW[20].

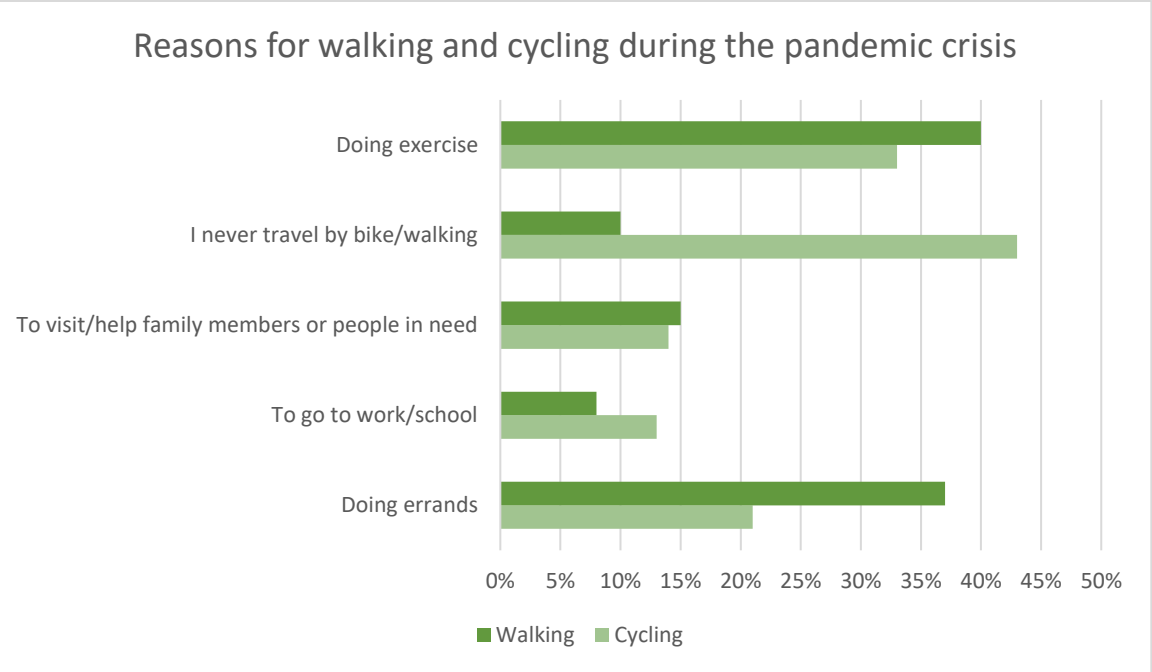
Cycling and walking

According to Table 3 below, Belgium people intend to increase their cycling practice to go to work or study (from 11% before the pandemic to 15% after the pandemic) even if previsions are less optimistic (12%). Walking and cycling are the modes of transport that respondents wish to increase the most according to BEMOB study (+40%).

As cycling and walking sharply increased during the pandemic period, the study asked participants to precise their motives to use these modes of transport.

[15] European Alternative Fuels Observatory, Belgium, 2020.
[16] See note *xi*.
[17] Trends-Tendances, « Le sauvetage de Brussels Airlines validé par la Commission européenne », August 24 2020.
[18] Brussels Airlines, « La pandémie de COVID-19 affecte fortement les résultats financiers de Brussels Airlines pour l'année 2020 ».
[19] Arthur Sente, Le Soir, « Brieuc De Meeus, CEO de la Stib: «Nous reviendrons à la fréquentation d'autrefois », 23 September 2020.
[20] RTBF, « Coronavirus : la Wallonie confirme le financement de 37 millions à son opérateur de transport public », 14 October 2020.

Figure 3 – Reasons for walking and cycling during the pandemic crisis.



Source: Service Public Fédéral Mobilité et Transports
**Table reproduced by the author*

On average, respondents stated to have increased their walking practice by 33% and by 22% for cycling. It must be noted that walking and cycling seem more popular for doing exercise and errands. More than 40% of the respondents never travel by bicycle.

On the infrastructure side, the European Cyclists Federation indicated in its COVID-19 Measures tracker[21] that the city of Brussels already implemented 26.5km of new cycling lanes and around the same number for traffic reduction. Dagmara Wrzesinska assumes that walking and cycling will be much more promoted for example in the Brussels area in light with the COVID-19 crisis, through the addition of new cycling infrastructure and a better urban planning and design favouring walking.

Road freight transport

Transport and logistics companies expect at short-term a flow of bankruptcies (8%) in the next six months and a 6% drop in turnover in 2022[22].

2. Belgium Recovery Plan: Focus on mobility issues

Recovery Plan on the European level

Belgium submitted its national Recovery and Resilience Plan on 30th April to the European Commission and will receive **€5.9 billion grants** from the Recovery and Resilience Facility that will be shared between the Regions and the Federal State. 65% of this amount will be engaged

[21] European Cyclists Federation, COVID-19 Measures tracker
[22] Banque Nationale de Belgique, « Les indépendants et les plus petites entreprises sont ceux qui continuent de souffrir le plus de la crise du coronavirus », 16 February 2021

by 2023[23]. According to the Ministry in charge "…***56% of the amounts allocated to the recovery concern infrastructure projects*** *such as the renovation of buildings including schools, the construction of new generation energy networks for CO2 capture and hydrogen transport, the renovation and construction of transport infrastructure (mainly cycling and railways) or digital infrastructure (5G, optical fibre) …*". The plan is composed of **6 main axes**, 17 components, 85 investments projects and 36 reforms:

1. Climate, sustainability and innovation
2. Digital transformation
3. Mobility
4. Social and cohesion
5. Future economy and productivity
6. Public expenditures and expenditure review

Each axel is subdivided in dedicated components and measures. The originality of the Belgian Plan holds with its political organisation. Each axel is composed of investments projects or measures which will be implemented and executed either by a Region (Wallonia, Flanders, Brussels-capital, German speaking community) or by the Federal State. The Belgium Plan is therefore a coordination between the regional governments and the Federal State considering that Regions detain extensive legislative and executive initiative in several policy areas, including transport and mobility. Each entity proposed its own recovery plan.

The third axel of the Belgium Plan deals directly with mobility with **a €1.292 billion budget**. The main goals regarding transport and mobility are the reduction of private and company car use by proposing alternative modes to users, mainly rail transport and cycling, and concentrate the modal shift efforts on road transport by greening vehicle fleets and deploying charging infrastructure.

It is divided in 3 components:

1. **"Pedestrian and cycling infrastructure", composed of 5 investments projects** - €410.7 million

   A large part of this component is used by Flanders with a €345.46 million "**Cycling infrastructure**" project which will build, repair and reinforce cycling infrastructure all over the Region in order to increase combined transport and the modal shift to active modes. Other projects held by Wallonia and the Brussels area follow this path, especially to complete a core cycling infrastructure network in and across the Brussels area.

2. **"Modal shift", composed of 11 investments projects and 2 reforms** - €672 million.

   This component comprises several investments projects targeting urban public transport and rail infrastructure mainly. The mains projects are **the extension of the**

[23] Thomas Dermine, Secrétaire d'État pour la Relance et les Investissements stratégiques, chargé de la Politique scientifique, adjoint au ministre de l'Economie et du Travail, « La Belgique envoie son plan de relance à la Commission européenne », April 30, 2021.

tram in Liège (€275 million), **metro extension in Charleroi** (€60 million) and **dedicated investments into the rail infrastructure network** (€275 million). The latter targets modernization and electrification investments as well as specific funding in the optimisation of rail freight strategic points (Gent, Antwerp).
Other investments projects are more clearly linked to **smart and connected mobility** such as intelligent traffic lights (€26 million) and the broader deployment of MaaS technology (€5.65 million).

Another interesting plan is the **SmartMove project (€51 million)** in the Brussels area. The SmartMove project includes the creation of a mobile MaaS application, allowing the insertion of a charge for the use of a motor vehicle. The main objective is to reduce congestion in the Brussels region and to encourage users to use alternative modes of transport. This project is announced to be operational in 2022 and **road pricing is the subject of consultation** between the competent authorities and stakeholders.

The Federal government intends also to introduce a reform of the "**mobility budget**" framework. **It specifically aims to strengthen the use of a mobility budget as an alternative to the use of company cars**. This project is part of the overall reform of car taxation which aims at several objectives, including the electrification of the company car fleet, the electrification of the whole fleet (including private cars) through tax incentives for the purchase and installation of charging stations, the development of a new car fleet and the introduction of a new car tax charging stations.

3. **"Greening the road transport", composed of 4 investments projects and 5 reforms** - €210 million.

   This third component insists on deploying greener company cars and appropriate charging infrastructure across Belgium, as well as replacing existing bus fleets in Flanders and Wallonia (€93million and €55 million). Charging infrastructure is clearly targeted both in reforms, incentivisation and funding projects in Flanders and at Federal level.

National Energy and Climate Plan (NECP)

According to EU Regulation, the Member States had to submit to the European Commission a national energy and climate plans (NECPs)[24] by the end of 2019, defining a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030. The European Commission issued recommendations to amend the NECP for 2020. In October 2020, it released a final assessment of each NECP. This assessment considers the European Semester objectives and the Recovery and Resilience Facility (RFF) criterion in the context of the COVID-19 outbreak.

National Long-Term Strategy

All Parties of the Paris Agreement must communicate by 2020 their long-term vision to consistently reduce their greenhouse emissions and to meet the Paris Agreement objectives.

[24] European Commission, National Energy and Climate Plans (NECPs).

The European Union included this obligation in a Regulation[25] in 2018. Then, each Member States must prepare a long-term strategy[26] for and at each decade. Transport and mobility are of course included. These strategies shall be coherent with the NECPs.

Belgium adopted its National Long-Term Strategy on 19th February 2020. As the country is a federal country, the 3 Regions (Wallonia, Flanders, Brussels) have large competencies and adopted their own long-term strategy. All the Regions intend to reduce transport emissions to zero and agree on these common elements[27]:

- Focus on "*managing and rationalizing transport demand with an emphasis on digitalisation demand, efficient spatial planning and a circular economy with shorter economy with shorter local value chains, thus reducing the need for freight transport*".
- "*Emphasise the importance of modal shift as a cornerstone for achieving the climate ambitions*" and "*aims to limit the share of the private car in the modal split in favour of modal split, in favour of alternative modes of transport such as active transport (walking and cycling), light electric vehicles (electric bikes, speedelecs, electric scooters, etc.) and shared transport mode (public transport and shared vehicles). To this end, they focus on a quality offer of alternative modes, adequate infrastructure and the promotion of combined mobility*".
- "*As far as freight transport is concerned, the Walloon and Flemish strategies both aim at a shift from road to rail and waterways*".

3. Existing mobility strategies

The Walloon[28] and Brussels[29] Regions have both published mobility plans in 2019 setting out several objectives. The Flemish Region has also proposed new concepts for mobility and transport All the approaches proposed in the three regions are in line with the same policies to various degrees: promotion of walking, cycling and public transport to the detriment of private vehicles, spatial reorganisation in favour of soft and active mobility, and reduction of the environmental impact of the transport sector.

Forecasts on the construction sector

Robert de Mûelenaere, Managing Director of the Belgium Construction Confederation, gave its insight in an interview in March 2021[30]. The construction sector has been hit by the pandemic (-3.8% in 2020) but get through the crisis (-6.2% for the national economy).

Past year was a difficult one for the construction industry. According to Mr. de Mûelenaere, "…60% of the players did not fill their order books as expected because of the crisis. Before the crisis, we had reached an all-time high with 6.1 months of orders. Now we are down to 5.7 months. 17% say that the order book is significantly less full to almost empty. These figures

[25] Official Journal of the European Union, REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, 22 December 2018.
[26] European Commission, National long-term strategies.
[27] European Commission, National long-term strategies, Belgium. .
[28] Région Wallonie, « Déclaration de Politique Wallonne 2019-2024 ».
[29] Brussels Regional Public Service, « Good Move : Le plan régional de mobilité 2020-2030 ».
[30] La Libre Eco, « Quels sont les effets du Covid-19 sur la construction ? », 09 March 2021.

are not insignificant, especially since 39% have liquidity problems (compared to 33% for the overall economy) …".

However, he remains confident for 2021 "…*If the planned public works are actually carried out, we expect an increase of +4.8% in 2021 against 5 to 6% for the overall economy*…". Moreover, important transformations are expected for the sector: "*Our companies now have digital tools to help them prepare their projects (first and foremost, BIM, a sharing tool that allows them to work in 3D by integrating the various players) …*".

DATA BOARD BELGIUM

General Data

Political organisation: Constitutional monarchy and parliamentary regime	**Head of government**: Alexander De Croo
Population (2020): 11.47 million	**Urban population** (2019): 98.04%

Economic indicators

GDP ranking (2019): 24/203	**GDP** (2019): 529.607 million USD
GDP growth (2019): 1.7%	**Expected GDP growth** (2020): 8.4%

Environmental indicators

Share in global CO_2 emissions (2018): less than 1%

Total CO_2 emissions (2018): 90.6MT

CO_2 emissions per capita (2019): 7.9T

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 81.6%
- Train: 8.1 %
- Bus and trolleys: 10.3%

Modal share of freight transport (2018):

- Roads: 72.1%
- Inland waterways: 16.2%
- Railways: 11.7%

Construction sector

Construction sector GDP share (2018): 6%

Jobs in the construction sector (2019): 286.000

Businesses in the construction sector (2019): 114.000

Investment in construction -civil engineering (2019): €6.5 billion

Tables & Figures

Abbreviations

FEBIAC: Belgium and Luxembourg Automobile and Cycle Federation

Croatia

Economic context: Covid-19

Prior to the Covid-19, Croatian GDP growth was accelerating, with a growth rate of 2.9% in 2019 (after a slight slowdown from 2017 to 2018). Unemployment was low, registering at 6.1% in January 2020. At the end of 2019, the Government budget ran a surplus of 0.9% GDP. **Croatia's economy strongly relies on the tourism sector, which represents around 20% of GDP**[31].

Because of economic slowdown and expansive fiscal measures aimed at mitigating the impact of the pandemic, the fall in GDP is estimated at 8% in 2020 according to the European Commission[32]. The public debt is projected to reach 87.3% of GDP in 2020, marking an increase from 72.8% in 2019[33]. According to the European Commission, the Croatian real GDP is expected to rebound by 5% in 2021 and 6.1% in 2022.

1. Impact of Covid-19 on mobility

Mobility behaviour in Croatia (before Covid-19)

According to demographic indicators, the growing population aging trend is reflected in the mobility needs of the population. A decline in the working population has been registered, expressed by a smaller number of trips to and from the workplace, while the number of trips related to recreation, entertainment and health have been increasing.

Mobility challenges identified

The traffic volumes along the main touristic routes usually double during the tourist season compared with the off-season period. In main touristic areas, it would thus be necessary to plan a completely different transport system for the summer season, with season-specific solutions.

Analysis of the existing bus services shows a lack of availability outside the agglomerations. Road design for public transport outside the agglomerations is not satisfactory. Public transport mainly takes place in areas of large cities like Zagreb, Rijeka, Osijek, Split and their agglomerations. In some areas of the Republic of Croatia public transport has almost disappeared, resulting in a negative impact on the population density.

A better integration of the transport modes would allow to optimise the efficiency and environmental and climate impact of the transport system. The use of integrated IT systems between rail and road as well as other modes (maritime along the coast lines) is lagging behind comparable countries. The idea of developing park and ride facilities along the railway lines as well as the establishment of passenger transport hubs (regional buses, rail, public transport system) is not strongly developed in Croatia. The ITS system on the motorway network is well developed, however the integration into the local and regional ITS system is lagging behind.

[31] OECD 2020: The Covid-19 crisis in Croatia – 20 April 2020. In: OECD 2020.
[32] European Commission, "Spring 2021 European Economic Forecast", May 2021.
[33] OECD 2020: The Covid-19 crisis in Croatia – 30 November 2020. In: OECD 2020.

Modal split within Croatia

In real terms, the number of passengers in all public transport modes was increasing from 2014-2017. However, **the modal split has increased in favour of private traffic during the recent years since the increase of the latter is much bigger than in public transport**. This trend is due to higher availability of personal cars and public transport systems that are not sufficiently integrated. Poor infrastructure of certain public transport systems also explains the increasing use of private traffic modes.

Passenger cars

The number of cars per 1,000 inhabitants has been increasing for the past several years. The number increased from 160 cars per 1,000 inhabitants in 1991 to over 275 cars per 1,000 inhabitants in 2001, up to 360 cars in 2008. As of 2008, there has been a slight decrease in the motorisation rate as a result of the global economic crisis, and in 2015 there was a total of 381 cars per 1,000 inhabitants. In general, the motorisation rate has registered an important growth due to the increase of the purchasing power and the change in lifestyles of the population (e.g. tendency to move to the suburban areas of the main cities), which is linked to an increase in the daily mobility needs of the population.

Public transport

The number of passengers in public transport using buses and trams has increased since 2012. Regarding urban and suburban public transport, which includes buses and trams, the number of passengers transported in 2007 lied approximately around 426 million. From 2008 to 2012 the number of users decreased to approximately 363 million passengers per year; in the period from 2012 to 2015 the number of passengers increased again to approximately 398 million passengers in 2015. Generally, **the decrease in the use of public transport is linked to the increase of the motorisation rate** in the country. Though the overall figures for Croatia show an increase of the total number of passengers in urban and suburban public transports, the increase is largely due to biggest agglomerations of Zagreb and Northwest Croatia, while most of the other continental regions see a decrease of number of passengers carried in public transport systems. The decrease in these regions is mainly related to depopulation and a decrease in job offerings.

Rail

The number of passengers using railways was falling constantly from 2009 when it reached the maximum (approximately 74 million passengers compared to 2015 with approximately 22 million passengers per year). Such a sharp decline is however due to changes in the methodology of assessing the numbers of passengers carried.

Cycling

Travel behaviour research that was conducted within the National Traffic Modell (NTM) project shows that **around 5% of all trips is made by bikes**, this is especially true in the cities of Koprivnica, Varaždin and Osijek. Zagreb was positioned on the 6th place among all EU capitals accounting for 10.1% of cycling modal share in 2012. A comparison with other EU cities led to a conclusion that a better integration of the bike system in public transport and the improvement of infrastructure would offer a big potential for improving the modal split in favour of bikes[34].

[34] Ministry of the Sea, Transport and Infrastructure 2017: Transport Development Strategy of the Republic of Croatia (2017-2030).

Modal split in comparison to EU27 (before Covid-19)

When comparing the share in passenger kilometre in 2017, the **share in passenger cars in Croatia lies slightly above 80%**. Public transport passenger share (including motor coaches, buses and trolley buses) lies slightly above 10% and rail passenger share reaches nearly 5%[35].

Focus on rail

Although rail passenger transport performance (in passenger-kilometres) at EU level recorded an increase in 2019 compared with 2018, Croatia is one of the three member states that showed a decrease of -3.1 %. All EU Member states reported increases in passenger transport (in number of passengers) between 2018 and 2019, except for Croatia (-2.1 %)[36].

Focus on freight

Croatia registered increases in all transport types (+6.8 %). It also recorded very strong growth for cabotage (more than 14 %)[37].

Mobility behaviour in light of the Covid-19 pandemic and the first lockdown

On 22 March 2020, the Croatian government introduced a partial lockdown of the population. On 24 March, it introduced a ban on travel between cities. Teleworking was encouraged for all businesses where possible. As of 20 April, restrictions on movement inside individual counties have been lifted for most counties.

Passenger transport

In the third quarter of 2020, almost 13.6 million passengers were transported, which was a **decrease of 42.2% compared to the third quarter of 2019**. A decrease is also noticeable in the road line transport of passengers by coaches, of 49.5%.

Compared to the second quarter of 2020, passenger transport shows a recovery in the third quarter, when an increase of 119.3% was recorded. The increase was present in all modes of transport: railway, of 83.3%, road, of 76.4%, seawater and coastal, of 252.6%, and air transport, of 275.5%.

In the period from January to September 2020, the total number of passengers transported amounted to 36.3 million, which was 43.6% less than in the same period of 2019. The decrease in the transport of passengers was realised in railway transport, of 33.3%, in road line transport, of 46.9%, in seawater and coastal transport, of 42.8%, and in air transport, of 67.5%.

Rail

In the railway transport, according to provisional data, 25% less passengers were transported.

Freight

In the third quarter of 2020, an increase was recorded in goods transport. A total of 32.1 million tonnes of goods were transported, which is an increase of 0.1% compared to the third quarter of 2019. This was mainly due to the transport of goods on inland waterways by ships.

[35] Eurostat: Passenger transport statistics. Accessed: December 11, 2020.
[36] Eurostat: Railway passenger transport statistics - quarterly and annual data. Accessed: December 11, 2020.
[37] Eurostat: Road freight transport statistics. Accessed: December 11, 2020.

The transport of goods by freight vehicles with Croatian plates decreased by 1.2%, and the decrease was also present in the railway transport, of 0.8%[38].

In the period from January to September 2020, the total quantity of transported goods decreased of 2.1% compared to the same period in 2019. The decrease was realised in road transport, of 3.6%, in seawater and coastal transport, of 8.4%, and in air transport, of 26.8%. An increase in the transport of goods was realised in railway transport, of 3.2%, in inland waterway transport, of 10.8%, and in pipeline transport, of 18.7%.

Second & third lockdown and lifting of restrictions (in progress)

Measures have been relaxed in three turns - on April 27, May 4 and May 11, 2020[39]. In May 2020 the country had one of the most favourable epidemiological situations in Europe and in the world[40]. Although the situation was deemed to be under control in early June, the epidemiological circumstances in Croatia has been progressively worsening. As of November 25, the Government confirmed there will be a new set of restrictions from November 26 which will be similar to a lockdown, however in a milder form than one which was declared in March.

Impact of Covid-19 on (road) construction and road infrastructure

Covid-19 had a relatively little impact on construction activities as such. According to working-day adjusted indices, in September 2020, as compared to September 2019, **the volume of construction works increased by 5%**. After three consecutive months of decrease in the volume of construction works (March, April and May 2020) due to the Covid-19 pandemic, an increase was recorded in the field of construction in the following four consecutive months[41].

It has also been recorded, that the quarterly Gross Value Added (GVA) increased in real terms by 1 % in the first quarter of 2020, as compared to the same quarter of 2019. It is estimated that the largest contribution to the quarterly GVA growth in the first quarter of 2020 was achieved in construction[42].

It was argued by the Transport and Infrastructure Minister that the financing of large-scale infrastructure projects based on European Union funds before the Covid-19 crisis would not be subject to delays in their implementation. It has also been stated by the Ministry that the transport, alongside tourism is hit hardest by the corona crisis, citing the situation in companies including Croatia Airlines, Jadrolinija and the Hrvatske Autoceste motorway operator[43].

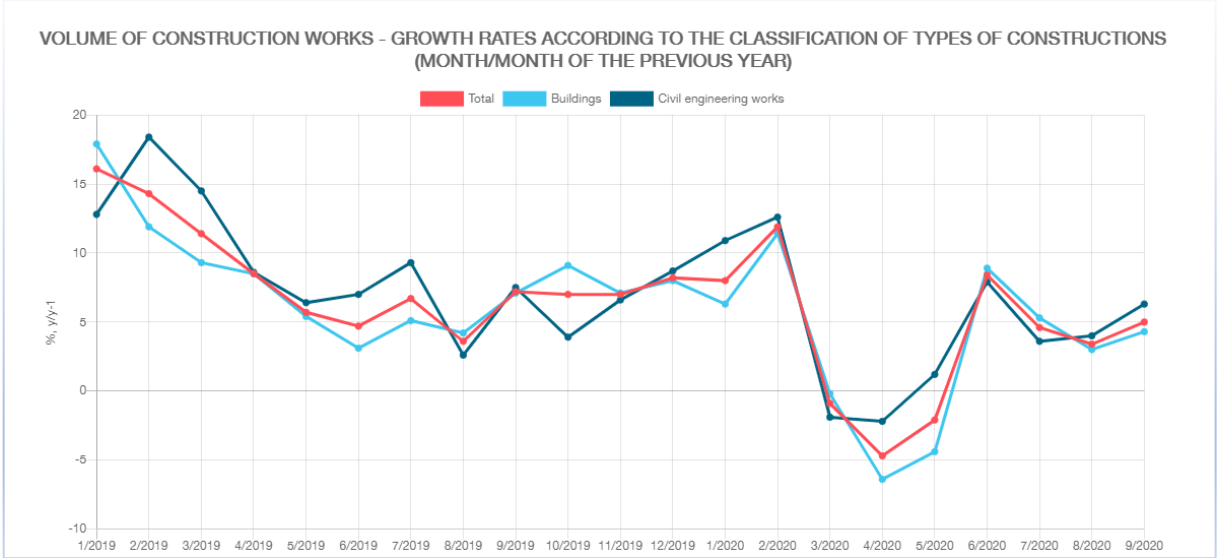
Before Covid-19, the Croatian Government expected large wave of investments in transport infrastructure. According to the State Secretary for infrastructure at the Ministry of the Sea, Transport and Infrastructure, large investment projects regarding railway, road and airport infrastructure were planned. Planned road infrastructure projects include for example the

[38] Croatian Bureau of Statistics 2020: Transport Third Quarter of 2020. Accessed: December 8, 2020.
[39] Government of the Republic of Croatia 2020: COVID-19 restrictions to be relaxed in three turns as of April 27. Accessed: December 10, 2020.
[40] Government of the Republic of Croatia 2020: We have one of the most favorable epidemiological situations in Europe and in the world. Accessed: December 10, 2020.
[41] Croatian Bureau of Statistics 2020: Effects of the COVID-19 pandemic on socioeconomic indicators. Accessed: December 8, 2020.
[42] Croatian Bureau of Statistics 2020: First quarterly Gross Domestic Product Estimate. Accessed: December 8, 2020.
[43] Government of the Republic of Croatia 2020: Corona crisis won't halt major infrastructure projects, says minister. Accessed: December 10, 2020.

€160 million Bina Istra project to upgrade the motorway network in Istria County, including the reconstruction of the Ucka tunnel, a road from Krapina to the Slovenian border, and the construction of an express road from Solin to Split to Omis in southern Croatia, a project worth €300 million. One of the largest projects planned is the construction of a lowland railway from the northern Adriatic city of Rijeka to the Hungarian border. The deputy director for EU funds of the HZ Infrastruktura railway company said that the company planned investment projects of HRK 9.3 billion (€1.26 billion), of which 60% would be provided by the EU[44][45].

In the context of the Covid-19 pandemic, the Croatian government wants to focus on infrastructure investments: it should invest HRK 45 billion (€6 billion) in the transport sector by 2027, including HRK 22 billion (€3 billion) in railroads, HRK 15 billion (€2 billion) in roads, HRK 3 billion in ports (€96 million) and HRK 5 billion in other investments. The most important projects will be completed in this period. The most important of these is the Pelješac Bridge, which will connect the northern coast of the Pelješac peninsula to the mainland in 2022.

Volume of Construction works (Buildings and Civil engineering works)



* NOTICE: provisional data since January 2020

2. Croatian Recovery Plan

Croatian Covid-19 relief package – National level

On March 17, 2020, the Government announced measures of a combined worth of over HRK 30 billion (around €3.9 billion) to support the economy in coping with the effects of the pandemic, including interventional procurement of critically important sanitary equipment, authorised delays in tax payments, purchasing of surpluses of potentially threatened

[44] Ministry of the Sea, Transport and Infrastructure 2019: Croatia expects large wave of investment in transport infrastructure. Accessed: December 9, 2020.

[45] It can be noted that, in the case of the Pelješac Bridge, one of the largest road infrastructure projects in Croatia, the construction project was made by a Chinese company under EU funding.

businesses, measures to support the tourism industry and aid for preserving jobs in affected sectors.

According to the Ministry of Finance, by the end of September, HRK 6.9 billion (around €913 million) had been invested to support businesses and employment, of which HRK 5.4 billion (€714 million) came from the state budget. An additional HRK 1.2 billion (€159 million) were invested by the end of the year 2020, amounting to a total expenditure of HRK 8.1 billion (€1 billion), out of which HRK 2.6 billion (€330 million) will have come from EU funds (React EU and ESF). Additional implemented measures for Covid-19 impact mitigation include HRK 1.2 billion in grants and expenses and HRK 4.8 billion (€635 million) in provided loans.

End of November, amid the enforcement of a second lockdown, a new aid package for businesses that have been ordered to shut down as part of efforts to curb the spread of the coronavirus epidemic amounted HRK 2.1 billion and included support for wages and for covering fixed costs[46].

It is expected that the figure will go up to 28.5 billion kunas (€4 billion) by the end of 2020[47].

National Recovery and Resilience Plan (NRRP) - European level

On April 23, 2021, the parliament adopted the shortened version of the National Recovery and Resilience Plan (NRRP) (76 votes out of 151). The NRRP presented on April 1 by the government defines 6 main pillars and 22 subcomponents: support to the economy (54% of the total); public sector and judiciary (10%); education, science and research (15%); social protection and labour market (4%); health (9%); reconstruction of buildings (12%). For the time being, Croatia will benefit from 6.3 billion euros of grants under NextGeneration EU (12% of GDP) and 3.6 billion in potential loans. It is to be noted that opposition MPs criticised the government for not giving them the full document.

According to EU Economy Commissioner, Paolo Gentiloni, Croatia will be one of the biggest recipients of EU recovery aid. Croatia has secured a total of €22 billion through the recovery fund (€9.4 billion) and the long-term budget (€12.7 billion). Besides, as Croatia is the only EU country to have used only one financial package in its EU membership, €400 million has also been allocated for cohesion and regional development[48].

Croatia would receive from the React EU fund €210 million this year and €330 million the next year for job retention measures. When it comes to the Recovery and Resilience Facility, the finance minister confirmed that 10% of €6.3 billion in grants would go towards strengthening the government's capacity to help the economy, underlining those reforms would be key for absorbing the money[49].

EU funds available 2021-2027: commitments (MFF and NGEU) in current prices unless stated[50]

[46] Government of the Republic of Croatia 2020: HRK 2.1bn aid package for private sector. Accessed: December 10, 2020.
[47] Trkanjec, Zeljko 2020: Croatia's coalition partners support 2020 budget revision, 2021 budget. Accessed: December 10, 2020.
[48] Trubić Macan, Tea 2020: ZAGREB – €22 billion for Croatia. In: Euractiv. Accessed: December 10, 2020.
[49] Trkanjec, Zeljko 2020: Croatia's coalition partners support 2020 budget revision, 2021 budget. Accessed: December 10, 2020.
[50] European Commission 2020: Summary of swd assessment NECP: Croatia.

Please note that the prices stated below represent 2020 prices which have been subject to minor changes.

Structural Funds	Common Agricultural Policy	Recovery & Resilience Facility	Just Transition Fund	Modernisation Fund	ETS auction revenue
EUR 8.7 bn	EUR 4.7 bn	EUR 6.0 bn*	EUR 0.2 bn*	EUR 0.2 bn**	EUR 0.1 bn ***

**in 2018 prices; **assuming a carbon price of EUR 20 per tonne; ***average of 2018 and 2019 actual auction revenues, amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.*

Prime Minister Plenković said that the implementation of the plan would achieve the European target share of renewable energy in energy consumption (for Croatia, the target is 36.6%) and reach the European target of at least 14% renewable energy in the transport sector until 2026. Investments in water management are also planned to make drinking water available to about 93% of the population. The plan also calls for improved broadband coverage, fast internet access for citizens and the business sector. Post-earthquake reconstruction accounts for 12% of the funds expected under the recovery and resilience plan.

Focus on mobility and infrastructure

The government wants to focus on infrastructure investments under the NRRP[51]: **it will invest HRK 45 billion (€6 billion) in the transport sector by 2027, including HRK 22 billion (€3 billion) in railroads, HRK 15 billion (€2 billion) in roads, HRK 3 billion in ports (€396 million) and HRK 5 billion in other investments**. The most important projects will be completed in this period. Prospects for the reconstruction of Zagreb and its surroundings after the earthquake of March 22, 2020, will cost HRK 42 billion (€5.6 billion) and will require 100,000 workers per year. It is also expected that longer-term investment projects will gradually resume, especially with the help of EU funding.

The Croatian Employers' Association (CEA) has suggested measures and recommendations for the Croatian national recovery plan in its work programme 2020 on July 2020. In addition to the proposed programme, in September 2020, CEA announced additional measures and reforms, dividing them into short-term ('corona') measures and longer-term (strategic) reforms. Among the long-term recommendations, the following can be linked, directly and indirectly, to mobility and infrastructure issues:

- Reduce administrative barriers to building mobile and fixed broadband networks.
- Accelerate the development of the 5G network.
- Include the ICT sector as a vertical industry in the new S3 strategy.
- Project continuation in energy sector to achieve climate targets: R&D and innovations in new technologies (hydrogen, CCS, RES), building alternative fuels infrastructure and advanced biofuels aligned with NECP.
- Better use of the principle of Most Economically Advantageous Tender in procurement and funding programme: value-based public procurement.

[51] Croatia Week 2020: Construction of second tube of Učka Tunnel starts. December 18, 2020. In : Croatia Week. Accessed: May 12, 2021.

- Energy renovation in building sector and supporting electro-mobility[52].

It is to be noted that the construction sector is included in the draft recovery plan, but especially with regards to the Renovation Wave Initiative. The energy renovation wave of buildings should be increased to at least 2% per year by 2026 and 3% per year from 2030. According to Croatian Government representatives, the priority has to be recovery from recent earthquake damage, thus renovation plans would have to be more focused on aiding economic recovery than reducing emissions and saving energy[53].

3. Existing mobility strategies

Transport Strategy of the Republic of Croatia (2014-2030)

In accordance with the methodology of the European Commission, the development of the Transport Strategy of the Republic of Croatia took place in three phases:

- The first phase was the preparation of the **Transport Development Strategy** for the period 2014-2030. Its adoption by the Government enabled the conditional use of EU funds from the Operational Program "Competitiveness and Cohesion".
- The second phase was the development of the **National Traffic Model** which was completed in June 2016. The reference year for the analysis of the existing traffic sector situation in the National Traffic Model was 2013 (the year Croatia became a member state of the EU).
- The third phase of the development of the Transport Strategy includes the **harmonisation of the National Traffic Model**.

The result of this approach was the development of sectoral strategies for rail, road, air transport, maritime and inland navigation (prepared in June 2013). The process of merging sectoral strategies into a unified national transport development strategy began in August 2013, considering the functional regional and sectoral approach. The functional regional approach implies the division of Croatia into functional regions based on the demand for traffic and the real interactions of mobility, regardless of the boundaries of counties or state borders, as they can also overlap.

Spatial Development Strategy (2017)

This strategy was the starting point for spatial planning, i.e. the development of master plans for functional regions and "*new generation*" spatial plans. Spatial plans are to be adopted on national, regional and local level. The Spatial Development Strategy also has set up the national policy framework for the establishment of infrastructure and the development of alternative fuels markets.

[52] CEA 2020: Croatia's national recovery plan (as proposed by CEA). In: CEA.
[53] Hayes, Mike 2020: Construction is key to recovery, says 2050 Alliance. In: KHL. Accessed: December 15, 2020.

The national policy framework for the establishment of infrastructure and the development of alternative fuels markets (adopted in April 2017)

The national policy framework for the establishment of infrastructure and the development of alternative fuels markets has defined the main objective of establishing infrastructure for alternative fuels for the development of a sustainable transport system, with minimal negative environmental and social impacts, and ensuring interoperability with neighbouring countries and member states of the European Union. It was adopted in 2017 based on the Act on Establishment of Alternative Fuels Infrastructure and the Directive no. 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure.

Rulebooks relating to cycling infrastructure

Croatia has adopted two rulebooks. The first one to determine a network of bicycle routes and the second one on cycling infrastructure. They should enable the development of the cycling infrastructure on the State, county and local levels and represent the basis for a detailed design of cycling infrastructure. Croatia has not yet adopted a National Cycling Strategy[54].

Sustainable Urban Mobility Plans in Croatia

Prior mobility strategies and policies can also be addressed in the context of the EU's 2013 Urban Mobility Package which has set out a concept for Sustainable Urban Mobility Plans (SUMPs) that provide guidelines for a modern and sustainable urban mobility and transport plan.

Sustainable Urban Mobility Plans in Croatia are not legally defined, there are no national guidelines for their preparation, and they are not connected to national funding sources. Although objectives of sustainability and political support for SUMPs exist, public participation and technical possibilities for the preparation of SUMPs are limited.

A 2014 public consultation by the Faculty of Transport and Traffic Sciences (FTTS) on SUMPs in Croatia indicated a lack of coordination between local, county and national levels. Half of the respondents thought that there was no integrated planning of urban mobility in their local community.

Through the project Adria.MOVE IT! (2007-2013) SUMPs were prepared for the cities of Dubrovnik, Umag and Novigrad. The city of Koprivnica developed a SUMP in 2015 within the CIVITAS Dyn@mo project (2012-2016), and through the CH4LLENGE project (2013-2016). The city of Zagreb plans to take a new innovative, participative step in sustainable urban mobility planning.

In order to modernise part of the bus fleet under the framework of the transport system, city of Sisak with financial support of European Bank for Reconstruction and Development (EBRD) is developing a SUMP to ensure best-practice urban transport planning (2016)[55].

[54] Ministry of the Sea, Transport and Infrastructure 2017: Transport Development Strategy of the Republic of Croatia (2017-2030).

[55] Eltis 2018: The Urban Mobility Observatory – Croatia. Accessed: December 10, 2020.

Croatia's National Energy and Climate Plan (2020) as reviewed by the EU Commission

Croatia's final National Energy and Climate Plan (NECP) can be linked as follows to upcoming mobility issues: the 2030 target for GHG emissions not covered by the EU Emissions Trading System (non-ETS) should be 7% below 2005 levels. Croatia expects to overshoot this target already with a continuation of current policies and achieve an 18.5% emissions reduction with planned policies.

Croatia's investments will focus on renovation and electricity generation needs for the period 2021-2030 and these are estimated at €19 billion. They focus mainly on building renovation and electricity generation[56].

Based on Croatia's final NECP, and the investment and reform priorities identified for Croatia in the European Semester, the Commission services invite Croatia to consider, while developing its national recovery and resilience plan, the following climate and energy-related investment and reform measures:

- Measures supporting investments in renewables, in particular through a stable legislative framework including a functioning and competitive electricity market.
- Measures to support sustainable transport including through reforms to develop sustainable urban and inter-urban mobility and investments to promote a modal shift from road to rail.
- Measures supporting investments in energy efficiency, in particular building renovation with focus on schools, hospitals and social housing, targeting households at risk of energy poverty.

Key take-aways

- Croatia will be one of the biggest recipients of EU recovery aid.

[56] Spasić, Vladimir 2020: Croatia's NECP: Renewables share to reach 36.4% by 2030. In: Balkan Green Energy News. Accessed: December 10, 2020.

Abbreviations

CEA: Croatian Employers' Association

EBRD: European Bank for Reconstruction and Development

FTTS: Faculty of Transport and Traffic Sciences

GDP: Gross Domestic Product

GVA: Gross Value Added

IMF: International Monetary Fund

ITS: Intelligent Transport Systems

NECP: National Energy and Climate Plan

NRRP: National Recovery and Resilience Plan

NTM: National Traffic Modell

SUMPs: Sustainable Urban Mobility Plans

- The construction sector is included in the NRRF, but especially with regards to the Renovation Wave Initiative (which became even more accurate in the context of the post-earthquake reconstruction).
- The financing of large-scale infrastructure projects based on European Union funds before the Covid-19 crisis should be continued. It has also been stated by the Ministry that the transport, alongside tourism is hit hardest by the corona crisis. Investments in transport infrastructure, with a focus on rail, are planned under the NRRP.

DATA BOARD CROATIA

General Data

Political organisation: Unitary parliamentary constitutional republic	**Head of government**: Andrej Plenković
Population (2019): 4.065 million	Urban population (2019): 57%

Economic indicators

GDP ranking (2019): 79/203	GDP (2019): 60,753 million of US dollards
GDP growth (2020):	**Expected GDP growth** (2021):

Environmental indicators

Share in world's CO_2 emissions (2016): 0.05%

Fossil CO_2 emissions (2016): 19,408,194 tons (increase by 3.02% over the previous year)

CO_2 emissions per capita (2016): 4.61

Transport & Mobility sector

Modal share of passenger transport **(2018):**

- **Private car:** 84.8%
- **Train:** 2.5%
- **Motor coaches, bus and trolleys:** 12.7%

Modal share of freight transport **(2019):**

- **Roads:** 70.7%
- **Railways, inland waterways:** 29.3%

Construction sector

Construction sector GDP share (2019): /

Jobs in the construction sector (2019): /

Businesses in the construction sector (2019): /

Investment in construction -civil engineering- (2019): /

Czech Republic

Economic context: Covid-19

According to the European Commission forecast from May 2021, **GDP is expected to decrease by 5.6 % in 2020 and again increase by 3.4% in 2021 and 4.4% in 2022**[57]. During 2021, the continuation of the pandemic outbreak, some remaining containment restrictions, and weak foreign demand will delay and weaken the economic recovery. Vaccines are assumed to be widely deployed for the second quarter of 2021[58]. Subdued activity and high uncertainty will dampen private consumption and business investment. Wages and prices will grow slowly, and inflation is expected to slow towards the 2% target level. Firm bankruptcies are expected to rise in 2021 due to prolonged economic weakness and withdrawal of some support measures. The unemployment rate is also expected to continue rising in the first half of 2021. It is estimated that once the pandemic is better controlled globally and locally, economic growth will gather pace with improving sentiment and rising domestic demand. In this context, trade should pick up, too[59].

1. Impact of Covid-19 on mobility

Mobility behaviour in Czech Republic (before Covid-19)

Main challenges

Czech cities are struggling to accommodate a more diverse population (elderly, immigrants) and provide services to people who increasingly reside outside the urban centres. According to the Czech Statistical Office, in 2016, **73% of the population lived in urban areas**. However, by the OECD regional typology, the Czech Republic is among the least urbanised countries in the OECD, with one-quarter of the population living in predominantly urban regions, half the OECD average. Building sustainable cities and improving the quality of life in urban centres while preserving the environment and promoting economic growth were identified as critical challenges by the OECD.

Despite an efficient public transport network, car use increased. Car ownership increased as incomes and suburbanisation rose. In Prague for example, it grew by 25% between 2010 and 2016, faster than in any other region, leading to congestion and parking problems, as well as noise and air pollution. Over 2006-16, while the number of passengers using public transport remained broadly stable, car traffic volume increased significantly in the outer zone of Prague, though it decreased in the centre.

Territorial fragmentation

The Czech Republic is taking a more integrated approach to territorial development so as to use EU structural and investment funds. However, it is stated that the resulting investment projects are hindered by a lack of effective metropolitan-area governance arrangements that support productivity and competitiveness. For instance, Prague's proposed strategic plan for the metropolitan area has not appear to involve significant cooperation with municipalities

[57] European Commission, "Spring 2021 European Economic Forecast", May 2021.
[58] Ministry of Finance of the Czech Republic 2021: Macroeconomic Forecast - January 2021. Accessed: March 31, 2021.
[59] OECD 2020: OECD Economic Surveys: Czech Republic 2020. Accessed: February 15, 2021.

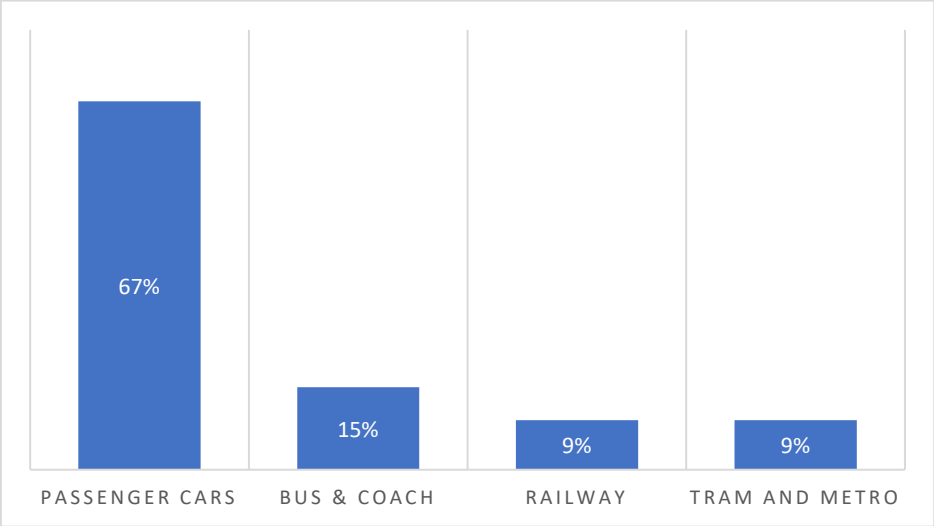
elsewhere in Central Bohemia. National legislation does not let Prague use land use planning tools beyond its administrative borders. Moreover, most municipalities are too small to ensure cost-effective provision of public services. To meaningfully influence the environmental impact of urban development issues such as land use and transport, authorities must act at a level that considers central cities and suburbs together. Incentives should be provided for inter-municipal cooperation and joint service provision. According to the OECD, there is a widespread perception that urban, social and environmental policies are still largely conducted in siloes, with a lack of unified direction for ministries on policy implementation. This suggests that the urban sustainability vision has not been integrated holistically.

Besides, a range of environmentally related taxes and charges are in place, but their rates are too low to achieve environmental goals, according to the OECD. Czech cities could use a mix of fiscal instruments to reduce transport externalities, including congestion charges, vehicle taxes, subsidies for clean vehicles and public transport, and higher parking charges[60].

Modal split within Czech Republic

Of the total passenger-kilometres travelled by land in Czechia, 9.2% were covered by tram or metro, with railway accounting for an additional 8.7%. Passenger cars made up the largest share[61].

Distribution of passenger-kilometres travelled by land in Czechia in 2018, by mode of transport



Source: Own graph based on Statista.

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

Although, the highest number of registered passenger cars was observed in Germany in 2018, it is in Czech Republic that the second highest growth over this period was recorded after Romania (31 %)[62].

[60] OECD 2018: Environmental performance reviews: Czech Republic 2018.
[61] Statista 2020: Distribution of passenger-kilometers travelled by land in Czechia in 2018, by mode of transport. Accessed: February 11, 2021.
[62] Eurostat: Passenger cars in the EU. Accessed: February 12, 2021.

Freight transport

Czechia is among the EU countries to have recorded the highest decreases in EU road freight transport[63].

Mobility behaviour in light of the Covid-19 pandemic and the first lockdown

The coronavirus pandemic first started gathering pace after March 9, 2020. A state of emergency was proclaimed on March 12. Internal travel and gathering in groups were restricted and international travel banned. Restaurants, hotels and most stores were closed. The first wave was soon effectively contained. This allowed the government to commence a gradual lifting of restrictions in mid-April and most restrictions were lifted by the end of June, and only bans on large gatherings remained in place[64].

Passenger traffic in general

Already at that time mainly transport activities were affected. The borders were gradually closing, and there were only limited border crossing points except for freight transport (truck drivers and rail crew). The transport of goods has thus never been stopped. Air passenger transport was stopped, all airports but Prague international airport were closed completely. This resulted in a significant decline of passenger transport and some decline in freight transport as lot of economic activities were on hold.

Public Transport

Data on bus transport are collected on quarterly basis. According to preliminary data, the number of passengers decreased in the 1st quarter of 2020 compared to 2019 by 17%.

Rail

According to the preliminary figures, total decrease in rail passenger transport in the first quarter 2020 was 20% in number of passengers transported and 15% in km. However, if monthly figures are considered, in March 2020, rail passenger transport dropped to nearly half in volume of passengers as well as in km. In April 2020, number of passengers transported by rail was, in comparison with the previous year, less than 1/3 and in km it was around 1/5, i.e. 20%[65].

Due to the imposed Covid-19 restrictions, České dráhy modified the offer of long-distance trains outside the peak hours and in edge times in October 2020. In cooperation with the Ministry of Transport, operation on some long-distance lines were slightly restricted. Also, regional connections were cut following agreements with regions[66].

[63] Eurostat: Road freight transport statistics. Accessed: February 12, 2021.
[64] OECD 2020: OECD Economic Surveys: Czech Republic 2020. Accessed: February 15, 2021.
[65] Kastlova, O. 2020: Czech Republic – consequences of Covid 19 pandemic for transport performance. In: ITF Webinar Meeting 4 June 2020, additional information.
[66] Ministry of Transport 2020: Czech Railways will reduce operation on some long-distance and regional lines from 19 October. October 15, 2020. Accessed: February 12, 2021.

Freight

Freight transport in general was not affected so much as it was exempted from many restrictions. For the first quarter 2020 decline was around 8%, while in March 2020 it was 14% in tons and 8% in km. In April 2020 the decline was around ¼ (drop by 75%)[67].

Second lockdown: November 2020

The government declared a state of emergency on September 30, 2020, and reintroduced a national lockdown on October 21, limiting the movements of people. Increasingly heavy restrictions were also imposed on economic activity, with bans on events and gatherings, the closure of education establishments and severe restrictions in the hospitality and retail sectors, among others. The number of new cases dropped significantly in November, albeit remaining elevated, and in December 2020, the government started easing some containment measures[68].

Impact of Covid-19 on road construction and road infrastructure

Although construction was kept ongoing, the Covid-19 pandemic had an important impact on the Czech construction sector. **The latter experienced an 8.2% decline in construction output in September 2020**. The decline is equally observable in the other branches of industrial production. If this trend continues, the Svaz podnikatelu ve stavebnictví (Union of Entrepreneurs in Construction) expects the output of the construction sector to decline by 10.0% (about CZK 500 billion – €18.9 billion). This would mean coming back to approximatively 2018 levels[69].

However, the sector is expected to grow from 2021 onwards. With the unlocking of the economy, stalled construction projects have already gained momentum, amidst the sector gearing up for the upcoming projects announced under the National Investment Plan 2020-2050. It was indeed acknowledged by the Ministry of Transport, that the development of infrastructure and construction activities must be one of the main tools for restarting the Czech economy[70].

2. Czech Recovery Plan: Focus on mobility issues

Recovery Plan on the European level

The Czech Republic will receive 7.1 billion euros from the European Recovery Plan. On March 22, 2021, the Czech Republic ratified the text allowing the European Commission to launch a loan on the financial markets.

As of April 30, 2021, the Czech Republic had not yet submitted its national plan to the European Commission. The draft Czech National Recovery Plan was published by the Ministry of Industry and Trade at the end of March. The "Digital Transition" component will represent 18% of the plan. It includes actions related to broadband deployment and 5G (228.2 million

[67] Kastlova, O. 2020: Czech Republic – consequences of Covid 19 pandemic for transport performance. In: ITF Webinar Meeting 4 June 2020, additional information.
[68] OECD 2020: OECD Economic Surveys: Czech Republic 2020. Accessed: February 15, 2021.
[69] European Commission 2020: European construction sector observatory. Country profile Czech Republic. October 2020.
[70] Ministry of Transport 2020: Thank you for building! April 8, 2020. Accessed: February 11, 2021.

euros). **The "Infrastructure and Green Transition" component will represent 42% of the plan.** It includes actions for the **development of intermodal transport**, the **digitisation of rail infrastructure or the electrification of railroads** (Sustainable and safe transport axis, 851 million euros); **the development of clean mobility** (268.2 million euros). The "Training and labor market" component represents 22% of the plan. The "Support for business" component will represent 3% of the plan. It includes a "Support for public investment" component (€96.3 million). The "Research and Innovation" component will represent 7% of the plan. The "Health and Resilience" component will represent 8% of the plan.

The Czech Recovery and Resilience Plan proposal, which was submitted in October 2020, is reported to have several shortcomings, for example, in terms of compliance with the requirements and overall aims of the Recovery and Resilience Facility, coherence and ambition of the objectives of the Facility and integration of the latter with other relevant strategies.

The Czech Republic is eligible for investments of CZK 181.9 bn (€7 billion) in grants and an additional CZK 405 bn (€15.7 bn) in loans totalling CZK 586.9 bn (€22.7 bn). The Czech government applied for CZK 222.61 bn in the draft proposal of the Facility. Citing a high level of national debt (30.8% of GDP in 2019), the Czech government does not plan to utilise the loan mechanism, and according to available information, Czech Facility investments are meant to be financed from grants only.

The amount available for grants is CZK 181.9 bn, however, the amount requested by the Czech government is CZK 222.61 bn (€8.6 bn). The difference between the amount available in grants and the amount requested (CZK 40.71 bn) (€1.6 bn) is not explained in the Plan. **It is estimated that, if the loan mechanism (CZK 405 bn) was not utilised, the Czech government would reject nearly 70% of the available funding**. By contrast, the Czech government appears willing to work with loans in the context of other EU funding mechanisms. It has requested a loan of over CZK 50 bn (€2 bn) under the EU SURE financial instrument.

The decision to not utilise the available funding to invest in a comprehensive recovery plan currently creates a risk of future redundant investments. This experience has already been made in the transport sector. While making public commitments to promote clean transport, the government has failed to systematically invest in its development and now it must dedicate around 38 % of the recovery budget (CZK 36 bn) (€1.4 bn) to the sector. Currently, the transport emissions account for approximately 16% of total Czech emissions (in 2018; second highest after the energy sector) and they are expected to grow by some 20% by 2030.

As reported by the Chamber of Commerce of the Czech Republic, the Czech plan would not provide sufficient proposals for reforms. Czech Plan investments are planned within the framework of the National Industrial Strategy and to a lesser extent to the National Energy and Climate Policy. The government should introduce necessary reforms into the Plan and improve its alignment with its climate and energy policy and the just transition strategy in order to ensure an integrated approach towards successful transformation. Furthermore, the Plan would be lacking an overall cohesion and consistency in its formulation. Some projects would be defined in detail (e.g. digital systems for public administration), while others would be only vaguely outlined (e.g. sustainable transport and green mobility).

At first glance, green initiatives comprise only 34.5% of the total requested amount of CZK 222.61 bn (€8.6 bn), which does not meet the requirement of 37%. Also, according to the stricter assessment of a coalition of Czech experts, the Recovery and Resilience Plan budget

includes only around CZK 36 bn (€1.4 bn) of valid green initiatives, which accounts for only 20%.

Moreover, it is reported that the preparation of the document, coordinated by the Ministry of Industry and Trade, was done non-transparently. Expert comments, which the Ministry itself called for, were not considered at first. Although a series of consultations was then organized, they allegedly still lack transparency[71].

EU funds available 2021-2027: commitments (MFF and NGEU) in current prices unless stated[72]

Please note that the prices stated below represent 2020 prices which have been subject to minor changes.

Structural Funds	Common Agricultural Policy	Recovery & Resilience Facility	Just Transition Fund	Modernisation Fund	ETS auction revenue
EUR 19.8 bn	EUR 7.9 bn	EUR 6.7 bn*	EUR 1.5 bn *	EUR 2.8 bn **	EUR 0.6 bn ***

**in 2018 prices; **assuming a carbon price of EUR 20 per tonne; ***average of 2018 and 2019 actual auction revenues, amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.*

Czech Covid-19 Relief Package

The Government of the Czech Republic took measures to support people employed by corporations, deployed tax-related support for businesses and individuals, and implemented a variety of additional measures to sustain the economy[73]. The package was approved on March 24, 2020. The chamber also passed the finance ministry's proposal to raise the 2020's planned deficit of the central state budget five-fold to 200 billion crowns[74].

Focus on mobility and infrastructure

On March 30, 2020, the government approved a series of measures to support the transport sector:

- The payments of toll and road tax has been postponed for truck transportation companies[75];
- Investment in traffic infrastructure has been strengthened and commuters travelling between the Czech Republic and Slovakia, or Poland were supported.

The Ministry of Transport also launched the COVID-BUS scheme to support entrepreneurs in irregular bus transport. As passed by the government, CZK 1 billion have been made available to help operators of irregular bus transportation overcome the current situation on the market until the second quarter of 2021. The amount of support will depend on the emission class of the bus. The bus capacity will be also taken in account. The support period is calculated

[71] Němeček, D. 2020: Czech National Recovery Plan: A missed chance for change. In: International Sustainable Finance Center.
[72] European Commission 2020: Summary of swd assessment NECP: Czechia.
[73] KPMG 2020: Czech Republic. Government and institution measures in response to COVID-19. November 18, 2020. Accessed: February 12, 2021.
[74] Reuters 2020: Czech parliament approves coronavirus emergency aid package. March 24, 2020. Accessed: February 12, 2021.
[75] Ministry of Transport 2020: Transport support package approved. March 30, 2020. Accessed: February 11, 2021.

from 12 March until 30 June 2020. The Ministry of Transport expects that CZK 1 billion will be provided in 2020. Of this, CZK 0.5 million shall be moved from the budget of the Ministry of Transport and CZK 0.5 billion comes from the "COVIC Rent" programme of the Ministry of Industry and Trade and its funds that have not been claimed[76].

State Fund for Transport Infrastructure

In October 2020, **the government approved the highest budget of the State Fund for Transport Infrastructure ever**. A total of CZK 127.5 billion (€4.4 bn) shall be spent on transport infrastructure in 2021. Of this 90.5 billion is from national resources and 22 billion from EU funds. And another 15 billion is from the European Recovery and Resilience Facility (RRF). A total of CZK 83 billion was allocated for investment in transport and CZK 44.5 billion (€1.7 bn) is ready for non-investment spending such as repair and maintenance of transport infrastructure. The budget can be increased if even more spending is needed, e.g. to accelerate some projects[77]. The budget can be increased if even more spending is needed, e.g. to accelerate some projects[78].

The transport package approved by the government is also addressed to construction companies, which can expect the budget of the State Fund for Transport Infrastructure to be increased by 6.5 billion to a record 113 billion CZK. The RSD (Road and Motorway Directorate) will have to prepare projects for repairs and maintenance or investments in state roads as soon as possible and SŽDC (Railway Administration) is to prepare further investments in railways amounting to the total of 3.5 billion beyond the current budget.

Linear Act (2020)

This amendment shall accelerate the construction of transport, water and power infrastructure. It entered into force on 1 January 2021**. It shall reduce the preparation time of strategic transportation projects to about two thirds or one half of the current duration which is up to 13 years**. The amendment shall simplify the permitting process to ensure that long delays before construction commencement can be avoided. The Ministry of Transport submitted the amendment together with the Ministry for Regional Development and the Ministry of Industry and Trade[79].

3. Existing mobility strategies

The national government plays a decisive role in urban development through urban and regional policy, enactment of legislation and elaboration of national strategies and programmes. Regions are responsible for regional roads, public transport, including several functions related to planning and spatial development: they approve planning documents and oversee regional economic development and environmental protection. Municipalities are responsible for local and urban planning, public transport, local roads, housing, land use and spatial arrangements, environmental protection and infrastructure (including water management and treatment, urban heating and waste processing) and local development in general[80].

[76] Ministry of Transport 2020: The COVID-BUS programme was launched, bus companies can register until 26 October. October 26, 2020. Accessed: February 11, 2021.
[77] Ministry of Transport 2020: A total of CZK 128 billion shall be invested in transport infrastructure in 2021. October 19, 2020. Accessed: February 11, 2021.
[78] Ministry of Transport 2020: A total of CZK 128 billion shall be invested in transport infrastructure in 2021. October 19, 2020. Accessed: February 12, 2021.
[79] Ministry of Transport 2020: Motorway preparation will be faster, the MPs passed a bill to accelerate infrastructure projects. September 29, 2020. Accessed: February 12, 2021.
[80] OECD 2018: Environmental performance reviews: Czech Republic 2018.

Principles of Urban Policy (update of 2017)

In 2017, the national government updated the **Principles of Urban Policy, a framework document, to propose guidelines conducive to sustainable urban development, coordinate the approach taken by all government levels and ensure implementation of the UN-Habitat New Urban Agenda**. They are also the basis for the forthcoming regional development strategy Czech Republic 2021+. They are valid until 2023, when they are to be revised and updated again. The principles aim to enhance competitiveness and sustainable development while promoting coordinated, integrated urban development[81].

The Climate Protection Act (submitted to the EU Commission on 30 January 2019)

The National Plan is based on two main strategic documents, namely the **State Energy Policy of the Czech Republic**, which was approved in 2015, and the **Climate Protection Policy of the Czech Republic**.

In March 2017, the Government of the Czech Republic adopted the Climate Policy in the Czech Republic, which represents a long-term strategy for the transition to a low-carbon economy and the contribution of the Czech Republic to achieving the targets of the Paris Agreement. The Implementation of the Climate Protection Policy in the Czech Republic will be evaluated by the end of 2021 and the first update is scheduled by the end of 2023 following the review of commitments under the Paris Agreement.

The Climate Protection Act requested by the EU Commission is based on already existing mobility strategies in the Czech Republic. In this context, the Strategic Framework Czech Republic 2030 can be considered as the overarching strategy covering all five dimensions of the Energy Union. At the same time, however, it should be noted that the document has a significantly wider scope and deals in general with sustainable development and quality of life[82].

Strategic Framework Czech Republic 2030

It is the main implementation platform for the Sustainable Development Goals (SDGs). Czech Republic 2030 replaces the Strategic Framework of Sustainable Development accepted by the Government in 2010. **Its priority on regions and municipalities provides a framework for mainstreaming sustainable development in regional and local policies**. It contributes to the achievement of SDG 11 on sustainable cities and communities, among other goals. The Government Council on Sustainable Development (GCSD) coordinates its implementation and other sustainable development issues across ministries. But the national government does not always seem to be implementing the GCSD's recommendations. Moreover, not all stakeholders seem to have the same level of influence on the GCSD.

The Climate Protection Act is further relying on key urban, energy and climate protection policies developed in the past years, among them:

[81] European Commission 2020: National Energy and Climate Plan of the Czech Republic November 2019.
[82] European Commission 2020: National Energy and Climate Plan of the Czech Republic November 2019.

Regional Development Strategy 2014-20 (2013)

The Regional Development Strategy 2014-20 aimed at supporting competitiveness and reducing economic, social and environmental territorial disparity. It covers:

- management of public spaces (buildings, parks, natural habitats) and waste management.
- territorial development (co-ordination of spatial planning, functional use of territory, participation of actors in land use planning).
- smart energy management (energy saving in buildings and transport, development of biomass and other local renewable energy resources).
- reduction of air emissions and noise.
- flood protection measures.

Territorial Development Strategy (2015) (last updated in 2019)

It establishes planning priorities for sustainable development, corridors and areas for transport infrastructure and areas of expected development for energy and water management. It seeks to ensure integrated territorial development in cities and regions, prevent spatial or social segregation in the urban environment, support polycentric development of the settlement structure, develop brownfields to protect agricultural and forest land and preserve public green areas, improve territorial accessibility through transport infrastructure while preserving landscape permeability and minimising landscape fragmentation, improve public transport infrastructure, ensure transport connectivity of residential and leisure and production spaces. The policy sets development planning priorities of the Prague, Brno and Ostrava metropolitan areas and other main cities.

New Transport Policy of the Czech Republic 2021–2027, with a view to 2050

This policy represents an update of the Transport Policy 2014-2020. **The new policy has been approved by the Government in March 2021.**

The vision of the Czech Republic's transport system in the long term assumes that the Czech Republic and its individual regions will be equipped with a transport system that meets the requirements of transport needs in both passenger and freight transport, supports sustainable economic development and inclusive policy aimed at structurally disadvantaged regions and their inhabitants. **This transport system should be neutral in terms of impact on global (not only climate) changes (in terms of mitigation and adaptation), will have minimal impact on public health, biodiversity, nature and landscape.** The aim is not to restrict transport, but to develop it. However, not in its current extensive form with a strong dependence on high energy consumption, especially fossil fuels, but in an energy-efficient and environmentally friendly form. The task is therefore to increase the energy efficiency of transport.

This vision will be achieved through the following three consecutive steps:

- **Optimisation of transport needs**: The results of applied research will be put into practice and modern technologies will be used, spatial planning will be improved, especially in cities, and the restructuring of the economy towards the creation of higher added value will be supported. This first step will therefore be the subject of a broader state policy in accordance with the adopted Strategic Framework Czech Republic 2030.

- **Multimodal approach**: In the case of concentrated (strong and regular) transport flows, it is necessary to make more use of more energy efficient modes of transport supported for this purpose by high-quality transport infrastructure, including energy and information superstructures, as they achieve the lowest energy intensity (kWh / pkm, kWh / tkm) as well as the lowest carbon dioxide production (kg / pkm, kg / tkm).
- **Accessibility of each region**: The precondition is a high-quality transport technology equipped with modern technologies as well as means of transport for sharing information and data on transport; the conditions for energy efficiency and minimisation of emissions within individual modes of transport must be met[83].

This objective is also closely linked to the electromobility policies of Czech Republic, namely:

The State Environmental Policy of the Czech Republic 2012–2020

It includes requirements for the support of the use of alternative fuels. The above-mentioned Transport Policy also envisages the gradual replacement of conventional fuels (i.e. oil-based fuels) for alternative energy in road transport and the further electrification of railways and urban public transport, with the gradual shift in freight transport from road to rail or water.

State Energy Policy of the Czech Republic (2015) and the National Emission Reduction Programme of the Czech Republic (2015)

A similar 2030 sub-target is set by these policies. Vehicles for the transport of persons or freight vehicles with a maximum permissible weight of less than 12 tonnes using alternative fuel (hybrid drives, electric motors, CNG, LPG and bioethanol E85) are exempt from road tax; lower excise rate is also applied to natural gas used in transport, even though the advantage is gradually decreasing[84].

National Action Plan for Clean Mobility (NAP CM) (2015) (last updated April 2020)

NAP CM was drafted by the Ministry of Industry and Trade in collaboration with other ministries, Czech vehicle manufacturers, infrastructure providers and gas and energy companies. NAP CM is based on the **Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure**. The Directive asks member states to develop infrastructure of charging and filling stations (electricity, CNG, LNG and partly also hydrogen)[85].

In April 2020 the Czech Government approved an update of NAP CM. The update of NAP CM responds to new EU documents approved in previous years, such as:

- new CO2 emission targets for passenger cars, light commercial vehicles and lorries;
- mandatory 14% share of renewable energy sources in transport;
- mandatory share of low and emission-free vehicles in over-limit public contracts;

[83] Ministry of Transport 2021: Dopravní politika České republiky pro období 2021 – 2027 s výhledem do roku 2050. March 11, 2021. Accessed: March 31, 2021.
[84] European Commission 2020: National Energy and Climate Plan of the Czech Republic November 2019.
[85] Ministry of Industry and Trade 2016: National Action Plan for Clean Mobility. August 11, 2016. Accessed: February 12, 2021.

- new programming period.

From the point of view of fulfilling the strategic goals of updating the NAP CM, it is crucial that financial support will be provided for the period 2021-2027, especially from EU funds. First and foremost, these are the European Structural and Investment Funds, from which individual operational programs are financed: OP TAK (under the responsibility of the Ministry of Industry and Trade), OP Transport (under the responsibility of the MoT), Integrated Regional Operational Program (under the responsibility of the Ministry of Regional Development). Furthermore, the Connecting Europe Facility (coordinated by the MoT) and the National Environment Program[86].

One of the strategic goals of the (non-updated) Action Plan is to achieve the operation of 250,000 EVs in Czech Republic by 2030, which represents more than 4 % of all registered automobiles in the country. This strategic objective is to be achieved by stimulating demand through subsidies, supporting the construction of charging infrastructure and providing information to the public. As only about 3,000 EVs are currently registered in the Czech Republic, which represents only about 0.05 % of all registered cars, relatively massive support for electromobility may be expected in the coming years from the government and the ministries concerned. To achieve the strategic objectives set out in the Action Plan, in 2018, the Ministry of Industry and Trade issued its fourth call to use the:

"Low Carbon Technology – Electromobility" support programme

Under this programme, businesses could, among other things, apply for subsidies to purchase EVs and non-public charging stations. Applications for subsidies were received from December 2018 to May 2019. During this period, 341 applications for subsidies totalling CZK 267m (€10.3m) were received. The original total amount of subsidies was only CZK 200m (€7.74m).

National Programme Environment

In addition to the subsidy programme for businesses, the Ministry of the Environment also announced a subsidy programme for municipalities, regions and other public-legal entities. In this framework of subsidy calls, grants totalling CZK 100m (€3.9m) were allocated, the vast majority of which were for EVs and smart charging stations. The introduction of low-emission zones is also supported. It is also geared towards supporting alternative modes of transport (e.g. carsharing, bike sharing etc.). Another measure is the introduction of a special 'EL' registration plate (effective from April 2019), which entails the exemption from the registration fee, and from tolls for the use of toll roads ('vignettes') from 2020 for electricity or hydrogen vehicles with emissions of up to 50 g CO2/km.

In addition to the subsidies, EV owners are already benefiting from road tax exemptions and free (or reduced fee) parking in some municipalities. Moreover, from April 2019 an amendment on the **Conditions of Operation of Vehicles on the Road**, came into effect, under which EV owners can apply for "EL" licence plates (free of charge). In the future, these plates will probably entitle them to other benefits, such as exemptions from motorway tolls or the use of dedicated lanes in municipalities. Unlike some other countries, the sale of EVs in the

[86] Ministry of Industry and Trade 2020: Aktualizace Národního akčního plánu čisté mobility. Accessed: March 31, 2021.

Czech Republic is not exempt from value added tax (a 21% rate currently applies). There are currently over 400 charging stations for electric vehicles in the country, mainly in large cities. According to the Action Plan, by the end of 2025, all cities with more than 10,000 inhabitants should be covered with charging stations[87].

According to predictions from the Car Importers Association, the number of clean EVs (BEVs) in the streets is estimated at 217.200 vehicles by 2030, which is about 3% of the fleet. The estimate of the development of the number of electric buses in the Czech fleet in 2030 corresponds to a level of approximately 800 to 1.200 units (without trolleybuses).

Charging infrastructure: The need for public charging stations is expected to be such as to allow a supply of 1 000 – 1 500 GWh of electricity/year (low), up to 2 000 – 3 000 GWh of electricity/year (high) by 2030. In order to develop electromobility at the level of 220 000, **the NAP CM Update quantifies the need for publicly accessible infrastructure in 2025 at 6 200 charging points and 19 000 charging points in 2030.** Achieving development in the amount of 500 000 vehicles then corresponds to the need of 11 000 charging points in 2025 and 35 000 charging points in 2030.

Increasing the share of RES in the transport sector: The developments in electromobility and future electricity consumption in the transport sector would also be very important in terms of contributing to the 14 % target of share of renewable energy in transport. In 2016, total electricity consumption in transport amounted to 1 636 GWh, with the rail transport accounting for the vast majority (94 %).

National Action Plan for Smart Grids

A study should be launched for the purposes of the National Action Plan for Smart Grids, which focuses, among other things, on analysing the measures necessary to ensure the readiness of distribution systems.

Hydrogen mobility: The original NAP CM focuses on the use of hydrogen in transport rather marginally. The reason is that in 2015, when this document was being prepared, there was no hydrogen vehicle registered in the Czech Republic, and that the only hydrogen station in the Czech Republic was not publicly accessible and is used primarily for a single hydrogen bus operated under the project TriHyBus of Nuclear Research Institute Řež. Nevertheless, the NAP CM declares the interest of the Czech Republic to include hydrogen in the national policy framework for alternative fuels in transport under Directive 2014/94/EU on the implementation of alternative fuels infrastructure. The initial target is to build 3–5 stations by 2025, with the NAP CM expecting it to increase in the future. **Hydrogen mobility should be supported by the same measures as electromobility. Therefore, the development of infrastructure for hydrogen filling stations should be stimulated, for example by investment support**. Similarly, it is assumed that hydrogen vehicles will enjoy the same benefits as EVs (parking in cities or the use of preferential lanes, exemption from paying the motorway toll charges). In order to realise these benefits, hydrogen vehicles will be classified as 'electric vehicles', which will be issued free special registration plates.

[87] Marek, J. 2020: Electromobility on the rise. In: Schönherr. January 13, 2020. Accessed: February 12, 2021.

Strategic Sustainable Urban Mobility Plan

The aim is to address the issue of mobility in bigger cities connected with suburban areas, not only in terms of transport issues, but also in terms of the possibilities of influencing mobility. Strategic Sustainable Urban Mobility Plans should be developed and regularly updated in cities with a population of over 40.000. The **public transport strategy 2015–2020 with a view to 2030**, prepared as the initial strategic document by the Ministry of Transport is one element to improve the public transport system. Public transport operators and transport infrastructure managers can apply for support through the **Integrated Regional Operational Programme** for a range of activities related to the increase in sustainable forms of transport, such as fleet renewal. In the area of freight transport, it is necessary to mention the **Freight Transport Strategy 2017–2023 with a view to 2030**, which should develop urban freight transport and city logistics to support smaller, preferably alternative-drive lorries for deliveries especially in historic city centres[88].

The new Concept of Sustainable Urban and Active Mobility 2021-2030 was approved by the Czech government in January 2021. This concept takes into account the specifics of Czech cities as it requires individual approach of each city towards sustainable mobility and at the same time proposes the categorisation of cities and sets targets and type measures that are appropriate for the proposed categories of cities, so that urban mobility becomes sustainable and gradually shifts to a mode of transport that minimises negative impacts on the environment, public health and improves the quality of life of people without adversely affecting transport needs. This update also includes a part of active mobility, which develops mainly the area of bicycle transport development[89].

National Cycling Development Strategy 2013–2020 (update from 2004 version)

Aims to improve the coordination of the development and the conditions for the use of cycling as well as the efficiency when building cycling infrastructure. It further aims to improve coordination among the government, city and municipal authorities. **The main objective of the Cycling Strategy is to reach a modal split of at least 25% for bicycle transport for short trips (up to 5km) by 2025 (Vision 25).** Vision 25 is also associated with urban mobility development which pays fair attention to all transport modes. Private car transport, cycling, walking and public transport should have the same status (4x25%). It is to be noted that the Strategy was prepared in the framework of Central MeetBike which is based on the transfer of know-how from Germany to Czech Republic, Poland and Slovakia. Therefore, the experiences of German Cycling Strategies could be implemented into the Czech one[90].

Action Plan of the Deployment of Intelligent Transport Systems (ITS) until 2020, updated to Strategy of the Development of ITS 2021-2017

The ITS Action Plan proposes follow-up measures for further ITS development in the Czech Republic. **Specifically, this includes obtaining and ensuring the transfer and quality of source data, storing data, assessment, processing and forwarding of the information to users or business entities**. Other measures relate to traffic control, process of passenger or goods carriage and provision of related services. Final measures focus on compliance with road

[88] European Commission 2020: National Energy and Climate Plan of the Czech Republic November 2019.
[89] Ministry of Transport 2021: Koncepce městské a aktivní mobility pro období 2021-2030. March 3, 2021. Accessed: March 31, 2021.
[90] City Changers: Czech National Cycling Development Strategy 2013 – 2020. Accessed: February 18, 2021.

traffic rules and systemic and cross-section measures and are divided into technical, organisational and R&D categories. For the purpose of implementing technical and R&D measures, investment activities are expected[91].

However, the Supreme Audit Office analysed how the Ministry of Transport (MoT) had managed and, together with the Road and Motorway Directorate, had introduced selected road ITS between 2012 and 2018 following the ITS Action Plan to improve the safety and fluidity of transport operations and to reduce the environmental impact of transport. The audit identified several shortcomings which mainly relate to how the MoT manages the ITS deployment. The set objectives are general, necessary indicators have not been laid down. It was concluded that the MoT cannot objectively monitor and assess whether the procured ITS helps to achieve the expected benefits[92].

Climate Protection Programme 2030: Assessment by the EU Commission (October 14, 2020)

Based on Czechia's final national energy and climate plan, and on the investment and reform priorities identified, the Commission services invite Czechia to consider, while developing its National Recovery and Resilience Plan, the following climate and energy-related investment and reform measures:

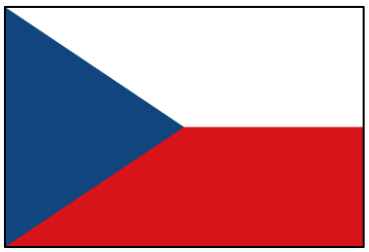
- Measures to promote renewables and energy efficiency to reduce dependency on coal and improve the flexibility of the grid, including by reducing administrative burdens to speed up building renovation;
- Measures increasing the roll-out of electric and hydrogen vehicles by developing charging infrastructure and alternative fuels, and tax reforms;
- Measures to promote sustainable transport infrastructure, in particular by investing into the backbone railway infrastructure and improving suburban transport networks[93].

Key take-aways

- The Czech Recovery and Resilience Plan proposal is reported to have shortcomings in terms of compliance with the requirements and overall aims of the EURRF, coherence and ambition of the objectives of the RRP and integration of the latter with existing strategies;
- The Covid-19 recovery will be supported by strong investments in transport infrastructure ;
- The Climate Protection Act of 2019 is based on existing mobility strategies in the country. It is not clear yet whether these existing strategies will also be integrated into Czechia's Plan (as in France or Germany).

[91] Pichl, M. 2017: Action Plan for the deployment of Intelligent Transport Systems (ITS) in the Czech Republic until 2020 (with a prospect of 2050). In: ITS Observatory. September 1, 2017. Accessed: February 12, 2021.
[92] EUROSAI 2019: Deployment of Intelligent Transport Systems in the road infrastructure of the Czech Republic. Accessed: February 12, 2021.
[93] European Commission 2020: Summary of swd assessment NECP: Czechia.

DATA BOARD
CZECH REPUBLIC



General Data

Political organisation: Unitary parliamentary democratic republic	**Head of government**: Andrej Babiš
Population (2019): 10.67 million	Urban population (2019): 74%

Economic indicators

GDP ranking (2019): 46/203	**GDP** (2019): 250.681 million USD
GDP growth (2019): 2.3%	**Expected GDP growth** (2020): -6.5%

Environmental indicators

Share in world CO_2 emissions (2016): 0.31%

CO_2 emissions (2016): 111,825,428 tons

CO_2 emissions per capita (2016): 10.53 emitting CO_2 per capita

Transport & Mobility sector

Modal share of passenger transport (2018):

- **Private car:** 73.3%
- **Train:** 9.6%
- **Bus and trolleys:** 17%

Modal share of freight transport (2019):

- **Roads:** 73.8%
- **Railways, inland waterways:** 26.2%

Construction sector

Construction sector GDP share (2019): 8%

Jobs in the construction sector (2019): Average registered number of employees - 207 100

Businesses in the construction sector (2019): 523 businesses for 50 or more employees

Investment in construction -civil engineering- (2019): €7.057 million

Abbreviations

GCSD: Government Council on Sustainable Development
SDGs: Sustainable Development Goals

Germany

Economic context: Covid-19

Activity contracted by 4.9% in 2020[94], driven by falling private consumption, business investment and exports. Growth is set to recover slowly to 3.4% in 2021 and 4.1% in 2022. Private consumption and exports initially rebounded rapidly, but demand for services have stayed weak into 2021 as virus containment measures have been tightened. Further uncertainty will constrain the recovery of investment as well as demand for capital goods exports before general deployment of a vaccine increases confidence. Short-time work has cushioned the increase in unemployment, but sustained falls in the unemployment rate are not expected until after mid-2021 once employees on short-time work have been reabsorbed. Additional targeted support is merited in 2021 and 2022 to reduce taxes for those on low incomes, increase research and development, support job placement and training, and deliver infrastructure needed for digital transformation and the energy transition[95].

1. Impact of Covid-19 on mobility

Mobility behaviour in Germany (before Covid-19)

Germans continue to be very mobile according to the latest Mobility in Germany (MiD) survey from 2017. They will have travelled around 3.214 billion km per day, which is 133 million km or 4% more than at the time of the last MiD survey in 2008. Transport performance has thus increased by an average of around 0.5% per year in previous years. The main reasons for this were the increase in population and the rise in economic output. The number of people in employment increased from 40 to 44 millions between 2008 and 2017. The distance travelled for work-related reasons increased notably:

- **In 2017, share of trips for work or business reasons** represented 16% and 11%, and 38% of passenger kilometres.
- **Between 2008 and 2017, professional trips, including training went from 39% to 42% in the number of daily passenger kilometres.**
- **The distance travelled leisure** has fallen slightly representing 28% of trips in 2017 instead of 31% in 2008, and 38% of passenger kilometres instead of 34% in 2017. Shopping share of passenger kilometres decreased from 9% to 7% between 2008 and 2017. The particularly strong decline in shopping and leisure time paths, combined with a high proportion of online shopping and Internet use, is probably a consequence of the influence of digitisation on shopping and leisure time behaviour. Young people are more purchasing online that the older population. The latter (up to 59 years old) has a 10 to 20 percentage points over the older ages' groups. This gap goes at over 90 percent taking the 20–29-year-olds group.

Modal split within Germany

There has been **a sharp increase in the use of bicycle transport and local and long-distance public transport.** This can be observed above all in the metropolitan areas.

[94] European Commission, "Spring 2021 European Economic Forecast", May 2021.
[95] OECD 2020: Germany Economic Snapshot. Accessed: May 11, 2021.

At the same time, however, there has been an increase in overall transport and, above all, in motorised private transport. In 2017, private transport has accounted for three quarters of all passenger kilometres. The density of cars in Germany rose by 12% from an average of 509 to 569 cars per 1,000 inhabitants between 2010 and 2019 alone, according to figures published by the Federal Statistical Office based on figures from the Federal Motor Transport Authority (KBA). In the same period, the number of passenger cars rose by 14% from 41.3 million to just under 47.1 million.

In the transport mix, local public transport is gaining slightly in share. The growing mobility is also reflected in the number of passengers in public transport. The number of passengers carried on buses and trains in Germany increased from 10.6 billion in 2010 to 11.4 billion in 2019 - an increase of 8%. While the western states showed higher growth rates in terms of car density, the number of people using public transport increased more in the eastern states (+14%) than in the western states (+6.5%)[96].

However, the bottom line is that the choice of transport mode in Germany has hardly changed since 2008[97].

Infrastructure

While the number of cars in Germany has been rising for years, the length of the road network of inter-local traffic has stagnated. From 1995 to 2019, it grew by around 1,200 kilometres to 230,000 kilometres (+0.5%) in Germany.

The length of the highways in Germany has risen sharply: from 1995 to 2019 by 18% to 13,100 km. Due to the particular pent-up demand in the eastern states, the length of the highways there increased by 57% to 3,050 kilometres, and in western Germany by just under 10% to 10,100 kilometres.

From 2005 to 2019, the rail network grew by 1.5% nationwide. While the network in the western federal states decreased by around 200 kilometres to 28,900 (-0.6%), it was expanded by around 800 kilometres to 13,000 (+6.6%) in the eastern federal states.

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2018, shares of petrol-powered cars among the new registrations were noted in Germany accounting for 62.4 % (6th position after the Netherlands, Estonia, Finland, Denmark, Slovenia and Malta). In 2018, the highest number of registered passenger cars was observed in Germany with 47 million cars[98].

Electric vehicles

- **Germany accounts for 20.61% of charging points in the EU27**. It has 47 fast public charging points per 100 km highway against 28 in the EU.
- In terms of alternative vehicles, Germany is the country where the most electrically chargeable vehicles (ECVs), hybrid electric vehicles (HEVs) and fuel cell electric vehicles

[96] Destatis 2020: Pkw-Dichte in Deutschland in den vergangenen zehn Jahren um 12 % gestiegen. Accessed: December 3, 2020.
[97] BMVI 2020: Mobilität in Deutschland (MiD). Accessed: December 2, 2020.
[98] Eurostat: Passenger cars in the EU. Accessed: December 3, 2020.

(FCEVs) were sold in the EU in 2018, representing respectively 2.0% and 2.9% of the national market share.

Freight transport

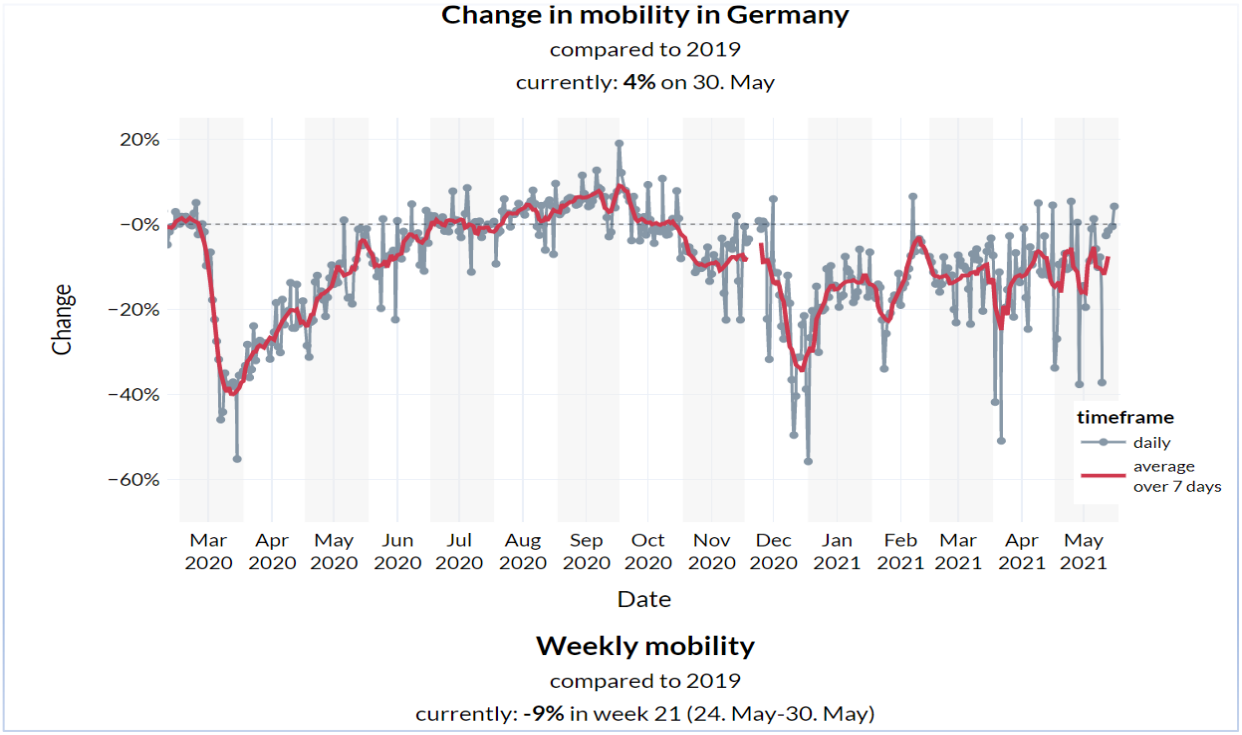
Due to the size of the country and its location in the middle of Europe, but also due to its importance as a country with large manufacturing industries, German roads continue to top the list for European-wide international road freight transport in 2018: 27.0 % of all tonne-kilometres performed in international road freight transport (corresponding to around 163 billion tonne-kilometres) took place in Germany, with a decrease of 4.5 % compared with the year before within the EU[99].

Mobility behaviour in light of the Covid-19 pandemic and the first lockdown (from March 22, 2020)

The level of mobility was closely linked to government measures to combat the Covid19 pandemic. On the one hand, this meant a significant drop in mobility with the introduction of a lockdown, but also a comparatively rapid recovery as soon as measures were lifted. This became very clear in the summer of 2020, when mobility at times even exceeded the previous year's figures.

Another characteristic feature was the change in the modal split toward individual modes of transport, especially the car, but also the bicycle. Studies showed that a major reason for this was the fear of increased contagion in public transport; scientific studies that refuted these fears did little to change this.

Change in mobility in Germany compared to 2019



Source: Current mobility · Covid-19 Mobility Project

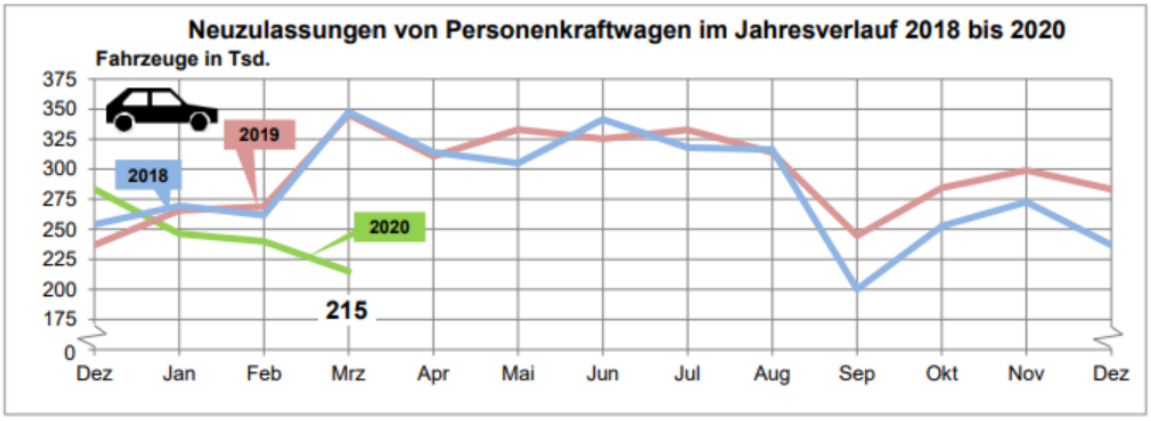
[99] Eurostat: Freight transport statistics - modal split. Accessed: December 3, 2020.

1) Passenger car traffic

215,119 new passenger cars were registered in March 2020. Compared with the same month the year before, the number of new registrations fell by -37.7% during the corona crisis. Nevertheless, registrations went up to 5% between 2018 and 2019, from 3,435 millions to 3,607 millions.

The number of new commercial registrations fell by -39.6%, while private new registrations lost -34.4%. After the end of the first quarter of the current year, **the overall decline in new passenger car registrations was -20.3%.**

New passenger cars registrations 2018-2020



Alternative fuel vehicles

The alternative drive types showed triple-digit growth in some cases compared with the same month of the previous year. In the case of hybrids, 28,735 new vehicles were registered, an increase of 62%, including 9,426 plug-in hybrids (+207.9 %). There were 10,329 electric vehicles registered, up 56.1% on the same month last year. Natural-gas-powered passenger cars increased by +8.6% to 507 units, reaching a share of 0.2%. By contrast, 82 liquid gas-powered passenger cars recorded a drop of -89.8%. New registrations of gasoline-powered cars fell by -48.3%, but with 107,507 new vehicles, their share was still 50%. 67,937 passenger cars were equipped with diesel fuel. After a decline of -39.3%, their share reached 31.6%.

Economic consequences

Germany is accounting for the biggest employee (568,518)[100] and production loss (1,077,943 motor vehicles)[101] within the EU in April 2020 according to approximate figures of ACEA. After the first lockdown, in July 2020, the car manufacturer Daimler for instance, announced that from April to June, turnover slumped by 29% to €30.2 billion compared to the same quarter last year. However, provided that there is no second strict lockdown, the Dax Group anticipates a positive operating result for the full year[102].

[100] ACEA 2020: Interactive map: Employment impact of COVID-19 on the European auto industry. Accessed: December 2, 2020.
[101] ACEA 2020: Interactive map: COVID-19 impact on EU automobile production, up until September 2020. Accessed: December 2, 2020.
[102] Ulrich, Klaus 2020: Autoindustrie im Fokus: Daimler mit Milliardenverlust, Tesla mit Gewinn. In: Deutsche Welle. Accessed: December 2, 2020.

It is important to note that 9.8% of the so-called gross value added in Germany is attributable to the automotive industry. Almost 10% of Germany's economic output is linked to the automotive industry. More than two million people in Germany live directly and indirectly from this industry. Besides, almost 40% of all research and development expenditure is linked to the automotive industry[103]. Germany is the first country in the EU with the highest motor fiscal income from motor vehicles, accounting for €99.9 billion according to the lasted ACEA Tax Guide 2021.

2) Public Transport

As a result of the corona pandemic, the passenger volume was 46% lower than in the same period of the previous year. As further reported by the Federal Statistical Office (Destatis), 41 million passengers travelled on long-distance rail services, 43% less than in the first half of 2019, while the number of passengers on scheduled long-distance bus services even fell by two thirds (-67 %) to 3.5 million[104].

During the first lockdown which was instituted across Germany on March 22, transport companies have maintained almost 80% of their bus and rail services, primarily to ensure the mobility of people in systemically important occupations and in public transport vehicles.

At the same time, passenger numbers have slumped drastically. According to estimates by the Association of German Transport Companies (VDV), passenger volumes in the period from the end of March to the end of April 2020averaged only 20 to 25%.

The progressive lifting of initial restrictions has brought passenger numbers back up to around 40% of pre-crisis levels.

Economic consequences for mobility operators

However, the loss of revenue suffered is said to be immense for companies as well as for cities and municipalities as responsible bodies. According to VDV calculations, they will amount to around €5 billion by the end of the year[105].

Breakdown of expected revenue losses in different Länders in 2020 due to the Covid-19 crisis

- Baden-Württemberg: 480 million euros
- Brandenburg: 115 million euros[106]

3) Rail

Public operator (Deutsche Bahn)

Deutsche Bahn (DB) suffered a crash in traffic after the coronavirus lockdown. DB introduced only minor adjustments to the long-distance domestic timetable, operating 70-90% of its usual services while it was carrying less than 10% of normal passengers.

[103] Rostek-Buetti, Andreas 2020: Der Druck der Zeit auf die Autobauer. In: Deutsche Welle. Accessed: December 2, 2020.
[104] Destatis 2020: KORREKTUR: 46 % weniger Fahrgäste im Fernverkehr mit Bussen und Bahnen im 1. Halbjahr 2020. Accessed: December 3, 2020.
[105] Deutschland Mobil 2030: Die neue Realität – Corona und die Auswirkungen auf den Nahverkehr. Accessed: December 3, 2020.
[106] Baltes, Ina 2020: Fahrgastaufkommen gesunken-Ruf nach Rettungsschirm für ÖPNV. In: ZDF.de. Accessed : December 3, 2020.

Economic consequences for mobility operators

According to DB's 2020 Integrated Report[107], **DB adjusted revenues dropped by 10.2%** from 44,431 million of euros in 2019 to 39,902 million of euros in 2020, representing a loss of 4,528 million of euros.

Private operators (Transdev, Keolis, FlixTrain)

- **FlixTrain**: In contrast to DB, the largest long-distance competitor FlixTrain was forced to suspend all services on March 20 until July 23.

- **Transdev**: Germany's largest private rail and bus operator, which operates 23 rail contracts in six federal states, covering more than 45 million train-km per year, experienced a 90% decline in passengers during the lockdown. According to Transdev, strong recovery trends were recorded in May and in June before reaching the status-quo. Differences exist from state to state, passenger numbers are lower in the South, like in Bavaria, were Transdev operates around 50%, whereas in the eastern parts of Germany, such as Saxony, it operates at 70-80% of ridership.

- **Keolis**: which operates four contracts in North-Rhine Westphalia and a cross-border service to the Netherlands accounting for 16.5 million train-km per annum, reported a similar fall[108].

4) Cycling

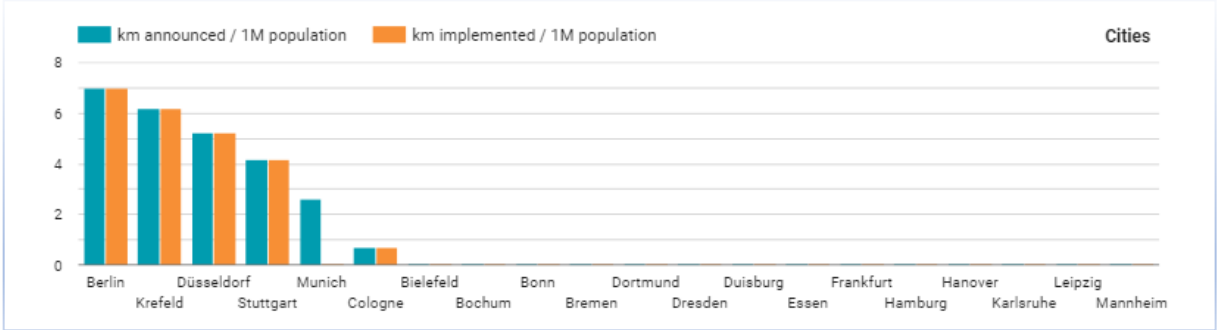
In order to create more space for cyclists*, pop-up cycle paths have been and are currently being set up in many German cities. In Düsseldorf, Berlin or Munich, the argument is based on infection control: conventional cycle paths would not be sufficient to maintain the 1.50 metre distance required in pandemic times.

In the first half of this year, an increase in cycling practice occurred mainly in the bigger cities for example a 26% increase in Düsseldorf compared to the previous year. Covid-19 is an important factor to this trend as many activities could no longer be performed and trip lengths were reduced.

This development is in line with a worldwide trend: European cities such as Brussels, Milan or Paris have long been giving significantly more space to pedestrians and cyclists. In Berlin, too, a total of 22 kilometres of car lanes has been converted into temporary cycle paths in various districts since the end of March. However, the yellow ad-hoc bicycle lanes were to be scraped off again by August 31. This will probably befall many of the pop-up cycle paths - except in Berlin, where they are to be converted into permanent ones[109].

[107] Deutsche Bahn 2020 Integrated Report, 2021.
[108] Smith, Kevin 2020: Pandemic pushes German operators to the brink. In: IRJ. Accessed: November 27, 2020.
[109] Von Lieben, Matthias 2020: Wie die Corona-Pandemie unsere Städte verändert. In: Deutschlandfunk. Accessed: December 3, 2020.

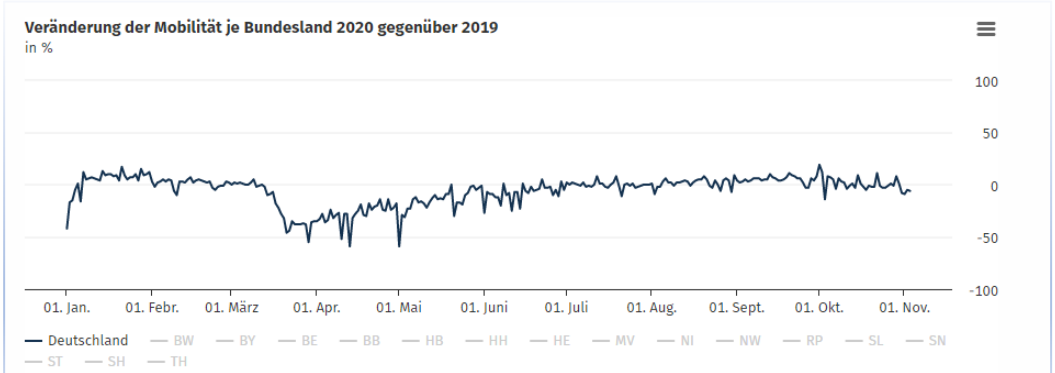
Covid-19 measures tracker (gathering additional bicycle lanes during the pandemic)[110]



Second & third lockdown and lifting of restrictions (in process)

As a special evaluation of experimental data from the Federal Statistical Office shows, mobility throughout Germany fell by 3.7% in the week from November 2, 2020, when the nationwide restriction measures came into force again and by 6.4% on the day after (in each case compared with the corresponding weekdays of the previous week)[111].

Changes in mobility in % (compared to 2019)



Impact of Covid-19 on road construction and road infrastructure[112]

Road construction in Germany has so far come through the crisis relatively well. According to the medium-term financial planning for infrastructure, investments in federal transport routes should continue to increase slightly. The Federal Government's draft law provides for investments of almost **€8.65 billion** for the federal trunk roads. From 2021, however, the level of investment should fall significantly. Only **€8.3 billion** are planned for 2022 and around **€8.4 billion** for the following two years. Autobahn GmbH will receive **€5.5 billion** from the federal government for the maintenance, expansion and construction of the approx. 13,000 km of motorway. Approximately €3 billion are estimated for federal roads.

[110] ECF: COVID-19 Cycling Measures Tracker. Accessed: December 2, 2020.
[111] Destatis 2020: Sonderauswertung zeigt Mobilität in Corona-Hotspots. Accessed: December 3, 2020.
[112] Pro Mobilität 2020: Zahlen Daten Fakten zum Verkehrsetat 2021. Accessed: December 3, 2020.

Budget projection Germany for 2021 and financial planning 2024

In billion €	State of being' 19	Target' 20	Draft'21	Plan'22	Plan'23	Plan'24	Ø17-20	Ø21-24
Total expenses	29,11	36,78	34,08	33,26	32,31	31,76	30,63	32,75
Investments	17,51	24,60	21,25	20,91	20,29	20,01	19,00	20,62
Trunk roads	7,76	8,41	8,65	8,31	8,40	8,43	7,53	8,45
Rail	6,29	12,67	8,55	8,49	8,66	8,67	7,97	8,59
Waterways	1,02	0,84	1,10	0,89	0,90	0,92	0,84	0,95

2. German Recovery Plan: Focus on mobility issues

Recovery Plan on the European level

The German government expects EU grants of **25.6 billion euros** (net excluding VAT). The gross expenditure stated in the federal budget then totals just under 28 billion euros (reforms to be implemented by 2026).

The German Recovery Plan consists of **40 measures divided into six focus areas**. They focus on the challenges in the areas of **climate policy and energy transition, digitization of the economy and infrastructure, digitization of education, strengthening social participation, strengthening a pandemic-resistant healthcare system, as well as modern administration and reducing barriers to investment**.

EU funds available 2021-2027: commitments (MFF and NGEU) in current prices unless stated[113]

Please note that the prices stated below represent 2020 prices which have been subject to minor changes.

Structural Funds	Common Agriculture Policy	Recovery and Resilience Facility	Just Transition Fund	ETS audition review
EUR 18.4 bn	EUR 42.3 bn*	EUR 22.7 bn*	EUR 2.3 bn*	EUR 2.9 bn **

**in 2018 prices; **assuming a carbon price of EUR 20 per tonne; ***average of 2018 and 2019 actual auction revenues, amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.*

The focus of the present analysis lies on mobility and infrastructure-related reform projects within the German RRF. The citation of (financial) measures in this report does not prejudice current or future budget negotiations. The measures listed here will be financed within the framework of the budgetary resources available.

[113] European Commission 2020: Summary of swd assessment NECP: Germany.

<table>
<tr><th colspan="4">Focus 1: Climate policy and energy transition</th></tr>
<tr><th>Reforms</th><th>Investments</th><th colspan="2">Financing</th></tr>
<tr><td rowspan="3">1.1 Decarbonization</td><td>1.1.1 Important Project of Common European interest (IPCEI) on hydrogen</td><td>TOTAL
RRF share: EUR 3259.288 million

Other financing: 3540 million EUR from Energy and Climate Fund (EKF)</td><td>EUR 3600 million of which 1500 million in grants from the RRF (2022-2026)</td></tr>
<tr><td>1.1.2 Support program decarbonization of industry</td><td>EUR 1889,288 million of which 449,288 million in grants from the RRF (2021-2024)</td></tr>
<tr><td>1.1.3 Investment and Reform: Pilot Program Carbon Contracts for Difference</td><td>EUR 550 million in grants from the RRF (2022-2024)</td></tr>
<tr><td colspan="4">1.1.1 Infrastructure: The aim of 1.1.1 is to establish a German and European transport and storage infrastructure for hydrogen. The selected projects should thus make a direct contribution to the design of future-proof and sustainable energy networks. As far as possible, capacities of the existing gas grid infrastructure that become available should be used for the transport of hydrogen. In the infrastructure sector, cross-border hydrogen pipeline systems could provide important insights for upcoming PCI projects under the amended TEN-E Regulation.

1.1.2 Construction companies: The measure 1.1.2 is aimed at commercial enterprises from the sectors of energy-intensive industries with process-related greenhouse gas emissions (in particular steel, cement, lime, chemicals, non-ferrous metals, glass, ceramics) that are covered by the EU emissions trading system. However, the funding program will only support projects whose projected CO2 equivalent emissions are significantly lower than the relevant benchmarks set for free allocation (e.g. zero emissions using green hydrogen produced on renewable energy sources). When applying, companies are asked to state the extent to which CO2 reductions are expected as a result of the respective project. This must be demonstrated by the company as part of the monitoring and evaluation of the respective projects.

1.1.3 Construction companies: The program under 1.1.3 is primarily aimed at companies in the steel, chemical and building materials industries with process-related emissions. In these industries, process-related emissions are particularly difficult to avoid. Relevant emissions can therefore only be achieved against the background of the goal of greenhouse gas neutrality and with fundamental process innovations, i.e. with considerable investment in new production facilities. The pilot program is therefore intended to promote the higher operating costs of decarbonization technologies, for example when green hydrogen is used instead of fossil raw materials. In the steel, chemical and building materials industry, e.g. using green hydrogen in the direct process for steel production instead of coking coal.</td></tr>
</table>

1.2 Climate-friendly mobility	1.2.1 Grants for the construction of refueling and charging infrastructure	**TOTAL** RRF share: EUR 5427.9 million	EUR 7110 million of which 700 million in grants from the RFF (2021-2024)
	1.2.2 Electromobility funding guideline		EUR 414 million available through 2025, of which EUR 75 million in grants from the RRF (2021 and 2022)
	1.2.3 Innovation premium to promote sales of electrically powered vehicles		EUR 2500 million in grants from the RFF (2021-2022)
	1.2.6 Grants for the promotion of alternative drive systems in rail transport		EUR 309.15 million available through 2025, of which 227 million in grants from the RRF

1.2.1 Charging infrastructure: With the funding guideline 1.2.1 "Publicly accessible charging infrastructure for electric vehicles in Germany", at least 50,000 charging points are to be installed by the end of 2025 (divided into approx. 20,000 fast charging points and 30,000 standard charging points). The object of the subsidy is the construction of publicly accessible charging infrastructure with more charging points, including the necessary grid connection of the charging site and the installation of the charging station. The expenses for planning, the approval process and operation are excluded from the funding. Natural persons and legal entities are eligible to apply. The subsidies are awarded by means of funding calls.

1.2.2 Charging infrastructure: Funding is provided for the procurement of EVs and charging infrastructure that ensures the charging necessary for the operation of these vehicles. The focus is on municipal and commercial fleets that require safe charging. Funding is provided in the form of an investment grant calculated based on the respective additional investment costs compared with a conventional vehicle.

1.2.3 Charging infrastructure: The innovation premium supplements the environmental bonus and is part of the 2016 market incentive program. The market incentive program includes a purchase premium for electric cars, the expansion of the charging infrastructure and procurement by the public sector.

1.2.6 Rail: The objectives of the funding is to enhance the procurement of innovative rail vehicles (in terms of the drive train or the conversion to alternative drive systems) that offer significant CO2 savings compared to conventional diesel vehicles for non-electrified lines.

1.3 Climate-friendly building and renovation	1.3.1 Further development of climate-friendly construction with wood	**TOTAL** RRF share: EUR 2577 million	EUR 20 million in grants from the RRF (in 2021). Due to the lack of empirical values, it is not possible to estimate the complete allocation of funds
	1.3.2 Municipal reallabs of the energy transition		EUR 57 million in grants from the RRF (2021-2025)
	1.3.3 CO2 building refurbishment: Federal funding for efficient buildings - Innovation funding		EUR 2500 million in grants from the RRF (2021-2025)

1.3.1 Construction: The aim of the measure 1.3.1 is to accelerate the development, introduction and dissemination of innovative technologies, processes, products and services (digital transformation) for greater use of wood as a climate-friendly building material. The measure is also intended to contribute to overcoming structural disadvantages and obstacles in order to be able to establish timber construction on an equal footing in large-volume construction as well. The measure also includes:

- Use of digital solutions (e.g. robotics, AI) to improve processes in the company;
- Identifying specific requirements and prerequisites for implementing operational change processes (e.g. introducing BIM into the planning and manufacturing process);
- Recommendations on cross-company networking opportunities (e.g. architects, planners, builders, construction companies);
- Advice on the introduction of standardized product and system solutions (including serial construction, modular construction, hybrid construction methods), as well as capacity expansion and specialization options;
- Analysis and evaluation of product recyclability and deconstructability;
- Concepts for better integration of environmental and life cycle assessment data into the business process.

1.3.2 Buildings: The measure 1.3.2 should provide for the existing urban neighbourhoods with a fossil-dominated heat supply to be increasingly transformed to renewable energies during ongoing operation. In this process, all stakeholders must be involved in an industry with (partially) dispersed real estate ownership. In addition to the purely technical issues, the municipal reallabs should also address the question of comprehensive involvement (participation). The technical prerequisites for the integration of renewable energies must be created, among other things, through renovations. The goal of the measure is to create transferable solutions for decarbonizing urban neighbourhoods with the long-term goal of achieving greenhouse gas neutrality by 2050. The majority of investments in

environmentally friendly technologies made within the framework of the real laboratories are borne by the participating companies and are thus tested close to the company.

1.3.3 Buildings: The aim of the federal funding for efficient buildings is to stimulate investments that increase energy efficiency and the share of renewable energies for heating and cooling in residential and non-residential buildings in Germany and to reduce CO2 emissions from the building sector.

Focus 2: Digitization of the economy and infrastructure			
Reforms	**Investments**	**Financing**	
2.2 Digitization of the economy	2.2.4 Promoting the digitization of the railroads by replacing conventional interlockings/ fast-track program to accelerate the rollout of "Digital Rail Germany"	**TOTAL** RRF share: EUR 3,138.5 million	EUR 500 million in grants from the RRF (2021-2022)
2.2.4 Rail: The program has two main objectives: • To strengthen employment and the sustainability of the rail sector in the short term in the wake of the Corona pandemic by implementing the program by the end of 2021. According to the rail industry, an extrapolation of the operational and economic effects suggests that around 10,000 jobs will be safeguarded or created in the value chain (planning, construction, installation/assembly, commissioning). • Acceleration of the starter package and future area rollout of the "Digital Rail Germany" by utilizing the results from the program with the aim of shortening implementation by up to five years. To this end, old interlocking technology is to be replaced by digital interlocking technology that is geared to the future technical target state of Digital Rail Germany and is upgradeable and compatible for a subsequent ETCS expansion thanks to uniform interfaces, and the interfaces are to be standardized for the use of compatible technology from different manufacturers.			

Focus 6: Modern public administration and reduction of barriers to investment			
Reforms	**Investments**	**Financing**	
6.2 Reduction of investment barriers	6.2.1 Joint federal and state program for a high-performance, citizen- and business-friendly administration	**TOTAL** EUR 50 million (*not clarified whether from RRF or other sources of financing*)	EUR 50 million in grants from the RRF (2021-2025)
	6.2.3 Acceleration of planning and approval procedures in the transport sector		tbc
6.2.1 Construction and procurement: The measure 6.2.1 should help to ensure that (Federal and regional level): • grants are issued in a standardized form as far as possible, with uniform procedures; • increase the number of successful business transfers to subsequent generations;			

- construction is further accelerated (from the creation of building rights to the occupancy), especially in order to reduce the average cost of building housing;
- planning and approval procedures, especially for infrastructure projects, are further effectively accelerated.

Buildings: The Länder agree to amend the joint model building code to speed up construction projects nationwide. In particular, the aim is to ease the burden on non-commercial builders and facilitate residential construction.

The federal and state governments are called upon to work towards a consistent strengthening of the planning and approval authorities in the interests of speedy implementation. The measures adopted for this purpose could be the following:

- Possible formation of competence teams;
- deployment of planning and environmental law experts;
- creation of a positive planning culture;
- strengthening and using digitalization.

Construction and procurement: The acceleration of planning and approval procedures should be enhanced. This concerns **s**ponsors of planning and approval projects as well as implementing companies, e.g. in the context of the expansion of infrastructure networks (energy, transport, telecommunications, digitization) as well as plant and housing construction.

Mobility: In the interests of environmentally friendly mobility, the Federal Chancellor and the heads of government of the federal states are committed to further accelerating planning, particularly for projects to strengthen rail and local public transport. Legal amendments are also a possible means of simplifying existing processes.

Procurement: via the Modernization of public procurement law and acceleration of public procurement in accordance with the country-specific recommendations. In the future, public contracting authorities will be able to use a competition register to find out quickly and easily whether there are grounds for excluding a bidder, in order to exclude the company from the award of a public contract on this basis. The nationwide electronic competition register at the Bundeskartellamt will gradually go live in the course of 2021.
The German government also aims to strengthen sustainable procurement. Among other things, the German government plans to issue a general administrative regulation on climate-friendly public procurement to implement the cabinet resolutions on the Climate Protection Program 2030.

6.2.3 Transport sector: The German government's goal is to substantially accelerate planning and approval procedures in the transport sector. On the one hand, this is intended to secure the performance of transport routes in the long term. On the other hand, the expansion of environmentally friendly modes of transport is an essential prerequisite for achieving climate protection targets.

In the last two and a half years, four laws have come into force at the federal level to this end. Overall, the legal regulations adopted make an important contribution to sustainably

improving the framework conditions for public investment in Germany. In this respect, they also take account of the Länder-specific recommendations for 2019 and 2020 with regard to strengthening investment demand and removing obstacles to investment by focusing a substantial part of the investment acceleration measures on more rapid expansion of the infrastructure and closing gaps in the electrification of rail lines.
Legislation of the measures has been completed and the laws must now be effective in practice. An evaluation of the laws is planned to assess their effectiveness. The evaluation period takes place after five to eight years.

The projects mentioned above are in different planning phases; a concrete date for a legislative procedure has therefore not been set yet. In addition, acceleration measures are taking place at the non-legislative level. The Federal Ministry of Transport and Digital Infrastructure, for example, is planning an AI-based knowledge platform for species protection in the environmental sector. This information should be made available to planners and authorities quickly. The knowledge platform should be ready for use by mid-2023. In addition, coordination is taking place with the federal states on possible further non-legislative acceleration measures.

Link to reforms and investment measures

- **Broadband and mobile communications expansion**

The German government is aiming for nationwide coverage with a gigabit-capable fixed network by 2025. The roll-out of gigabit connections is primarily taking place via market processes in competition. Investments have recently reached record levels. With the amendment to the Telecommunications Act ("Telecommunications Modernization Act") adopted by the Cabinet on December 16, 2020, the German government aims to provide targeted incentives for investment and innovation. Only where market-driven expansion does not take place is public funding envisaged.

- **Power grid expansion**

The Act Amending the Federal Requirements Plan Act came into force on March 4, 2021. This updates the list of network expansion projects for which there is an urgent need. It is based on the 2019-2030 network development plan, which for the first time takes into account the German government's increased target in this legislative period of achieving a 65% share of renewable energies in gross electricity consumption in 2030.

German Covid-19 Relief Package

Initially, the German Government agreed on a **€130 billion** economic stimulus package for 2020 and 2021 in June 2020. In sum, until 31th December 2020, the value added tax was reduced from 19 to 16% to stimulate consumption. €50 billion euros were earmarked for investments in, among others, the promotion of e-cars and more charging stations. The total aid measures of the Federal Government now account for almost 1°% of the German GDP[114].

[114] Sigmund, Thomas 2020: Das 130-Milliarden-Konjunkturpaket steht: Mehrwertsteuer wird gesenkt, Bonus für Familien. In: Handelsblatt. Accessed: December 3, 2020.

Regarding the second lockdown, the economic stimulus package amounted up to **€160 billion**. For the new financial year 2021, the government planned new borrowings of **€180 billion**.

Focus on mobility and infrastructure

1) Share for passenger car transport

Users

Car tax for passenger cars: The tax will be more CO2 oriented, which is intended to have a steering effect towards lower-emission or zero-emission vehicles. For new registrations, the assessment basis as of 1 January 2021 will therefore mainly be based on CO2 emissions per km. In addition, the already existing ten-year vehicle tax exemption for purely electric vehicles will be granted until 31.12.2025 and extended to 31.12.2030.

Eco-rebate: Is intended to promote the replacement of the car fleet with climate- and environmentally friendly electric vehicles. Car manufacturers had exerted pressure for the introduction of a so-called scrapping premium for diesel and petrol cars, but the state-subsidised premium of **€6,000** is only available for EVs[115].

"Social & Mobile" fleet exchange programme: The programme is limited to the years 2020 and 2021 and will be set up to promote electric mobility to promote urban transport and to support the non-profit organisations in the conversion of their fleets. **€200 million** are required.

Industry

Bonus programme: Will be set up for 2020 and 2021 for future investments by vehicle manufacturers and the supply industry. It should promote investment in new technologies, processes and equipment. Research and development for transformation-relevant innovations and new regional innovation clusters, especially in the supply industry, will be supported with **€1 billion in 2020 and 2021**.

Charging infrastructure

Expansion of modern and secure charging point infrastructure: Investment of an additional **€2.5 billion** in the promotion of research and development in the area of electric mobility and battery cell production. The expansion of the charging infrastructure as a necessary prerequisite for the ramp-up of e-mobility should be accelerated. To this end, the **charging infrastructure master plan** is to be implemented rapidly. In particular, the uniform payment system for charging points. Through a supply obligation, it should be regulated that loading points are also offered at all petrol stations in Germany. The development of publicly accessible charging infrastructure (e.g. at day-care centres, hospitals, district centres, sports grounds) will be intensified as part of the master plan. It is also being examined whether the construction of rapid charging points can be considered as a decarbonisation measure for the petroleum industry.

[115] Bannon, Eoin 2020: Deutschlands grünes Hilfspaket weist Europa den Weg. In: Transport & Environment. Accessed: December 3, 2020.

Hydrogen

Germany has set itself the goal of building hydrogen capacities of five gigawatts by 2030 and another five gigawatts by 2035 or 2040 at the latest. The aim is to promote the switch from fossil fuels to hydrogen, particularly in industrial processes. **In this context, the EU's RED II Directive is to be implemented more ambitiously than the EU requirements, and the regulatory framework for the development of the hydrogen infrastructure is to be created quickly**. The development of green hydrogen capacities is accompanied by the accelerated expansion of offshore wind energy: 20 gigawatts by 2030 and 40 gigawatts by 2040[116]. **€9 billion** will be dedicated to the development of the hydrogen economy.

Share for public transport, including rail

The initial €130 billion German recovery package included measures for bus and rail, including:

Compensation for Corona-related revenue shortfalls in local transport: The Federal Government is making **€2.5 billion** available from its budget. Another 50% is to be financed by the Länder[117].

In order for the Länder to be able to pay the compensation, the EU Commission had to approve the aid. EU Directive 1370/07 does not actually allow transport companies to receive operating subsidies without a transport or service contract. On August 7, 2020, the European Commission has approved, under EU State aid rules, the €6 billion German scheme[118]. Under the scheme, transport companies will be entitled to compensation in the form of direct grants for damages incurred between 1 March and 31 August 2020. Germany has to ensure that no individual transport operator receives more in compensation than it suffered in damages and that any payment in excess of the actual damage is recovered[119]. The Federal Government is also investing in a:

Bus and truck fleet modernisation programme: It is open to private and municipal operators to promote alternative drive systems. In order to increase the demand for e-buses and make urban transport more environmentally friendly, the funding for e-buses and their charging infrastructure will also be increased for a limited period until the end of 2021. The financial requirements account for **€1.2bn**.

Criticism is voiced by private mobility operators as the different Länder decide whether relief measures will also benefit to private operators. Private operators fear that a big portion of the federal funds will go to municipal transport companies in cities which would not have been able to reduce costs during the crisis.

"Smart City" programme: It is to be continued and increased by **€500 million** to projects in towns and communities that have not yet been implemented also have a may be eligible for further funding.

[116] Bannon, Eoin 2020: Deutschlands grünes Hilfspaket weist Europa den Weg. In: Transport & Environment. Accessed: December 3, 2020.

[117] Deutschland Mobil 2030: Die neue Realität – Corona und die Auswirkungen auf den Nahverkehr. Accessed: December 3, 2020.

[118] In reality it is a €5bn aid programme, with the federal government contributing €2.5bn and the Länder €2.5bn.

[119] European Commission 2020: State aid: Commission approves €6 billion German scheme to compensate public transport companies for damages suffered due to coronavirus outbreak. Accessed: December 3, 2020.

2) Focus on Rail

Compensations for Corona-related revenue shortfalls for Deutsche Bahn: The Federal Government's intention to grant DB **€5 billion** as additional equity capital in view of its corona revenue shortfalls is highly controversial. It is set to be followed by up to **€3.6bn** next year. According to the opposition, this would inevitably lead to the impression that the already heavily debt-burdened railways now want to use the crisis as a pretext for a financial rescue. Previously, the Federal Court of Auditors (BRH) had presented an extremely critical special report on DB's corona financing needs, demanding that DB should not solve its problems through corona aid[120].

Compensations for Corona-related revenue shortfalls in local transport: There are also questions over how or whether DB will benefit from these compensations, normally to be granted to local public transport. DB Regio could receive up to €800m and is potentially the biggest single beneficiary of the **€5bn** aid programme.

It is argued by private mobility operators that the cumulative funding would ensure DB an unfair competitive advantage. Other competitors should have had the opportunity to fill this gap[121]. The Federal Government had already decided, among other, in the framework of the **Climate Protection Act 2030** (adopted in 2019) to acquire an additional €1 billion of equity capital in Deutsche Bahn every year from 2020 to 2030. This should enable Deutsche Bahn to invest additional capital in modernisation, expansion and to invest in the electrification of the rail network and the railway system.

3) Focus on freight

Fleet renewal programme: The German government will lobby the EU Commission to ensure that a temporary Europe-wide fleet renewal programme 2020/21 for heavy commercial vehicles to purchase trucks with the latest Euro VI emission standard. It would provide a grant for the replacement of Euro 5 lorries of €15,000 and €10,000 euros for the exchange of Euro 3 or Euro 4 vehicles. The financing is expected to come from European funds.

3. Existing mobility strategies

The Federal Minister of Transport was granted one of the largest investment portfolio in the Federal Cabinet: In 2020, the ministry has had a total of **€31.5 billion** at its disposal, decided before the crisis. However, the federal Government's competence in transport has so far been limited to parts of the infrastructure: the financing of federal roads, waterways and railways. Airports already fall under the sovereignty of the Länder, which are also responsible for planning and building supra-regional transport routes. Counties and municipalities are also involved, ordering bus routes and building roads, car parks and cycle paths. Many of them are quite willing and want to promote environmentally friendly mobility. But often it is extremely difficult to coordinate with the surrounding communities[122].

[120]Bus und Bahn 2020: Rettungsschirm für den ÖPNV beschlossen. In: Bus und Bahn. Accessed: November 27, 2020.
[121] Smith, Kevin 2020: Pandemic pushes German operators to the brink. In: IRJ. Accessed: November 27, 2020.
[122] VCD 2020: Deutschland braucht ein Bundesmobilitätsgesetz. Accessed: December 3, 2020.

Focus on local passenger rail services (2019): Funding measures

In general, the federal states and local authorities are primarily responsible for planning, organising and funding urban and regional transport. The Federal Government was providing in 2019 more than **€9 billion** to the federal states to support the offer of public transport services. Federal Government funding particularly benefits local passenger rail services, that is rapid transit, local trains, regional trains and regional express trains.

In 2019, the Länder have received state subsidies from the government's revenue of taxes, amounting **€8.6 billion**, to finance local public transport and local passenger rail services. State subsidies for local and regional passenger rail services will be increased by 1.8 % annually until 2031.

In addition, the Länder received compensation payments from the federal budget to improve transport in the municipalities, amounting to about **€1.336 billion** annually (until the end of 2019) under the Unbundling Act and another **€332.6 million** annually under the "Federal Programme" to improve transport at the local authority level. In accordance with the Coalition Agreement, the Federal Programme is to be increased to one billion euros annually until 2021.

The Federal Government is also financing local public transport through tax breaks (e.g, value added tax reductions) as well as compensation payments (e.g. for the carriage of disabled persons with severe walking difficulties).

Infrastructure focus: The 2030 Federal Transport Infrastructure Plan (FTIP) (till 2030)

Key issues of the FTIP 2030 are the structural maintenance of the existing networks and the removal of bottlenecks on the major transport arteries and at important transport hubs. Of the plan's total level of funding of about **€269.6 billion**, an amount of **€141.6 billion** will be invested in the structural maintenance of the existing networks in the period until 2030 alone. Around **€98.3 billion** are earmarked for upgrading and new construction projects[123].

The implementation of the projects of the FTIP 2030 comes with the objective to lessen congestion on federal trunk roads and increase capacity in passenger rail services and rail freight. The upgrading and new construction measures for the rail network planned in the FTIP 2030 are, for the first time, geared towards the objective of a nationwide integrated regular interval timetable (Deutschland-Takt) by 2030, and they should create the infrastructure basis for the latter's introduction. It has the objective of making the transport chain in the rail system more attractive by offering coordinated timetable intervals throughout the national rail network in passenger rail services.

The costs for the FTIP are currently estimated at around **€270 billion**. The money comes mainly from tax revenues. The car toll, which has been declared illegal by the CJEU, should has actually also contributed to this.

Focus on public transport: 2017-2020 Immediate Action Programme for Clean Air

In the context of the "2017-2020 Immediate Action Programme for Clean Air", the funding is focused, among others, on purchasing electric vehicles, digitalising local public transport as well as retrofitting diesel buses with exhaust gas after treatment systems. The Federal

[123] The FTIP is nothing new. The 2003 one was valid until 2015; its predecessor was the 1992 plan. Citizens were able to comment on the FTIP 2030. The concepts of recent years have mainly focused on expanding the rail network and connecting cities with their surroundings.

Government is also funding so-called innovative transport projects in model cities. Together with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the Federal Ministry of Transport and Digital Infrastructure will have provided about **€130 million** by 2020. The five model cities include Bonn, Essen, Herrenberg, Mannheim and Reutlingen which are expanding local public transport services, reducing ticket fees, enhancing traffic management and building new cycle tracks.

Focus on cycling: The National Cycling Plan 3.0 (NRVP)

The NRVP is the Federal Government's strategy for promoting cycling in Germany. The NRVP contains mission statements and priorities that are intended to be pursued by the federal government, the Länder and local authorities and other actors within their areas of responsibility.

The NRVP is valid until the end of 2020. Until 30 June 2019, the federal ministry of transport issued an online citizen participation. The updated cycling plan should be issued in 2021[124].

Local level: Berlin Mobility Act (adopted on June 28, 2019)

Berlin has adopted a law to strengthen cycling and local transport[125]. More than 50 million euros shall now being invested in cycle paths every year. However, it has been assessed that little has changed.

The Mobility Act contains separate sections for local transport, cycling, walking and "intelligent mobility" such as car sharing. More lines are planned for suburban trains, trams and regional transport, as well as rapid cycle routes for commuters. Lower fares and simple tariffs should also make the switch to clean transport more affordable. One of the guiding principles of the Mobility Act is "Vision Zero". This means that the number of seriously injured and killed accident victims should be reduced to a minimum in the long term. For cycling, 100,000 bicycle parking spaces, cycle paths on all major roads, improved traffic lights, clearer intersections, cycle lanes, promotion of cargo bikes are planned. Some of this is already being implemented, e.g. about 7,500 parking spaces, publication of an online tool for the expansion of the cycle path network. In addition, new bus lanes and separate towing vehicles for the Berlin transport company are planned.

However, many observers are sceptical about whether the Mobility Act will bring improvements. Although it may contain many good projects, experience has shown that most of them are bogged down in the planning stage. To set up a zebra crossing in Berlin, for example, would take 18 administrative steps and three years[126].

Recent legislative initiatives: The new Climate Protection Act (published December 18, 2019)

The Federal Climate Protection Act is a major step towards implementing the decisions of the Federal Cabinet of 25 September 2019 on key points for the **Climate Protection Programme**

[124] BMVI 2019: Well-connected by public transport. Accessed: December 3, 2020.
[125] Senatsverwaltung für Umwelt, Verkehr und Klimaschutz: Berliner Mobilitätsgesetz. Accessed: December 3, 2020.
[126] Franke, Fabian 2019: Und das Auto hat immer noch am meisten Platz. In: Zeit online. Accessed: December 3, 2020.

2030. The latter has been handed over to the European Commission. The European Commission has assessed the final national energy and climate plan (NECP) of Germany on October 14, 2020.

The 2019 Climate Protection Act provides for a gradual reduction in greenhouse gas emissions compared with 1990, with at least 55% by the target year 2030. In the long term, the German government is pursuing the goal of greenhouse gas neutrality by 2050.

If higher national climate protection targets become necessary to meet European or international climate protection targets, the German government will take the necessary steps to increase the target values. Climate protection targets can be raised, but not lowered.

The Climate Protection Act determines for the first time how much CO2 each sector is still allowed to emit. The federal ministries are obliged to ensure that the annual emission targets are met in the different sectors: energy, industry, buildings, **transport**, agriculture, forestry and waste management.

If a sector does not meet its statutory targets, the responsible ministry must submit an emergency programme within three months. Before the Federal Government decides on follow-up measures, an Expert Council examines the underlying assumptions. On this basis, the Federal Government decides which measures it will take to continue to reduce emissions in the sectors and thus to further achieve the climate target[127].

Transport

Compared to 1990, emissions from transport must be reduced by 40 to 42% by 2030. This is to be achieved with a package consisting of the promotion of electric mobility, strengthening the railways and CO2 pricing.

Charging infrastructure

In Germany, a total of **one million charging points should be available by 2030**. The Federal Government is funding the development of public charging points until 2025 and presented a master plan for charging point infrastructure. The Federal Government will make it mandatory that charging points are also offered at all petrol stations in Germany and installed in customer car parks. However, most charging processes will take place at home or at work. Private and commercial charging infrastructure will therefore also be funded.

Switch to electric vehicles

The purchase premium for cars with electric, hybrid and fuel cell drive will be extended and increased for cars under 40,000 euros. The German government's goal is to have 7 to 10 million electric vehicles registered in Germany by 2030. Electric vehicles will initially be exempt from tax on initial registration and conversion. This scheme is extended until 31 December 2025. E-commercial vehicles will also continue to receive tax incentives, and purely electric vehicles (up to a price of €40,000) will be given special tax breaks.

[127] Bundesregierung 2020: CO2-Ausstoß verbindlich senken. Accessed: December 3, 2020.

Public Transport

The Federal Government has increased the federal funds for local public transport to one billion euros per year from 2021. This is intended to expand the local transport network. From 2025 these funds will amount to 2 billion euro per year. For example, bus fleets with electric, hydrogen-based and biogas drives will be promoted.

Rail

By 2030, the federal government and Deutsche Bahn will invest 86 billion euros in the rail network. Freight transport will also benefit from this modernization in order to put more freight on the rails. Between 2020 and 2030, Deutsche Bahn will receive €1 billion annually for modernising, expanding and electrifying the rail network[128].

Cycling

The Climate Protection Programme 2030 is to provide additional funding of €900 million for cycling by 2023. Together with the previous funding and financing possibilities of around €560 million (2020 to 2023), this will result in a total of around **€1.46 billion** for the promotion of cycling and the expansion of the cycling infrastructure by 2023[129].

Additional legislative acts from the Climate Protection Act: CO2 pricing (adopted on October 8, 2020)

The German government will introduce **CO2 pricing for heating and transport from 2021**. Through a national CO2 emissions trading scheme, greenhouse gas emissions from heating and driving will receive a price.

For building heating and transport, an effective price signal that reflects the CO2 intensity caused by the consumption of fossil fuels is still missing. This is because the European ETS does not apply to these two sectors. The new CO2 price will make the consumption of fossil heating and transport fuels more expensive. This will make it more profitable to use climate-friendly technologies such as heat pumps and electric mobility, to save energy and to use renewable energy.

The Federal Government and the Länder agreed to set the CO2 price at an initial level of 25 euros per tonne from January 2021. Thereafter, the price will gradually increase to 55 euros in 2025. For 2026, a price corridor of at least 55 and at most 65 euros will apply.

The Federal Government will use the revenue from CO2 pricing primarily to ease the burden of the renewable energy levy and thus reduce electricity prices. In addition, the fiscal distance allowance will be increased, and a mobility bonus will be granted, and measures of the Climate Protection Programme 2030 will be promoted - for example, for climate-friendly transport and energy-efficient buildings[130].

[128] Bundesregierung: Klimaschutzprogramm 2030. Accessed: December 3, 2020.
[129] BMVI: Förderung und Finanzierung des Radverkehrs. Accessed: December 3, 2020.
[130] Bundesregierung: Grundlage für CO2-Preis steht. Accessed: December 3, 2020.

Additional legislative acts from the Climate Protection Act: Increase of the commuter allowance and mobility premium

In order to ease the burden on commuters, the commuting allowance is to be increased by five cents to 35 cents from 2021 and by a further three cents from 2024 to a total of 38 cents. Alternatively, low-income commuters who are within the basic allowance will be able to choose a mobility premium of 14% of this flat rate. The increase in the tax distance allowance and the granting of a mobility premium are limited to the period from 1 January 2021 to 31 December 2026.

Additional legislative acts from the Climate Protection Act: Reduction of VAT on long-distance rail tickets

In order to improve the attractiveness of rail, the VAT rate for long-distance tickets is to be reduced from 19 to 7% from 2020. This regulation will apply for an unlimited period[131].

Climate Protection Programme 2030: Assessment by the EU Commission

Germany's final integrated national energy and climate plan (NECP) sets the target to reduce greenhouse gas (GHG) emissions for sectors not covered by the EU Emissions Trading System (non-ETS) by 38% by 2030 compared to 2005. Although Germany's national and sector-wide greenhouse gas emission reduction targets for 2030 are in line with its long-term strategy (national climate plan 2050), they are not always reflected in sector-specific national contributions.

In the context of the European Semester framework 2019, Germany received one country-specific recommendation on climate and energy, calling on it t**o focus on sustainable transport as well as energy networks and affordable housing, taking into account regional disparities**. In the 2020 country report adopted on 20 February 2020, the Commission found that Germany had achieved limited progress on this recommendation[132]. The Commission further invites Germany to consider, while developing its national recovery and resilience plan, the following climate and energy-related investment and reform measures:

- Measures to promote investments in sustainable mobility projects and infrastructure, backed by investments in greener energy infrastructure and R&D on clean technologies;
- Measures to reform green taxation, phase out fossil fuel subsidies and address inconsistent price signals;
- Measures addressing investment bottlenecks related to electricity networks, offshore wind and sustainable transport by simplifying administrative procedures and building capacity in the public sector[133].

[131] Bundesregierung: Umweltfreundliches Verhalten wird gefördert. Accessed: December 3, 2020.
[132] European Commission 2020: Summary of swd assessment NECP: Germany.
[133] European Commission 2020: Summary of swd assessment NECP: Germany.

Key take-aways

- The Climate Protection Act 2019 is overlapping with the measures listed in the corona relief package of June 2020. The development of electromobility and hydrogen technology is central;
- Debate among mobility actors, especially for rail transport on state aid eligibility in the context of the corona rescue packages (private vs. public rail operators);
- Before the Covid-19 outbreak, it is stated that despite an increase in cycling and public transport use in metropolitan areas, the modal split in Germany has hardly changed since 2008: motorised private transport has increased and stays dominant in the transport mix.

Abbreviations

- **ECVs**: Electrically Chargeable Vehicles
- **BRH**: Federal Court of Auditors
- **DB**: Deutsche Bahn
- **FCEVs**: Fuel Cell Electric Vehicles
- **HEVs**: Hybrid Electric Vehicles
- **KDA**: Federal Motor Transport Authority
- **MiD**: Mobility in Germany
- **VDV**: Association of German Transport Companies

DATA BOARD GERMANY

General Data

Political organisation: Federal Republic	**Head of government**: Angela Merkel
Population (2019): 83.13 million	Urban population (2019): 77%

Economic indicators

GDP ranking (2019): 4/203	**GDP** (2019): 3.845,630 million USD
GDP growth (2019): 0.6%	**Expected GDP growth** (2020): -5.6%

Environmental indicators

Share in global CO_2 emissions (2018): 2%

CO_2 emissions (2018): 0.75GT (6th Co_2-emitting country)

CO_2 emissions per capita (2018): 9.12T (9th country emitting CO_2 per capita)

Transport & Mobility sector

Modal share of passenger transport (2018):

- **Private car:** 85.1%
- **Train:** 9.1%
- **Bus and trolleys:** 5.8%

Modal share of freight transport (2019):

- **Roads:** 73.4%
- **Railways, inland waterways:** 26.6%

Construction sector

Construction sector GDP share (2019): 5.6%

Jobs in the construction sector (2019):

Businesses in the construction sector (2019):

Investment in construction -civil engineering- (2019): €44.360 million

Italy

Economic context: Covid-19

Before the pandemic, the Italian economy was not growing significantly. For instance, in 2019 the growth rate was around 0.3%. Italy has been one of the most impacted EU countries by the Covid-19 crisis, and this brought to a fall of the GDP by **8.9% in 2020**[134]**,** while the EU economy knew a contraction by 6.1%. A rebound is forecasted for 2021 (4.2%) and 2022 (4.4%), but the real GDP is not expected to fully return to its 2019 level by the end of 2022[135]. Economic activity has been severely impacted by the first lockdown period in spring where the GDP growth fell by **12.9% in 2020 second quarter** and by 11.2% in the EU[136]. It was especially the case in consumer services, where manufacturing and construction sectors are now leading the economic rebound.

1. Impact of Covid-19 on mobility

Mobility trends in Italy (before Covid-19)

Before the pandemic, Italian mobility was on an ascending curb. Between 2017 and 2019 the total number of trips on the average working day **increased by 8.0%**, from 95,97 to 105,7 million of trips. On the same period, the total number of passengers*km on the average working **day increased by 14.3%**, from 1.137 to 1.185 million of trips[137].

In 2019, **75.1% of travels were on short distances** (0-10km) and **70.2% of passengers*kilometres were made on short and medium distances** (0-50km, of which 43.9% for 10-50 kilometres distances).

Urban mobility rate also went 62.9% in 2008 to 73.9% in 2019, indicating a concentration of mobility location in metropolitan areas. In urban mobility, it can be noted as well that travels of less than 15 minutes were made at 59.2% in urban areas, 26.2% for 16-30 minutes ones.

It is also interesting to look at the **mobility motivations of Italians**. In 2019, travels for work represented 32%, studying 4.6%, family motives 17.1% and leisure time 37.2%.

If we have a look now on **the transport modal split in Italy**, the use of private car remains predominant. In 2019, the use of private car represented 62.5% of travels against 20.8% for walking, 10.8% for public transport, 3.3% for cycling and 2.6% for moto use. In 2019 and on average, **active mobility (non-motorised) counted for 23.9% against 64.0% for private mobility (motorised including car and moto) of travels. Public transport use was at 12.2%**.

Italians are more satisfied by private and motorised mobility than collective mobility means. In 2019, in average satisfaction ratings on a scale of 1-10 of the use of different types of mobility in the three months preceding the interview, 88.1% of the respondents ranked automobile between 7 and 10 where 61.5% did the same for metro. Tram and urban buses (46.5%) and sharing mobility (65.7%) are in lower levels as well.

[134] Eurostat, Real GDP Growth Rate – Volume, 2021.
[135] European Commission, European Economic Forecast, Spring 2021.
[136] Eurostat, News Release Euro Indicators 121/221, 31 July 2020.
[137] ISFORT, 17° Rapporto sulla mobilità degli italiani "La Mobilità In Italia Tra La Gestione Del Presente E Le Strategie Per Il Futuro'', Relazione di sintesi, 04 November 2020.

In 2019, the **active mobility rate** went from 37.2% in 2002 to 35%. Some gaps exist in the country according to the regions or the city size. North-West of Italy has an active mobility rate of 40.5% when the North-East (32.4%), the Central Region (33.7%) and the South and islands (32.8%) have lower rates. On the same way, small cities of a maximum of 10.000 inhabitants have a 24% active mobility rate against 47.7% in cities over 250.000 inhabitants. Active mobility is then more concentrated in large cities and in the North West of Italy. It is confirmed by **comparing cities size and travel modal split**. In 2019, the use of private car has a modal share of 74.9% in cities of maximum 10.000 habitants and more than 60% in cities of maximum 250.000 inhabitants, against 47.7% for cities over 250.000.

If now we **compare the travel modal split across the different regions**, we observe that the use of private car is slightly lower in the North-West (56.9%) than in the other regions (more than 60%). The use of public transport is higher in the North-West as well (15.1%) than in the rest of the country (from 7.5 to 12.2%). Another interesting figure is **the increase of the intermodal travel rate** which went from 2.3% in 2004 to 7.2% in 2019, especially in travels combination including cycles which went from 3.7% in 2001 to 10.1% in 2019.

Mobility intentions are slowly changing. In 2019, 35.6% of the respondents indicated they would like to reduce the use of private car (29.4% in 2018) and 54.3% they would not change their car use (60.7%). Regarding the use of public transport, 36.3% would like to use it more (30% in 2018) and 54.7% would not change their use (62.2% in 2018).

Infrastructure

In 2017, according to ERF Statistics 2020[138], Italy invested €3.4 billion in gross in road infrastructure at the same scale that Spain (€3.6 billion), but quite lower than France (€9 billion), Germany (€14 billion) or the United Kingdom (€9 billion). Italy has also the 4th motorway network in length in the EU with 6.943 kilometres.

According to national experts, "*road infrastructure maintenance is a key issue in Italy due to the age of these assets, particularly on structures such as bridges and tunnels. The country is the second largest country in the world in terms of number and length of tunnels*".

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2019, the car fleet in 2019 exceeded 39.5 million vehicles with a variation of 7.6% compared to 2010 levels, and the motorisation rate continues to grow. In 2018, with 646 cars for 1.000 inhabitants, the Italian motorisation rate (numbers of cars for 1.000 inhabitants) is the highest in the EU. Car registrations collapsed as expected by 38% between January and August 2020. Between 2015 and 2019, the motorisation rate increased in all large cities except Milan (-1.5%).

Two-wheels

In 2019, the motorbike fleet reached almost 6.9 million vehicles with a variation of 15.3% compared to 2008 levels. Moto registrations fell by 11.5% between January and August 2008, after a positive variation of 5.8% between 2018 and 2019.

[138] ERF, Statistics, Road Maintenance and Investment 2020.

Collective transport

Considering the different transport modes (road collective transport, railway, undergrounds, trams, etc.) the local and regional public transport in Italy accounts for a revenue of €12 billion per year, transporting over 5 billion passengers on a total of 2 billion trips/km across the different modes, notably by bus. The market is composed by about 800 contractors and more than 113.000 employees[139]. In 2018, collective transport (train excluded) accounted for 11.3% of the modal split of mobility, whereas rail alone accounted for 6.3%.

Alternative powered vehicles

The alternative powered vehicles share increased in Italy in the past years but remains still low. Between 2015 and 2019, the share of alternative vehicles in the car fleet went from 8.3% to 9.8%, with a large share of vehicles powered by natural gas. We observe the same trend by looking the share alternative vehicles in registrations. Between 2015 and 2019, it went from 12.8% to 14.3% with a notable increase of Plug-In Hybrid Electric Vehicles (PHEV) share from 1.7 to 5.3%.

Cycling

The bicycle market was on the rise before the COVID-19 pandemic. Bicycles sales, including E-bike rose by 7.4% between 2018 and 2019 (12.7% for E-bikes). The number of bicycles produced in Italia increased by 11.4% on the same period (108.8% for E-bikes). Use of bicycles is nevertheless rather average: 23.9% declared to use it at least once per week and 25.9% to use it less than once per week.

In 2019, 38.2% indicated they would like to use more bicycle (+34.3% compared to 2018 levels and 57.9 that they would not modify their use.

On the infrastructure side, the density of cycle paths increased during the last decade (2013-2018) in Italy from 19.9 km to 23.5km per 100km2 of land area. The North has a much higher density than the rest of the country, from 48.2km to 56.3km per 100km of land area.

Walking

The same trend is observed regarding pedestrian infrastructure. Between 2013 and 2018, the availability of pedestrian areas on average in Italy went from 36.9m^2 to 42.7m^2 per 100 inhabitants. The North obtains higher numbers from 49m^2 to 58.2m^2 of available pedestrian areas per 100 inhabitants.

Mobility behaviours considering the first COVID-19 wave: first lockdown (12th March-03rd May) and aftermath (18th May-15th October)

General data

The first lockdown period obviously had a severe impact on mobility in Italy. The mobility rate decreased by 53 percentage points compared to 2019, from 85% to 32%. The average number of daily trips lost 67% as well from 2.14 to 0.70. The mobility rate of "proximity" (5 minutes

[139] Ministry of Infrastructure and Transport, Osservatorio Nazionale sulle Politiche per il Trasporto Pubblico Locale, Relazione 2018.

trip by foot) increased by 11% during the lockdown. The average total number of passengers*km per day (millions) is the most impactful figure by decreasing from 104 to 34 (-67%). The fear of contagion, restrictions and self-discipline are the main reasons of this massive drop in mobility indicators.

Nevertheless, the demand of mobility had a very high rebound after the first lockdown. In 2019 and on average, the mobility rate was 85%. It is at 75% since the end of restrictions in May. Compared to the lockdown period (32%), the mobility rate rose by 43 percentage points. The same trend is at stake on average total number of passengers*km per day with a figure covering 74% of the 2019 target. The most impressive is for the mobility rate of "proximity" which covered the 2019 target by 175% unless it lost some points compared to the lockdown period from 17% to 10% on October 15.

Alternative fuel vehicles

By comparing car registrations in Italy between Q3 2019 and Q3 2020[140], APV registrations impressively increased (+60.3%) when conventional cars registrations begun to fall (-20.3% for petrol cars and -7.6% for diesel cars). It is too soon to predict this trend is the 'new normal'. In the other hand, market shares of electric and hybrid vehicles remained quite low in 2019 in percentage (0.6% and 0.7%). In absolute values, Italy counts 39,018.170 passengers' cars[141], of which **40,237 are Battery Electric Vehicles (BEV)** and **29,248 are Plug-In Hybrid Electric Vehicles (PHEV).** The curbs must be frequently followed to know if either the COVID-19 outbreak made APV market took off or was a temporary trend within the automotive market.

Charging infrastructure remains insufficient for the time being with **13,176 electric charging points** (6.17% of the total EU network). Despite a better growth than the EU average in 2020. Electric charging infrastructure growth fell between 2019 and 2020 from 167.4% to 42.7%.

Collective mobility

Collective mobility has been severely hit by the lockdown period. In local public transport, the **occupancy rate was 10% during the lockdown period and returned to 30-40% after May 18th**. Compared to 2018, **the loss of revenue** in 2020 for the local public transport amounted to **€2200 million**[142]. In 2017 and in comparison, the total traffic revenues of local public transport amounted for **3.672 million euros** of which 2.138 million euros for bus, metro and 1.330 million euros for regional rail transport. It is an increase of 4.52% compared to 2015 levels. Traffic revenues are more located in Northern cities such as in Lombardia (923 million euros), in Venezia (394 million euros), in Piemonte (259 million euros) or in Liguria (162 million euros) If we take the total revenues of local public transport, **it amounted for 7.622 million euros of which 4.797 million euros for bus, metro and 2.692 million euros for regional rail transport**. Also, a high impact is pointed out on client loyalty through an estimated reduction of 50% of annual and monthly subscriptions in September 2020.

In the same path, **revenues for commercial transport by road and for touristic road transport (with driver) dropped by 75% for the January-August period compared to the same period**

[140] European Automobile Manufacturers Association (ACEA), New passenger cars registrations by fuel type in the European Union, 05 November 2020.
[141] European Alternative Fuels Observatory, Italy, 2020.
[142] National Association of Passenger Transport (ANAV), Bilancio di Previsione 2021-2023, 2021.

in 2019. In 2018, small and medium enterprises with 1-10 employees (60%) and 10-100 employees (28.7%) constitute the majority of the businesses of the sector.

The main explanations remained in the restrictions during the lockdown period and the fear of contagion in collective transport. The fact that mobility on public transport did not bounced back at the previous levels during summer, when the restrictions were removed, might result in a permanent modal shift to the detriment of public transport[143].

Cycling

Several large Italian cities announced new mobility plans during the first wave of COVID-19, often related to cycling infrastructure. The city of Rome is the most ambitious city in Europe by announcing last May the implementation of extra 150km of cycling paths in the frame of an extraordinary plan for the construction of cycle paths "transitory". Milan proposed among others measures the construction of transitory 35km of cycling paths as well. Other cities to extend the dedicated lanes to active mobility and then reduce the space of private cars in the traffic, or to launch new bike sharing services as in Turin. Extra 115 million euros have been announced in Italy for cycling infrastructure and 190 million euros of subsidies for bicycle buying or repairing[144]as responses to the first COVID-19 wave.

In May 2020 the Italian Government released the **Decree Bonus Mobility** to incentive alternative forms of sustainable mobility in urban areas. The bonus consists in a subsidy up to 500 euros for the private purchase of bicycles, e-bikes (pedal assisted bikes), and electric scooters. The initiative was conceived and discussed by the Ministry of Environment in 2019, but the pandemic furtherly exacerbated the need to boost sustainable mobility as even regular public transport users faced important limitations in the service fruition. 558.725 purchases of bicycles, e-bikes and electric scooters benefitted from the Bonus Mobility, which mobilized 215 million euros between May and December 2020. Even though at first the initiative was highly criticized as a waste of public money in a period of more prominent issues – when the platform to request the Bonus was released, the first lockdown was not completely over yet – the Bonus Mobility proved to be a success and was reproposed in February 2021. It is also being discussed the possibility to make the Bonus permanent with a long-term budget allocation.

COVID-19 impact and mobility scenarios

TRENDS	
1)	**The future volumes of mobility demand will not be far from the "old" normality**, but will **remain structurally attested at a lower level**, with **equal recovery of the economy and employment**; in fact, **the processes of permanent reduction of transport demand (agile work, teleconferences, online acquisitions) are becoming more and more widespread** (one can then consider their impact).
2)	**Non-motorised mobility (walking, cycling, micro mobility) will grow steadily in the modal share**, **because it is clear that those who have experienced more ecological, less onerous and healthier solutions to move around during the period of residence**

[143] Ministry of Infrastructure and Transport, "Observatory on mobility trends during COVID-19 – Volume 2", 2021.
[144] European Cyclists Federation, COVID-19 Measures Tracker.

	have no desire to go back, obviously if the destinations of the new express mandate allow it and if safety and health conditions for those who walk, or cycle are saved.
3)	**Public transport will struggle to complete the recovery journey started in the first few weeks of the restart**; a large number of citizens, including a share of former public transport users, are afraid of get infected and do not feel sufficiently protected on collective vehicles. On this front, it will therefore be necessary **to strengthen communication and attention to the needs of demand, while trying to maintain quantitatively adequate levels of service**. Finally, the car sector is likely to recover also by absorbing the market share of former public transport users who changed their habits as consequence of the covid pandemic. However, this is not an inevitable drift. Obviously, net of the health emergency, policies to regulate and contrast traffic in urban areas, fluctuation in fuel prices, and national policies to support the public transport sector, could undoubtedly influence the short and medium-term dynamics of private motorised mobility, avoiding or not the risk of a future explosion in the use of the car, which at the moment appears to be contained.

2. Italian Recovery Plan: Focus on mobility issues

Recovery Plan

The Italian government submitted its national recovery and resilience plan at the end of April 2021 to the European Commission[145]. Until 2023, Italy is expected to be the largest beneficiary of the RFF with a **€191.5 billion** envelope over the three years. According to a national expert, "*Europe and the recovery plan are considered quite widely in Italy as the means to develop a "blocked country", which finds it difficult to project itself into new projects or to implement its project ideas*".

The plan is composed of 6 main missions:

- Digitalisation, innovation, competitiveness, culture and tourism
- Green revolution and ecologic transition
- Infrastructure for a sustainable mobility
- Education and research
- Inclusion and cohesion
- Health

[145] Italian government, "Piano Nazionale di Ripresa e Resilienza''.

Figure 1 – Overview of policy missions and funding in the Italian recovery and resilience plan

Source: Italian recovery and resilience plan (screenshot)

Mobility and infrastructure are well addressed in the Italian plan:

- Within **Mission 1**, under a dedicated policy action towards **ultrafast-networks and take-up of 5G** (€6.71 billion), proposals are made "*to accelerate deployment of 5G coverage along more than 2,000 km of European transport corridors and 10,000 km of suburban roads, to enable the development of services supporting road safety, mobility, logistics and tourism".*

- Within Mission **2**, **€230 million euros** are dedicated for the deployment and experiments of 40 hydrogen fuelling stations **to support market penetration of hydrogen vehicles in road freight transport**. Another **€300 million budget is focused on rail transport, through the deployment of several trainlines in rail passenger transport powered by hydrogen** and the establishment of fuelling infrastructure and cohesion with long haul truck fuelling infrastructure. In total, more than €500 million euros are dedicated for the development of hydrogen in transport.

  Mission 2 comprises also a component entitled "*Developing more local sustainable transport*", with a **€8.68 billion budget**. This component underlines 4 main actions:

  - "**Enhancing cycling**": with a **€600 million funding**, this action aims at boosting the growth in the cycling and active means of transport by "*construction and maintenance of cycling networks in urban, metropolitan, regional and national areas, for both tourist or recreational purposes, as well as to promote daily travel and intermodality, ensuring safety*". It envisages the construction of nearly 570 km of cycle paths in urban and metropolitans' areas and 1.250 km of tourism cycle paths. Half of the funding will go for Southern regions for a social cohesion purpose.
  - "**Developing of rapid mass transport**": with a **€3.60 billion funding**, a great effort is to be noted here. The main target is to shift at least 10% of private car traffic to the public transport system. Doing so, the construction of **240 kilometres of equipped network for rapid mass transport infrastructure are proposed** through metro (11 kilometres),

tramways (85 kilometres), trolleybuses (120 kilometres) and cableways (15km). The focus will be on metropolitans' areas of Italy's major cities.

- "**Development of electric charging infrastructure**": with **€740 million budget**, this measure "*aims to build enabling infrastructure to promote the development of sustainable mobility and accelerate the transition from the traditional model of fuel-based refuelling stations to refuelling points for electric vehicles*" by establishing **7.500 fast charging points on motorways, 13.755 in urban centres and about 100 experimental charging points with energy storage system.**
- "**Renewing bus fleets, green trains**": with **a €3.64 billion budget**, it is one of the core elements of the component with rapid mass transport. This measure proposes 3 actions:

    - Renewal of the bus fleet with low environmental impact vehicles
    - Renewal of the regional and intercity train fleet with alternative propulsion
    - Renewal of the fire brigade vehicle fleet

  In this path, and in line with the National Strategic Plan for Sustainable Mobility, it plans the purchase of **3.360 low-emissions buses, 53 trains, "*100 newly designed carriages, developed with recyclable developed with recyclable materials and covered with photovoltaic panels*" by 2026**. In addition, and in link with the modernisation of the Fire Brigade's vehicle fleet, **200 new hybrid electric-endothermic vehicles at airports and approximately 3.600 electric and gas-powered vehicles for institutional services will be introduced**. The plan highlights the necessary industrial and technological transition as well in the renewal of bus fleet in Italy, by expanding production capacity and boosting the bus production chain transformation in Italy.

- Within **Mission 3 (Infrastructures for a Sustainable Mobility),** the most relevant subsection of the Plan when it comes to infrastructure, transport, and mobility, €**25.4 billion euros** are mobilised to modernise and digitalise the infrastructural system by 2026, while ensuring its sustainability. The goals of the mission are in line with the ones of the European Green Deal, especially the "Strategy for Smart and Sustainable Mobility", and the ones of the Integrated National Energy and Climate Plan (NECP). The mission is articulated in two main sections:

- **Investments in railway are proposed for €24.77 billion** (97% of the Mission's budget). 90% of passengers transport in Italy happens on road, while railways only account for 6% (against a European average of 7.9%). A similar yet slightly better picture can be drawn for freight transport: the road is the main option (54,5%) while only 11,7% of goods are transported by trains (European average: 18,7%). Structural shortcomings prevent the transition towards the systemic use of railways as main transport mean: railways are more developed in the North than in the South of the country, around urban areas than in rural regions. The main high-speed line stops in Naples, the rest of the South is cut off from the most efficient transport system of the country, while regional lines often prove to be limited in capacity, reliability, and frequency. Besides transport networks and joints, it is crucial to improve the links among railways, harbours, and airports. Finally, the overall logistics must be improved to boost competitiveness: this mostly concerns problems related to the "last mile" links. The

investment projects of this section aim to effectively tackle the aforementioned main issues.

- **High-speed rail links in the South for passengers and goods (€4.64 billion)**: improvement of the lines Napoli-Bari, Palermo-Catania-Messina, Salerno-Reggio Calabria in terms of duration and number of journeys.
- **High-speed railways in the North connected to Europe (€8.57 billion)**: improvements of the lines Brescia-Verona-Vicenza and Liguria-Alpi in terms of duration and number of journeys, separation of routes of high-speed and regular trains; realisation of the "rail ring" around Trento to further develop the Verona-Brennero route.
- **Diagonal connections (€1.58 billion):** high speed lines in the Centre and the South of the country to connect "diagonally" the Italian costs. Realisation of lines to connect Roma and Pescara, Taranto, Metaponto, Potenza and Battipaglia, overall enhancement of train frequency.
- **Development of the European Railway Transport Management System (ERTMS) (€2.97 billion):** the European System conceived to enhance the inter-operability of the railway network and to ensure security and effective maintenance only exists in few sections of the Italian railway network. The investment aims to update the existing security and reporting systems to optimise the network performance.
- **Strengthening of urban railway joints and key national links (€2.97 billion):** investments on urban joints aim to reinforce efficient widespread services in metropolitan and urban areas, making railway and public transport more attractive than private cars while moving in cities. The projects of this section mostly concern the northern borders (Switzerland), and the areas around the harbours, notably in the South.
- **Strengthening of regional lines (€0.94 billion)**: action on both railway maintenance and new trains purchase to boost the efficiency of regional lines, notably in the South
- **Strengthening, electrification, and resilience of Southern railways (€2.4 billion):** several railways in the South present bottlenecks which prevent efficient linkages with the rest of the network, therefore interventions such as electrification and modernisation are needed to improve the overall competitiveness and logistics of the Southern regions.
- **Improvement of Train Stations in the South (€0.7 billion):** pain points of the railway system in the South also concern train station, which are often not easily accessible nor well integrated with their context. The investments of this sections are focused on one hand to the improvement and further development of public transport networks to better reach the train stations. On the other hand, action will be taken to regenerate train stations in terms of energetic efficiency and accessibility.

1) **Inter-modality and Integrated Logistic – €0.63 billion**
   This minoritarian section of Mission 3 is focused on improving the environmental sustainability and supporting the digitalisation of transport networks besides railways, notably harbours and airports.

Mission 5: inclusion and Cohesion – €1.9 billion only subsection 3 (M5C3)

Focus on Special Economic Areas (ZES): regions located in the South which benefit from favourable economic law. The reform included in the plan aims to favour the settlement of new firms also by enhancing the infrastructures needed to make these areas more attractive.

- **National Strategy for Internal Areas (€0.83 billion):** besides social cohesion initiatives, links with urban areas and accessibility constitute a key issue. The reform implies the increment of the funds from the central government to local authorities to boost the provision of services.
- **Interventions in Special Economic Areas (ZES) (€0.63 billion)**: development of adequate links of ZES areas with the national transport network (SNIT) and Trans-European networks (TEN-T) to make ZES truly effective:
    1. Last mile linkages: effective links between industrial areas, SNIT and TEN-T (mainly railways) to lower logistic times and costs
    2. Resilient and sure transport networks: targeted local interventions to boost the access to the main infrastructures (airports, harbours, productive areas)

All in all, the Italian Recovery and Resilience Plan highlights that infrastructures and mobility are among the key issues to tackle, not only in the recovery process, but also as long-term goals to strengthen the overall productivity and competitiveness of the country, while also promoting the economic convergence of the less developed areas. Infrastructures and mobility will also benefit from a large share of complementary funds (both national and European) for a total of €17.35 additional billion. The implementation of the National recovery and resilience plan between 2021 and 2026 is expected to enhance the added value of the construction sector by 3.3% and the one of the transport sectors by 0.7%[146] .

National Energy and Climate Plan (NECP)

According to EU Regulation, the Member States had to submit to the European Commission a National energy and climate plan (NECP)[147] by the end of 2019, defining a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030. The European Commission issued recommendations to amend the NECP for 2020. In October 2020, it released a final assessment of each NECP. This assessment considers the European Semester objectives and the Recovery and Resilience Facility (RRF) criterion in the context of the COVID-19 outbreak.

Regarding the Italian NECP, the Commission highlighted several points in its staff working document[148]:

- Italy proposed to that 22% of the energy would come from renewables in the transport sector by 2030.
- Additional measures in transport and mobility sectors have been announced:
    - funding measures for the renewal of public fleets, obligations for public fleets to ensure a minimum share of electric and plug-in hybrid vehicle
    - incentives for modal shift of freight transport and renewal of private vehicle fleets

[146] Italian National Recovery and Resilience Plan, Annex.
[147] European Commission, National Energy and Climate Plans (NECPs).
[148] European Commission, Commission Staff Working Document Assessment of the final national energy and climate plan of Italy SWD (2020) 911 final, 14 October 2020.

  - incentives to modal shift: promotion of public transport, mandatory blending of alternative fuels and improved urban mobility planning requirements.
  - Supporting electric charging infrastructure by fiscal incentives and funding to address an expected fleet of 6 million electric vehicles in circulation by 2030
- The Commission finally recommends to Italy to consider some additional measures while implementing its national and recovery resilience plan:
  - "Measures and investments to develop sustainable transport, including infrastructure"
  - "Measures promoting climate change adaptation, including to ensure the climate-proofing of existing and future infrastructures."

Here, the Commission highlights the role of infrastructure in the development of sustainable transport. The "Relation on Emissions" attached to the 2020 Edition of the Economic and Financial Document presented by the Italian government estimates the greenhouse gas emissions from 2020 to 2030, considering both the existing measures and the ones that will be implemented according to the NECP. The goals for 2030 will be achieved on condition that the implementation of the NECP measures will take place as scheduled.

National Long-Term Strategy

All Parties of the Paris Agreement must communicate by 2020 their long-term vision to consistently reduce their greenhouse emissions and to meet the Paris Agreement objectives. The European Union included this obligation in a Regulation[149] in 2018. Then, each Member States must prepare a long-term strategy[150] for and at each decade. Transport and mobility are of course included. These strategies shall be coherent with the NECPs.

The Italian Long-Term Strategy on Greenhouse Gas Emission Reduction has been published and submitted to the Commission in January 2021, with a delay of more than one year. The strategy mostly focuses on the decarbonisation process, which is analysed by the two sides of the energy market:

1) **Energy demand**
   Final consumption shall drop by 40% compared to current values. To achieve this goal, the effort must be put on sectors such as real estate (energy efficiency and regeneration), trade (logistics efficiency), and transports (radical change of everyday life habits towards more sustainable mobility). Electricity and renewable sources shall also become the main components of energy demand, together with the growth and the improvement of circular economy to minimise waste. As most of the goals impact individual habits, citizens shall also support and share the Strategy vision. The same is true for those industries that still rely consistently on highly polluting energies sources, such as the steel industry.

2) **Energy supply**
   In order to follow the radical changes in the energy demand, the energy supply must effectively manage the transition. Electricity production shall double and reach 600-700 TWh by exploiting untapped potential sources, notably wind and solar power. This

[149] Official Journal of the European Union, REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, 22 December 2018.
[150] European Commission, National long-term strategies.

will also require the strengthening of energy storage by 4-5 times more than the current capacity. Furthermore, a large share of the additional electricity shall be destinated to hydrogen production, whose production technology and economic rentability must be furtherly developed. Hydrogen, which is supposed to gradually replace gas, will also need the upgrade of the infrastructure.

Overall, both by the demand and the supply side, the energy market will be completely reshaped by the objectives of the Strategy and the Green Deal, bringing to a radical reduction of CO_2 emissions. A final word is dedicated to the non-energetic sector, where reducing the emissions is structurally harder. This sector includes agriculture and industry. Concerning agriculture, there is room for relative improvement. By contrast, industry is not addressed in the Strategy as all intervention that could be done was already put in place.

A section of the Strategy outlines in detail the main **decarbonisation options for the transport sector.** Concerning collective mobility, it is realistic to forecast the total transition to green energy (electricity from renewable sources and hydrogen). Conversely, heavy transports on roads, ships, and airplanes are less likely to succeed in reducing emissions. For each of these transports, the Strategy provides a list of potential technologic improvements in terms of alternative engines and fuels, but all these technologies are not fully developed yet.

3. Existing mobility strategies

Current ongoing mobility plans and strategies

	FONTE DI FINANZIAMENTO	VALORE ECONOMICO (milioni di euro)	AMBITO
Piano Strategico Nazionale per la Mobilità Sostenibile	art. 1 c. 613 della L.232/16	3.700	Bus su gomma innovativi
Rifinanziamento PNSMS	art.1 c. 95 legge bil 145/18 (fondo investimenti)	185	Bus su gomma innovativi
Rinnovo materiale rotabile	art.1, c. 866 legge bil 208/2015	640	Ferro
Rinnovo materiale rotabile	FSC, Del Cipe 56, 1 dicembre 2016 - PO	800	Ferro
Rinnovo materiale rotabile	FSC, Del Cipe 56, 1 dicembre 2016 - PO	200	Bus su gomma
Rinnovo materiale rotabile	art.1, c. 1072, legge bil 205/2017 (fondo investimenti)	193	Ferro
Rinnovo materiale rotabile	art.1 c. 95 legge bil 145/18 (fondo investimenti)	138,5	Ferro
Rinnovo materiale rotabile	vari fine 2016	302	Bus su gomma
Rinnovo materiale rotabile	FSC, PON metro 2014-2020	200	Bus su gomma
Rinnovo materiale rotabile	art. 1, c. 140, legge bil 232/2016 (fondo investimenti)	300	Navi (Tpl marittimo)
Rinnovo materiale rotabile	art.1, c. 1072, legge bil 205/2017 (fondo investimenti)	267	Bus su gomma
Rinnovo materiale rotabile	art.1 c. 95 legge bil 145/18 (fondo investimenti)	132,9	Bus su gomma
Rinnovo materiale rotabile	fondo TRM	680	Misto
Rinnovo materiale rotabile	FSC, Del Cipe dicembre 2017 e febb 2018 - addendum PO	516	Misto
TOTALE		**8.254**	

Erreur ! Source du renvoi introuvable.[151]

[151] ISFORT, 17° Rapporto sulla mobilità degli italiani "La Mobilità In Italia Tra La Gestione Del Presente E Le Strategie Per Il Futuro'', Relazione di sintesi, 04 November 2020.

Italy has an ongoing National Plan for Sustainable Mobility. Otherwise, most of the actions are dedicated to the fleet renewal or replacement of road vehicles for public transport and railway transport.

National Strategic Plan for Sustainable Mobility

A national strategic plan for sustainable mobility for "for the renewal of the fleet of road vehicles for the services of local public transport and improvement of air quality"[152] was adopted in April 2019 with a 3.7 billion euro's budget. The plan intends:

- to put in context, the necessary renewal of public transport fleets, mainly buses.
- To define a reference framework for enhance air quality, especially in urban areas.
- To identify the main drivers of demand for local public transport.
- To identify the state of art of technologies for alternative powers and of the mass production of this type of vehicle in Italy.

In this path, the Plan includes additional funding of **200 million euros for 2019 and 250 million euros for each year from 2020 to 2033**. It does not only include the renewal of public transport fleets of vehicles, but also the promotion of relevant charging infrastructure and the competitiveness of companies producing goods and services in the road public transport and intelligent transport systems chain, through support for productive investments aimed at the transition to more modern and sustainable forms of production, with particular reference to research and development of alternative power supply modes.

The Plan, which has been expected for years, also foresees that **no less than 34% of the allocated resources should go to the South**[153]. It is also established that **the resources allocated in the first three years, up to 50% of the grant allocated, may be allocated to the construction of the infrastructure network for alternative fuels** (e.g., methane, hydrogen, electricity).

Mass transport resources

The "2018 Budget Law" provided to the sector of rapid mass transport systems to fixed installations were allocated resources amounting to **€2.38 billion divided between 2019 and 2033**.

The "2019 Budget Law" provided **€1,33 billion to split between 2019 and 2033** for the development and safety of mass public transport systems on site own.

The "2020 Budget Law" provided the allocation of **€20.81 billion to split between 2019 and 2034**: **832 million allocated for the implementation of Line 2 of the Turin Metro** and **634 million were allocated to the development of rapid mass transport**.

According to a national expert, "*Public transport is a major problem in Italy: the coverage and availability of public transport (urban rail, bus) is weaker than in other large conurbations such as Paris or London and is a real handicap in mobility (especially home-work), which the COVID crisis has only accentuated, with a very significant shift to the individual vehicle; moreover, the fleets of public vehicles are very old and not very efficient (example of the bus fleet in Rome)*". He adds that "*rail transport on the national network works fairly well and is competitive, both*

[152] Italian Ministries, Piano Strategico Nazionale della Mobilità Sostenibile per il rinnovo del parco mezzi su gomma per i servizi di trasporto pubblico locale e il miglioramento della qualita dell'ariaai sensi della legge n. 232/2016, art. 1, commi 613, 614, 615, December 2018.

[153] Ministero delle Infrastrutture e dei Trasporti, Tpl, governo adotta Piano Nazionale Mobilità Sostenibile, 18 April 2020.

for passenger and freight transport (mixed trains), especially on rail and the high-speed lines (Turin-Rome, Turin-Venice West-East and North-South axes), and investments are under way for the Naples-Bari-Sicily axis".

The extraordinary network maintenance program road of provinces and metropolitan cities

This program allowed a total expenditure of **€1.62 billion for the period 2018-2023**, to be allocated to the financing of interventions relating to extraordinary maintenance programmes for the road network of provinces and metropolitan cities. As pointed out by a national expert, "*the pivot of transport policies are the Regions, and they are the ones who make concrete progress on these issues*". More specifically on road works, he insisted on the fact "*that new projects must from now on include a qualitative dimension: taking into account environmental data, spatial planning (preservation of landscapes or existing environment) and no longer simply roads that "cut" or "pass" through their environment*". Moreover, public procurement issues in this field were evoked by the expert, stating that "*many legal problems such as disputes and lawsuits are brought in the market with many more SMEs, which are in fact more vulnerable and more reluctant to respond to calls for tenders*".

Additional funding of **€3.74 billion has been approved in 2019 and 2020 of which €995 million for the years 2020 - 2023 and the remainder for the years 2024-2034**.

The resources for the design and implementation of and safety measures for the safety of the city cycling

€137.2 million are allocated, of which 51.4 million euros for 2020 (allocated 49.9 million) and 85.8 million euros for 2021 (allocated 83.1 million) for this plan.

A share of resources amounting **to €4.2 million** is allocated to the municipalities where a university institution has its registered office, for the design and construction of cycle stations and traffic safety measures city cycling, aimed at connecting the railway stations with the university poles.

Incentives for the purchase of bicycles, micro-mobility vehicles, mobility and car sharing services

In 2020, **a €220 million -initially €120 million- contribution ("bonus mobility")** has been adopted for the purchase of bicycles, including pedal-assisted bicycles, as well as powered personal mobility vehicles mainly electric (e.g., scooters, hover boards and e-bikes) or for the use of services of shared mobility for individual use excluding those with cars, equal **to 60% of expenditure** supported and, in any case, **not exceeding 500 euros**. The following can take advantage of the mobility voucher for the year 2020 those over 18 years of age who are resident in the regional capitals (even under 50.000 inhabitants), in the provincial capitals (even under 50.000 inhabitants), in municipalities with a population over 50.000 inhabitants and in the municipalities of metropolitan cities (even below 50.000 inhabitants). As stated before, the success of the Bonus Mobility is likely to turn the initiative into a permanent policy.

Another **€500 million contribution has been adopted for the purchase of ecological cars**, i.e. electric cars, hybrids, plug and play cars in and thermal motor vehicles if they have Co2 emissions within 110 g/km. The incentive varies from 3.500 to 10.000 euros according to the ecological bands of the car purchased and any scrapping.

Forecasts on the construction sector

The construction sector is an important aggregate for the Italian economy, counting for **8.0% of the GDP in 2019**, representing 1.3 million jobs and 500.000 businesses[154]. Regarding investment, in 2019, €130 billion were invested in the construction sector, of which **€70 billion in civil engineering** (a variation of 2.9% compared with 2018).

The first lockdown in Italy hit the production in the construction sector which dropped by 35.4% in March 2020 compared to March 2019 (-13.4% in the EU)[155]. Considering the COVID-19 pandemic and the restrictive measures taken accordingly, at the end of 2020 the investments in the sector **contracted by 10.1%** [156]. In the meantime, the grow rate of the industry until 2024 is expected to be 1.4% per year on average, with an important rebound of 5.9% in 2021.

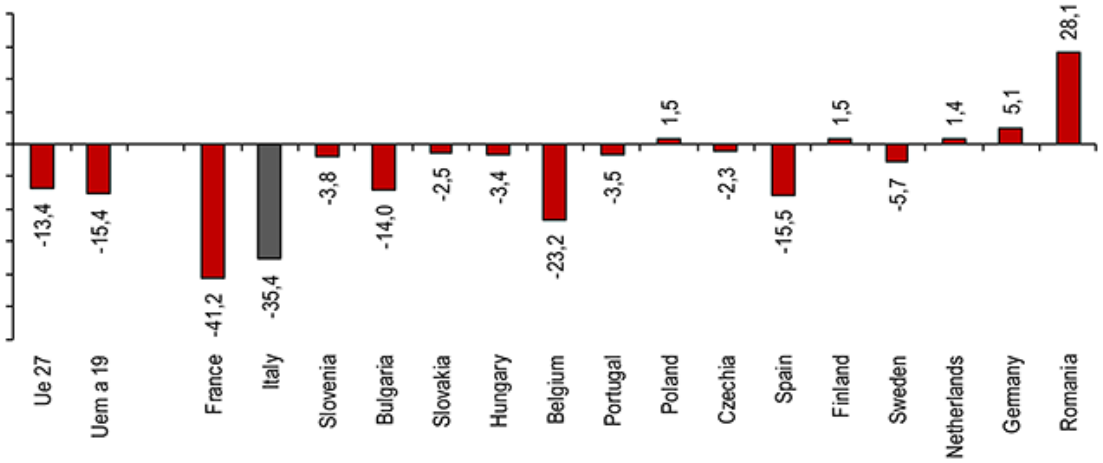


Figure 3 - Trend in construction production in March 2020 % change compared to the same month of the previous year - Elaboration of Confartigianato Studies Office based on Eurostat data[157]

The Italian government took urgent measures during the first lockdown to support civil and public works companies, as for example a number of measures **to support the liquidity of companies engaged in public works have been included in the Relaunch Decree no. 34/2020, namely the advance of 30% to the contractor, or the allocation of a further 40 million euros to the Works Save Fund, the instrument created by the Growth Decree to support subcontractors with respect to the bankruptcy of main contractors**. In addition to reducing the economic impact of the health emergency on businesses connected with the construction of public works, the measure is aimed at ensuring the rapid completion of the work begun. The applications received as from May 2020 amount to 82 million euros[158]. The Italian government took several stimulus packages all along 2020 to response to the economic crisis caused by COVID-19 restrictions. As from October 2020, all of those packages are estimated to amount for 4.9% of the total GDP[159].

[154] European Construction Industry Federation (FIEC), Statistical Report n°63, Italy, Edition 2020.
[155] Eurostat, News Release 83/2020, 19 May 2020.
[156] National Association of Constructors (ANCE), Edilizia Flash 5/2021, April 2021.
[157] CONFARTIGIANATO IMPRESE, "STUDI – Attività costruzioni a marzo: Francia -41%, Italia -35% vs. Germania +5%. Nell'artigianato del settore 705 mila addetti", 20 May 2020.
[158] ANAEPA-Confartigianato Edilizia (Associazione Nazionale Artigiani dell'Edilizia dei decoratori, dei Pittori e Attività Affini), "Dl Rilancio e appalti: anticipazione del 30% e niente tassa sulle gare", 27 May 2020.
[159] Statista, Statista Research Department, "Value of COVID-19 fiscal stimulus packages in G20 countries as of October 2020, as a share of GDP", 26 November 2020.

Another report from Mordor Intelligence seems to be more optimistic regarding the evolutions of the construction sector. On the period 2016-2025, with 2019 as the reference year, the average growth rate would be of 3.5% especially due to the government investments in developing public assets and infrastructure in civil and public works projects. Important funding was allocated in the Budget Law 2020 as for example "***loans to municipalities for public works amounting to 2.5 billion*** *during 2020-2024, for urban regeneration interventions USD 9.62 billion over the 2021-2034 period and for the design of the works USD 3.02 billion over the 2020-2034 period*"[160].

According to ANCE, the national construction association, **the construction sector will represent 51% of investments of the National Recovery and Resilience Plan**. It will be an amount of €114 billion, of which 74 will be dedicated to sustainability.

[160] Mordor Intelligence, Italy Construction Market - Growth, Trends, and Forecasts (2020 - 2025), 2020.

DATA BOARD
ITALY

General Data

Political organisation: Democratic republic	**Head of government**: Prime Minister Mario Draghi
Population (2018): 60.42 million	**Urban population** (2019): 70.73%

Economic indicators

GDP ranking (2019): 8/203	**GDP** (2019): 2.001,244 million USD
GDP growth (2019): 0.3%	**GDP growth** (2020): -8.9%

Environmental indicators

Share in global CO_2 emissions (2018): 1%

CO_2 emissions (2018): 0.33GT - 20th Co_2-emitting country

CO_2 emissions per capita (2018): 5.56T- 15th country emitting CO_2 per capita

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 82%
- Train: 6.3%
- Bus and trolleys: 11.3%

Modal share of freight transport (2018):

- Roads: 86.8%
- Railways, inland waterways: 13.2%

Construction sector

Construction sector GDP share (2019): 8%

Jobs in the construction sector (2019): 1.3 million

Businesses in the construction sector (2019): 501.000

Investment in construction -civil engineering- (2019): €70 billion

France

Economic context: Covid-19

While France had a 1.5% growth rate in 2019, the European Commission expects **a fall of 8.1% in 2020**[161]. France is one of the most impacted countries by the pandemic in the EU, essentially due to stricter restrictions than most of its neighbours. A rebound is forecasted for 2021 (5.7%) and 2022 (4.2%). Economic activity has been severely impacted by the first lockdown period in spring where the economic activity felt by **5.9% and 13.7% in 2020 first and second quarters** and by 11.4% in the EU[162]**. According to the Commission,** "…*France's GDP growth is set to gain momentum in 2021. Economic activity is forecast to rebound gradually, particularly in the second half of the year when restrictions should be eased and supported by the recovery plan 'France Relance'*…." .

1. Impact of Covid-19 on mobility

Mobility trends in France (before Covid-19)

According to the European Commission Statistical Pocketbook 2020, passenger cars is very dominant in land transport in France[163].

Table 1 - Modal split of passenger transport on land in France (passenger-km in %) in 2018

Modal split of passenger transport on land in France (2018)	
Passenger cars	82.1%
Bus and coaches	6.2%
Railways	10.5%
Tram & metro	1.2%

Source: DG Move Statistical Pocketbook 2020

Table 2 – Modal split of passenger transport on land in France (number of trips)

Division of trips made per transport mode (2019)	
Private car	63%
Public transport	9.1%
Cycling	2.7%
Walking	23.5%
Other	1.7%

Source: Ministère de la Transition Écologique[164]

Car use remains largely dominant as well in number of trips. Walking is nevertheless significant as well as public transport use. Cycling is marginal with only 2.7% of trips made in 2019.

[161] European Commission, European Economic Forecast Spring 2021, May 2021.
[162] Eurostat, News Release Euro Indicators 121/221, 31 July 2020.
[163] European Commission, Directorate-General for Mobility and Transport, Transport in figures 2020, Table 2.3 "Performance of passenger transport (pkm)".
[164] Ministère de la Transition Écologique, « Comment les Français se déplacent-ils en 2019 ? Résultats de l'enquête mobilité des personnes », 16 September 2020.

Table 3 – Main mode of transport for work purposes according to distances in France (2017)

Main mode of transport for work purposes according to distances in percentage (2017)						
Distance (km)	**Private car**	**Motorised two-wheels**	**Public transport**	**Cycling**	**Walking**	**Total**
0-1	48.8	1.3	6.5	4.0	39.4	100
5-6	72.3	2.7	20.0	3.1	1.9	100
9-10	78.4	2.5	17.3	1.2	0.6	100
20-21	83.9	1.6	14.0	0.3	0.2	100
More than 50km	77.6	0.7	21.1	0.3	0.3	100

Source : Institut National de la Statistique et des Études Économiques[165]

According to Table 3, **car use remains the main mode of transport in all proposed distances for work purposes,** even the shorter ones. It is for example the case for 5-6 kilometres distances where it represents 72.3% of trips made. Public transport has an interesting share for medium distances (9-10 and 20-21 kilometres), around 15%.

Table 4 – Modal split of freight transport on land in France (tonne-km in %) in 2018

Modal split of freight transport on land in France (2018)	
Road	84.6%
Rail	9.6%
Inland waterways	2.2%
Pipelines	3.7%

Source: DG Move Statistical Pocketbook 2020[166]

On land freight transport, road is the main used transport infrastructure (84.6%), followed by rail for almost 10%.

Infrastructure

In 2016[167], France spent more than **$19 billion** in its road infrastructure. Its road network was 1088.89 km of which 12.356k m of highways and 8.219 km of main roads.

[165] Chantal Brunel, Jeanne Pages, INSEE, « La voiture reste majoritaire pour les déplacements domicile-travail, même pour de courtes distances », 16 January 2021.
[166] European Commission, Directorate-General for Mobility and Transport, Transport in figures 2020, Table 2.2.3 "Modal split of freight transport on land by country".
[167] Consortium (ERF, FIEC, Routes de France, FNTP, CICA), "New mobility and road infrastructure - International benchmark 2020", 08 September 2020.

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2019, the car fleet was 33.020,132million of passenger cars and **2.173,481passengers' cars were registered in 2018**[168][169]. In 2017, with 590 cars for 1.000 inhabitants, the French motorisation rate (numbers of cars for 1.000 inhabitants) is below the average in the EU.

Alternative powered vehicles

In 2019, according to European Automobile Manufacturers Association (ACEA)[170]:

- Electrically Chargeable Vehicles (ECV) represented 0.6% and
- Alternative Fuels Vehicles (AFE) 0.4 % of the French car fleet

In total, alternatively powered passenger cars made up 1.0% of the total French car fleet against 4.1% in the EU.

Cycling

As previously seen, cycling modal share represented 2.7% of trips made in 2017.

Mobility behaviours considering the COVID-19 pandemic

General data

In March 2020, French authorities decided of a strict lockdown until May 2020, as it also been the case in Italy and in Spain. The number of trips brutally decreased across the country by around 80% during the first two weeks of lockdown[171]. Short-distance trips up to 5 kilometres increased by 5.5 points at the same period compared to the period just before the crisis (2nd February- 12th March 2020). The number of passengers in railway stations and airports decreased by 80 and 90% between 04 March and 18 March 2020. **The mobility drop was quick and massive**.

Restrictive measures were lifted as from May 2020 until the end of October 2020, enabling a relative return to "normal" mobility habits. **A survey indicated that main mobility motives were not very impacted compared to 2019**[172]. For the September-November 2020 period, respondents indicated for a large majority (75%) that they were going to work and to study as much as in 2019 or more, but they were only 48% and 45% respectively to propose the same answer regarding leisure and non-essential food shopping. More interestingly, around 30% of the respondents indicated that they were more using active modes of transportation (walking, cycling) than in 2019. Almost 20% declared using more motorised means of transport (car, motorcycle) than in 2019. Road traffic levels are largely above the ones measured during first lockdown period (between 65 and 103%) but represent only 56 to 80% of the pre-crisis levels in several cities. A majority of respondents (52%) assumed using public transport less than in 2019. On average, 50% of the respondents were moving as much as or more than in 2019.

[168] European Alternative Fuels Observatory, Belgium, 2020.
[169] European Automobile Manufacturers Association (ACEA), "The Automotive Industry Pocket Guide 2019-2020", 2020.
[170] European Automobile Manufacturers Association (ACEA), "Passenger car fleet by fuel type", 2018.
[171] Kisio, Roland Berger, "Covid-19 Confinements et Mobilités", 10 April 2020.
[172] IPSOS, Mobimétrie, Ooh Trends, Bruno Schmutz, "Covid: Quelles conséquences pour la mobilité ?", 2020.

From these perspectives, it appears that **French people relied more on individual means of transport** (active and motorised) and **for compulsory trips** (work and study). Public transport is logically the most impacted mean of transport.

From November 2020 to May 2021, restrictive measures and lockdowns periods were put in place and slightly eased or reinforced during this period to fight new waves of the Covid-19 pandemic. Most of the non-essential shops were closed, early curfews were put in place (18.00 to 21.00), homeworking was mandatory for concerned workers.

The Mobility Observatory of the Great Paris area conducted several surveys to follow-up mobility trends in the region during this period, on behalf of the regional transport operator "Île-de-France Mobilités"[173][174]:

- During November-December 2020, the number of trips decreased by 24% compared to 2018 figures. A comparable figure (-22%) can be noted for the January-February 2021 period.
- Work trips were quite impacted by the restrictive measure (less trips, intense homeworking practice, partial or total unemployment).
- Walking was the first mean of transport in the period (16 million trips/day over 32 million)
- Public transport trips remained quite impacted (-40%), such as road traffic levels (-27%)
- During January-February 2021, trips increased for all parts of the population compared to November-December 2020 (except for the elderly and retired population) and the decrease of public transport and private cars was less intense.

Alternative fuel vehicles

Alternative fuel vehicles registrations knew some changes in 2020 in France[175]:

- **Electrically Chargeable Vehicles (ECV**) registrations went from 61.419 in 2019 to 185.719 in 2020 (+202%), above the EU dynamic (+169%)
- **Hybrid Electric Vehicles (HEV**) registrations went from 106.781 in 2019 to 168.873 in 2020 (+58%), following to the European trend (+59.4%)

Alternative fuels vehicles were more registered in 2020 indeed than in 2019. According to the French Ministry of Ecological Transition, **all alternative vehicles represented 11.0% of the new registrations in 2020**[176].

The electrification and "greening" of the car fleet seems to be launched. In addition, France is among the best countries where it goes to charging infrastructure for electric vehicles. The

[173] Île-de-France Mobilités, Omnil, « La mobilité au temps de la Covid-19 Enquête Mobilité Covid Vague 2 : novembre -décembre 2020 ».
[174] Île-de-France Mobilités, Omnil, « La mobilité au temps de la Covid-19Enquête Mobilité Covid Vague 3 : janvier-février 2021 ».
[175] European Automobile Manufacturers Association (ACEA), "Fuel types of new cars: electric 10.5%, hybrid 11.9%, petrol 47.5% market share full-year 2020", 04 February 2021.
[176] Ministère de la Transition Ecologique, « Essor des ventes de voitures neuves à motorisations alternatives en 2020 », 20 January 2021.

number of charging points grew by **53.2% between 2019 and 2020**, from 29.701 to 45.751[177]. More specifically, fast charging points grew by 83.8%, from 2.040 to 3.751. The same trend can be observed for normal charging points with a 151.83% growth, from 27.661 to 42.000.

Collective mobility

Collective mobility suffered from the COVID-19 pandemic. According to the French Rail and Public Transports (Union des Transports Publics et Ferroviaires) in a recent insight from its mobility observatory, occupancy rates in public transports as a whole where under 10% during the first lockdown[178]. Those rebounded during summer and decreased once again in November below 50% for urban public transport and between 30 and 40% for rail transport.

The first lockdown would represent a loss of €2-3 billion euros for transport operators, considering the reduction of passengers and an according funding reduction, where urban public transport operations represent €8.5 per year.

Based on conducted surveys, 69% of the public transport users would continue to use them as much as or more than before. The main reasons indicated are the practice aspect of public transport (67%), its impact on the environment (57%) and its cost (45%). For those that would use them less or not anymore, they would walk (19%), rely on private car (16%) or cycle (8%) as alternatives means of transports.

Cycling

As in many countries, COVID-19 pandemic has an impact on cycling policies and practices. During the first wave at spring 2020, the city of Paris proposed "**tactical urbanism**" measures by implementing 70 kilometres of temporary cycling lanes. Paris is the city in Europe where cycling increased the most between 2019 and 2020, by 66%, helped by a very dense city and a very low car ownership rate[179].

According to the European Cyclists' Federation and its COVID-19 Measures Tracker, French cities proposed a total additional funding for cycling infrastructure of €300 million and subsidises for cycle purchase or repair of €220 million, placing France among the most involved countries in Europe on developing cycling mobility[180].

Road freight transport

Transport and logistics companies have been severely hit by the pandemic. According to the French Road Transport Federation, the sector experienced a 40% drop in turnover after the first 3 months of the pandemic in 2020, notably from a decrease of the economic activity (-39%)[181].

[177] European Alternative Fuels Observatory, France, 2020.
[178] Union des Transports Publics et Ferroviaires, « Observatoire de la mobilité », 19 November 2020.
[179] Fabien Jannic-Cherbonnel, France Info, "#NousLesEuropéens Comment le vélo a changé de braquet grâce au Covid-19 dans les grandes villes européennes", 09 May 2021.
[180] European Cyclists' Federation, Covid-19 measures tracker, 08 July 2020.
[181] Fédération Nationale du Transport Routier, « CORONAVIRUS : Impact de la crise sur les entreprises du transport routier de marchandises. Quatrième enquête FNTR, pour la période du 8 au 15 juin », 18 June 2020.

2. The French Recovery Plan

Recovery Plan on the European level

France submitted its National Recovery and Resilience Plan at the end of April 2021, as requested by the Recovery and Resilience Facility[182]. France will be the third beneficiary of the grants part of the Recovery and Resilience Facility with a **€40 billion envelope**. A €100 billion national plan "France Relance" was presented in September 2020 by the government, of which the Recovery and Resilience Facility funding is part of. The National Recovery and Resilience Plan is the adaptation of this plan according to the Recovery and Resilience Facility conditions.
The French plan is composed of **6 main objectives**:

- "**Green transition**": it is considered as the main addressed challenge with a total funding above 50% to this objective.
- "**Digital transition**": more than €10 billion is dedicated below this objective.
- "**Inclusive and sustainable growth**": modernising and stimulating the French economy is the key challenge here, notably through cross-borders projects (hydrogen, cloud, electronics, batteries) and lowering production taxes.
- "**Social and territorial cohesion**": the main lines proposed are the preservation of employment and the partial activity system, as well as reforms related to professional training and the unemployment insurance system.
- "**Health and economic, social and institutional resilience**": a clear support is given to the social and health sector with a €6 billion plan as well as the management and sustainability of public finances
- "**Policies for the next generation**": this section focuses more on schemes relating to the professional integration of young people

It is as well composed of several components describing the proposed reforms and investments:

1. Energy renovation
2. Ecology and biodiversity
3. Green infrastructure and mobility
4. Green technologies and energies
5. Business financing
6. Technological sovereignty and resilience
7. Digital upgrading of the State, territories and companies, culture
8. Job preservation, youth, disability, vocational training
9. Research, Health Plan ("Ségur") and Dependency, Territorial Cohesion

Focus on transport, mobility, and infrastructure measures

Component 2 "Ecology and biodiversity" contains interesting measures:

[182] Gouvernement de la République Française, « Plan National de Relance et de Résilience 2021 », April 2021.

- **Densification and renewal urban renewal: support for recovery of the sustainable construction**: with a €350 million budget, the aim is to reduce artificializing of land in dense urban areas by encouraging the construction of more sustainable housing. The issue of proximity to services and access to a softer mobility to reduce the use of transport is also mentioned.
- **The Climate and Resilience Bill**: this bill is still under legislative process and will be adopted in 2020. Among different measures, it promotes incentives to private car and reduction of air mobility towards a more sustainable mobility.

Component 3 is entirely dedicated to infrastructure and mobility with a **€8.8 billion budget**. Main measures are:

- **Implementation of a support plan for the railway sector (€4.7 billion)**: a bit more than half of the total entitled budget of component 2 is channelled towards the railway sector, under two main parts:
  - **A recapitalisation of the national public railway company (SNCF) of €4.05 billion**, directed in full to the monopoly infrastructure manager, SNCF infrastructure manager, "SNCF Réseau", mainly to ensure that a high level of track regeneration is maintained, despite the effects of the regeneration of the railways, and to develop investments projects. 2.3 billion will be allocated to the regeneration of the national rail network and 1.5 billion will be devoted to making the rail network safe and reliable (rail equipment).
  - **€650 million in budgetary credits to finance mainly rail freight infrastructure**, fine rail lines and the investment needed to revive night trains

- **Support for the demand for clean vehicles in the automobile plan (€1.9 billion)**: several measures are proposed to incentivise and complete alternative vehicles objectives:
  - Ecological bonus for light vehicles (€885 million)
  - Conversion bonus (€795 million)
  - Ecological bonus for heavy vehicles (€100 million)
  - Innovative projects could be proposed in electric mobility and mobility (€120 million)

- **Development of everyday mobility** (€1.2 billion): the main target here is public transport development through:
  - **A €900 million measure** to co-finance public transport projects in Île-de-France (€670 million), metro projects in other regions (€200 million) and studies on the development of metropolitan express rail services (€30 million).
  - **€300 million delegated to the Regions** for daily transport.

- **Acceleration of work on transport infrastructures** (€550 million): the measure will be implemented mainly via the French Transport Infrastructure Financing Agency for projects related to **the development of the French railways**, for projects related to the development of **dedicated lanes for shared use** (€50 million), the **modernisation of the river network** (€175 million) or the **Lyon-Turin project** (€200 million) in addition to the trajectories already programmed or, in the case of support for the installation for **the installation of electric charging stations** (€100 million).

- **Energy transformation of the State's vehicle fleet** (€180 million)

- **Greening of ports** (€200 million)

- **Strengthening the resilience of electricity networks** (€5 million)

- **Green budget**: it aims "*to establish a standardised and comprehensive information framework for Parliament and civil society on the environmental impact of the State Budget. Increased transparency contributes to the alignment of public funding with the Paris Agreement*". Moreover, it will provide "…*a support for decision-making that is likely to increase the effectiveness of the policies implemented and the dynamics of ecological transition*…".

- **Implementation of the "Mobility Orientation Act"**: voted in 2019, this bill is considered **a keystone in mobility and transport policy governance for years to come**. Above funding components, the Mobility Orientation Act intends to transform transport operations and governance with a renewed framework. According to the Plan, it includes reforms of responsibilities and governance such as:
  - A better integration and coordination of the different territorial levels for implementation in 2021 of the new responsibilities of the organising authorities and coverage of 100% of the territory by these authorities.
  - Possibility of transferring the management of small railway lines in line with the railway recovery plan from 2021.
  - Clarification of the modalities for opening Ile-de-France road transport services to competition.
  - Regulation of platforms and relations with driver.
  - Regulation by an independent authority of the Great Paris public transport company remuneration as an infrastructure manager.
  - Development and regulation of new forms of mobility, including:
  - Promotion of cycling with the obligation to have secure parking facilities in stations by 2024 and the development of bicycle carriage on trains and coaches.
  - Digital booking tools for taxis.
  - Adaptation of legislation by 2022 to accommodate the development of automated vehicles.

  - Definition of a prioritised policy for **state investment in transport infrastructure to be reviewed by 2023**.
- The measures included in the recovery plan are fully in line with these priorities:
  - Maintenance of existing networks (rail, river, road).
  - The desaturation of the major rail hubs to boost the supply of daily transport.
  - Opening medium-sized towns and rural areas by road, especially when there are no roads
  - The development of clean mobility and in particular, the development of clean mobility, particularly shared mobility (carpooling), public transport and active mobility (cycling).
  - The reinforcement of the efficiency of modal shift in the transport of goods.

Component 4 "Green technologies and energies" **(€7.2 billion**) gives an important insight concerning French ongoing and upcoming industrial strategies in the ecological transition, notably where it regards mobility and transport:

- A part of the component deals with "**Developing sustainable hydrogen**": following the French National Energy and Climate Plan, the objective here is to develop **a national sustainable hydrogen industry** for several reasons of which decarbonising the mobility industry. Hydrogen is seen as a mean to **decarbonise new heavy vehicles** notably through an Important Project of Common European Interest (€1.575 billion) which will aim to the development of fuel cells, tanks, and materials to enable the development of hydrogen vehicles for heavy mobility.

- Another part of the component entitled "**Innovate for the ecological transition**" describes 7 acceleration strategies to support green new markets. These strategies are still under regulatory process. Their definitive agenda and funding are not known yet. Regarding mobility and transport policies, two of them are of interest such as:

  - **The sustainable hydrogen strategy (€500 million)** which is the only one already acted from September 2020.
  - The "**Digitalisation and decarbonisation of mobility" strategy (€200 million)** which aims to control greenhouse gas emissions by accelerating the sector's ecological and energy transition, while developing and improving the daily transport offer in all regions to meet the objectives of the of the Mobility Orientation Act. The strategy's priorities are the **optimisation of operations and infrastructure**, **digital transformation**, and **automation**. The strategy will place particular emphasis on demonstrators and pilots of systems and services.

  The Nantes e-Busways is one of the quoted projects under this sub-part. Nantes' line 4 provides a new generation of electric buses with exclusive right-of-way buses. This mobility solution will be able to accommodate 56,000 passengers by 2020 while reducing polluting emissions according to the Plan.

Component 5 "Business financing" includes information related to the **Public Action Acceleration and Simplification Act** that has been voted in December 2020. During the parliamentary discussion, amendments to the public procurement code were introduced. The rules of public procurement are relaxed in case of exceptional circumstances and for SMEs. The compulsory awarding of certain contracts has been simplified (general interest becomes a reason for recourse to a general contract), access to public procurement contracts for companies in difficulty has been facilitated, and the system in favour of SMEs for partnership contracts has been extended to all global contracts.

National Energy and Climate Plan (NECP)

According to EU Regulation, the Member States had to submit to the European Commission a National energy and climate plans (NECPs)[183] by the end of 2019, defining a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030. The European Commission issued recommendations to amend the NECP for 2020. In October 2020, it released a final assessment of each NECP. This assessment considers the European Semester objectives and the Recovery and Resilience Facility (RFF) criterion in the context of the COVID-19 outbreak.

In its assessment of the French NECP, the Commission highlighted the intended objectives for the transport sector decarbonisation as "*a strong element*"[184]. The clean mobility strategy (2019-2028) passed in April 2020 provides several objectives in the road transport field, such as:

- "***Modal shift towards alternatives to cars*** *is expected to increase by 26 percentage points in 2050 as compared to 2015, with the aim of* ***multiplying the modal share of cycling by four*** *as of 2030, while equally investing in a strong increase of public transport's modal share*".
- "***Electromobility is projected to increase substantially****, with 35% of new vehicles in 2030 projected to be electric vehicles, as well as 10% plug-in hybrid electric vehicles, while aiming for 100% full-electromobility by 2040*".
- "*Support to electromobility is envisaged through different measures including fiscal incentives, a 'bonus-malus' system and charging*".

For the transport sector, "*France provides a target of 15% of final fuel consumption supplied by renewables, which is above the 14% target*" required, realised on new road transport vehicles energy efficiency, through a set of measures:

- "***Imposing emission standards on car manufacturers*** *(cf. the European regulation setting a target of 95 g of CO2/km for passenger cars in 2020).*

[183] European Commission, National Energy and Climate Plans (NECPs).
[184] European Commission, "Commission Staff Working Document, Assessment of the final national energy and climate plan of France", 14 October 2020.

- ***Encouraging the development of low-emission vehicles*** *(in particular through a purchase bonus for electric and plug-in hybrid vehicles, through the promotion of the deployment of charging infrastructures).*
- ***Addressing obstacles to the development of electric vehicles*** *(cf. the lack of recharging infrastructures).*
- ***Promoting the development of biofuels and other alternative fuels*** *(via fiscal measures).*
- ***Supporting modal shift*** *(by improving the supply of transport services and infrastructures in alternative to road or by promoting measures to encourage cycling and active mobility).*"

The Commission's assessment is rather positive towards the French NECP, especially on transport objectives.

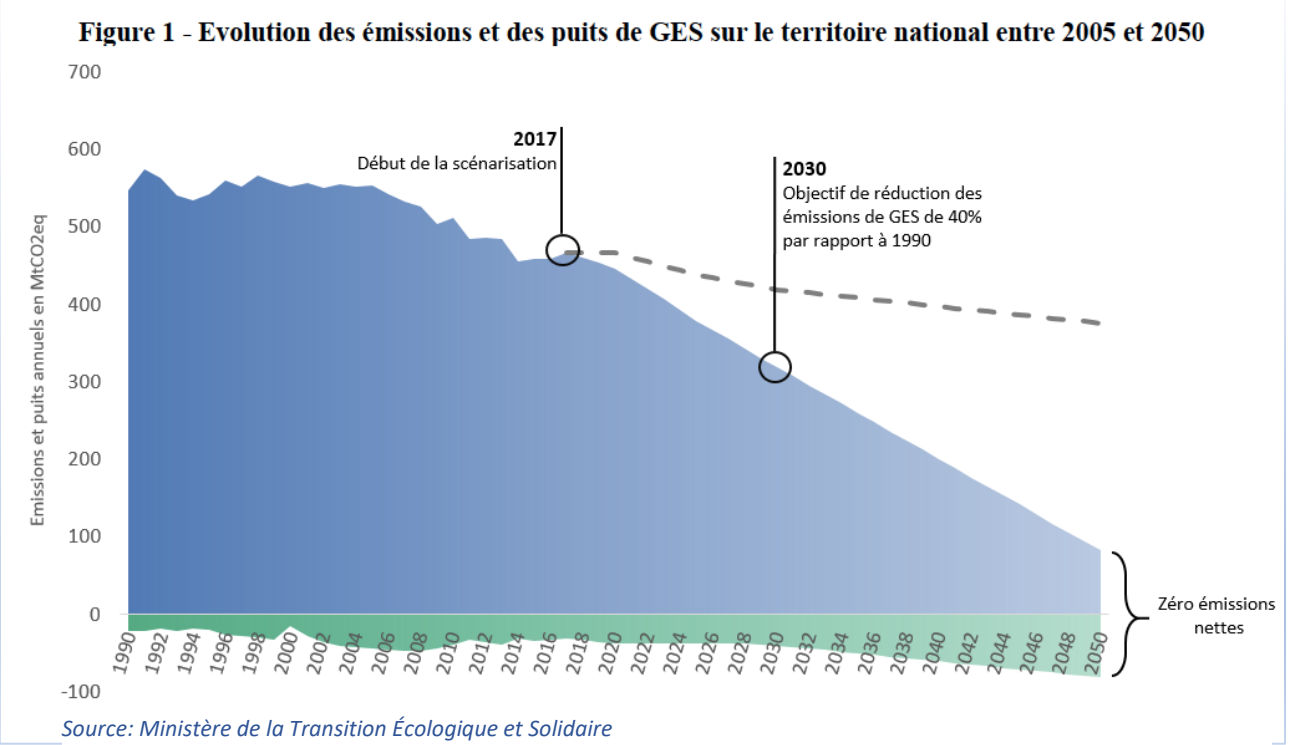
National Long-Term Strategy

All Parties of the Paris Agreement must communicate by 2020 their long-term vision to consistently reduce their greenhouse emissions and to meet the Paris Agreement objectives. The European Union included this obligation in a Regulation[185] in 2018. Then, each Member States must prepare a long-term strategy for and at each decade[186]. Transport and mobility are of course included. These strategies shall be coherent with the NECPs.France adopted and submitted its National Long-Term Strategy called "National Low-Carbon Strategy", as the national strategy of reference[187]. Two main objectives are proposed (see Figure 1 and Figure 2 below):

- The introduction of **carbon budgets**. These are caps on gas emissions that have been set to remain unchanged at the national level for five years, expressed in millions of tons of CO2 equivalent.
- Reducing GHG emissions by 40% by 2030 compared to 1990 levels and complete carbon-neutrality society by 2050.

[185] Official Journal of the European Union, REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, 22 December 2018.
[186] European Commission, National long-term strategies.
[187] Ministère de la Transition Écologique et Solidaire, "Stratégie Nationale Bas-Carbone'', March 2020.

Figure 1 – Changes in GHG emissions and related sinks on the national territory in 2005 and 2050



Source: Ministère de la Transition Écologique et Solidaire

Table 5 – Next carbon budgets in the revised National Low-Carbon Strategy

Average yearly emissions ($MtCO_2eq$)	Reference years			2nd carbon budget	3rd carbon budget	4th carbon budget
Period	1990	2005	2015	2019-2023	2024-2028	2029-2033
Total (excluding land sector)	546	553	458	422	359	300
Total (including land sector)	521	505	417	388	320	258
Adopted carbon budgets in 2015 (excluding land sector) – adjusted in 2019 (as reference)				*398*	*357*	

Source: Ministère de la Transition Écologique et Solidaire

**Table reproduced by the author*

On transport, the strategy proposes to **reduce transport emissions by 28% compared to 2015 levels and targets a complete carbon-neutrality by 2050**. Transport is the first emitting sector in France in 2015, accounting for 30% of GHG. Several options are pointed out to achieve those objectives:

- **Provide the sector with price signals that encourage the development of low-carbon mobility** (harmonisation of fuel tax rates between European countries, internalisation of external costs to the road user, etc.) and strengthen the fiscal and market mechanisms in

place (European Emissions Trading Scheme - ETS, international compensation and reduction mechanism CORSIA), in order to accelerate the decarbonisation of air transport.

- **Set ambitious targets in terms of vehicle energy performance**, both for private vehicles (targets of 4 L/100 km in 2030 in real conditions for thermal vehicles and 12.5 kWh/100 km by 2050 for electric vehicles compared to 17.5 kWh/100 km in 2050)
- In addition to energy efficiency gains, **set ambitious targets for decarbonising the energy consumed by vehicles**, such as:

  - "*By 2040, 100% of the light-duty vehicles sold must be zero-emission.*
  - *Support the development of all modes of transport, in particular by means of aid for the renewal of vehicles and adapting infrastructure (infrastructure refuelling of bio CNG or electric charging).*
  - *Support local authorities and businesses in the implementation of innovative initiatives and involve them in their own mobility policies (deployment of low-emission zones, development of the action plan for the reduction of missions and de-floating renewal, etc.).*
  - ***Initiate a modal shift towards the most energy-efficient and least emitting modes of transport** such as rail or public transport and support active modes, such as cycling (with a target of 12% modal share in short journeys distance in 2030, and 15% in 2050), which can also improve health through regular physical activity.*
  - ***Optimising the use of vehicles in terms of volumes and weights of goods loaded** to streamline logistics operations (increase in the current loading rate of heavy goods vehicles from 9.8 to 12 to 12 in the vehicle in 2050).*
  - ***Control the growth in demand for passenger transport** (+26% between 2015 and 2050 for all modes of transport combined10) and freight transport (+40% between 2015 and 2050), in particular by promoting work, carpooling and short circuits*."

3. Existing mobility strategies

The cycling plans

The cycling plan was announced in 2018 with a fund of **€350 million over seven years** has been created to help local authorities build safe and reliable cycle paths[188]. The aim is to triple the share of cycling in everyday travel from 3% to 9% by 2024. The cycling plan notably includes improving visibility at pedestrian crossings, making "bike locks" at traffic lights more widespread and developing two-way cycle lanes on streets with a maximum speed limit of 50 km/h. Support schemes for the purchase of electric vehicles are proposed as well as the inclusion of cycling in companies.

[188] Ministère de la Transition Écologique et Solidaire, « L'État vous aide à adopter le vélo au quotidien », 13 January 2021.

Ecological bonus for an electric or hybrid car or van

The French government offers grants for the purchase of electric or rechargeable hybrid vehicles subject to conditions[189]. These rules will change in 2022. These bonuses can vary from €1000 to €6000.

National strategy 2020-2022 to develop autonomous vehicles

The French government updated its strategy towards autonomous vehicles in 2020 with a comprehensive schedule over 2022 on legal and technical aspects[190]. The main objective is "*to make France the preferred location in Europe for the deployment of automated transport services, between 2022 and 2025 depending on the use cases*". The main targeted uses cases are:

- **The automotive industry** with a deployment of driving assistance system, preparation to Level 3 automation services and trials on connected, electric and shared mobility in specific areas for 2020-2025 period.
- **The logistic challenge** with automated solution for goods transports in closed areas and remote last mile deliveries in urban centres between 2022 and 2024.
- **The transport industry** with the deployment of electric, automated and shared mobility services without drivers in a secured way by 2022 to address mobility challenges at local levels.
- **A hybrid challenge** by ensuring cooperation between the infrastructure and automated carpooling and public transport.

Main challenges and objectives are proposed in the French strategy:

- **The development of a secure environment with no driver on-board**, especially on supervision and remote functions which are critical.
- **Improving connectivity functions**, notably between the infrastructure and the vehicles. Links between C-ITS technologies and mobile technologies remain as strategic in automated vehicles research.
- **A security framework** which needs to be confirmed at all levels (national, European, and international) for each use case.
- **Social acceptance** from users.
- **Data management** which starts to be regulated at national and EU levels.

Forecasts on the construction sector

According to the French Federation for Public Works, "*In 2020, marked by the crisis linked to the Covid-19 pandemic, public works recorded **a historic fall in activity (-12.5%).** For 2021, the FNTP expects a marked technical rebound (from +2% to +8% compared to 2020 depending on the scenario), which will not, however, allow the sector to return to pre-crisis levels of activity. The rate of recovery of the sector will depend **on a favourable evolution of the health context** but also on the **speed of diffusion of the recovery in the territories**, linked in large part to **the***

[189] Ministère de la Transition Écologique et Solidaire, « Bonus écologique pour une voiture ou une camionnette électrique ou hybride », 21 January 2021.
[190] French Government, « Stratégie nationale de développement de la mobilité routière automatisée 2020-2022 », 15 December 2020.

mobilisation of the authorities to preserve local investment" [191]. On **public procurement contracts**, the Federation adds that "*for the year, contracts concluded are down by -13.2% compared to 2019. This trend is like that observed for public procurement tenders, which fell by -15% in value and -31% in volume in 2020 compared with 2019*."

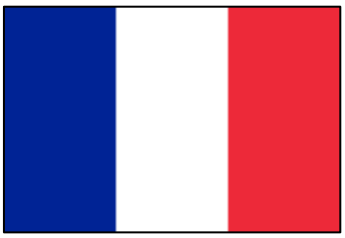
The French Federation for Public Works' President, Bruno Cavagné, insisted on the fact that public works are very much dependent of local and regional means and policies. He considers that the recovery plan does not sufficiently covers public works, with only dedicated €3.8 billion over €100 billion with only €700 million in 2021.[192]

Tables & Figures

[191] Fédération Nationale des Travaux Publics, Bulletin de conjoncture mensuel n° 239, « 2020 : chute historique de l'activité », 08 February 2021.

[192] Cédric Néau and Romain Gaspard, La Gazette des Communes, « Bruno Cavagné : « Le plan de relance patine dans les travaux publics », 16 June 2021.

DATA BOARD FRANCE



General Data

Political organisation: Unitary Republic with a semi-presidential regime	**Head of State**: Emmanuel Macron
Population: 67.055 million	**Urban population: 80.70%**

Economic indicators

GDP ranking (2019): 7/203	**GDP** (2019): 2,715,518 million of US dollars
GDP growth (2019): 1.5%	**Expected GDP growth** (2020): -8.1%

Environmental indicators

Share in global CO_2 emissions (2018): 1%

Total CO_2 emissions (2019): 293.2

CO_2 emissions per capita (2019): 4.4T

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 83.3%
- Train: 10.3%
- Bus and trolleys: 6.4%

Modal share of freight transport (2018):

- Roads: 87.9%
- Inland waterways: 2.4%
- Railways: 9.7%

Construction sector

Construction sector GDP share (2018): 6%

Jobs in the construction sector (2019): 1.790.000

Businesses in the construction sector (2019): 419.000

Investment In Construction -Civil Engineering (2019): €40,982 Billion

Netherlands

Economic context: Covid-19

While the Netherlands had a 1.7% growth rate in 2019, the European Commission expects **a fall of 3.7% in 2020**[193]. the Netherlands is one of the less impacted countries by the pandemic in the EU, where the GDP growth is expected to fall by 6.1%, essentially due to softer restrictions than most of its neighbours. A rebound is forecasted for 2021 (2.3%) and 2022 (3.6%) in the country. According to the Commission, "*the economy is projected to rebound swiftly to its pre-pandemic level on the back of a robust recovery in consumer demand and more favourable external factors*".

1. Impact of Covid-19 on mobility

Mobility trends in the Netherlands (before Covid-19)

According to KiM Netherlands Institute for Transport Policy Analysis, modal share of transport can be drawn by **division of number of trips per transport mode (see Table 1)** and **division of distance travelled per transport mode (see Table 2)**.

Table 1 - Division of number of trips per transport mode[194]

Division of number of trips per transport mode (2019)	
Car as driver	35%
Car as passenger	12%
Train	2%
Bus/Metro/Tram	3%
Bicycle	28%
Walking	16%
Other	4%

Source: Netherlands Institute for Transport Policy Analysis – KiM

Table 2 - Division of distance travelled per transport mode[195]

Division of distance travelled per transport mode (2019)	
Car as driver	50%
Car as passenger	19%
Train	12%
Bus/Metro/Tram	3%
Bicycle	8%
Walking	2%
Other	6%

Source: Netherlands Institute for Transport Policy Analysis – KiM

Cars use still remains important by accounting 35% of trips and 50% of distance travelled. Cycling and walking are high and represent 44% of trips, near to 50% if public transport is

[193] European Commission, "Spring 2021 European Economic Forecast", May 2021.
[194] Netherlands Institute for Transport Policy Analysis| KiM, Mathijs de Haas, Marije Hamersma, "Cycling facts: new insights", 03 November 2020.
[195] Netherlands Institute for Transport Policy Analysis| KiM, Mathijs de Haas, Marije Hamersma, "Cycling facts: new insights", 03 November 2020.

added. Public transport is not very used by Dutch people even if it represents longer distances than cycling or walking. The Dutch population very much relies on active and eco-friendly mobility in their trips on short distances, and on car and train for longer ones. The report confirms it later: "*Trips up to 500 m are primarily made by foot (80%), with bicycles only claiming a 17% modal share of such short trips. Bicycles claim a relatively large modal share of trips between 500 m and 5 km (34 to 47%), while for trips longer than 5 km the modal share decreases further*".

In the "**Key transport figures 2018**"[196] published by the KiM Netherlands Institute for Transport Policy Analysis, the number of passengers (in billion kilometres of passengers) is divided between transport modes:

Table 3 – Passenger transport statistics in the Netherlands (2017)

Passenger transport	2017	Share (%) *
Transport in the Netherlands (in billion kilometres of passengers)	188.5	100%
Car driver	98.0	51.98%
Car passenger	40.0	21.22%
Public transport	25.0	13.26%
Cycling	15.5	8.22%
Mopeds	1.0	0.53%
Walking	4.0	2.12%
Other	5.0	2.65%

**Percentages calculated from absolute figures by the author*
Source: Netherlands Institute for Transport Policy Analysis – KiM

These figures are near to the ones in Table 2, with a large dominance of private car use in distance travelled figures compared to other modes of transport.

The report establishes as well interesting figures for freight transport:

Table 4 – Freight transport statistics in the Netherlands (2017)

Freight transport	2017	Share (%) *
Freight transport on Dutch territory (in billion tonnes kilometres)	130.8	100%
Road (excluding delivery vans)	60.4	46.17%
Inland waterways	49.0	37.46%
Railways	6.5	4.96%
Pipelines	15.0	11.46%

**Percentages calculated from absolute figures by the author*
Source: Netherlands Institute for Transport Policy Analysis – KiM

Roads remain the most used mode of transport for freight transport where inland waterways are at a high level.

[196] Netherlands Institute for Transport Policy Analysis| KiM, "Key Transport Figures 2018", 11 January 2019.

Infrastructure

In 2016[197], the Netherlands spent near to $1.5 billion in its road infrastructure. Its road network was 188.119km of which 7.163km of highways and 5.935km of main roads.

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2019, the car fleet was 8.37 millions of passenger cars[198] and **443.812 passenger cars were registered in 2019**[199]. In 2017, with 557 cars for 1.000 inhabitants, the Dutch motorisation rate (numbers of cars for 1.000 inhabitants) is below the average in the EU.

Alternative powered vehicles

In 2018, according to European Automobile Manufacturers Association[200]:

- Hybrid Electric Vehicles (HEV) represented 2.1% of the Dutch car fleet,
- Electrically Chargeable Vehicles (ECV) represented 1.6% and
- Alternative Fuels Vehicles (AFE) 1.5%

In total, alternatively powered passenger cars made up 5.2% of the total Dutch car fleet against 4.1% in the EU.

Cycling

The Netherlands is a major country in cycling worldwide. It indeed has the highest cycling modal share in the EU (28%) where the closest country is Denmark with a 17-18% modal share. Also, there were 22.9 million bicycles in Netherlands for 17.2 millions of inhabitants, which makes the country "*world leader in bicycle ownership rates*"[201].

Mobility behaviours considering the COVID-19 pandemic

General data

A recent study[202] released Netherlands Institute for Transport Policy Analysis in August 2020 draws mobility evolutions in light with the COVID-19 crisis.

First at all, the population has reduced its trips even after the first wave. One third of the population still stays at home. It was one of five before the crisis and one of two during the crisis. **The number of trips decreased by 29% with a drop from 8,3 trips to 5,7 trips on 3 days.** Nevertheless, the number of trips increased compared to the beginning of the crisis (+57%). Compared to the beginning of the crisis, the number of trips has increased again for all motives. Despite the fact that the number of trips to "visit, walk" is higher than the corona crisis, this number has decreased since the beginning of the corona crisis. Compared with the

[197] Consortium (ERF, FIEC, Routes de France, FNTP, CICA), "New mobility and road infrastructure - International benchmark 2020", 08 September 2020.
[198] European Alternative Fuels Observatory, Netherlands, 2020.
[199] European Automobile Manufacturers Association (ACEA), "The Automotive Industry Pocket Guide 2019-2020", 2020.
[200] European Automobile Manufacturers Association (ACEA), "Passenger car fleet by fuel type", 2018.
[201] See reference III.
[202] Netherlands Institute for Transport Policy Analysis| KiM, Mathijs de Haas, Marije Hamersma 'Nieuwe inzichten mobiliteit en de coronacrisis', 5 August 2020.

situation before the crisis, the number of trips for "Education" (-73%) and "Social leisure, other" (-53%) are the areas where the number of trips has decreased the most.

In comparison, **the distance travelled increased (+90%) and not the number of trips, even if it lower than before the crisis**. Distance travelled remains below than before the COVID-19 crisis: (94km) / (59km). Trips decreased especially in public transport and car as passengers where bicycle use increased.

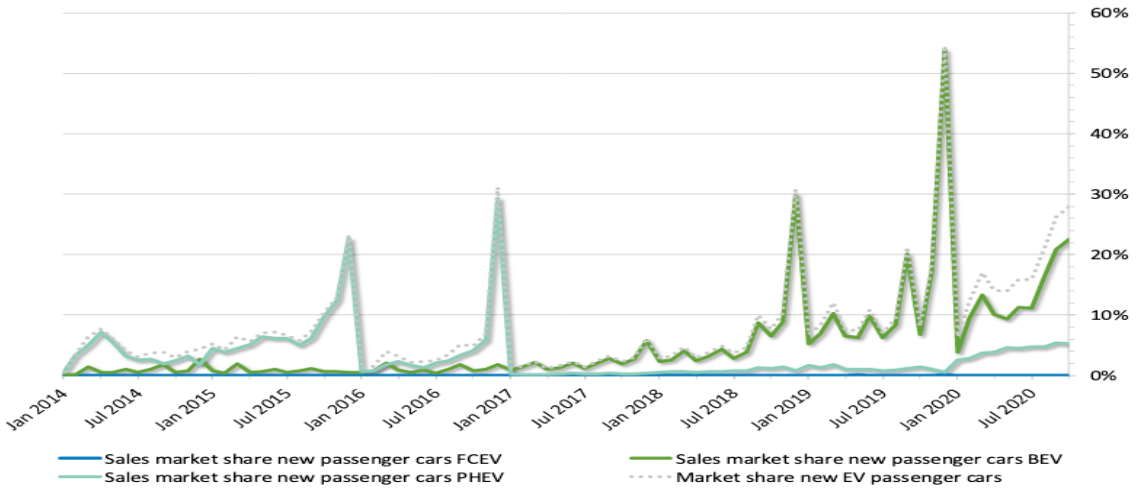
Secondly, just as at the beginning of the corona crisis, people think differently about other modes of transport than before. The picture has not changed much since then. However, the group that is positive about cars has increased slightly and people are more often very positive about bicycles**. 84% of people indicate that they currently prefer individual transport to public transport**. At the beginning of the corona crisis, this percentage was 87%. Among those under 25, the proportion is currently lower (73%).

More people expect a change in use of transport modes. About 28% expect to use public transport less in the future, compared to 8%who expect an increase. About 26% expect to cycle more often and 23% expect to walk more often, while only 4% and 3% respectively expect to do so less often. For the car as well, a larger group expects to use it more often (14%) than less often (8%). (14%) than to use them less frequently (7%) in the future after the corona crisis.

Alternative fuel vehicles

By comparing car registrations in Netherlands between Q3 2019 and Q3 2020[203], APV registrations impressively increased (+57.3%) when conventional cars registrations dropped significatively (-29.5% for petrol cars and -56.5% for diesel cars). It is too soon to predict this trend is the 'new normal'. We can observe the important increase of electric passenger vehicles market share registrations since 2014. A net drop is to be noted after January 2020. However, the market share of BEV vehicles in new registrations is higher than 20% after July 2020.

Figure 1 - Development in the market share of new registrations (sales) of electric passenger cars in Netherlands



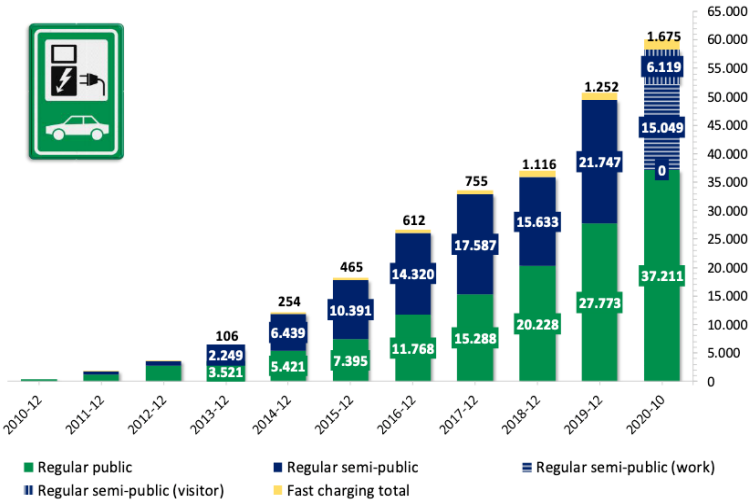
Source: Netherlands Enterprise Agency[204]

[203] European Automobile Manufacturers Association (ACEA), New passenger cars registrations by fuel type in the European Union, 05 November 2020.

[204] Netherlands Enterprise Agency, "Statistics Electric Vehicles in the Netherlands (up to and including October 2020)", November 2020.

The charging infrastructure for electric vehicles is already very well deployed in the Netherlands, counting 60.054 charging points in total, of which 37.211 public ones and 1.675 fast charging ones.

Figure 2 - Development in the number of charging points in Netherlands (November 2020)



Source: Netherlands Enterprise Agency[205]

Collective mobility

First at all[206], the majority of public transport passengers feel safe and can maintain sufficient distance in the station/platform and in the vehicle Travel after June 1 was considered less pleasant than before June 1. The majority (63%) also find wearing a mouth mask unpleasant. However, nearly 60% of public transport passengers say that wearing a mouth mask is a good measure.

The most frequently cited reasons for reducing travel by public transport are government advice to make only the necessary trips (48%), undertaking fewer activities (46%) and fear of corona contamination (33%). **Among those who currently use public transport less, the vast majority (73%) also expect to continue to do so less in the coming months**. A smaller proportion expects to travel more. A smaller proportion expects to travel more during off-peak (13%) or peak hours (5%).

Among travellers who now use the train less 46% now say they use their car more often and 14% use their bicycle more often as a substitute for the train. 45% do not use alternative modes of transport instead of the train.

For bus/tram/metro travellers, cycling is a more popular alternative than the train. This is probably because this kind of journeys are generally shorter than train journeys. Among those who now travel less by bus/tram/metro, 37% use their bicycle more often, 41% use their car more often, 5% use their moped/scooter/moped and 17% walk more often as a replacement for bus/tram/metro travel. 29% do not use other modes of transport instead of bus/tram/metro.

[205] Netherlands Enterprise Agency, "Statistics Electric Vehicles in the Netherlands (up to and including October 2020)", November 2020.
[206] See note xii.

The use of alternative modes of transport instead of public transport is most appreciated. On average, the use of bicycles is preferred (70%). The use of the car is better as an alternative to public transport (73%) than the use of the train (58%).

Around 80% of people currently using an alternative mode of transport to public transport also plan to use a bicycle, moped or motorbike in the coming months. Expect to use a bicycle, moped or car as an alternative to public transport. For walking, the percentage is 66%, which is slightly lower.

Even after the removal of the corona measures, a part of the population still expects to use an alternative mode of transport. **Of those who now use bicycles more often as a substitute for public transport, 52% expect to do so more often after the corona crisis. after the corona crisis. For the moped 47%, the car 34% and walking 40%.**

These percentages only give an indication of the possible decrease of the public transport and the increase in the use of the alternative mode of transport. **The exact change depends, among other things, on the frequency of use of public transport before the corona crisis and the extent to which the alternative mode is used for some or all the trips**.

Cycling and walking

Cycling use increased during the crisis and walking is one of the modes of transport that decreased the less[207]. Longer distances are not noted in walking and cycling compared to before the crisis (3.4 to 4.1km), but there has been a decrease compared to the beginning of the outbreak (4.4km by bicycle and 2.3km by walk). Also, electric bicycle and walking are used for longer distances than before the crisis.

Walking decreased compared to the beginning of the crisis trough the relatively growth of other transport modes. It nevertheless is higher compared to before the crisis. For all reasons, with the exception of walking, there is still a decrease in the number of journeys compared to the period before the corona crisis.

Road freight transport

Road freight transport in the Netherlands in 2020 was comparable with 2019, as provided by Statistics Netherlands. A drop is to be noted during spring corresponding with the beginning of the crisis. Another lighter decrease at the end of summer is to be observed as well.

[207] See note xii.

Figure 3 – Evolution of road freight transport in 2019 and 2020 per week (thousands of movements)

Source: Statistics Netherlands[208]

2. Dutch Recovery Plan: Focus on mobility issues

Recovery Plan on the European level

The Netherlands did not issue its national recovery and resilience plans yet[209]. Nevertheless, the European Commission proposed some figures on the funding the country will receive for the 2021-2027 period.

Table 5: EU funds available for the Netherlands, 2021-2027, commitments, EUR billion

Programme	Amounts
Cohesion policy funds (ERDF, ESF+, Cohesion Fund)	1.3
Common agricultural policy European Agricultural Fund for Rural Development and direct payments from the European Agricultural Guarantee Fund	5.6

[208] Statistics Netherlands, "Snelle indicatoren Goederenvervoer", 21 January 2021.
[209] Jessie Goeman, NewEurope, "Eight EU countries have yet to submit recovery plans", February 11, 2021.

Recovery and Resilience Facility	5.6
Just Transition Fund	0.6
ETS auction revenue	3.3

Source: European Commission[210]

National Energy and Climate Plan (NECP)

According to EU Regulation, the Member States had to submit to the European Commission a National energy and climate plans (NECPs)[211] by the end of 2019, defining a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030. The European Commission issued recommendations to amend the NECP for 2020. In October 2020, it released a final assessment of each NECP. This assessment considers the European Semester objectives and the Recovery and Resilience Facility (RFF) criterion in the context of the COVID-19 outbreak.

The Dutch NECP[212] proposes a 49% greenhouse gas emission reduction by 2030 compared to 1990 levels and a 95% reduction by 2050 in line with the National Climate Law. **In transport, the Netherlands intends to reduce transport emissions from 35.6Mt (2018 levels) to 29.4-31.7Mt in 2030**. To support this aim, some policy measures are indicated:

- Supporting electromobility by reducing "*the number of work-related kilometers and make logistics more sustainable*."
- Further deploying charging infrastructure "*by the stimulation of sustainable energy carriers, electrification of the car fleet (financial incentives and a shift to 100% electric vehicles by 2030) and a specific agenda for electric charging stations*".
- Going to a "*yearly reduction of 8 billion fewer kilometers of professional road transport by 2030*"
- All new cars are to be emission-free by 2030 by proposing tax incentives that will be gradually phased out.

The Commission notes in its assessment that "...*However, the plan does not provide more details on the specific measures for all modes and alternative fuels*…".

National Long-Term Strategy

All Parties of the Paris Agreement must communicate by 2020 their long-term vision to consistently reduce their greenhouse emissions and to meet the Paris Agreement objectives. The European Union included this obligation in a Regulation[213] in 2018. Then, each Member States must prepare a long-term strategy[214] for and at each decade. Transport and mobility are of course included. These strategies shall be coherent with the NECPs.

[210] European Commission, "Commission Staff Working Document Assessment of the final national energy and climate plan of the Netherlands", 14 October 2020.
[211] European Commission, National Energy and Climate Plans (NECPs).
[212] European Commission, "Commission Staff Working Document Assessment of the final national energy and climate plan of the Netherlands", 14 October 2020.
[213] Official Journal of the European Union, REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, 22 December 2018.
[214] European Commission, National long-term strategies.

The Netherlands issued its National Long-Term Strategy[215] in December 2019. **It develops that climate policy in Netherlands is defined at national level by the Climate Act passed in 2019, from which a Climate Plan has been issued. This plan is to be revised every 5 years and is the compass of long-term climate objectives in the country.** As seen in the Dutch NECP, the Netherlands intend to reduce their GHG by 49% by 2030 and 95% in 2050, appearing as the most ambitious country worldwide. The Climate Plan includes a 100% CO_2 neutral electricity supply by 2050.

3. Existing mobility strategies

The Climate Agreement[216] is the masterpiece of legislation setting climates policies targets in the Netherlands since 2019. It includes transport and traffic sectors. Main policies developments in these fields should be seen under the Climate Agreement, which provides very detailed actions. The Agreement is based on built common commitments from pertinent stakeholders according to their nature and their location (public/private, local/national).

A dedicated part of the Agreement concerns mobility issues. The proposed objective is a carbon-free mobility by 2050. To do so, the Dutch government asked for recommendations from the Mobility Sector Platform. It proposed several policy options:

- **A transformation of the Infrastructure Fund into a Mobility Fund by the government**. This modification is firstly requested for an "…*optimal use of existing infrastructure, the stimulation of smart transport systems, such as self-driving cars, carbon-neutral mobility solutions and Mobility as a Service optimal use of existing infrastructure, the stimulation of smart transport systems, such as self-driving cars, carbon-neutral mobility solutions and Mobility as a Service*…"
- **Further progresses have to be made by public authorities through regional and specific locals mobility plans in line with a national one.**
- **A transition towards a new funding system,** with a pay-as-you-go or pay per usage approach.
- **Rely on innovation and developments for the mobility of tomorrow,** through the mission-driven Multi-year Knowledge and Innovation Program.

Same requests have been made regarding 2030 objectives with sectoral targets:

- *"sustainable energy carriers:*
- *renewable energy carriers;*
- *stimulation of hydrogen;*
- *sustainable procurement by government.*
- *stimulation of electric passenger and other transport*
- *ambition for 100% of new cars sold to be emissions-free by 2030.*
- *sustainability improvements in logistics:*
- *medium-size zero-emissions zones in city logistics in 30 to 40 larger municipalities by 2025;*
- *zero-emissions construction traffic and mobile machinery;*

[215] Dutch Ministry of Economic Affairs and Climate Policy, "Long Term Strategy on Climate Mitigation", December 2019.
[216] Klimaatakkord, 'Climate Agreement', 28 June 2019.

- *climate-neutral and circular ground, road and water works;*
- *30% reduction of carbon dioxide emissions through hinterland and continental transport by 2030;*
- *inland shipping;*
- *sustainability of personal mobility (including business travel, public transport and cycling):*
- *reduction of 8 billion kilometers in business mileage by 2030;*
- *survey of other types of mobility funding*."

Several agreements have been signed for the development of electric transport to reach the objective of 100% of carbon-free new sold cars in 2030, especially on a National Charging Infrastructure Agenda.

Forecasts on the construction sector

According to Bouwend Nederland[217], the national construction association, for the construction market as a whole, **economic growth went down by 9.4% and 2.5% in the second and third 2020 quarters**. The orderbook remained stable compared to 2018 levels.

On the infrastructure construction market[218], investment remained stable at €5.4 and €5.3 billion at the two first 2020 quarters. **It dropped at €4.1 billion at third quarter, as a likely consequence of Covid-19 restrictions**. The total turnover value of public works companies decreased by 3% at first quarter where the one of SMEs increased by 7.0%.

Table 6 – Key Figures for the Dutch infrastructure market 2018-2020

KEY FIGURES FOR THE DUTCH INFRASTRUCTURE MARKET 2018-2020[219]								
		2018	**2019**	**2019 Q3**	**2019 Q4**	**2020 Q1**	**2020 Q2**	**2020 Q3**
Production	Millions of euros	17.175	17.850					
Investments	Billions of euros	17,8	18,8	4,0	4,8	5,4	5,3	4,1
Total turnover	%, value	5,6	7,3	9,0	6,0	9,4	8,0	-3,0
SMEs turnover	%, value	10,4	7,9	8,6	3,9	20,9	9,9	7,0
Procurement (public)	Number	677	680	134	162	178	179	136

Source: Bouwend Nederland figures

[217] Bouwend Nederland, 'Kerncijfers bouwsector 2018-2020'.
[218] Bouwend Nederland, "Kerncijfers inframarkt 2018-2020".
[219] Bouwend Nederland, "Kerncijfers inframarkt 2018-2020".

DATA BOARD NETHERLANDS

General Data

Political organisation: Constitutional monarchy and parliamentary regime	**Head of government**: Mark Rutte
Population (2018): 17.2 million	**Urban population** (2019): 91.87%

Economic indicators

GDP ranking (2019): 17/203	**GDP** (2019): 909.070 million USD
GDP growth (2019): 1.7%	**Expected GDP growth** (2020): 5.3%

Environmental indicators

Share in global CO_2 emissions (2018): less than 1%

Total CO_2 emissions (2018): 150MT

CO_2 emissions per capita (2019): 8.2T

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 85.7%
- Train: 11.2 %
- Bus and trolleys: 3.1%

Modal share of freight transport (2018):

- Roads: 50.4%
- Railways, inland waterways: 43.2%
- Railways: 6.4%

Construction sector

Construction sector GDP share (2019): 4.5%

Jobs in the construction sector (2019): 483.000

Businesses in the construction sector (2019): 190.000

Investment In Construction -Civil Engineering (2019): €79 Billion

Tables & Figures

Poland

Economic context: Covid-19

According to the European Commission, the Polish economy was significantly growing before the pandemic, recording an increase of **4.7% of its GDP in 2019**. The Covid-19 **pandemic made the GDP fall by 2.7% in 2020**[220]. A strong rebound is forecasted for the upcoming years: **+4% in 2021 and +5.4% in 2022**[221]. After a strong rebound in the third quarter of 2020, owing to pent-up consumption and government support, output fell again in end-2020 as new restrictions have been introduced to contain the second outbreak of the virus. Domestic demand will regain momentum in 2021 and 2022, with the prospect and actual deployment of an effective Covid-19 vaccine. Unemployment is expected to peak in 2021 and slowly decrease afterwards. The OECD recommends that public investment would be needed to improve interregional infrastructure and to green the energy mix. This would simultaneously support the recovery and help to meet environmental objectives[222].

1. Impact of Covid-19 on mobility

Mobility behaviour in Poland (before Covid-19)

According to a 2015 World Bank report, Poland suffers from a considerable gap between the national principles and policies addressing sustainable development, mobility, and urban spaces, and the actual implementation of public transport and land-use planning. Because of residential development in metropolitan areas, many Polish cities are experiencing significant suburbanization. Analysis by the OECD have acknowledged that suburbanization conflicts with policies to promote sustainable development, but policy instruments to harmonise local and regional policies have not yet been appropriately developed. Polish cities, which had been characterized by very high modal share for public transport, are now upgrading their infrastructure in an environment that has become more challenging for public transport.

Challenges

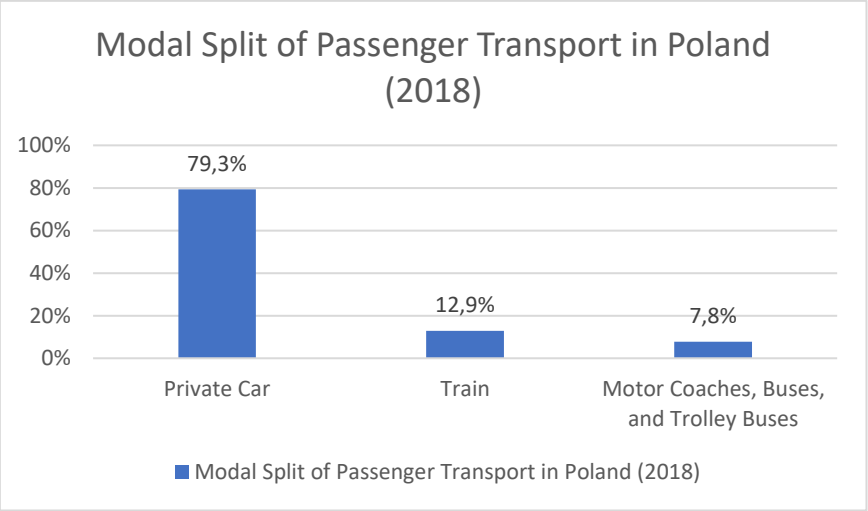
While working to achieve the objective of greener cities and more sustainable transport system, Polish towns are facing a key challenge: declining urban population. This trend is due to both the overall decline in Polish population and the progressive shift towards suburban areas and major urban centres. This is due to the decline in total population in Poland and population movement to the suburbs or more-developed cities. A pain point has been the absence of strong legal mechanisms to ensure coordination of spatial and transport planning within functional urban areas[223].

[220] Eurostat, Real GDP Growth Rate – Volume, 2021.
[221] European Commission, European Economic Forecast, Winter 2021.
[222] OECD 2020: Poland Economic Snapshot. Accessed: May 11, 2021.
[223] The World Bank Group; Korea Green Growth Partnership 2015: Urban Mobility in Eastern Poland: The Way Forward.

Modal split within Poland

According to Eurostat, in 2018, of the total passenger-kilometres travelled by land in Poland, 79.3% were by car, 12.9% were by bus or coach, and 7.8% by rail. The most significant portion of Poles thus travelled by car[224].

Modal split of passenger transport in Poland - 2018



Source: Own graph based on Eurostat: Modal split of passenger transport – 2018

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

Overall, the passenger car fleet in almost all of the EU Member States has grown over the last five years. In 2018, Poland had by far the highest share of passenger cars older than 20 years (36.5%), followed by Estonia (29.6%) and Finland (25.2%). In 2018, Poland was among the EU countries having one of the highest shares of petrol-powered cars, accounting for 53.8%.

Amongst the EU Member States with the highest 'motorisation rates', i.e. passenger cars per 1000 inhabitants, small countries such as Luxembourg head the rank, followed by Italy. Poland lies in the 5th place, with 617 passenger cars per 1000 nationals.

Alternative fuel vehicles

In 2018, the highest share by far of alternative fuels in new registrations could be seen in Poland (8.75 %, 2017 data) and Italy (8.70 %) and, from the EFTA (European Free Trade Association) countries, like in Norway (33.4 %)[225].

Freight transport

In terms of transport of goods in the national territory, Germany, France, Spain, the United Kingdom and Poland continued to dominate European road transport in 2018, measured in tons. These countries accounted for 60.8 % of the total goods transported in the member states of the EU[226].

Mobility behaviour in light of the Covid-19 pandemic and the first lockdown

The first case of a Covid-19 infection in Poland was recorded on March 4, 2020. On March 14, the Polish Government declared the state of emergency. Poland reintroduced border controls,

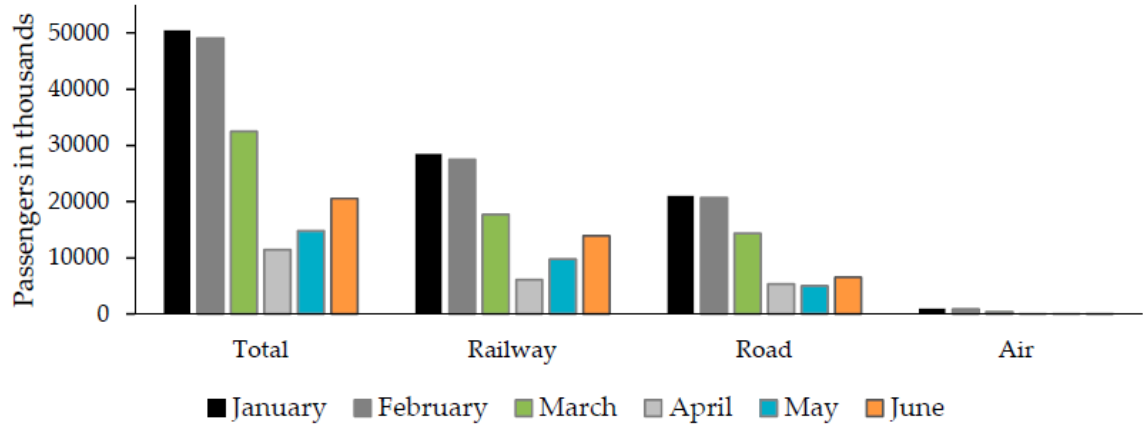
[224] Eurostat, Modal split of passenger transport - 2018.
[225] Eurostat: Passenger cars in the EU. Accessed: February 4, 2021.
[226] Eurostat: Road freight transport statistics. Accessed: December 11, 2020.

closed some service facilities, closed schools, and introduced social distancing measures. On March 24, 2020, some further restrictions on people's mobility and on public gatherings were announced. All non-essential travel was forbidden. Public transport capacity was reduced to prevent infection. On April 1st, 2020, the restrictions were strengthened.

Global passenger transport

By the end of March 2020, global road transport dropped by more than 50% compared to the same period in 2019. A combination of government restrictions and fears of contracting/spreading Covid-19 when using mass transport caused the reduction in passenger transport demand.

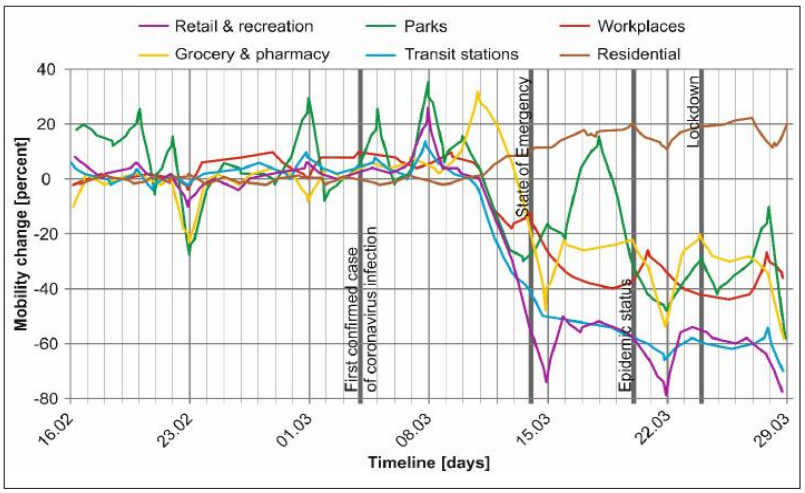
Passenger transport in Poland from January to June 2020 by means of transport, in 1000 persons



Source: Tarkowski M., Puzdrakiewicz K., Jaczewska J., Połom M., 2020, based on COVID-19 Community Mobility Report (2020).

The largest drop in mobility was observed in the retail & recreation and transit station sectors (-78%) while the smallest one in the workplace category (-36%). As for the residential areas, the mobility increased by 13% as some people were working from home[227].

Mobility changes in Poland from February 16 to March 29 (2020)



Source: Tarkowski M., Puzdrakiewicz K., Jaczewska J., Połom M., 2020, based on COVID-19 Community Mobility Report (2020).

[227] Tarkowski M., Puzdrakiewicz K., Jaczewska J., Połom M., 2020: COVID-19 lockdown in Poland – changes in regional and local mobility patterns based on Google Maps data, Prace Komisji Geografii Komunikacji PTG, 23(2), 46–55.

Economic consequences

The pandemic has not yet led to an increase in the number of bankruptcies of large transport companies and layoffs of their staff[228].

Transport externalities

A reduction in CO2 emissions is not an obvious consequence in Poland where energy production is based on coal and transport is to 3/4 dominated by road transport. Currently in Poland, transport is responsible for 19% of carbon dioxide (CO2) emissions, including road transport by 18% (i.e. passenger cars by 10%, trucks and buses by 8%).

Between March and October 2020, the Covid-19 pandemic contributed to a redaction by 2/3rd of air traffic in air traffic and intercity bus transport in Poland, which led to less CO2 emissions, but the share of these modes of transport in total CO2 emissions does not exceed 1%. At the same time, passenger car traffic has decreased very slightly and as it represents 10% of total CO2 emissions it has not reduced the environmental burden to a large extent. On the other hand, the movement of trucks responsible for 8% of the total CO2 emissions has increased by 5-6% thus increasing the environmental burden. Overall, the economic downturn caused by Covid-19 is not accompanied by a reduction in CO2 emissions to the same extend as in China, India or Italy for example.

Another consequence is that urban congestion has increased significantly due to the massive shift from public transport to private cars.

Despite the pandemic, Polish transportation still contributes to around 19% of total greenhouse gas emissions, due to a slight decrease in road passenger traffic and an increase in road freight traffic, which accounts for about 3/4 of all Polish transportation. The temporary reduction in road traffic has led drivers to drive faster and has resulted in a fairly significant increase in the number of accidents on out-of-town roads[229].

1) Passenger car traffic

There are no up-to-date monthly statistics on all road transport. The impact of the Covid-19 pandemic on road transport can only be based on random measurements of traffic on toll roads.

As such, it is estimated that car traffic on national roads was reduced by -40% between March and May 2020, then returned to pre-pandemic levels in summer. Since June 2020, traffic on national roads has returned to normal and truck traffic has begun to increase. The exception is an 11% decline in passenger car traffic in October. Similar traffic changes are likely to have occurred on regional and local roads[230].

Despite a drop in mobility concerning trips to the workplace was observed in Poland, the changes were minimal. Most of the professionally active people were commuting to their workplaces. However, public transport was less used than private cars. The general drop in mobility resulted in a visible change in traffic. As an example, commuting to the business and science centre in the cities Gdańsk Oliwa from Gdynia, Sopot and Gdańsk, the average travel time was shorter by 18%; by 15% during the morning peak and by 21% in the evening.

[228] TDIE 2020.
[229] TDIE 2020.
[230] TDIE 2020.

Even before the pandemic, the increasing number of residents using their private cars was not accompanied by the adequate development of adapted social and technical infrastructure. Development of the transport network was also hampered by geographical factors. The western districts of Gdańsk and Gdynia for example are separated from the central ones by the Tricity Landscape Park, which is a protected area. This has made it difficult to develop a road network of higher density. Technical parameters of the existing roads allow users to drive with a speed reaching 70km/h. However, the daily congestion is so high that the actual speed is much lower. The Covid-19 mobility restrictions have made those roads more drivable.

The mobility restrictions were more profitable for the citizens living in the peripheral districts connected by high-speed roads with high daily congestion. Therefore, the Covid-19 pandemic has consolidated the less sustainable mobility patterns observed in large Polish cities[231].

Economic consequences

The number of new cars and vans up to 3.5 tons registered between January and October 2020 was 45,504, compared to 52,722 for the same period in 2019, a decrease of -26%. The decline was -39.9% in March, -65.8% in April and -53.7% in May 2020[232].

2) Public transport

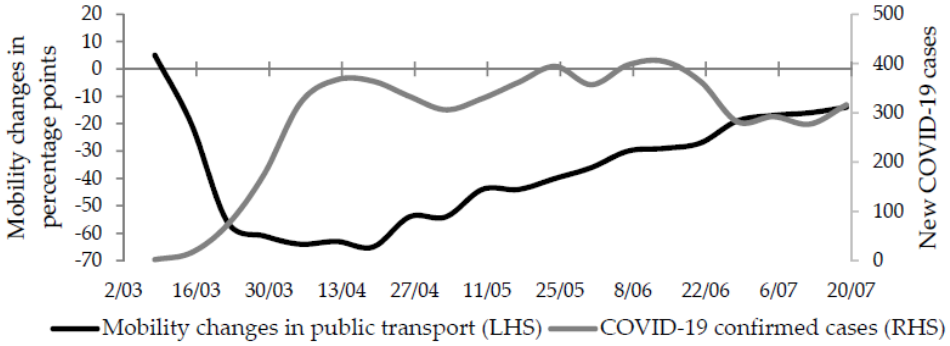
A substantial decrease in passenger transport in Poland since the Covid-19 pandemic outbreak in March 2020 can be noticed. By the end of April 2020, the total number of passengers in public transport had dropped by 77% in comparison to January 2020. When Covid-19 related restrictions were however eased in June 2020, nearly 21 million passengers in Poland were carried by public transport, 38.6% more than in May 2020.

This situation also persisted during the summer months, as there were limits of 50% on the number of seats on buses, streetcars, trolley buses, and subways. However, in the absence of statistics on intercity bus services, it is difficult to assess the extent of the decline in these services, but it is likely to be in the order of about 60-80%. Also, it can be stated that in public transportation, the negative effects of the epidemic are most acute on intercity bus routes (almost -70% in the first 3 quarters of 2020).

It is estimated that in urban transport, passenger numbers have declined by about two-thirds as they have shifted to private cars, leading to increased congestion[233].

[231] Tarkowski M., Puzdrakiewicz K., Jaczewska J., Połom M., 2020, COVID-19 lockdown in Poland – changes in regional and local mobility patterns based on Google Maps data, Prace Komisji Geografii Komunikacji PTG, 23(2), 46–55.
[232] TDIE 2020.
[233] TDIE 2020.

Average weekly mobility changes in public transport and the average of new Covid-19 cases



Source: Wielechowski, M.; Czech K.; Grzeda L. 2020: Decline in Mobility: Public Transport in Poland in the time of the COVID-19 Pandemic. In: MDPI. Department of Economics and Economic Policy, Institute of Economics and Finance, Warsaw University of Life Sciences-SGGW.

The increase in the number of new Covid-19 cases was first associated with the sharp decline in the mobility of people in public transport, particularly till mid-April 2020. However, since the beginning of May 2020, a large increase in mobility was observed, despite the constantly high number of new Covid-19 cases. From the second half of April 2020, an increase in mobility in public transport was noticed, which can be explained by the fact that the Polish society has learned to function more effectively despite the social distancing regulations. It suggests that government restrictions and ongoing pandemic information campaigns have a greater impact on human mobility rather than information about new confirmed cases[234].

Economic consequences for mobility operators

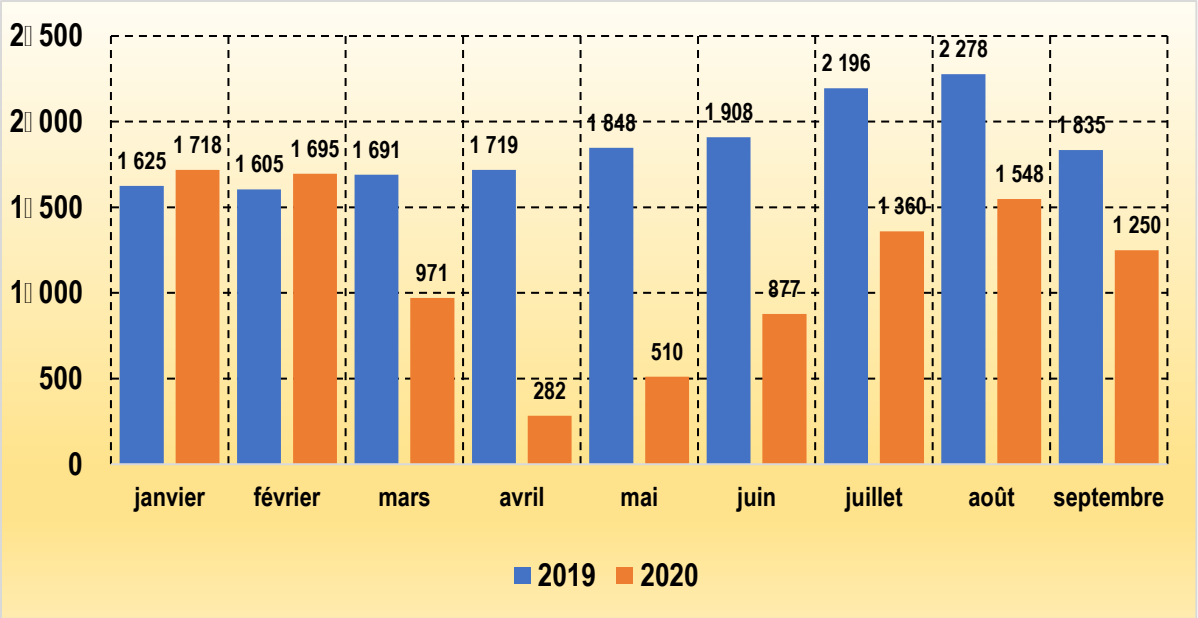
Urban carriers lost about 70% of ticket sales revenue. At the same time, urban transport costs have increased as a result of the adaptation of vehicles to epidemic requirements[235].

3) Rail

In mid-March the government introduced strict restrictions on the mobility of residents, but there was no complete suspension of long-distance and local train traffic. Rail carriers reduced train frequencies and shortened their routes in the face of a sharp decline in travel demand. In the first 9 months of 2020, passenger-kilometres decreased by 38.9% compared to the same period in 2019. In April and May 2020, the drop in transportation was about 3/4. Besides, on March 15, the government suspended all international air and rail passenger services. International trains have resumed in June 2020.

Monthly evolution of rail passenger traffic in Poland in 2019 and 2020 (million passenger-kilometres)

[234] Wielechowski, M.; Czech K.; Grzeda L. 2020: Decline in Mobility: Public Transport in Poland in the time of the COVID-19 Pandemic. In: MDPI. Department of Economics and Economic Policy, Institute of Economics and Finance, Warsaw University of Life Sciences-SGGW.
[235] TDIE 2020.

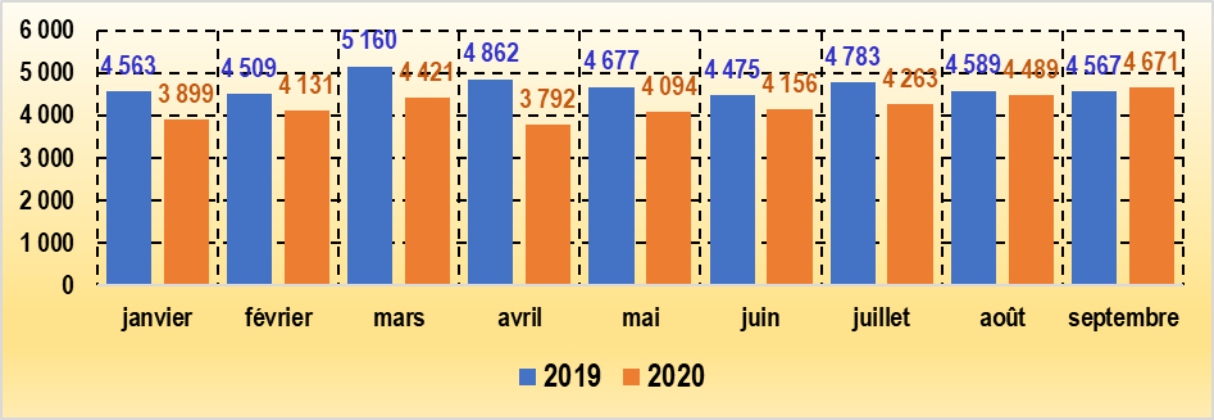


Source : Jan Burnewicz on the basis of the national statistic center for rail (Urząd Transportu Kolejowego) - https://www.utk.gov.pl/pl/raporty-i-analizy/analizy-i-monitoring/statystyka-przewozow-pa/16386,Dane-eksploatacyjne-w-2020-rMonthly-statistics-2020.html

Economic consequences for mobility operators

During the worst month of the epidemic (April), passenger rail revenues declined by 70% (in some cases by as much as 85%). In the following months, revenues increased due to the introduction of additional trains, but were still almost halved compared to 2019. The epidemic had a smaller impact on freight revenues (-15-20%). Despite the epidemic, road freight transport is increasing, both domestically and internationally (+5-6%) as shown in the graphic below[236].

Monthly evolution of rail freight in Poland in 2019 and 2020



Source: elaborated by Jan Burnewicz on the basis of the statistics of the Rail Transport Office (Urząd Transportu Kolejowego) - https://www.utk.gov.pl/pl/raporty-i-analizy/analizy-i-monitoring/statystyka-przewozow-to/16385,Dane-eksploatacyjne-w-2020-rMonthly-Statistics-2020.html

4) Freight

The crisis caused by the Covid-19 pandemic is rather well supported by Polish road hauliers (TRM). These hauliers provide logistical support for the EU economy and account for about

[236] TDIE 2020.

16% of total European road haulage revenues. According to a survey carried out in April 2020 by INLEO analysis centre among about 800 of the companies, domestic road transport has slightly decreased, and the companies' revenues were similar to pre-crisis levels. The problems caused by the epidemic for the road hauliers surveyed are the following (% of responses): (a) fewer orders (81%), (b) lower prices for services (64%), (c) loss of fixed contracts (58%), (d) late payments (39%), (e) more empty runs (40%)[237].

5) Cycling

Example of the city of Kraków: In general, bicycle traffic in Kraków has risen significantly – including by over 60% on weekends – since 2019. When comparing cycle traffic in September in 2019 and September 2020, it can be stated that cycle traffic had increased by 27% in weekdays and by 62% in weekends.

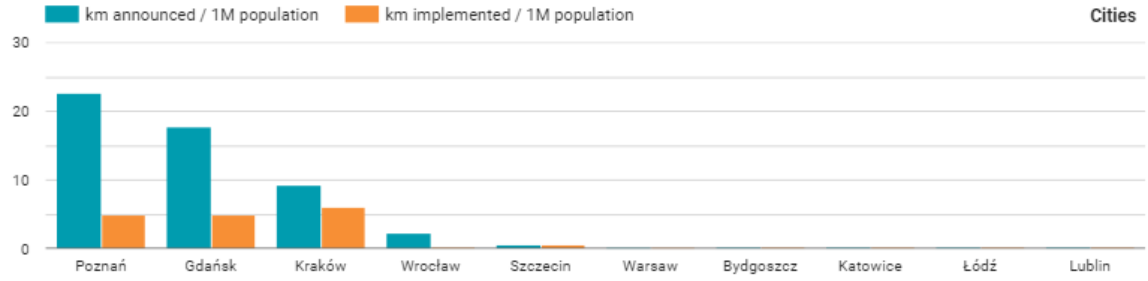
Other cities in Poland have also reported the increasing popularity of cycling amid the Covid-19 pandemic. In April, the Kraków authorities responded to the dramatic drop in car traffic and passenger numbers in public transport caused by the lockdown by launching the so-called "Mobility Shield". Measures included an initial additional seven kilometres of temporary cycle paths on car lanes that were being little used as people stayed at home. New bike paths have since been added at the expense of car lanes on refurbished and previously often congested roads.

Gdańsk: Cycling also seems to be growing in popularity in other Polish cities. Gdańsk counted one million cyclists in 2020 using one of its most popular routes.

Warsaw: Recorded an increase in bike traffic of 17% in July and August compared to 2019[238].

The European Cycling Federation (ECF) Covid-19 tracker however records, that the real implementation of bike path during the pandemic is much lower compared to what was announced.

Covid-19 measures tracker (gathering additional bicycle lanes during the pandemic)[239]



Second & third lockdown and lifting of restrictions (in progress)

Authorities increased restrictive measures on October 15, 2020, following a record rise in Covid-19 cases. In November, mobility restrictions were tightened again. Poland was extending Covid-19-related domestic and international entry restrictions until February 14, 2021[240]. Limited capacity remained in place on public transport. From March 20 to April 25,

[237] TDIE 2020.

[238] Gambol, Craig 2020: Bike use jumps in Poland amid pandemic as cities encourage cycling. October 13, 2020. In: Company news HQ. Accessed: February 4, 2021.

[239] ECF: COVID-19 Cycling Measures Tracker. Accessed: December 2, 2020.

[240] GardaWorld 2021: Poland: Authorities extend COVID-19 restrictions nationwide until Feb. 14 /update 23. January 28, 2021. In: GardaWorld. Accessed: February 4, 2021.

2021, Poland was again confined and sanitary measures were tightened. Non-essential shops opened under conditions, schools, bars, and restaurants were closed. Poland has been gradually lifting its restrictions since May 1, 2021.

Impact of Covid-19 on road construction and road infrastructure

In April 2020, the Polish government announced plans to invest PLN 30 billion (EUR 6.6 billion) in road and rail infrastructure. The investment includes contracts worth PLN 11 billion (EUR 2.4 billion) in the railway sector and PLN 19 billion (EUR 4.2 billion) for highway construction.

In March 2021, production in the construction sector fell by 10.8% compared to March 2020. There is a temporary stagnation in infrastructure work (tenders indicate that a rebound is a matter of time). The current pandemic will have both short- and long-term impacts on the construction sector. For example, some Polish construction companies have closed, and some construction projects have been put on hold. Nevertheless, the sector is not expected to decline significantly, mainly due to the measures taken by the government[241].

2. Polish Recovery Plan: Focus on mobility & infrastructure issues

Polish Recovery and Resilience Plan - European level

Poland will receive €23.9 billion in subsidies from the European Recovery Plan and over €34 billion in loans. On April 27, the Council of Ministers adopted the text allowing the European Commission to launch a loan on the financial markets. Poland submitted its recovery and resilience plan on May 3, 2021. In Poland, this process is managed by the **Ministry of Funds and Regional Policy** (MFiPR).

Poland has requested a total of €23.9 billion euros in grants under the plan and €12.1 billion in loans.

Projects submitted for the National Recovery and Resilience Plan (NRRP) by the different Polish ministries are evaluated by eight thematic working groups. These groups are composed of representatives of the institutions managing national operational programmes, ministries, regions, socio-economic partners and external experts. The working groups operate in the following areas: innovation, energy and environment, digitisation, transport, infrastructure, society, health and territorial cohesion[242].

[241] MENAFIN 2021: Poland: Recovery has started even before lockdowns end. April 22, 2021. Accessed: May 11, 2021.

[242] Ministry of Development Funds and Regional Policy 2020: Poland is implementing the National Recovery Plan. Accessed: February 3, 2021.

EU funds available 2021-2027: commitments (MFF and NGEU) in current prices unless stated[243]

Structural Funds	Common Agricultural Policy	Recovery & Resilience Facility	Just Transition Fund	Modernisation Fund	ETS auction revenue
EUR 72.2 bn	EUR 31.2 bn	EUR 23.1 bn	EUR 3.5 bn *	EUR 1.9 bn **	EUR 1.9 bn ***

**in 2018 prices; **assuming a carbon price of EUR 20 per tonne; ***average of 2018 and 2019 actual auction revenues, amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.*

The Polish NRRP's focus on mobility and infrastructure (European level)

The plan includes measures to improve air quality, energy efficiency in buildings, development of renewable energy sources, zero-emission transportation, and high-speed internet access. The plan's projects cover the period until 2026. In the area of mobility, a budget of €7.5 billion is planned (€700 million in loans and €6.8 billion in grants). Actions are planned in particular to promote the development of low-carbon transport and the development of rail lines.

Context

According to Euractiv, the process of drafting the Polish NRRP would reveal that it is highly scattered, uncoordinated, and inconsistently carried out, without clearly defined goals. Among one of the biggest criticisms is its lack of transparency. The Ministry and some Voivodships have made their lists of submitted projects public, but the complete list of all proposals is unknown. Neither selection criteria nor the composition of the so-called working groups that are responsible for the selection of projects were known to the public. However, on January 27, 2021, it was officially announced that the NRRP draft would be sent for public consultations, allowing local governments and other non-state actors to highlight their priorities.

As the financial situation of small cities and villages is critical, local government officials are impatiently waiting for the economic life and investments at the regional level to get back on track, possibly enhanced by the funds coming from the EU. Among the main priorities for local governments mentioned by the mayor of Gdansk for example are buildings insulation, replacement of furnaces, electromobility and the support for public transport. Numerous Voivodeships already submitted applications to the NRRP for the purchase of hybrid vehicles or hydrogen trains[244].

It is also pointed out that, for Poland, the conditionalities of the RRF (green and digital investments) may be critical, as principles of sustainable development have not been effectively embedded into the process of devising national strategies, public finance sector operations and the Covid-19 relief package of the government, the Anti-Crisis Shield.

The government would have no up-to date sectoral strategies for buildings, transport, energy, industry and agriculture, which would ensure the transposition of the 2030 European climate agenda's objectives to the national level and, simultaneously, support the achievement of the quantified sectoral targets with appropriate tools. It is acknowledged that some of these

[243] European Commission 2020: Summary of swd assessment NECP: Poland.

[244] Plevak, Ondrej et. al. 2021: National recovery plans in the V4: An uneasy exercise. 28 january 2021. Accessed: February 3, 2021.

documents have mostly been developed, but they either have not been officially adopted by the government (buildings, energy), or are not fully aligned with EU objectives (energy, transport), or do not incorporate climate and energy targets in a manner that would allow their effective operationalisation (transport, agriculture, industry). This would pose a major risk that the National Recovery and Resilience Plan's projects focusing on net-zero investments (like renewable energy sources, energy storage technologies, energy efficiency, or low-emission transport and industry) will not match the scale and pace necessary for implementation of the binding climate targets for 2030. It could result in Poland not using its NRRP as a leverage to push forward the low-carbon transformation of the economy[245].

There would be no clear criteria for resource allocation and selection procedures of green projects. This approach differs between Poland and other countries such as Germany or France, whose programmes aim to allocate a significant part of funds to low-emission objectives during the crisis and immediately afterwards. In the preparation of the plan, the Commission had for example emphasized rail transport, which was insufficiently present in the project.

Polish Covid-19 Relief Package – National level

On 18 March 2020, the Polish government presented its relief project entitled "The Economic and Social Anti-Crisis Shield for the Security of Companies and Employees to Face of the COVID-19 Virus Pandemic", or simply "Anti-Crisis Shield". Poland's government has been providing relief in respect to social security in terms of deferments of payments for entrepreneurs and special arrangements for making arrears payments[246].

On 17 April 2020, the "Act on Special Support Measures Due to the Spread of SARS-CoV-2" was published. The Act updates the "Anti-Crisis Shield" provisions and extends the "Act on the System of Development Institutions with New Instruments Forming the Financial Shield." This intervention package accounted for approximately 10% of GDP (PLN312 billion/ €69,5 billion), financed through a rapid increase in public debt[247].

Focus on mobility and infrastructure in the Polish Covid-19 Relief Package - National level

Focus on rail

The second phase of the Anti-Crisis Shield announced by the government in May 2020 included support solutions for rail transportation. Two mechanisms are foreseen to allow public transport operators of general interest in rail transport to raise funds directly:

- Subsidies to provincial, interregional and international passenger rail operators transferred from the state budget to cover lost revenues from the fare reductions provided for in the law;
- Additional subsidies from the Covid-19 Crisis Shield Fund to cover unrealized sales revenues and planned but unrealized operating expenses due to the reduction in train

[245] Bukowski, M.; Leszczyński, P.; Wetmańska, Z. 2020: Green Recovery. From crisis to sustainable recovery. In: Wise Europa - Warsaw Institute for Economic and European Studies.
[246] KPMG 2020: Poland – 'Anti-Crisis Shield' Project Counters COVID-19's Fiscal Impact. Accessed: February 3, 2021.
[247] KPMG 2020: Poland – COVID-19: Relief for Social Security Charges, Charitable Donations, Arrears Interest. Accessed: February 3, 2021.

journeys. In accordance with the EU ban on state aid, these two types of rail support are only for public passenger transport services.

Focus on cycling

Cycling can also be identified as one of the priorities by the Polish government in its draft National Recovery and Resilience Plan on European level.

The scope of the new mobility scheme includes the creation of new bicycle infrastructure, the modernization of the existing one and the creation of accompanying infrastructure (e.g. bicycle service points) to ensure the continuity of bicycle routes in cities. The scheme would also support the construction of tourist bicycle routes, enabling daily transport on short distances, but also long-distance connections between the most important cities and areas attractive for tourists.

14 out of 16 Polish regions recognized cycle projects as crucial for rebuilding regional economies and strengthening resilience to Covid-19 and submitted cycling-related proposals to the Polish National Recovery and Resilience Plan. The list of projects includes, among others, the construction of the network of main cycling connections in the Podkarpackie Voivodship, with an estimated budget of PLN 1.5 billion (€340 million) and a program for the development of bicycle paths along main provincial roads in Wielkopolskie Voivodship, with an estimated budget of PLN 300 million (€67 million)[248].

3. Existing mobility strategies

Strategic Adaptation Plan for sectors and areas sensitive to climate change by 2020 with a perspective by 2030

In this context, the Ministry of Climate implemented a project entitled “Development of Urban Adaptation Plans for cities with more than 100,000 inhabitants in Poland”. This project was implemented under de aegis of an agreement of the Ministry of the Environment with the largest 44 cities in Poland. Plans comprise sensitivity, vulnerability and risk analysis of the cities and selection of adaptation measures respond. The project included city workshops with local governments and non-governmental organizations. Financial instruments included funds from the National Fund for Environmental Protection and Water Management. Co-financing covers activities in the field of green and blue infrastructure.

New Urban Agenda (2015)

The New Urban Agenda is linked to the implementation of the Sustainable Development Goal (SDG) number 11 and should help cities to strengthen their development potentials, create jobs and ensure high quality of life in the cities. This was translated into national level by the Polish National Urban Policy (NUP), adopted by the Council of Ministers on 20 October 2015.

Thematic areas of urban policies specified in the NUP that have strongest links with the SDG 11 are: shaping space; revitalization; **transport and urban mobility**; social participation; low-

[248] ECF 2020: Investments in cycling one of the priorities in Polish national Recovery and Resilience plan. October 2, 2020. Accessed: February 4, 2021.

emission and energy efficiency; environmental protection and adaptation to climate change and investment policy.

The Ministry of Investment and Economic Development cooperates with regions and cities on implementing urban policies deriving from the NUP. Due to developed self-governance administration at the regional and local levels in Poland, cities benefit from a high marge of independence in shaping their development policies and strategies. The cooperation between central public administration and self-governmental partners is thus deemed as essential for successful urban policy implementation.

The main strategic framework for implementing the new urban agenda is provided by the **Strategy for Responsible Development 2020** (updated to 2030) (SRD), adopted on 14 February 2017.

SRD defines the main directions and development priorities, including those concerning sustainable urban development. Among those strategies are the **National Strategy for Regional Development 2030** (NSRD), the **National Spatial Development Concept 2030** (NSDC), adopted in December 2011 as well as the updated **National Urban Policy 2023 (2015)**.

Updated National Strategy for Regional Development 2030 (NSRD 2030)

NSRD 2030 aims at facing Poland's regional challenges, also identified earlier on by the OECD, such as demographic trends, including aging of the population, or decrease in urban population at the expense of rural areas (sub-urbanization) and related problems in the access to public services or in transportation. The following areas are tackled by the NSRD:

- Promoting **social participation** in planning and management of the cities;
- Strengthening the importance of **planning and spatial development**;
- Supporting urban **revitalization**;
- Promoting **sustainable urban mobility and electro mobility** in cities;
- Implementing low-emission strategies and strategies for sustainable urban mobility, related to **improving air quality**, developing public transport systems etc.;
- Improving **access to public services** in the cities, supporting entrepreneurship;
- Building **cities cooperation networks** on the national scale that enable exchange of knowledge and best practices on sustainable urban development;
- Solving environmental challenges, especially air pollution problems, greenhouse gas emissions and adaptation of urban areas to climate change.

Examples of policy measures resulting from the NSRD listed below

Strategy for Sustainable Transport Development 2030 (September 2019)

The document commits to the implementation of 22 strategic projects resulting from the "Strategy for Responsible Development" and new projects, key to the development of Poland's transport system.

The Strategy was adopted on September 24, 2019 aiming to both increasing transport accessibility and improving the safety of traffic participants and the efficiency of the sector. It sets out several measures dedicated to the reduction of the adverse impact of transport on the environment.

The updated strategy was elaborated behind the background of rising traffic across all modes of transport. Over the period 2015-2030 for example, it is estimated that the total volume of passenger traffic by all modes of transport will increase from around 31 billion today to around 37.5-39.1 billion people (by 21% to 27%)[249]. The implementation of the strategy will require such actions as:

- promotion of energy efficiency through the development of inter-modal transport of cargo, and through means of transport that reduce the dependence of the transport sector on fuels derived from non-renewable energy sources;
- support to environment-friendly transport (railway transport, sea transport and inland waterway transport) and commitment to create conditions helping to shift transport from roads to railway or inland waterway transport, in particular at a distance of more than 300 km;
- reduction of transport congestion, in particular in urban areas, by: increasing the share of collective transport, optimising city/regional passenger transport, promoting pedestrian traffic and cycling, and eliminating heavy freight traffic through intense-investment urban areas, facilitating even distribution of municipal transport services to reduce the peak-hour effect;
- promotion of new forms of mobility through: access to travel information, integrated tariffs, delimitation of residential areas with limited access for cars, educational and information activities aimed at promoting sustainable transport, transport demand management through e.g. spatial planning, development of teleworking systems and carpooling solutions;
- delimitation of low-emission zones (LEZ);
- modernisation and expansion of transport infrastructure (linear and nodal) meeting the EU and national environmental standards and requirements;
- modernisation of rolling stock and vehicle fleet in all modes of transport to put it in line with the EU and national environmental protection standards and requirements;
- implementation of innovative transport management systems for particular transport modes and interoperative means of transport contributing to the optimisation of the traffic and thus to a reduction in transport generated emissions;
- application of new technologies, procedures and systems improving the energy efficiency of transport and contributing to a reduction in pollution emissions to the environment;
- modernisation and provision of the internal interoperability of telematic systems supporting particular transport modes[250].

Revitalization Act (2015)

The high priority of revitalization in the urban policy in Poland is included in both the NUP and the SRD. It assumes an optimal use of specific conditions of a given area and strengthening its local potentials. Areas concerned are: financing revitalization, social policy and labour market, social participation, housing, urban space, environmental protection, economic development

[249] Wyrzykowski, Krystian: The government adopted a transport development strategy until 2030. In: Poland SEA. September 24, 2019. Accessed: February 8, 2021.
[250] Ministry of Energy 2019: National Energy and Climate Plan for the years 2021-2030 Objectives and targets, and policies and measures - version 3.1 of 4 January 2019.

and building investment attractiveness, urban mobility in degraded areas, and protection and exploitation of the potential of cultural and natural heritage.

Human Smart Cities

Both, the NUP and the SRD promote the smart city concept that is often associated with new technological solutions in the cities but also using resources in a smart and sustainable way, building social capital and high quality of life, as well as smart urban management. The Ministry of Investment and Economic Development is implementing the project to promote smart solutions in designing urban space and managing the cities, with the active involvement of the citizens.

Sustainable Urban Mobility Plans

The Ministry of Infrastructure, based on the SRD and the Sustainable Transport Development Strategy, promotes implementation in the cities Sustainable Urban Mobility Plans (SUMP). SUMP is a local strategic document, which holistically responds to the problems and challenges of transportation in the cities. Those plans are not obligatory, but many Polish cities adopted SUMPs.

Clean Air Project

The program will be implemented for ten years until 2029 and it amounts to 103 billion PLN. It is assumed that over 4 million single-family houses will undergo thermal modernization under this program. Its aim is, among others, to reduce pollutants emission, through elimination of ineffective and out-dated heat sources and improvement of energy efficiency of single-family houses.

Electro-mobility

Promoting and developing electro-mobility in Poland includes such elements as, among others, the adoption of the Clean Transport Package (2016) and Electro-mobility Development Plan (2017), which aims to build an ecosystem for sustainable transport in Poland, including electric cars and buses. Other own policy instruments have been implemented to support the deployment of electromobility:

Fund for Low-emission Transport (2018)

In this context, in 2018, the **Fund for Low-emission Transport** (Ministry of Energy) was established enabling to finance projects in electro-mobility (e.g. electric cars) and projects based on alternative energy sources in transport. The Fund has an internal source of financing from excise taxes, energy fees and from emissions fees imposed on fuel producers. The fund is managed by the National Fund for Environmental Protection and Water Management. In June 2020, a few supporting schemes for the purchase of private electric cars, light commercial vans and taxis were issued under the fund. The eligible projects will comply with the Electro-mobility Development Plan, the National Framework for the Development of Alternative Fuels Infrastructure Policy and the Act on electro-mobility and alternative fuels (2018).

Financing of the National Urban Policy

Currently, Poland is the biggest beneficiary of the cohesion policy funds in Europe. During the years 2014-2020, significant amount of funding was dedicated to cities, which had an impact on elaborating the National Urban Policy. The Partnership Agreement, which sets out the rules for the use of EU funds for 2014-2020, points out that the urban dimension is significantly strengthened by indicating cities as the so-called areas of strategic state intervention.

Committed allocations (amounting 5%) from the European Regional Development Fund to cities in the 2014-2020 perspective, have been implemented in the form of the Integrated Territorial Investment (it is) instrument in functional urban areas (FUA).

Another territorial instrument that have been implemented in 2014-2020 was the Community-Led Local Development (CLLD).

it is in Poland enable to implement a territorial strategy for FUA that includes e.g. sustainable urban mobility or energy efficiency projects. The projects deriving from the FUA strategy are financed from a dedicated envelope, as well as, indirectly, from national operational programs. The aim of ITI is to promote a partnership model of cooperation between various administrative units in functional urban areas. The allocation under the instrument for 2014-2020 was €3.8 billion, but with complementary projects (co-financed from the national programs), the value of it is around €6.2 billion[251].

Poland's National Energy and Climate Plan (2019)

All the related policies to the Polish National Urban Policy are also taken over and complemented in the Polish National Energy and Climate Plan of 2019. In most of the other countries studied, the policies drafted in the NECP are taken over in the National Recovery Plans. As for now, this cannot be assessed in the Polish NRRP yet.

GHG emissions from the transport sector in Poland decreased from ca. 48.8 million tons of CO2equivalent in 2011 to ca. 44.1 million tons of CO2equivalent in 2013, to grow again to ca. 52.8 million tons of CO2equivalent in 2016 and constitute ca. 13 % of the total domestic emission (in the EU emissions from the transport sector this accounts for as much as 25 % of the total emissions on average). Road vehicles, in particular passenger and light commercial vehicles, are responsible for the largest share (ca. 97%) in the transport sector emissions in Poland. Poland has thus been working, among others, on the introduction of new CO2 emission standards via the following programmes that were created before the NECP and embedded into Poland's NECP.

The National Air Protection Programme (September 2015)

To enhance the effectiveness of the announced measures in terms of air protection programmes and short-term action plans, local governments have been provided with an additional tool as part of the amendment to the **Environmental Protection Law (known as the Anti-Smog Act) of 10 September 2015**. The provincial assembly may set out restrictions or prohibitions on the operation of installations in which fuels are combusted. At the same time, such a resolution is to define the types or quality of fuels to be admitted for use or prohibited from being used. It should be emphasized that measures aimed at improving the quality of the air have also been envisaged in other documents, including in the **Strategy for Responsible Development**, **the Clean Air project**, **the Electromobility Development Plan 'Energy for the Future'**, as well as in the **draft Energy Policy for Poland 2040**.

[251] National Urban Forum 2019: Sustainable urban development in Poland: national urban policy in the context of the 2030 Agenda's Goal 11 and the New Urban Agenda. In: Ministry of Investment and Economic Development.

Spatial Planning System (in progress)

The problem of the inadequate air quality in cities is also caused by inappropriate spatial planning. The issue of reducing undesirable urban sprawl and green wedge blocking has been reported in the reform of the spatial planning system. This also covers the issues of the construction of transit routes in densely populated areas. Their location outside urban areas should be considered, along with the construction of by-pass roads taking traffic outside urban areas, the construction of inter-modal nodes and the expansion of environment-friendly transport networks (including a railway system). The following recommendations have been issued:

- Establishing a permanent monitoring system or adapting the existing monitoring systems to the need to control construction and transport infrastructure elements vulnerable to climate change and establishing or adapting warning systems;
- Reviewing or creating measures and plans designed to maintain smooth traffic flow in transit routes or to change routes and apply substitute means of transport. The vulnerability of transport infrastructure to climate factors needs to be properly assessed in order to undertake effective adaptive and preventive measures. Design standards are expected to be developed and a transport route management system is expected to be implemented by 2030;
- Taking into account the blue-green infrastructure concept and the system of aeration corridors (wedges) in zoning plans and revitalising natural environment, also by restoring greenery in degraded areas and original functions to water reservoirs.

Act on electromobility and alternative fuels (2018)

The Act of 11 January 2018 on electromobility and alternative fuels provides for the construction of a core infrastructure network for alternative fuels in urban agglomerations and densely populated areas, as well as along roads belonging to trans-European transport corridors. The core network will be created by approx. 6,400 electricity charging points and 70 Compressed Natural Gas (CNG) refuelling points located in urban agglomeration areas and densely populated areas. New policy measures are planned to be added in this regard for Hydrogen Refuelling Stations (HRS). Pilot programmes aimed at intensifying measures in the area of the construction of infrastructure and the development of electromobility industry will be implemented.

Charging infrastructure: The network will be fully prepared to provide power to 1 million electric vehicles. Polish industry will produce subassemblies for electric vehicles, vehicles themselves and tools and infrastructure necessary for the development of electromobility. The task of the Low-Carbon Transport Fund is to support the expansion of alternative fuels infrastructure and to build up a market for those fuels. Over the next 10 years, the Fund will have financial means of ca. PLN 6.7 billion (€1.4 billion).

On January 1, 2019, a database of locations for charging infrastructure availability was launched under the name **Alternative Fuels Infrastructure Register**, which is a public register kept providing users of electric vehicles and vehicles powered by natural gas with information facilitating the use of these vehicles. Hydrogen refuelling stations will be added to the register via upcoming legislation.

The Act also entails provisions on exemption from excise duty, which apply to electric, hydrogen-powered and plug-in hybrid vehicles. It also introduced the possibility for municipal councils to create clean transport zones in city centres with over 100,000 inhabitants.

It also allows for the use of public procurement in support of alternative fuels. The definition of green public procurement covers situations where the contracting authority considers one or more environmental factors in the tender procedure. The goal of green public procurement is to achieve the widest possible coverage of environmental issues in procurement procedures.

Carbon-Free Public Transport Programme

At present, a growing number of local governments and bus transport companies in Poland introduce electric buses into their fleet or plan to do so in the next future. Electric buses are still a small part of municipal transport fleet in Poland. Public transport is also an element of the strategy of switching the economy to alternative fuels.

These objectives are consistent with the government **Electromobility Development Plan for Poland**, as well as with the **EU Clean Mobility Package of 2017**. Among the main barriers to transport electrification, the higher costs of purchase of electric vehicles should be mentioned, along with the lack of access to rapid charging infrastructure and the lengthy investment process. The Government is planning to provide financial support for investments aimed at expanding electric bus charging infrastructure, to be carried out by entities providing collective transport services. Support for zero- and low-carbon public transport is one of the priorities of the Polish Government listed in the Strategy for Responsible Development. This segment requires support to local governments in the form of public funding not only in the area of the construction of infrastructure for public transport, but also in the area of fleet replacement. The financing of the purchase of low-carbon buses and the construction of charging infrastructure will be provided from, among others, the Low-Carbon Transport Fund[252].

Climate Protection Programme 2030: Assessment by the EU Commission

Based on Poland's final national energy and climate plan, and on the investment and reform priorities identified for Poland, the Commission invites Poland to consider, while developing its national recovery and resilience plan, the following climate and energy-related investment and reform measures:

- Measures supporting investments in renewable energy to reduce dependency on coal, and in energy efficiency in buildings and industry;
- Measures enhancing energy system integration and promoting the decarbonisation of gas consumption, including by developing the market for storage technologies and clean hydrogen;
- Measures fostering sustainable transport, including developing and modernising the public transport infrastructure, promoting intermodal transport networks and electromobility[253].

[252] Ministry of Energy 2019: National Energy and Climate Plan for the years 2021-2030 Objectives and targets, and policies and measures - version 3.1 of 4 January 2019.
[253] European Commission 2020: Summary of swd assessment NECP: Poland.

Key take-away

- Poland's existing Covid-19 relief package as well as existing mobility strategies may not be fully adapted to the EU climate, energy and digital transformation goals. In the case of the Polish existing relief package, only few resources are allocated to green projects. This approach differs when compared to Germany or France, whose programmes aim to allocate a significant part of funds to low-emission objectives during the crisis and immediately afterwards.
- As such, existing policies as well as the draft NRRP may not match the pace for implementing the conditionalities of the EU Recovery and Resilience Plan.

Abbreviations

EFTA	European Free Trade Association
ECF	European Cycling Federation
NRRP	National Recovery and Resilience Plan
MFiPR	Ministry of Funds and Regional Policy
PLN	Polish currency, *zloty*
SRD	Strategy for Responsible Development 2020
NSRD	National Strategy for Regional Development 2030
NSDC	National Spatial Development Concept 2030
NUP	National Urban Policy 2023
LEZ	Low-Emission Zones
SUMP	Sustainable Urban Mobility Plans
ITIs	Integrated Territorial Investment
FUA	Instrument in functional urban areas
CLLD	Community-Led Local Development
NECP	National Energy and Climate Plan
CNG	Compressed Natural Gas
HRS	Hydrogen Refuelling Stations

DATA BOARD POLAND

General Data

Political organisation: Unitary semi-presidential constitutional republic	**Head of government**: Mateusz Morawiecki
Population (2019): 38 million	**Urban population** (2019): 60%

Economic indicators

GDP ranking (2019): 4/203	**GDP** (2019): 628.2 billion USD
GDP growth (2019): 4.7%	**GDP growth** (2020): -2.7 ¼ %

Environmental indicators

Share in global CO_2 emissions (2018): 2%

CO_2 emissions (2018): 0.34GT - 18th Co_2-emitting country

CO_2 emissions per capita (2018): 9.08T - 10th country emitting CO_2 per capita

Transport & Mobility sector

Modal share of passenger transport (2018):

- **Private car:** 79.3%
- **Train:** 7.9%
- **Bus and trolleys:** 12.9%

Modal share of freight transport (2018):

- **Roads:** 73.1%
- **Railways, inland waterways:** 26.9%

Construction sector

Construction sector GDP share (2019): 9%

Jobs in the construction sector (2019): 1,2 million people working in the construction sector

Businesses in the construction sector (2019):

Investment in construction -civil engineering- (2019): €49 billion

Spain

Economic context: Covid-19

In 2019, the Spanish GDP grew by 2.0%. However, Spain figures among the EU countries which have been affected the most by the pandemic. For this reason, the Spanish GDP fell by 10.8% in 2020[254]. A rebound is forecasted for 2021 (5.9%) and 2022 (6.8%)[255]. Economic activity has been severely impacted, notably during the first lockdown period in spring, where the GDP growth fall by **17.8% in 2020 second quarter** against a European average of -1.4%[256]. Manufacturing and service sectors had a clear rebound after the first wave, thanks to the lively activity of sectors such as leisure and tourism during the summer.

1. Impact of Covid-19 on mobility

Mobility trends in Spain (before Covid-19)

In 2017 and on average, the modal split in Spain in metropolitans' areas depends on the reasons behind the trips[257].

Table 1 – Transport modal share in Spain according to journey motives (2016)

Mode of transport modal share on average (%)	Journey motives		
	Work journeys	Non-compulsory journeys	All journeys
Motorized mobility (car+motocycle)	63%	37-38%	43-44%
Public transport	13%	11-12%	12%
Non-motorized mobility (walking+cycling)	23%	50%	43-44%

Source: Ministerio de Fomento, Gobierno de España
**Data reproduced and elaborated by the author*

Motorized mobility remains dominant in work journeys (63%) and still important in all journeys (43%). The share of public transport remains stable in all cases (11-13%). Active modes of transport represent half of the non-compulsory journeys, which is very high.

Share of individual motorized means of transport remains quite high in all areas[258]. In 2017, share of car and moto use for **'compulsory'** mobility is near 70% in small areas, slightly above 60% in average areas and less than 60% in large areas. By contrast, **the share of walking and cycling is high in 'not compulsory' mobility and urban "in town" mobility: it accounts for about 50%**.

[254] Eurostat, Real GDP Growth Rate – Volume, 2021.
[255] European Commission, European Economic Forecast, Spring 2021.
[256] Eurostat, News Release Euro Indicators 121/221, 31 July 2020.
[257] Gobierno de España, Ministerio de Fomento, "El transporte urbano y metropolitano en España", April 2019.
[258] Club de Excelencia en Sostenibilidad, "Estudio del Observatorio sobre el Estado de la Movilidad Sostenible en España".

In 2017, the **share of public transport in urban mobility is very different according to cities size**: 1% for cities of less than 10.000 inhabitants, 5% for cities between 10.000 and 100.000 inhabitants, 11.4% for cities between 100.000 and 1 million inhabitants and 39.4% for cities with more than 1 million inhabitants. For information, on 8.124 cities in Spain, 90,7% are small cities with less than 10.000 inhabitants, 8,5% between 10.000 and 100.000 inhabitants and 0.8% of more than 100.000 inhabitants. Only 4 cities have 100.000 inhabitants and only 2 have 1 million inhabitants or more (Madrid and Barcelona).

The number of transported passengers[259] (urban transport -bus and metro-, interurban transport -bus, rail, air and ship- and special and occasional transport by bus) has increased by 41.53% before COVID-19, which means, in absolute number **from 307 millions in August 2019 to 434.591 millions in February 2020**.

Infrastructure

In 2018, according to ERF Statistics 2020[260], Spain **invested €3.5 billion in gross in road infrastructure**, which is in line with the Italian investment (3.4 billion in 2017), but quite lower than France (€9.6 billion), Germany (€15.6 billion) or the United Kingdom (€8.6 billion). Spain has also the **longest motorway network** in length in the EU with 17.228 kilometers (2018).[261]

Modal split in comparison to EU27 (before Covid-19)

Passenger cars

In 2019, the car fleet was 24.56 million vehicles with a variation of 9.4% compared to 2012 levels (22.25 million)[262]. In 2018, with 515,25 cars for 1.000 inhabitants[263], the Spanish motorisation rate (numbers of cars for 1.000 inhabitants) is above the average in the EU. **Car registrations were above 1,26 million in 2019[264]**.

According to ANFAC, **car registrations completely shrunk in spring 2020[265]**, from 86.442 registrations in January to 4.163 in April 2020. Registrations had a very strong rebound on the second part of 2020: 117.928 in July and 105.841 in December.

Alternative powered vehicles

The alternative powered vehicles share took off in the recent years in Spain. Whereas they barely existed on the market in 2008, they represented 3.6% of new registrations in 2019[266], composed by respectively 0.6% of Plug-In Hybrid Electric Vehicles (PHEV), 0.9% of Battery-

[259] Instituto Nacional de Estadística, Estadística de Transporte de Viajeros, TV1004 Total de viajeros. Viajeros transportados. Total Nacional.
[260] ERF, Statistics, Road Maintenance and Investment 2020.
[261] Ministerio de Transportes, Movilidad y Agenda Urbana – Anuario estadístico 2018. Capítulo 7. Carreteras Tabla 1.c. Red de carreteras del Estado, Comunidades Autónomas y Diputaciones y Cabildos según su tipología, 2018.
[262] Ministerio del Interior, Dirección General de Tráfico, "Series históricas - Parque de vehículos".
[263] Statista, I.Wagner, "Number of passenger cars per 1,000 inhabitants in Europe as of 2018, by country", 18 September 2019.
[264] Asociación Española de Fabricantes de Automóviles y Camiones (ANFAC), Informe Anual 2019, 15 Julio 2019.
[265] Asociación Española de Fabricantes de Automóviles y Camiones (ANFAC), Cifras Clave, Matriculaciones de turismos y todoterrenos.
[266] European Alternative Fuels Observatory, Spain, 2020.

Electric Vehicles (BEV), 1.7% of Liquid Natural Gas (LPG) vehicles. In January 2020, PHEV represented 0.13% of the total vehicle fleet, BEV counted for 0.15% and LPG vehicles for 0.26%.

Cycling

The bicycle market was on the rise before the COVID-19 pandemic. Bicycle's sales went up from 1,35 billion euros in 2014 to 1.87 billion euros in 2019[267]. In volume, 1.08 million bicycles were sold in 2014 compared to 1.26 million in 2019. Sells of electric bikes rose by 28,3% as well[268].

According to the Bicycle Observatory 2018[xii], the average modal share of cycling in 19 cities in Spain in 2019 was **1.3%**, where 89.5% of these cities have a strategic plan for cycling and **23.5% of the road network** is considered accessible for cycling.

Walking

According to the same source, in 2018, non-motorised mobility (bicycling and walking) accounts for 41.3% on average in the cities studied, mostly consisting in walking.

Mobility behaviours during the COVID-19 pandemic

General data

Mobility figures show a massive drop in 2020. When **423,328 thousands** of travellers (urban transport-bus and metro-, interurban transport -bus, rail, air, and ship- and special and occasional transport by bus) were counted in January 2020 across the country, it jammed to **212,233 thousand** in March and 36,141 thousand in April. It came back at the highest to 261,543 thousand in October, representing **61.78%** compared to January[269].

The transport sector is one of the most hit by the crisis, notably for what concerns transport of passengers. **A large fall in income around 50% is expected for 2020**. According to McKinsey, transport is also considered as one of the sectors that will recover the more slowly to precrisis levels[270]. **Insolvency risks due to the outbreak is multiplied by 5 to 7 in specific sectors, including transport, whereas it represents more than 2.5% of the annual GDP**.

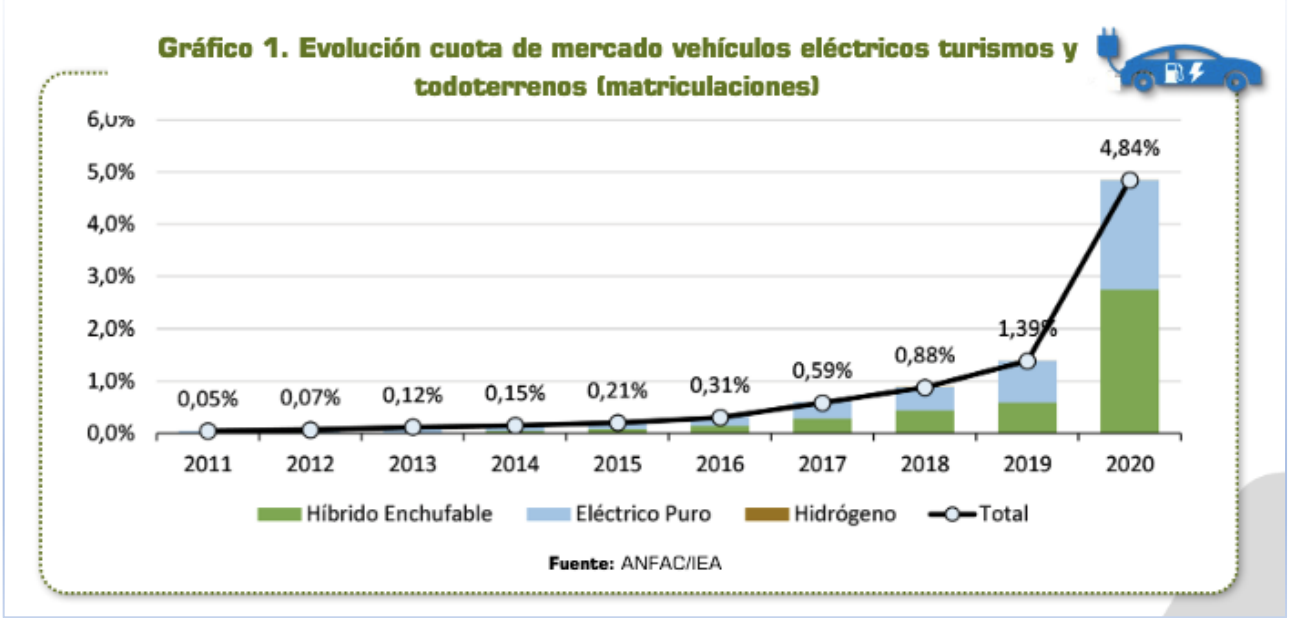
Alternative fuel vehicles

By comparing car registrations in Spain between Q3 2019 and Q3 2020[271], APV registrations impressively increased (+51.6%) when conventional cars registrations begun to fall (-19.9% for petrol cars and -5.0% for diesel cars). It is too soon to predict this trend is the 'new normal'. In the other hand, market shares of electric and hybrid vehicles remained quite low in 2019 in percentage (0.9% and 0.6%). In absolute values, Spain counts 24,074.216 passengers' cars[272],

[267] Flourish, Bike Europe, "Spanish bike market", 30 September 2020.
[268] Asociación de Marcas y Bicicletas de España (AMBE), Informe "El sector de la bicicleta en cifras 2019", July 2020.
[269] Instituto Nacional de Estadística, Estadística de Transporte de Viajeros, TV1004 - Total de viajeros. Viajeros transportados. Total Nacional.
[270] McKinsey, "España post COVID-19 : de la resiliencia a la reinvención" ,June 2020.
[271] European Automobile Manufacturers Association (ACEA), New passenger cars registrations by fuel type in the European Union, 05 November 2020.
[272] European Alternative Fuels Observatory, Spain, 2020.

of which **45,057 are Battery Electric Vehicles (BEV)** and **43,481 are Plug-In Hybrid Electric Vehicles (PHEV).** The curbs must be frequently followed to know if either the COVID-19 outbreak made APV market took off or was a temporary trend within the automotive market.

Figure 1 - Evolution of the market share of the electric vehicle market for passenger cars and SUVs (registrations)[273]



According to ANFAC, the market share of alternative fuels vehicles increased from 1.39% to 4.84%.

Charging infrastructure remains insufficient with **6,045 electric charging points (**3.03% of the EU network) **2,120 fast charging points** (3.38% of the EU network), despite a better growth than the EU average between 2019 and 2020 (34.3% against 28.95%).

Collective mobility

Transport operators are severely hit by the COVID-19 pandemic, notably for what concerns passenger transport. In April 2020, the number of trips corresponded to the 8.9% of the previous year figure. The transport demand increased again with the end of the lockdown to reach 58.2% compared to the reference year in August, then declined again at the end of the summer. Evidence shows that collective mobility is slowly coming back to the pre-covid levels, but this path is rather heterogeneous across the country. Notably, the biggest Spanish towns, Madrid and Barcelona, are recording a slower catch-up[274]. From its side, the Association of Urban and Metropolitan Public Transport (ATUC), which brings together most of the bus and metro and suburban travellers has recorded a **€1.2 million reduction in income from tickets sales in 2020**. RENFE, the Spanish national rail company, declared a €400 million loss of revenues. The mix between mobility restrictions, homeworking, fear of contagion and an increase of private mobility (especially cars) had a very strong impact on Spanish public transport operators. This shift in mobility trends might become partially permanent after the pandemic due to habit change of former users.

[273] ANFAC, « Medidas para impulsar el despliegue de infraestructuras de recarga eléctrica de acceso público en España », January 2021.
[274] Observatorio del Transporte y la Logística en España, Movilidad y Transporte en tiempos de COVID-19, December 2020.

For 2020, the **Transport Department injected €800 million to rescue transport operators**. However, this funding only reached transports operators managed by autonomous communities (regional level) yet and not the ones depending on town councils. An additional fund in support to insolvent companies of the amount of €10 million was released in July. Finally, a package of €663 million was enabled to reactivate the sector of transport by providing liquidity via financial instruments to highly impacted firms.

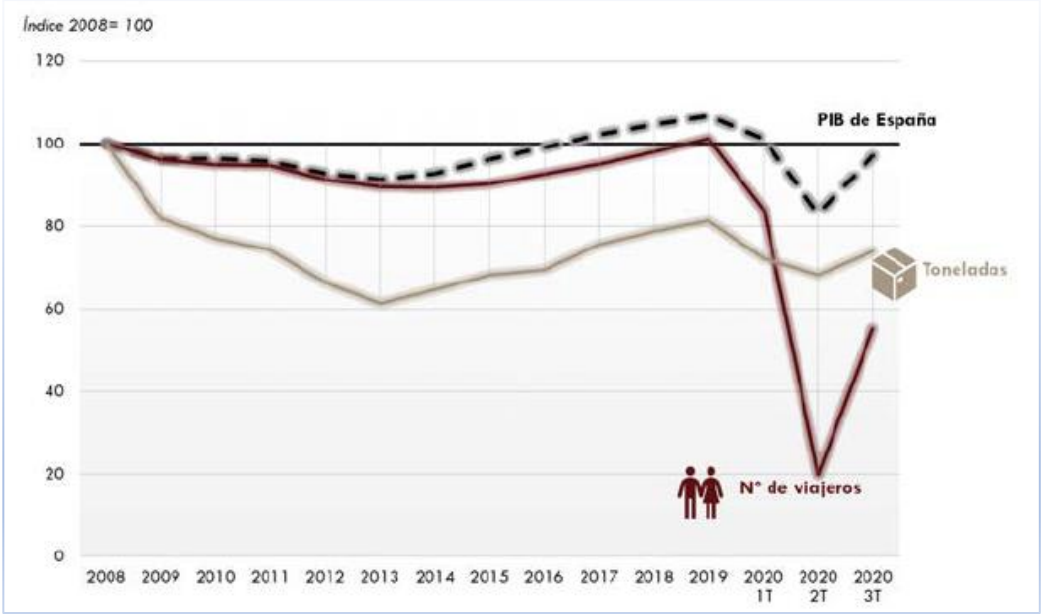
Cycling

Several Spanish cities announced in light with the COVID-19 pandemic new cycle paths, as Barcelona (70km) and Valladolid (more than 32km)[275]. Other cities as Granada proposed measures to reduce traffic over their road network (60 km in this case). At the national level, additional €7.8 million have been mobilised to support cycle infrastructure.

Freight road transport

Even though freight transport experienced a contraction as well, the negative impact of the covid crisis was way less severe than in the case of passenger transport. The trough was recorded during the second trimester of 2020 and corresponded to a -10% compared to the previous year. Then the third trimester shows a rebound. All in all, the volume of transported tons of goods in 2020 knew a decrement of 2.6% compared to 2019. Figure 2 shows a comparison between Spanish GDP, number of transported passengers and tones of goods transported. The minor impact on the freight transport sector also explains why the rebound of the subsequent months is less important compared to the one of passengers transport. The trend of freight transport has therefore been anticyclical with respect of the covid-crisis, which is in line with the fact that transport of goods became even more essential to provide local communities what they needed during the lockdown periods.

Figure 2: Comparison between Spanish GDP (euro) and transport sector activity in both passengers' transport (number of users) and freight transport (tons). Index: 2008=100



Source: Observatiorio del Transporte y la Logistica en España

[275] European Cyclists Federation, COVID-19 Measures Tracker.

2. Spanish Recovery Plan: Focus on mobility issues

Recovery Plan on the European level

The Spanish government submitted its national recovery and resilience plan the 30th of April 2021 to the European Commission[276]. It is structured by 4 pillars and 10 policy axes:

Figure 3 – Spanish Recovery and Resilience Plan: Pillars and policy actions

Source: Screen capture from the Spanish Recovery and Resilience Plan

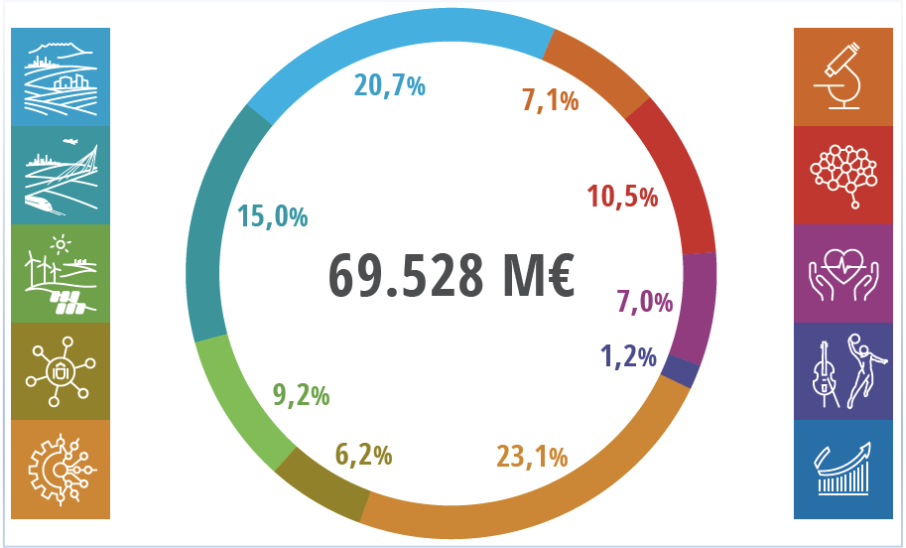
The plan is nearly €70 billion budgeted, prioritizing policy axe 1 (20.7%), policy axe 2 (15.0%) and policy axe 5 (23.1%). Policy axis 3 (9.2%) and 7 (10.5%) are following. Spain is expected to receive around **€140 billion in total for the 2021-2017 period** from the RFF, the REACT-EU Fund, and the EU Structural Funds, equally divided between grants and loans. It must be noted that the NGEU funds will be received by the Central State which will transfer a significant share of them to the Autonomous Communities. Overall, 54% of the funds will be directly managed by the Central States while 46% will be managed by the Autonomous Communities and to less extents by local authorities[277].

In fact, the Autonomous Communities had the right to write their own Recovery Plans to decide on how to use the European Funds. For this reason, many sections of the Spanish National Recovery Plan only establish reforms, budgets, and broad guidelines on the subjects, while the local Recovery Plans go into details of the actions to take. The main criticisms of the Spanish Recovery Plan concern both the governance (centralisation/decentralisation) of the management of the funds and the beneficiaries of these funds (SME/big firms). Moreover, the Plan has been presented by the government at the very end of the redaction process and right

[276] Gobierno de España, « Plan De Recuperación, Transformación Y Resiliencia », 27 April 2021.
[277] Gobierno de España, Hacienda presenta el Plan de Recuperación a las comunidades autónomas y a la Federación Española de Municipios y Provincias, April 19, 2021.

before the submission to the European Commission. This did not allow to include other stakeholders in the redaction process.

Figure 4 – Policy actions funding of the Spanish Recovery and Resilience Plan



Source: Screen capture from the Spanish Recovery and Resilience Plan

The four pillars deal with the fight against climate change, the digital revolution, social and territorial cohesion and inclusiveness. Among the ten policy axes proposed, the first two deal directly with mobility and infrastructure issues through:

- A "***Shock plan for sustainable, safe and connected mobility in urban and metropolitan areas***" (Policy Axe 1)

This policy action intends to "*promote the decarbonisation of urban mobility, the improvement of air quality and the quality of life in cities, taking advantage of the economic, social and industrial opportunities associated with this transformation*". With **€6.5 billion planned investments**, several actions are proposed.

Two main reforms deal with **recharging infrastructure and electric vehicle taking-up:** on one hand, this will be done via a "*comprehensive package of measures to enable a new regulatory and strategic framework to support the deployment of recharging infrastructure for the promotion of electric vehicles*". On the other hand, a **dedicated legislation on transport and mobility financing** "*Law on Sustainable Mobility and Transport Financing"* will regulate financing of transport infrastructure and services, fuels and non-conventional fuels.

Concrete investments are then channelled towards:

- "***Low-emission zones and digital and sustainable transformation of urban and metropolitan transport in municipalities with more than 50.000 inhabitants*** *to reduce the use of private vehicles, thus improving air quality, reducing greenhouse gas emissions*". It includes an incentive plan for the transformation of passenger and goods transport fleets to promote passenger and freight transport fleets to favour zero or low-emission vehicles.
- "*An* ***incentive plan for the installation of public and private recharging points****, the acquisition of electric and fuel cell vehicles and lines to promote unique projects and innovation in electro-mobility, recharging and green hydrogen to promote electric*

mobility."

- "*Actions to improve the **quality and reliability of the suburban rail service** to maximise the use of public transport services by means of by improving the capacity, quality and reliability of the service, **reducing the use of private vehicles** and therefore polluting emissions*."

Looking at the initiatives, the reduction of conventional private vehicle and greening of vehicles fleet figure amongst the main objectives. Notably, the full-scale deployment of recharging infrastructure is indeed a top priority.

- "***Sustainable, safe and connected mobility***" (Policy Axe 2)

This policy action implies a "*series of measures and investments aimed at **modernising, digitising and improving the safety and sustainability of key interurban and intermodal transport infrastructures** throughout the country, with a special focus on rail transport*". With a **€6.67 billion budget**, two main reforms are proposed:

- A "***Safe, Sustainable and Connected Mobility Strategy**, with a new approach **that moves from a purely investment-based vision** to one based on the daily mobility of citizens, the environmental sustainability of transport and its digitalisation*."
- **A Rail Infrastructure Strategy** to anticipate and plan needs in rail infrastructure

To meet these goals, several investments are planned for corridors of the EU core network such as the Atlantic and Mediterranean Corridors, **with the priority given to rail infrastructure**. A combination between intermodality, logistics and digital technologies is also proposed to enhance the effectiveness and the sustainability of the transport sector.

Less specifically, a program for boosting industrial competitiveness and sustainability is proposed under the Axe 5 "***Spanish Industrial Policy 2030***". The objective is to promote and support SMEs in sectors considered as strategics such the automotive sector and the industrial take-up of the electric vehicle.

National Energy and Climate Plan (NECP)

Spain presented its NECP on December the 30th, 2020, almost one year after the established deadline which was scheduled for the end of 2019. According to EU Regulation, the National energy and climate plans (NECPs)[278] which must be submitted to the European Commission defines a 10-year integrated roadmap of actions to be implemented in the period 2021-2030. The NECP draft for Spain was subjected to a series of recommendations by the EC which aimed to include the COVID-19 context and challenges within the final version[279]. The published NECP establish for main goals[280]:

- **Decarbonisation of the economy and development of renewable energy**: -23% in CO_2 emissions to be achieved through the systemic use of renewable sources for at least the 42% of the total energy demand, including 28% for transports (via electrification and biofuels).

[278] European Commission, National Energy and Climate Plans (NECPs).

[279] Agencia Estatal Boletin Oficial del Estado, Resolución de 30 de diciembre de 2020, de la Dirección General de Calidad y Evaluación Ambiental, por la que se formula la declaración ambiental estratégica del Plan Nacional Integrado de Energía y Clima 2021-2030, January 11, 2021.

[280] Gobierno de España, Plan Nacional Integrado de Energía y Clima 2021-2030.

- **Energetic efficiency**: improvement of the efficiency by 39,5% within 2030 to be achieved by taking action on the thermal envelope of private and public buildings
- **Energy security**: this dimension aims to guarantee security of supply and access to the necessary resources to ensure the diversification of the national energy mix, promote the use of indigenous sources, and supply safe, clean and efficient energy. Actions on renewables and efficiency will reduce the degree of external energy dependence from 74% in 2017 to 61% in 2030.
- **Internal Energy Market**: need to develop a more competitive, flexible, inclusive, and transparent internal energy market with a higher degree of interconnection which must also address the issue of the protection of users during the transition
- **Research, innovation, and competitiveness**: aligning the Spanish policy with the European objectives in terms of climate and energy both at the public and at the private levels.

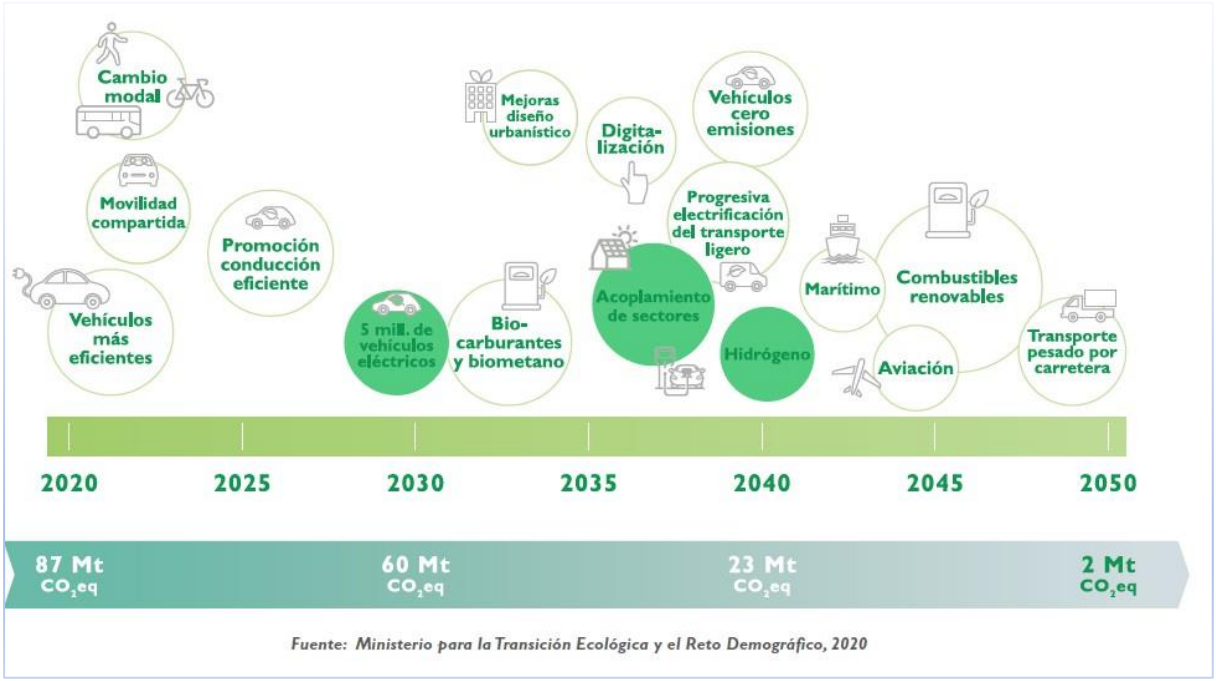
National Long-Term Strategy

All Parties of the Paris Agreement must communicate by 2020 their long-term vision to consistently reduce their greenhouse emissions and to meet the Paris Agreement objectives. The European Union included this obligation in a Regulation[281] in 2018. Then, each Member States must prepare a long- term strategy[282] for and at each decade. Transport and mobility are of course included. These strategies shall be coherent with the NECPs.

Spain proposed its national long-term strategy on 03 November 2020, entitled "Long-Term Strategy for A Modern, Competitive and Climate-Neutral Spanish Economy In 2050"[283]. A dedicated subpart is focusing on **transport and mobility and defines short and long-term objectives until 2050 (see Figure 2 below)**. It follows the objectives announced in the NECP (28% of the energy would come from renewables in the transport sector and reduce transport emissions by one third (compared to 2017) by 2030).

[281] Official Journal of the European Union, REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, 22 December 2018.
[282] European Commission, National long-term strategies.
[283] Ministerio para la Transición Ecológica y el Reto Demográfica, 'Estrategia A Largo Plazo Para Una Economía Española Moderna, Competitiva Y Climáticamente Neutra En 2050', 03 November 2020.

Figure 5 - Spanish transport and mobility long-term strategy, 2020



The strategy proposes as the main target to reduce GHG emissions from transport and mobility sectors as a whole from 87Mt CO_2 EQ in 2020 to 2Mt Co_2 EQ in 2050. To that end, each mode of transport (road, rail, air and sea) will be assessed separately, assuming that they are different from each other. The key objectives and strategies are:

- The introduction of new technologies to ensure technical and service requirements for each mode will be driven by a criteria of cost-effectiveness.
- Energy efficiency and mobility behaviours will change through the promotion of a modal shift: from the dominance of individual modes of transport, which are highly polluting and energy consuming, to group modes (public transport) and individual alternative mobilities (walking, cycling, electric vehicles).
- Electric will remain the key energy in the road sector, particularly for vehicles
- Renewable fuels will be particularly important for heavy freight transport on road, airways, and navigation
- Innovative technologies and the complementary of sectors can provide important advantages, such as renewable hydrogen, an important energy vector to contribute to decarbonisation
- Digitisation and innovation will allow a better use of all energy resources
- Urban planning should be integrated with the transport sector

More specifically, road transport is the main target of this plan. In the Strategy Annex[284], it is confirmed that currently 92.57% of the transport emissions are due to road transport (2018), of which 61.74% from passenger cars and 30.17% from heavy-duty vehicles and buses (2017).

[284] Ministerio para la Transición Ecológica y el Reto Demográfica, 'Estrategia A Largo Plazo Para Una Economía Española Moderna, Competitiva Y Climáticamente Neutra En 2050 ANEXOS', 03 November 2020.

Different proposals are stated regarding **road transport decarbonation by 2050**:

- Reaching energy efficiency in road transport:

- Reducing mobility needs through urban design and work mobility (teleworking)
- Promote a modal shift from the private car to other more efficient modes (public transport, walking, cycling, and car sharing) by raising awareness of the population, improving public transport financing and service quality and enhancing intermodality between transport modes trough the implementation of intelligent and connected mobility solutions
- Shift to most-efficient energy modes of transport, in particular electric vehicles
- Improving the modal shift from road to rail in freight transport
- Promoting shared mobility both in urban and interurban areas: it is a mean to integrate smart and connected mobility and to reduce both the car fleet growth and traffic congestions in cities
- Improving the energy efficiency of combustion engines, especially for heavy vehicles
- Intelligent Transport Systems (ITS) applications are a viable solution to make both people and freight transport more efficient throughout the different modes: implementation of management systems for fleets that optimise consumption according to the selection of routes, loads, type of vehicles and traffic situation

- Alternative technologies in road transport:

- Electric vehicle: a deeper penetration is expected by 2025, based on a renewable energy mix production (NECP). A complete electrification of the passenger road transport is reachable in 2050. Automated solutions and vehicles weight restrictions are more envisaged than a strengthen electrification of vehicles in road freight transport by 2050.
- Reaching biofuels targets by 2030
- The development of renewables and carbon-free gas (biomethane and hydrogen) with a broader implementation between 2030 and 2050

The Strategy considers the need and necessity of new design and management of infrastructure as well**, especially in land transport**. It states indeed that considering the rising risks induced by climate change, national rail and road network are exposed to new risks, rail for a larger extent (12%). In this path, integrating new design, management, and life cycle in all new infrastructure project is considered as essential and has hardly begun for the time being. New infrastructure will have to be adaptive and in accordance with evolving climatic conditions.

Road infrastructure will have to be more connected to enable a great level of vehicle automation both in passenger and goods transport, to avoid congestions and manage CO_2 emissions.

3. Existing mobility strategies

To understand mobility strategies in Spain, it is essential to highlight the existing repartition of competences alongside three administrative levels[285]:

Tabla 2 - Club de Excelencia en Sostenibilidad, ''Estudio del Observatorio sobre el Estado de la Movilidad Sostenible en España''

Territorial competences according to administrative level	
Administrative level	**Competences**
State	• **Infrastructure of general interest or affecting more than one Autonomous Community** • **Air Transport** • **Transport beyond the territorial scope of the Autonomous Community**
Autonomous Communities	• **Urbanism** • **Land use planning** • **Housing**
Local administrations	• **Public passenger transport in municipalities with more than 50,000 inhabitants** • **Promotion and management of housing** • **Environmental protection and public**

Under this scope, different modes of transport and related infrastructure are managed at various steps of administrations.

Current ongoing mobility plans and strategies

Different policies have been put in place at national level regarding mobility and transport:

- In 2009, the **Spanish Strategy for a Sustainable Mobility (EEMS)[286]** which had already 5 main objectives:

  - Territory, transport planning and its infrastructure
  - Combating climate change and reducing energy dependence,
  - Improvement of air quality and reduction of noise
  - Improvement of health and safety,
  - Demand management

- In 2011, **the Sustainable Economy Law** provides that public transport in cities would be granted if cities adopt Sustainable Urban Mobility Plans (SUMPs)[287]

[285] Club de Excelencia en Sostenibilidad, "Estudio del Observatorio sobre el Estado de la Movilidad Sostenible en España".
[286] Gobierno de España, Estrategia Española de Movilidad Sostenible, 2009.
[287] European Commission, Directorate-General for Mobility and Transport, Sustainable Urban Mobility Plans.

- In 2016, **the Spanish government passed the National Action Plan for alternative fuels in transport**, in line with the Alternative Fuels Infrastructure Directive 2014/94/EU, with a direct impact on local policies in this field for the 8.114 municipalities[288].
- **Several other national programs or incentives** are in force since 2017[289]:

    - On electric vehicles, city councils such as Barcelona or Madrid reduce annual circulation tax by 75% for eco-friendly vehicles
    - Reserved traffic lanes for Battery Electric Vehicles (BEVs) or eco-friendly vehicles are available in Sevilla, Madrid, and some parts of highways
    - The MOVES programs (€45 million), "*to finance actions to support mobility based on criteria for energy efficiency, sustainability and promotion of alternative sources of energy, including the availability of electric vehicle charging infrastructure*"[290].It mainly represents purchase subsidies for low-emission vehicles.

- In September 2020, the Ministry for Transports, Mobility and Urban Agenda (MITMA) released **a new mobility strategy for 2030**[291], named "es. movilidad" for "Strategy for a Safe, Sustainable and Connected Mobility". This master plan on mobility includes a participative discussion from all actors (national and regional powers, private sector, citizens) from September to December 2020.

  This strategy is proposed according to Spanish commitments both at international and European contexts: Sustainable Development Goals (SDGs), the European Green Deal, the 2021-2027 Multiannual Financial Framework (MFF) and the European Smart and Sustainable Mobility Strategy. It is also in line with Spanish national commitments such as its NECP or its national long-term strategy.

January 2021

[288] Gobierno de España, Grupo Interministerial para La Coordinación Del Marco De Acción Nacional De energías Alternativas En El Transporte, Marco De Acción Nacional De Energías Alternativas En El Transporte desarrollo Del Mercado E Implantación de La Infraestructura De Suministro, 14 October 2016.

[289] International Energy Agency, Spain, Policies.

[290] International Energy Agency, Spain, Policies, MOVES program.

[291] Gobierno de España, Ministerio de Transportes, Movilidad y Agenda Urbana, "Estrategia de Movilidad 2030", September 2020.

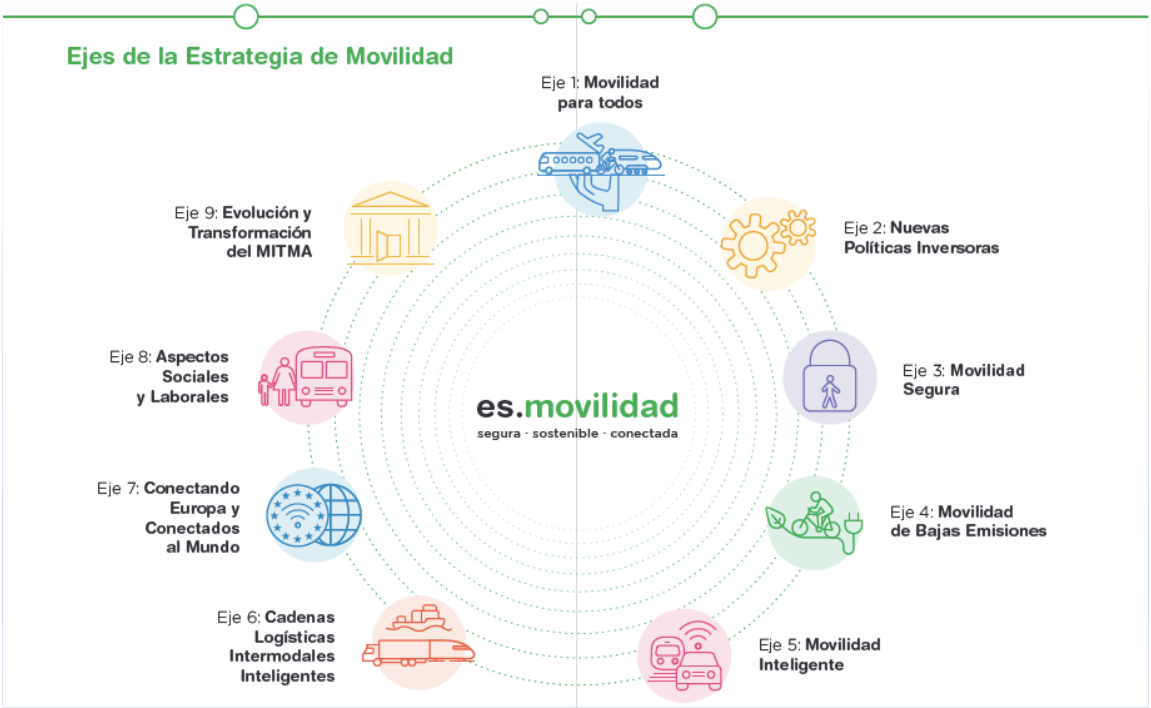


Figure 6 – The 9 axes of the Spanish Mobility Strategy for 2030

Source: Ministerio de Transportes, Movilidad y Agenda Urbana

The Strategy is composed of 9 strategic axes with principles and general objectives:

STRATEGIC AXIS	PRINCIPLES	GENERAL OBJECTIVES
1. Mobility for All	• Mobility as a citizen's right and an essential element of social cohesion • Sustainable, safe, accessible, and affordable mobility solutions for all citizens. • Universal accessibility	• Offering everyone, everywhere, alternative mobility solutions to the private car. • Guaranteeing mobility for people with disabilities and reduced mobility capacities. • Integrate urban development and mobility policies, promoting urban developments based on criteria of proximity and autonomy of the citizen.
2. New Investment Policies	• **Shift from the paradigm "investment in infrastructure" to "investment in mobility".** • **Efficient use of limited resources** • **Prioritisation of safety, maintenance and upkeep, daily**	• **Ensuring adequate financing of transport infrastructure and services as essential elements for efficient and sustainable mobility performance.** • **Review the process of**

	mobility, intermodality and technology	prioritisation of transport investments according to available resources and social profitability criteria.
3. Safe Mobility	• Security as a basic cross-cutting element of the right to mobility • Security from an integral point of view	• Reinforcing investment in maintenance and upkeep as a central axis of security • Strengthening supervision and control organisations, as well as the creation of new technical accident investigation bodies. • Incorporation of technology to improve safety. • Increasing the levels of security against illegal acts. • Improving operational management policies in the event of emergencies and crises. • Strengthening cyber security
4. Mobility and Low Emissions	• Improving people's quality of life by protecting their physical health and mental wellbeing. • Efficiency in the use of resources and in the management of transport systems, means and terminals. • Basic regulatory homogeneity, technological neutrality, and respect for free competition. • Internalisation of the negative externalities of transport (particularly energy and environmental).	• Internalisation of the negative externalities of transport (particularly energy and environmental). • Increasing the effectiveness and efficiency of the transport system, promoting co-modality and intermodality. • Reduce energy consumption, improve energy efficiency, and reduce environmental externalities (air and noise pollution) per unit transported. • Contribute to the long-term decarbonisation of

		the economy through, notably, the progressive electrification of transport.
5. Smart Mobility	• Technology as a tool, not as an end in itself • Technology neutrality • Future-proof regulation	• Improving the user experience • Intelligent management of infrastructures: optimising their use, reducing maintenance costs, etc... • Improve the efficiency of the transport system as a whole. • Boosting R&D and innovation in mobility • Ensuring the security of new technologies and data protection.
6. Smart intermodal logistics chains	• Intermodality as a strong ally of mobility in Spain • Gaining competitiveness and logistic efficiency as basic elements of an efficient intermodality.	• Promoting intermodality as a key element to increase the efficiency, competitiveness, and reliability of freight transport. • Prioritise rail freight transport in public and private agendas, involving public companies attached to MITMA in the development of transport intermodality, especially in freight logistics nodes. • Promote multimodal distribution in urban freight transport. • Promote the digitalisation of the logistics chain, favouring the integration and interoperability of the different modes of transport.
7. Connecting Europe and Worldwide Connected	• Free movement of persons and goods at European level • Continuous and seamless mobility in our connections with Europe. • TEN-T as a connecting and	• Creating a single European transport space • Connecting the major ports, intermodal logistics terminals, industrial zones and airports with the TEN-

	integrating element of Europe • Spain as a European logistics platform	T to enable their connection with the major European and world trade systems. • Intensify cooperation with neighbouring countries and the European Commission to coordinate the construction and/or improvement of cross-border infrastructures and to organise fast, regular and high-frequency services along the European multimodal corridors Atlantic and Mediterranean.
8. Social and labour Aspects	• Public awareness and sensitisation are key elements in moving towards sustainable and safe mobility. • Public action must promote professionals in the mobility sector with the appropriate skills to respond to the needs of the productive sector and society. • New business models cannot threaten labour rights. • The field of transport cannot remain on the margins of gender equality policies.	• Establish a specific policy of sensitisation and awareness-raising on sustainable and safe mobility. • Address training and employment challenges in the transport and mobility sector. • Establish specific measures to give visibility to the role of women in the sector.
9. MITMA Evolution and Transformation	• Evolve from an all-investment policy a shared investment policy, with coordination leadership in the implementation of cross-cutting transport policies.	• Active communication policy towards citizens, as well as strengthening the Ministry's presence at the international level • Training of civil servants in new skills should be reinforced, and a process of revision and adaptation of the selection system should be initiated to face a complete digital transformation

Source: MITMA
*Translation from the original source and chart made by the author.

Forecasts on the construction sector

The Spanish Association of Infrastructure Construction Companies and Concessionaires (SEOPAN) presented in November 2020 its previsions for the construction sector[292]. The sector is expected to know an **18.4% investment drop in 2020**, with a **small rebound of 2.0% in 2021 et a net recovery of 8.0% in 2022**. It is more the case for construction that does not include housing (+5.1% in 2021 and +8.7% in 2022, see Figure 2). Spain is expected to register **€104 billion euros of investment** in the construction sector in 2021, which represent 6.10% of the total investment in the EU and UK area.

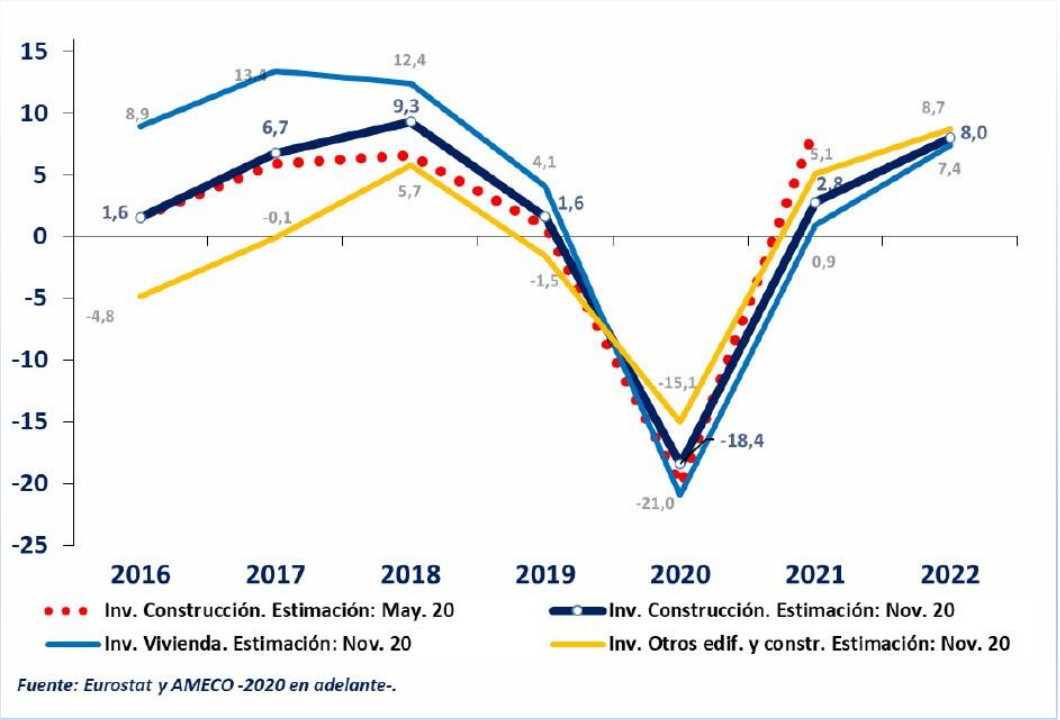


Figure 7- Evolution of investment in construction in Spain (Year-on-year rate of change in real terms) - SEOPAN

[292] SEOPAN, "La Inversión En Construcción En Europa Previsiones De Otoño De La Comisión Europea", November 2020.

DATA BOARD SPAIN

General Data

Political organisation: Constitutional parliamentary monarchy	**Head of government**: Prime Minister Pedro Sanchez
Population (2020): 47.3 million	**Urban population** (2019): 80.56%

Economic Indicators

GDP ranking (2019): 13/203	**GDP** (2019): 1.394,116 million USD
GDP growth (2019): 2.0%	**Expected GDP growth** (2020): -12.4%

Environmental Indicators

Share in global CO_2 emissions (2018): less than 1%

CO_2 emissions (2018): 0.24GT

CO_2 emissions per capita (2018): 5.3T

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 84.9%
- Train: 7.1%
- Bus and trams: 8.1%

Modal share of freight transport (2018):

- Roads: 95.0%
- Railways, inland waterways: 5.0%

Construction sector

Construction sector GDP share (2019): 5.9%

Jobs in the construction sector (2019): 1.27 million

Businesses in the construction sector (2019): 422.000

Investment in construction -civil engineering- (2019): €20 billion

Sweden

Economic context: Covid-19

In 2019, the Swedish GDP increased by 1.4%, while in 2020 **it fell by 2.8% as a consequence of the Covid-19 crisis**. However, the contraction is not dramatic compared to the overall EU figure (-6.1%)[293]. The Swedish economy is gradually recovering from the Covid-19 crisis. **GDP is forecasted to grow by 4.4% in 2021 and by 3.3% in 2022**[294]. Nevertheless, high unemployment and ongoing social distancing measures will limit the pick-up in household consumption. Low-capacity utilisation and uncertainties hold back business investment. Exports will gradually pick up as the global economy recovers. Unemployment will decrease slowly despite the economic recovery. Monetary policy will remain accommodative to facilitate credit and provide sufficient liquidity to firms. The government is implementing a sizeable fiscal package to support the economy and employment as well as to tackle structural issues like green transition and regional inequality. However, additional measures may be needed to support young, low-skilled, and foreign-born unemployed, as well as displaced workers from remote regions[295].

1. Impact of Covid-19 on mobility

Unlike many countries, Sweden opted for a strategy relying mainly on recommendations rather than mandatory enforcements to limit human interaction. From the middle of March to at least summer 2020, Swedish citizens were advised to stay at home if feeling sick and work from home if possible. Meetings involving more than 50 people were not allowed, and high schools, colleges and universities were closed for students. From early April 2020, people were advised to use public transport only if necessary. Public transport services were generally operating near nominal levels to restrict transmission risks. The distinct approach towards the pandemic makes Sweden an interesting case from an international perspective to study the mobility impacts.

Mobility behaviour in Sweden (before Covid-19)

While it seems that Swedish cities are ranking rather well in international comparisons regarding the use of active and soft modes, when looking at the national level, passenger cars remain a predominant mode of transport.

Based on study which is zooming in the biggest urban areas in Sweden in 2015 (Stockholm, Linköping, Helsingborg and Malmö**), it can be stated that modal split of daily trips is assessed to be just under 50% for public transport, walking and cycling combined, meaning that modal share in these Swedish urban regions is pivoted rather equitably between the more sustainable and less sustainable modes**.

In this context, it is argued that Swedish cities are atypically low in density, and more horizontally developed compared to most other European cities, which means that roads are freeways are generally longer. These conditions partially explain why Swedish cities on

[293] Eurostat, Real GDP Growth – Volume, 2021.
[294] European Commission, European Economic Forecasts – Spring 2021.
[295] OECD 2020: Sweden Economic Snapshot. Accessed: May 12, 2021.

average have lower public transport boarding's than typical European cities. On the other hand, the Swedish cities excel in their extremely low transport emissions per capita and low spatial intensity of emissions (per hectare) compared to other regions in the world. Likewise, Swedish cities report the lowest transport fatalities in the world.

Main mobility challenges

When comparing Swedish cities with other European ones, **it can be stated that the latter have three times higher rail use**. This is mostly due to the fact that Sweden presents a low density in the distribution of its population, and as a consequence the development of an extensive railway network is often not cost efficient. As already said, the low density and the horizontal development of Swedish towns did not encourage the development of widespread public transport as well. However, urban railway networks are nowadays desirable. Stockholm ranks as the best among the Swedish cities in sustainable transport and although it is still overall a relatively low-density region, it is bound together by strong urban rail networks around which very high density, mixed use centres have been built[296].

Modal split within Sweden

On a national level, and according to Eurostat, in 2018, **passenger cars accounted for 83.1% of the modal split, railway use for 9.7%, and other public transport for 7.2%**.

On a city level, the modal share is slightly different as shown in the example of Stockholm: according to the Deloitte City Mobility Index of 2018, **the modal share of public transport accounts for 32%, walking for 15% and bicycle use for 7% of trips, compared to 46% for private cars**[297].

In Politico's Urban Mobility Index for 2018, Stockholm is ranked 2nd best out of 20 European cities. The city is well ranked regarding low congestion levels, bicycle use and mass transit use, with the lowest ranking in the cost of single city public transport ticket. The city is also ranked first regarding the air quality level[298].

Possible explanations to the alleged good urban mobility performance on the city level:

- Swedish cities have lower car ownership.
- Swedish cities tend to have comparatively low parking supply in their central business districts (CDBs) and a relatively high proportion of metropolitan jobs located in the CBDs, which would enable the use of public transport in the journey-to-work.
- Despite low densities, it is stated that Swedish cities have developed relatively well-performing and more extensive public transport systems than many comparable lower density cities measured in terms of seat kilometres per capita. However, seat occupancy is comparatively low. This spare capacity could be utilised through better urban planning to create back-loading of passengers.
- Swedish cities have high levels of reserved public transport routes.
- The average operating speeds for public transport in Sweden is quite high and public transport overall have a modest speed advantage over car speeds.

[296] Kenworthy, Jeff 2019: Sustainable Mobility in Swedish Cities A Comparative International Assessment of Urban Transport Indicators in Sweden's Five Most Populous Urban Regions. In: K2 Working Papers 2019:1.
[297] Deloitte City Mobility Index 2018: Stockholm. Deloitte Insights.
[298] Posaner, Joshua; Solletty, Marion; Ginger, Hervey; Murphy, Connor 2018: POLITICO's urban mobility index. The best places in Europe to get around. POLITICO. April 17, 2018.

- Swedish cities spend relatively generous amounts of money operating their public transport systems, on average about 1.34% of their local GDPs, which is close to the European cities' average (1.50%).
- Cost recovery from fares of public transport operating costs is on average a bit less than 50% and less on average that the other global cities.
- Swedish cities have significant areas of urban fabric that are supportive of non-motorised modes and where walking and cycling is high, leading to over 27% of daily trips in Swedish cities by these modes, despite a very cold climate[299].

Modal split in comparison to EU27 (before Covid-19)

Focus on passenger cars

In 2018, high shares of petrol-powered cars among the new registrations were noted in Sweden (58.9%). However, Sweden is also quoted among the EU countries accounting for notable shares of passenger cars using alternative fuels (6 %), behind Italy (9 %), Lithuania (8 %) and Latvia (7 %)[300].

Electric Vehicle (EVs) and charging stations' share

In 2019, in terms of charging infrastructure for EVs, Sweden accounts for 4,34% of charging points in the EU[301]. The country has 48 fast public charging points per 100 km highway against 28 in the EU. In addition, there were a ratio of 23 EVs per public charging point in Sweden against 7 in the EU. Electric-chargeable vehicles represented 8.0% and hybrid electric vehicles 5.8 % of the market share of alternatively powered cars in the country in 2018[302].

The market share of battery electric vehicles is 8% in 2018, making it the world's third largest share. Extensive research into the electrification of roads, particularly for freight transport, also supports this trend[303].

Focus on rail

When looking at rail passenger transport within the EU between 2018 and 2019, one of the largest increases in the EU average was recorded in Sweden (+11.8%). Concerning the evolution of international rail transport performance between 2018 and 2019, the second largest increases was reported by Sweden (+26.6 %)[304].

Focus on freight

Looking specifically at rail freight transport over the two most recent reference years (2017-2018), tonne-kilometres increased significantly in Sweden (+9.3 %)[305].

[299] Kenworthy, Jeff 2019: Sustainable Mobility in Swedish Cities A Comparative International Assessment of Urban Transport Indicators in Sweden's Five Most Populous Urban Regions. In: K2 Working Papers 2019:1.
[300] Eurostat: Passenger cars in the EU. Accessed: January 12, 2021.
[301] European Alternative Fuels Observatory: Sweden. Accessed: January 7, 2021.
[302] European Automobile Manufacturers Association 2019: Sales of zero- and low-emission cars highly unbalanced across EU, alerts auto industry. Accessed: April 22, 2020
[303] International Energy Agency 2019: The Global EV Outlook. Scaling-up the transition to electric mobility. Accessed April 24, 2020.
[304] Eurostat: Railway passenger transport statistics - quarterly and annual data. Accessed: January 7, 2021.
[305] Eurostat: Freight transport statistics - modal split. Accessed: January 7, 2021.

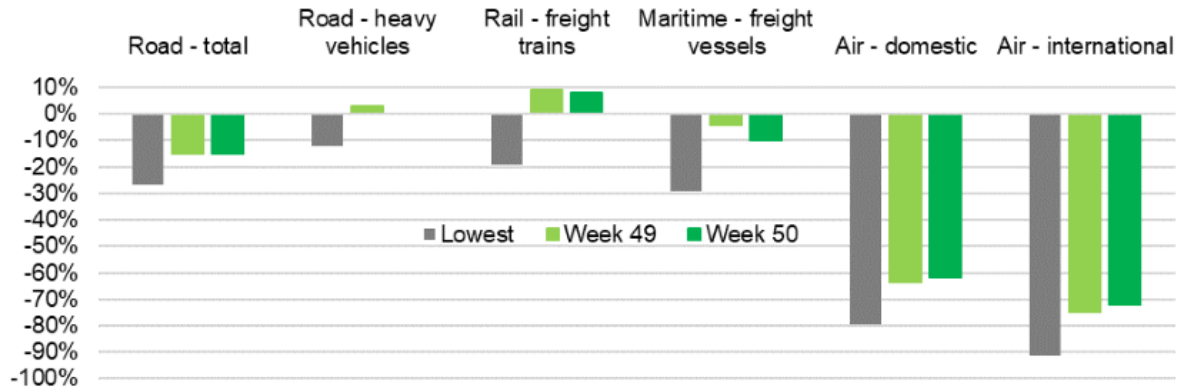
Mobility behaviour in light of the Covid-19 pandemic (first lockdown)

Passenger transport in general

Passenger transport began falling as early as March 2020. Mainly air transport has been affected, decreasing by 88% in April 2020.

The Swedish government agency for transport policy analysis have been mapping weekly changes in traffic volume by comparing a week in 2020 with the corresponding week in 2019. An example is to be shown from week 50 (December 7, 2020 – December 13, 2020).

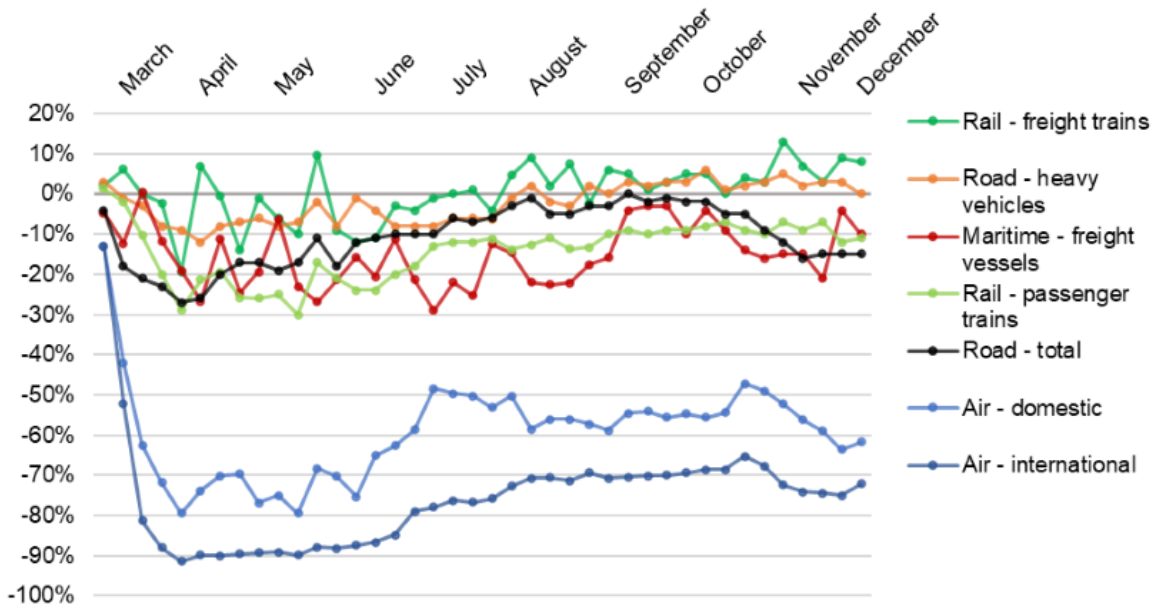
Transport indicators – Week 50, 2020 (December 7 – December 13)



**The week "lowest" refers to one week between week 11–50 with the largest decline in traffic. This week varies between the modes of transport.*
**Road traffic refers only to the national road network.*
** The calendar week with the largest relative decline in traffic (lowest) is here given in parentheses: total road traffic (calendar week 15), heavy road traffic (16), passenger trains (21), freight trains (15), cargo ships (28), domestic flights (15), and international flights (15).*
**Note the calendar effects, such as Easter period, affect weekly comparisons. Easter occurred in week 15 in 2020 and in week 16 in 2019, which is generally reflected in lower traffic levels in those weeks.*
Source: The Swedish Transport Administration

- Calendar week 50 2020 indicates that total road traffic in the national road network decreased by 15% (a statistically significant decrease) while heavy traffic was at the same level as last year.

Development for the different (sub-) modes of traffic



**Traffic by means of transport, weekly change in traffic volume during calendar weeks 11 – 50 in 2020 compared with the corresponding week 2019. Road traffic above refers to only the national road network.*
Source: The Swedish Transport Administration

In sum, **road traffic as a whole had a large reduction at the beginning of the pandemic (as low as -27%)** but returned to normal in August-September 2020. In October-November 2020, however, road traffic has had greater reductions again, compared with 2019. During calendar week 47-50, total traffic on the national road network decreased by around 15 – 16%[306].

Economic consequences

Since March 2020, sales in all transport industries were lower than in the corresponding period of the previous year. The same is true for October 2020, compared to the same month last year and in increasing order: aviation -71%, maritime transport -36%, rail operators -33%, cab -28%, public transport -9%, storage and support services -7%, and road freight traffic -3**%. Revenues for all transport industries combined were 13% lower in October than in October 2019.** The difference compared to 2019 was the highest in May 2020, up to -24%.

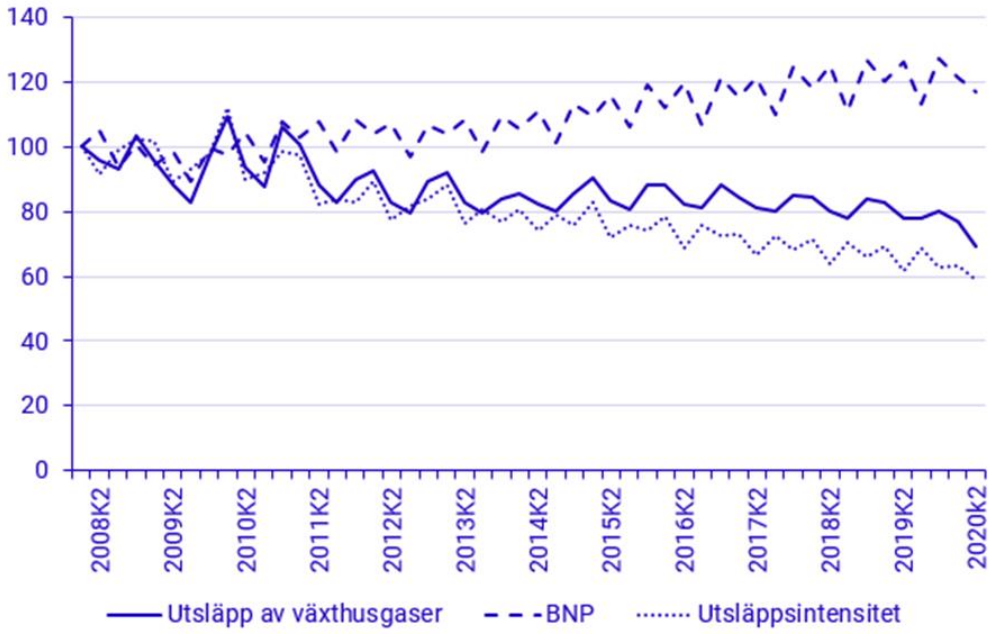
Transport externalities

Greenhouse gas emissions from the Swedish economy will decrease by 11% in the second quarter of 2020 compared to the same quarter in 2019. This is mainly due to reduced emissions from the transport industry, such as airlines and shipping companies, and households.

The second quarter of 2020 shows total greenhouse gas emission of 12.1 million tons of CO2 equivalent from the Swedish economy. This is a decrease of 11.2% compared to the same period in 2019. The Swedish GDP decreased by 7.3% over the same period. Greenhouse gas intensity, i.e. greenhouse gas emissions per krona produced in the economy, continued to decline.

Greenhouse gas emissions and economic development, GDP, constant prices 2019, 2008K1 - 2020K2 (Index 2008K1=100)

[306] Transport Analysis 2020: Transport indicators week 50. Accessed: January 05, 2020.



------- Emissions - - - - GDP …… Intensity of GHGE

In the transportation industry, emissions will decrease by 45% in the second quarter of 2020 compared to the same quarter of 2019. The transport industry includes emissions from aviation, shipping companies and land transport, such as freight and rail, from Swedish economic operators, wherever they take place in the world. The decline in the transportation industry is observed in both the shipping industry and the air transportation industry. From an economic point of view, the value added of the whole transport industry decreases by 25%.

Household greenhouse gas emissions is estimated to decrease by 15% in the second quarter of 2020 compared to the same period in 2019. The reduction in travel is mainly responsible for the reduction in household greenhouse gas emissions[307].

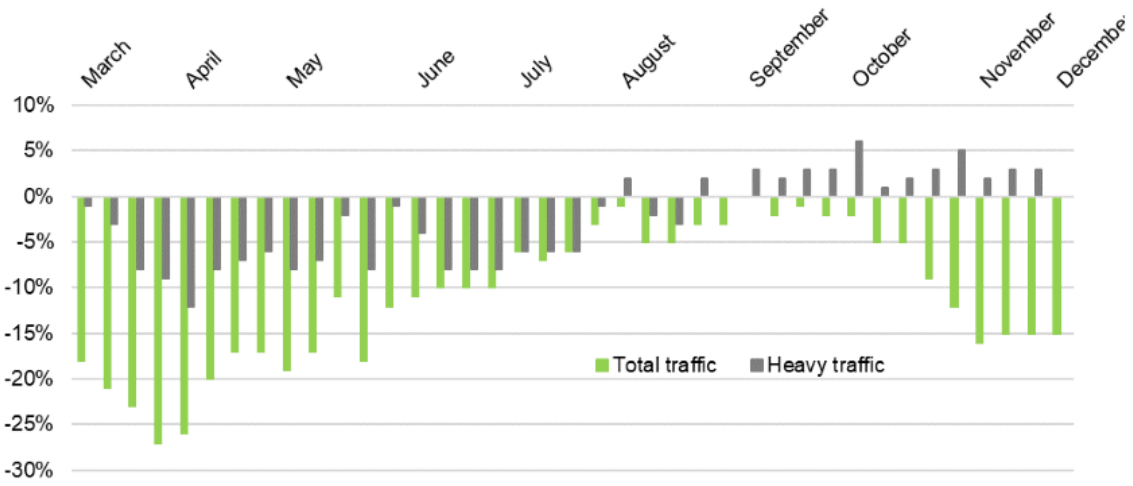
Passenger car transport

During calendar week 50 2020 compared to 2019, total road traffic in the national road network decreased by 15%. This would represent the eight week in a row with a statistically significant reduction in the total traffic flow on the national road network. Heavy traffic however, has increased for several weeks in a row but for the latest week (calendar week 50) heavy traffic was at the same level as 2019[308].

Traffic (vehicle kilometres) in the national road network, total traffic and heavy traffic (heavy goods vehicles and buses).

[307] TDIE 2020: tbc

[308] Transport Analysis 2020: Road - week 50. Accessed: January 11, 2020.



**Percentage change of a certain number of weeks in 2020 compared to the corresponding weeks in 2019*
Source: The Swedish Transport Administration

Economic consequences

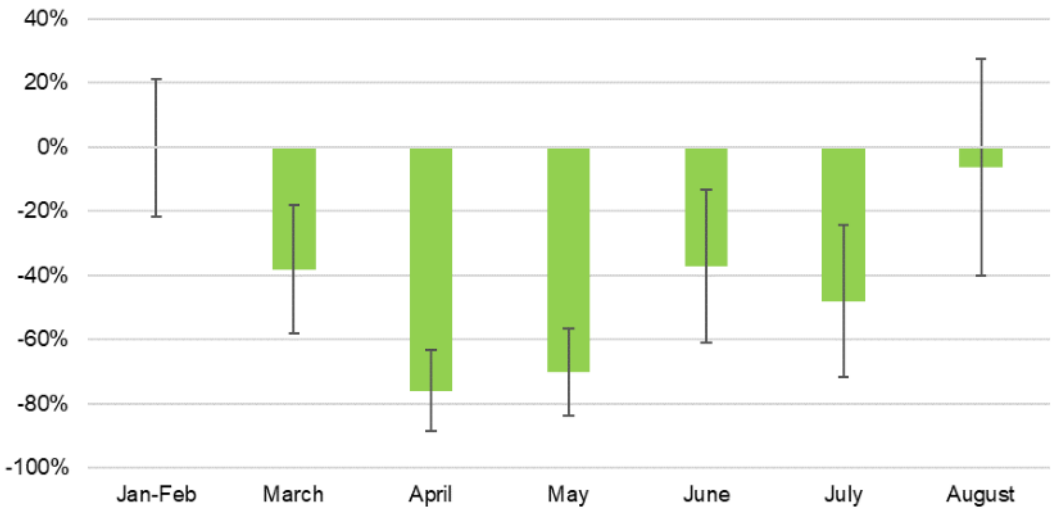
In November 2020, 27 443 passenger cars were registered for the first time, 11.8% less than in November 2019, according to the Transport Analysis monthly official statistics on new registrations[309]. Besides, it is estimated that at least 67,000 employees in the automotive sector in Sweden have been affected by the crisis[310] within the EU in April 2020 according to approximate figures of ACEA.

Public transport

Before the pandemic outbreak, in January-February 2020, no significant changes in public transport use compared to the previous year were recorded. **In April 2020, journeys made via public transport dropped by 76% compared to the same month of 2019**. In May 2020, the decrease was 70%. A significant contraction of public transport use was also recorded over summer: in June and July, the reduction compared to 2019 records was around 40%. There has thus been a statistically significant reduction in the number of journeys by public transport from March to July 2020. During August, no distinct decline was observed.

The number of journeys by public transport per person in 2020 compared with the corresponding period in 2019

[309] Statistics Sweden 2020: Registered vehicles. Accessed: January 05, 2020.
[310] ACEA 2020: Interactive map: Employment impact of COVID-19 on the European auto industry. Accessed: December 2, 2020.



**Statistical uncertainty intervals are marked on the bars.*
Source: Preliminary results from the Swedish National Travel Survey (Transport Analysis)

It is stated that ridership was not restricted by service levels as supply generally remained unchanged throughout the period. The ridership reduction stems primarily from a lower number of active public transport travellers[311].

Economic consequences

Revenues from public transportation decreased relatively slightly by 15% compared to the rest of Europe, also considering that trips apparently decreased much more than that.

According to a study by Transdev Sweden in collaboration with YouGov, 60 % of public transit passengers state that they will continue to travel by public transportation when the pandemic is over. However, 13 % state that they are unlikely to return to public transportation after the pandemic, this would correspond to a loss of revenue of about 3.5 billion SEK (approximately €334 million) per year for the entire Swedish industry.

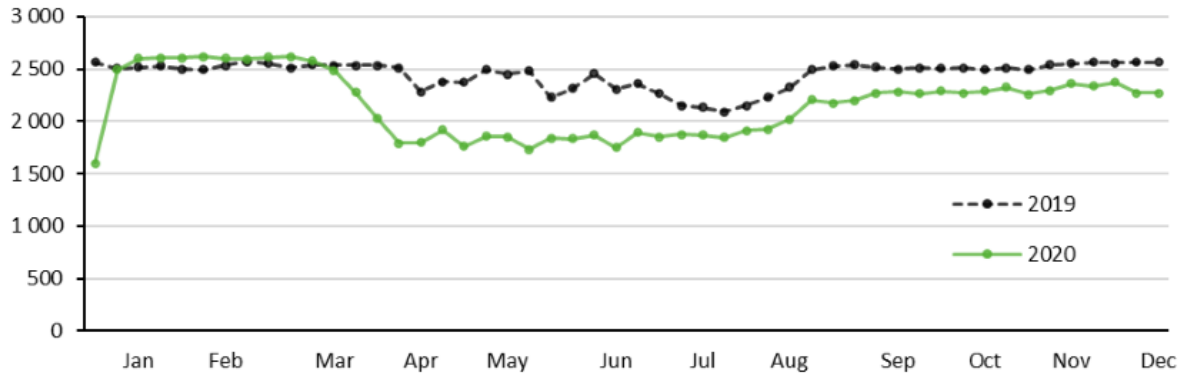
Less public transportation means fewer alternatives for people to be able to travel sustainably, the risk is that car travel increases but also that a reduced supply can lead to increased gaps in society[312].

Rail

Passenger transport by rail noted an upward development early in 2020, but turned downwards in March, and traffic was up to 32% lower compared with the same period last year. In 2020 between week 13 and 35, the traffic was 10–30% lower than in 2019. The largest decrease was during week 21, -30%. During the last week measured (calendar week 50), the difference was -11%[313].

[311] Transport Analysis 2020: Public transport and passenger mobility - week 48. Accessed: January 11, 2021
[312] Transdev 2020: The COVID-19 pandemic leaves long-lasting effects on public transit travel in Sweden. Accessed: January 05, 2020.
[313] Transport Analysis 2020: Rail - week 50. Accessed: January 11, 2021.

Passenger railway traffic, by calendar week year 2019 and 2020 (Thousands of train-kilometres)



Source: The Swedish Transport Administration

Freight

In total, goods transport fell by 13% in April 2020. The lowest values were recorded within sea transport, air transport and shipping[314]. By contrast, heavy road traffic increased for several consecutive weeks and for week 50 by 2%.

The development of freight train traffic so far shows no clear trend in 2020, it has been similar to the previous year's trend. During the last calendar week measured (week 50), freight train traffic measured in gross-gross tonne-kilometres hauled was 8% higher in 2020, compared with the same week in 2019[315].

Road freight traffic (including carriers) was the least affected sub-industry throughout the period, while aviation was the most affected. This could partly be explained by the rise in e-commerce which is also largely operated by truck. In the second quarter of 2020, e-commerce turnover grew by 49% and by 39% in the third quarter compared to the same quarter of the previous year[316].

Impact of Covid-19 on (road) construction and road infrastructure

According to GlobalData, the Swedish construction industry has been impacted due to Covid-19, with **the industry expected to contract by 4% in 2020** despite the country's no-lockdown decision. Reflecting the lack of strict containment measures – for large parts of the economy and the construction industry, this has meant businesses are continuing as usual, with the construction works continuing at sites. Although the direct impact may be relatively low, the construction industry has been weak, notably the residential sector, which is the largest market in the Swedish construction industry[317].

The transport network was the subject of investment under the National Transport Plan 2014-2025, with a budget of 522 billion SEK (€50.2 billion). In addition, in June 2018, the government adopted the National Infrastructure Plan 2018-2029, involving a total investment

[314] Statistics Sweden 2020: Transport sector falls during the coronavirus crisis. Accessed: January 05, 2021.
[315] Transport Analysis 2020: Rail - week 50. Accessed: January 11, 2021.
[316] TDIE 2020.
[317] Thomas, Emily 2020: GlobalData: Swedish construction industry to contract due to coronavirus pandemic. In: GlobalData. Accessed: January 8, 2020.

of 700 billion SEK (€67.3 billion). Other priority investment projects also included a €277 million grant for construction investments (the budget is allocated annually).

Despite these favourable policy initiatives and investment plans, the Swedish construction sector continues to face challenges on two fronts. First, the construction sector is suffering from deteriorating access to finance. Banking institutions remain reluctant to lend to Swedish construction companies. Secondly, the continuing shortage of skilled workers continues to be a major concern for the sector, especially in the area of infrastructure. This is especially challenging given that the infrastructure market is quite dynamic compared to the residential and non-residential markets.

Despite the onset of the pandemic, the Swedish construction sector has a positive medium to long-term outlook. The infrastructure market continues to outperform the residential and non-residential markets, partly due to their longer planning periods. Most projects have been deferred to future dates. Nevertheless, the sector is expected to grow from 2021 onward. Investment in the civil engineering sector is expected to increase with upcoming projects announced in the 2018-2029 National Infrastructure Plan.

2. Swedish Recovery Plan

National Recovery and Resilience Facility (NRRF) - European level

Sweden will receive grants totalling 3.2 billion euros under the Recovery and Resilience Facility. The Swedish Recovery Plan was submitted to the European Commission on 28 May 2021, almost a month later than the deadline of 30 April.

The Swedish Recovery Plan is based on 5 missions:

- Green recovery
- Education and transition
- Improving conditions to meet the demographic challenge and ensuring the integrity of the financial system
- Investment for growth and housing

All measures related to infrastructure, buildings and transport in the Swedish Recovery Plan is strongly linked to an important focus on the environment: therefore, all reforms and investments in these sectors fall under the first mission, *'green recovery'*, and have the objective of reducing environmental impact. The various reforms and investments concern the energy sector and the transition to less polluting fuels, support for local communities with funds for nature protection, and a series of more targeted measures concerning industry, rail transport and buildings. Mission 1 has an estimated cost of SEK 16.30 billion, or **EUR 1.6 billion**.

Rail

Rail is concerned by the Mission 1 investment "*rail investment*". Sweden's railways need to be modernised so that more passengers and goods can be transported by rail rather than by car or truck. The government wants to stimulate climate-friendly transport in general, for example by shifting transport from road to rail. A well-developed, reliable and well-maintained rail

system is a prerequisite for this. The investments in the recovery plan include the modernisation of tracks and switches, road protection facilities and the replacement of bridges. T**he total cost is SEK 1.5 billion from the RIF, spread over SEK 500 million (€50 million) per year between 2021 and 2023, plus SEK 110 million (€11 million) from national funds.**

Railway is the only transport mean considered in the Swedish recovery plan. All things considered, the Recovery and Resilience Plan presented by Sweden gives fundamental importance to the environmental issue, which is the basis for all interventions related to infrastructure and transport. However, the measures in the Plan are limited to certain areas of intervention (rail, buildings) and do not mention others (urban mobility, electric vehicles). This is due to the fact that Sweden has already implemented several measures in this direction at national level, notably the Climate Act enabled in 2018 aiming to eliminate greenhouse gas emissions within 2045 at last. Therefore, the framework of the RRF is an additional opportunity to intervene in specific areas, while keeping coherence with an already existing strategy to reduce the country's environmental impact.

Swedish Covid-19 relief package - National level

In March 2020, the Swedish government presented **a package of measures worth more than 300 billion Swedish kronor (€29.58 billion) to support the economy in the face of the coronavirus pandemic**. The biggest cost accounted for allowing companies to put off paying tax and VAT for up to a year - retroactive to the start of 2020.

Sweden also announced extra cash for local authorities to help fight the coronavirus outbreak while the central bank has provided up to 500 billion Swedish crowns (about €46 billion) in loans to companies through the banking system[318].

In September 2020, Sweden's Finance Minister presented a 2021 budget with €9,86 billion in extra spending and additional tax cuts. The stimulus measures include 75 billion kronor (€7.07 billion) to bolster the welfare state and combat climate change, as well as tax cuts worth approximately 30 billion kronor (€2.95 billion). The stimulus is expected to ease the pressure on Sweden's central bank to boost growth amid the Covid-19 crisis.

In the Budget Bill for 2021, the Government proposes a green restart package for the Swedish economy, but also long-term reforms to solve societal problems. In total, the investments in the Budget Bill for 2021 amount to just over SEK 105 billion (€10.35 billion) in 2021 and just over SEK 85 billion (€8.38 billion) in 2022. The calculations have assumed that RRF funds will be paid out during 2021–2023[319]. This newly announced stimulus package is estimated at 2% of gross domestic product[320].

Focus on mobility and infrastructure

The Government is proposing investments of SEK 9.7 billion in green recovery initiatives in the Budget Bill for 2021.

[318] Reuters 2020: Sweden launches coronavirus crisis package worth more than $30 billion. In: Reuters. Accessed: January 08, 2020.
[319] Government Offices of Sweden 2020: EU Recovery and Resilience Facility (RRF). Accessed: January 8, 2021.
[320] Lindeberg, Rafaela; Rolander, Niclas 2020: Sweden Loosens Purse Strings With Virus Stimulus Budget. In: Bloomberg. Accessed: January 8, 2020.

Biodiversity: One of the Government's initiative will be to restore wetlands. Emissions from drained peatlands that were previously wetlands account for 11 million tonnes of carbon dioxide equivalents – which is more than from private cars in Sweden.

Sustainable transport reduced emissions: Domestic transport accounts for about one third of Sweden's greenhouse gas emissions. The Government proposes initiatives in the Budget Bill for 2021 accelerating the reduction of GHE, among them:

- The transition to a fossil-free vehicle fleet should be reinforced by means of changes to the bonus-malus system;
- The reduction obligation will be tightened so that more renewable fuels are mixed in with petrol and diesel;
- A major investment is being made in railways in the form of greater maintenance. To continue pushing for the transfer of freight transport from roads to rail, the Government proposes extending and further developing the environmental compensation;
- Green Cargo is currently facing a challenging financial situation, which is further aggravated by the ongoing pandemic. Thus, Green Cargo will receive a capital injection so that necessary investments can be made and to ensure the company's long-term stability and profitability. This capital injection is given in light of the environmental compensation for rail freight transport simultaneously proposed to the Riksdag.

Energy efficiency in housing: The Swedish Government considers major investments are still needed both to achieve better energy performance and to address the renovation needs of the existing building stock. The Government will therefore provide SEK 900 million for 2021 to a new form of support for energy efficiency improvements and renovation of apartment buildings.

Initiatives for local green transition: The Government proposes initiatives to support local and regional efforts for a green transition. This includes municipal energy and climate advisory services, and measures to reduce the risk of landslides.

Improved climate projections and international climate action: The Government also proposes initiatives to support national and international environmental and climate action in the Budget Bill for 2021[321].

3. Existing mobility strategies

It must be noted that the Swedish State has exclusive competence in the planning of the road network, the regional level has competence in the organization of public transport, the municipality has competence in the maintenance of its local road network, health and environmental protection (the protection of nature and the environment is also a competence of the prefect, at a "regional" level). The State may define ecological and sustainable transition

[321] Government Offices of Sweden 2020: Green recovery will lift Sweden out of dual crisis. Accessed : January 8, 2020.

policies or objectives. Nevertheless, municipalities directly implement the corresponding types of mobility, with freedom of action on their territory[322].

National Plan for Infrastructure (2018-2029)

The Swedish Government has adopted a national plan for infrastructure for the period 2018–2029. In total, SEK 622.5 billion (€61.39 billion) will be invested. An additional SEK 90 billion (€8.88 billion) will come from congestion charges, track access charges and co-financing. The SEK 622.5 billion will be distributed as follows:

- SEK 125 billion (€12.33 billion) for operation and maintenance of state-owned railways (will increase by 47% in the coming plan period compared with the previous plan);
- SEK 164 billion (€16.17 billion) for operation and maintenance of state-owned roads;
- SEK 333.5 billion (€32,89 billion) for the development of the transport system.

It must be noted that the selected railway investment objects accounts for a total of SEK 148 billion (€14.59 billion), which is an increase of 32% compared with the previous plan period. This means that 77% of the total funds for the selected objects of SEK 193 billion (€19.03 billion) go to railway objects.

In general, the Government has been investing SEK 100 billion (€9.86 billion) more than in the previous plan period[323].

National Strategy for Liveable Cities (2018)

In the Strategy for Liveable Cities, the Government presents its overall policy for sustainable urban development, **encompassing earlier initiatives**. It is Sweden's first national urban development strategy. The strategy focuses on goals for sustainable cities and policies primarily for urban transport and green areas, as well as innovative and sustainable construction. The proportion of passenger transport in Sweden **using public transport, cycling and walking must be at least 25% by 2025**, expressed in passenger kilometres, with the aim of doubling the proportion of walking, cycling and public transport over time. Also, a significant part of the vehicle fleet will be electric. To this end, the Government has established a Council for Sustainable Cities, which will act to implement the Government's policy for sustainable urban development. The Council will be a forum for the heads of government agencies and be active until May 2022.

Innovative and sustainable construction: The Government has introduced a public grant for innovative and sustainable housing construction with reduced impact, climate adaptation and sustainable material choices.

Designed Environment (2018): The Swedish Government presented a new policy for architecture and design for sustainable designed living environments in the government bill "The policy for sustainable designed environments", which includes an enhanced responsibility structure and proposals for new national goals for architecture and design.

[322] Arsenault, Line 2005: Décentralisation. Portrait de la Suède. Ministère des Affaires Municipales, du Sport et des Loisirs (Québec).

[323] Government Offcies of Sweden 2018: The Government's plan for infrastructure – how we build Sweden strong and sustainable. Accessed: January 13, 2021.

Initiatives for more and better sustainable housing: Contains a number of measures to create more housing and more sustainable housing environments. An investment grant has been introduced to promote the construction of rental housing and student accommodation. To receive the grant, the building must have low energy consumption.

Sustainable passenger transport: "The next generation's travel and transport partnership programme" puts focus on developing solutions for a more transport-efficient society, where transport should be used in a smarter way and with more resource-efficient vehicles.

Urban environment agreements (2015): In 2015, the Swedish Government established urban environment agreements to encourage a higher proportion of passenger transport by means of cycling and public transport in cities. This support provides opportunities for municipalities and county councils to receive up to 50% in central government co-financing for infrastructure for public transport, and from 2017 also for cycling. As of 2018, urban environment agreements are part of the economic framework for the development of the transport system and are expected to amount to SEK 1 billion annually between 2018 and 2029. The Government also intends to include measures for sustainable freight transport solutions in urban environments that reduce climate and environmental impacts, such as mixed loading, coordinated city logistics and goods by cycle. This aspect has also been covered by the Swedish National Energy Plan handed over to the European Commission in 2019.

National Cycling Strategy (2017): The Swedish Government has adopted this updated strategy for more and safer cycling. A national strategy was already developed in 2014 targeting more bike paths, safer roads and awareness raising about how to ride a bike safely[324]. The Swedish Government is investing a total of SEK 100 million (€9.89 million) in this additional cycling initiative[325].

The Climate Leap (Klimatkliv) (2015): Municipalities, companies, organisations, and others can apply for support for measures that reduce climate impact. Support has been granted to some 14 000 charging points for EVs that lead to reduced greenhouse gas emissions, air pollution and noise. Other examples are support to expansion of district heating networks, information on sustainable commuting and other campaigns, and energy efficiency in apartment buildings. The candidates compete for this investment based on the estimated reduction in greenhouse gas emissions per krona. In 2019, the Government budgeted SEK 1.5 billion for the Klimatkliv initiative.

Low emission zones (LEZ): The Government introduced legislative amendments that will allow municipalities to introduce LEZs that also cover light vehicles, and an additional LEZ for heavy vehicles, with the aim of improving air in the cities.

Electric Vehicle Premium (2017): To significantly improve the possibilities of commuting and travelling in a climate-friendly way by cycle, the Government has allocated SEK 1 050 million (€103,54 million) between 2018 and 2020 to an EV premium for the purchase by private individuals of electric bicycles, electric mopeds or electric motorcycles.

Electric buses (2016): In July 2016, the Government introduced a premium to speed up the electrification of the transport sector and contribute to a sustainable urban environment. The premium covers part of the additional costs for electric buses in relation to conventional buses.

[324] ECF: National cycling policies. Accessed: January 14, 2020.
[325] Government Offices of Sweden 2017: A national cycling strategy for more and safer cycling. Accessed: January 14, 2020.

EV30@30 Campaign

Sweden is part of the EV30@30 campaign, which aims to achieve a market share for electric vehicles for passenger cars, light commercial vehicles, buses, and trucks of 30% by 2030[326].

Electric Motorway Systems

Sweden was the first country to launch a test of electric motorways for freight transport in 2016, in a Scania-Siemens partnership. The country also created the world's first dynamic electric road in 2019, particularly for buses and trucks. Sweden has shown its interest in the electrification of roads, where it plans to invest €3 billion[327]. In this context, Sweden is liaising with other European partners. On January 31, 2017, the German and Swedish governments have agreed under the declaration: "Innovation and cooperation for a sustainable future – A German & Swedish partnership for innovation", among others, on conducting a joint study on the electrification of roads.

Sweden's Integrated National Energy and Climate Plan (January 2020)

Sweden's National Energy and Climate Plan was submitted to the European Commission at the end of 2019. It covers cross sectoral policy measures. The Integrated Energy and Climate Plan elaborates on **Sweden's existing energy and climate goals, policies and measures and on the associated scenarios**. In this context, it has to be noted for example that a Swedish carbon pricing policy was implemented nearly 30 years ago. The prices have risen gradually from about €23 per ton to €110 per ton of carbon emissions[328]. Concerning transport infrastructure, the following elements can be retained in addition to measures stated in the previous initiatives above:

An obligation to reduce petrol and diesel consumption: It was introduced on 1 July 2018. All fuel suppliers must reduce the greenhouse gas emissions of petrol and diesel over their entire life cycle by a certain percentage every year by gradually increasing the amount of added biofuel.

A bonus-malus system: has been in force in Sweden since 1 July 2018. The system means that purchases of low carbon vehicles qualify for a bonus, while high carbon vehicles are subject to a higher rate of vehicle tax for the first three years.

Carbon-based vehicle tax: To give buyers an incentive to choose cars, light-duty trucks, light-duty buses and mobile homes with low greenhouse gas emissions, Sweden applies different annual tax rates based on the vehicle's carbon emissions per kilometre, which means that vehicles with low carbon emissions are taxed at a lower rate than those with high emissions.

The Pump Act -Requirements for biofuels at filling stations: To improve the availability of renewable fuels, Sweden has passed a law requiring filling stations with sales of over 1 500 m3 of petrol or diesel to offer at least one type of renewable.

Measures to improve information and raise awareness of the transition to a fossil-free transport system: In April 2019, the Government tasked the Swedish Transport Administration with taking measures to improve information and raise awareness of the transition to a fossil-free transport system. These measures are intended to contribute to

[326] International Energy Agency 2019: The Global EV Outlook. Scaling-up the transition to electric mobility. Accessed: January 12, 2021.
[327] Rébillion, Hervé 2019: La route électrique à recharge par induction en mouvement. In: TRM 24. January 2019.
[328] OECD 2020: COVID-19 and the low-carbon transition: Impacts and possible policy responses. Accessed: January 14, 2020.

meeting the Riksdag's climate target of reducing the 2010 levels of greenhouse gas emissions from domestic transport, excluding aviation, by at least 70% within 2030, and to enable Sweden to achieve net zero emissions by 2045. This project will continue until 31 December 2022, but the Swedish Transport Administration must submit a report by 30 June 2021 outlining the measures that should be taken to improve information and raise awareness of the transition to a fossil-free transport system during the rest of the planning period (2023–2029).

Electric bus incentive payment: The regional public transport authorities (municipalities and companies to which the regional public transport authorities have authorised the access to the public transport contracts) and private operators of public transport services can apply for an electric bus incentive payment. This payment applies to electric buses, plug-in hybrid buses, trams and fuel cell buses for public transport. The amount of the payment depends on the number of passengers and whether the buses are electric only or hybrid. The budget for the electric bus incentive payment in 2019 is SEK 80 million (€7.89 million). From 2020, the electric bus incentive payment will become a climate incentive payment. This will make it possible to apply for support for electric trucks and other environmentally friendly trucks and electric machinery as well as electric buses. The budget for this will be increased to SEK 120 million (€11.83 million) in 2020.

Electrification commission: The Swedish Government will commit SEK 5 million a year until 2022 for an electrification commission to accelerate work on the electrification of the transport sector. The electrification commission will help to accelerate investments in electric roads, charging infrastructure for electric trucks and other effective applications. The commission will also shed light on matters related to funding, how quickly roads can be electrified, and the effects of converting goods transport on the electricity supply. It will work with the business community and relevant stakeholders to produce an action plan for electrification of Sweden's busiest roads and will investigate other electrification options.

Electric roads: A demonstration project is being carried out on the E16 outside Sandviken (heavy goods vehicles) and at Arlanda airport (heavy goods vehicles and cars). In April 2019, the Swedish Transport Administration decided to launch two more demonstration projects, which are currently being carried out in Lund (public transport) and on Gotland (heavy goods vehicles and public transport). The demonstration project on Gotland uses induction, so there is no need for a fixed connection with the vehicle, while the other projects use conduction, so the vehicle has to be physically connected to the electricity supply. The Swedish Transport Administration is currently planning to build the first permanent electric road. The Swedish Government believes that electric roads will increase the efficiency of goods transport and reduce greenhouse gas emissions. It therefore intends to develop a long-term plan to construct and expand electric roads. Major goods routes and links to ports should be prioritised. The need for complementary technologies to allow vehicles to run on electricity outside the electric road network, for example rapid charging points for heavy goods traffic, should be addressed in future work.

Coordination of charging infrastructure and renewable fuels which require specific infrastructure: The Swedish Energy Agency is tasked with coordinating support for the vehicle charging and renewable fuels infrastructure and providing information about the location of charging stations and filling stations for biodiesel. As part of its coordination work, the Swedish Energy Agency has held discussions with the county councils about developing regional plans for the renewable fuel infrastructure. It has focused its work on the charging infrastructure on

increasing the capacity of society operators, by involving relevant operators in the development of a suitable charging infrastructure. In its work on the renewable fues infrastructure it has focused on collecting knowledge and experience of renewable fuels which require specific infrastructure by increasing access to relevant and reliable information about the infrastructure for various operators.

Rapid charging along major roads: In response to the Government's proposal in the draft budget for 2020, the Riksdag has introduced support for rapid charging infrastructure along major roads to cover the large areas which do not have this infrastructure yet. The Government proposes spending SEK 50 million over three years on this expansion.

The county councils' task to prepare regional plans for infrastructure for EVs and renewable fuels: In its 2018 spending authorisation, the Government asked county councils to prepare regional plans for infrastructure for EVs and renewable fuels. This is part of the county councils' long-term leadership and coordination of regional work in all areas relevant to the energy transition and reduced climate impact. A report on the regional plans must be submitted by 31 January 2020.

Sustainable cities with a focus on climate-smart mobility: The Government has appointed the Swedish Energy Agency as main project manager and administrator of the Nordic Council of Ministers' Sustainable Nordic Cities project, focusing on climate-smart mobility. The project will consist of five sub-projects:

1. the launch and the concluding conference on sustainable cities, focusing on climate-smart travel and transport;
2. the presentation of good examples and recommendations for ways of increasing the number of zero-emission vehicles in cities;
3. recommendations for promoting attractive and climate-smart transport in cities;
4. exchanges of experience and attempts to find solutions for charging EVs in cities; and
5. development of a database of EV charging stations. The Government has commissioned the Swedish Transport Administration to lead the sub-project on attractive and climate-smart transport in cities. It must submit a report on its work to the Infrastructure Department by 15 March 2021.

Long-term infrastructure planning: In May 2018 the Government decided to introduce a new national transport infrastructure plan for all modes of transport for 2018–2029. The Swedish Transport Administration is responsible for long-term planning for all modes of transport and for implementing the plan. The plan will be prepared in consultation with municipal and regional authorities and other stakeholders.

National goods transport strategy: In June 2018 the Swedish Government decided to introduce a national goods transport strategy. The strategy highlights three priorities for further work concerning Competitive and Sustainable Goods Transport, Transition to Fossil Free Transport and Innovation Competence and Knowledge. The Government has also set up a national goods transport council.

Public procurement of transport: The Vehicle and Public Transport Service Procurement (Environmental Requirements) Act (2011:846) sets out the criteria to be met for the public procurement of cars and public transport services. These criteria aim to reduce environmental impact by setting requirements for aspects such as energy consumption and emissions. According to FRIDA, the Swedish Environment and Vehicle Database for Public Transport, around 85% of public transport ran on renewable fuels in 2018. Statistics from the Swedish

Confederation of Transport Enterprises show that 63% of busses ran on fuels other than conventional diesel in 2017. Procurement authorities apply criteria for public procurement of passenger transport, goods transport, fuel, tyres, public transport, and vehicles which help those procuring transport to set requirements.

Night trains abroad: The Government wants to give people a better choice of public transport with a low climate impact. On 11 July 2019 it tasked the Swedish Transport Administration with investigating the possibility of providing daily night train services to several European cities. It must submit proposals for the transport to be procured, prepare a timetable for the implementation, and assess the cost to the state. It must also investigate other options for providing night train services abroad and for the state to contribute to replacing the 91 Air Travel (Tax) Act.

Based on Sweden's final national energy and climate plan, and on the investment and reform priorities identified for Sweden in the European Semester, the Commission invites Sweden to consider, while developing its NRRP, the following climate and energy-related investment and reform measures:

- Measures supporting investment in energy efficiency, including by investing in the renovation of buildings;
- Measures supporting new infrastructure for the electrification of road transport (recharging infrastructure for EVs & investment in research and innovation related to green technologies);
- Measures to continue the phase-out of fossil fuels subsidies against a clearly defined schedule[329].

Key take-aways

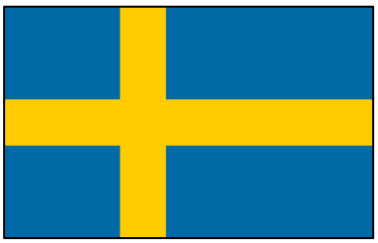
- The existing mobility strategies are cumulative and earlier initiatives are often taken over in updated plans;
- Although Sweden is low in density, and high in roads and freeways, Swedish cities account for advanced urban mobility strategies and resulting low transport emissions per capita;
- This could explain why the main focus of the Swedish Government regarding transport lies in developing Sweden's railway network. The need for more extensive urban rail networks can also be identified as one of Sweden's major transport challenge in the European average;
- Sweden is a pioneer in developing electric road systems. Its further deployment is clearly stated in Sweden's National Energy and Climate Plan.

Abbreviations

EVs	Electric Vehicles
FRIDA	Swedish Environment and Vehicle Database for Public Transport
LEZ	Low emission zones
SEK	Swedish Currency: Kroner
VAT	Value Added Tax

[329] European Commission 2020: Summary of swd assessment NECP: Sweden.

DATA BOARD SWEDEN



General Data

Political organisation: Constitutional Monarchy	**Head of government**: Stefan Löfven
Population (2019): 10.285 million	**Urban population** (2019): 88%

Economic indicators

GDP ranking (2019): 22/203	**GDP** (2019): 530.9 million USD
GDP growth (2019): 1.3%	**GDP growth** (2020): -2.8%

Environmental indicators

Share in global CO_2 emissions (2018): 2%

CO_2 emissions (2018): emitting 63.8 million tonnes of carbon dioxide equivalents.

CO_2 emissions per capita (2018): 3.6 tonnes

Transport & Mobility sector

Modal share of passenger transport **(2018):**

- **Private car:** 83.1%
- **Train:** 9.7%
- **Bus and trams:** 5.8%

Modal share of freight transport **(2018):**

- **Roads:** 68.9%
- **Railways, inland waterways:** 31.1%

Construction sector

Construction sector GDP share **(2019):** 5.4% (real estate excluded)

Jobs in the construction sector (2019): 389.000

Businesses in the construction sector (2016): 213,434
The overall number of enterprises in the broad construction sector experienced a 21.4% increase over 2010-2016.

Investment in construction -civil engineering (2019): €51,819 million

United Kingdom

Economic context: Covid-19

The United Kingdom knew a GDP historical drop in 2020. **While its GDP rose by 1.4% in 2019[330], national statistics show that it contracted by 9.8% in 2020**[331]. In 2020, Q2 was the critical point with a -19.5% growth drop, followed by a strong 16.9% rebound in Q3[332]. It is obviously due COVID-19 pandemic in spring 2020 and urgent national lockdown measures. The current economic forecasts expect a 5.0% and a 5.3% GDP growth in 2021 and 2022[333].

1. Impact of Covid-19 on mobility

Mobility trends in the U.K (before Covid-19)

As its European neighbours, the transport landscape in the U.K is heavily characterised using private car and private means of transport.

Table 1 - Modal split - Passenger transport (Billion passenger-kilometres/%) in 2019

Modal split - Passenger transport (Billion passenger-kilometres/%) in 2019*	
Bus & Coaches	4%
Cars, vans and taxis	84%
Motorcycles	1%
Pedal cycles	1%
All road	89%
Rail	9.9%
Air	1.1%
All modes of transport	100%

Source: Department of Transport Statistics[334]
**Table and figures reproduced by the author*

Passenger transport is largely dominated by road transport (89%), notably private motorized means of transport (84%). Rail transport only accounts for nearly 10%.

Table 2 - Division of distance travelled per transport mode

Division of distance travelled per transport mode in percentage (%) in 2019	
Walk	2.61
Bicycle	0.81
Car/van driver	49.04
Car/van passenger	27.75
Motorcycle	0.26
Other private transport	1.69
Bus in London	1.03

[330] Eurostat, Real GDP Growth Rate – Volume, 2021.
[331] Office for National Statistics, "Gross Domestic Product: Year on Year growth: CVM SA %", 31 March 2021.
[332] Office for National Statistics, "Gross Domestic Product: Quarter on Quarter growth: CVM SA %", 31 March 2021.
[333] European Commission, "European Economic Forecasts" – Spring 2021.
[334] Department for Transport Statistics, "Transport Statistics Great Britain: 2020 tables", Table TSGB0401, Passenger transport: by mode, annual from 1952, 17 December 2020.

Other local bus	2.49
Non-local bus	0.61
London underground	1.58
Surface rail	10.56
Taxi/minicab	0.84
Other public transport (air, ferries and light rail)	0.67
All modes	100

Source: Department of Transport Statistics[335]
**Table and calculation produced from absolute numbers*

Within private motorised means of transport, the use of car constitutes between 75 and 80% of distance travelled in the U.K in 2019. Private car remains then extremely dominant. Collective means of transport accounts for about 15%. Walking and cycling accounts for almost 4%.

Table 3 – Domestic freight transport (2017)

Transport mode	Goods moved (billion tonne kilometres)	Share (%) *
Road	154	78.57
Rail	17	8.67
Water	25	12.75
Pipeline	--	--
All modes	196	100

Source: Department of Transport Statistics[336]
**Table and calculation produced from absolute numbers*

Road freight accounts for almost 80% of domestic freight transport in the U.K, which is comparable to the other European countries.

Road infrastructure

In 2020, the U.K road network consisted of 3,735 kilometres of highways and 47,511 kilometres of main roads (called 'A' roads). The rest of the network consists in minor roads ('B', 'C' and 'U' roads), totalling 398,358 kilometres.[337] In 2019/2020, the U.K spent **£34,156 million in transport, of which £10,888 million in roads**.[338] Regarding **road maintenance** in 2018/2019, the country spent £960 millions in trunk motorways and trunk 'A' roads. Local authority roads have been granted £3,920 million as well.[339] According to national statistics,

[335] Department for Transport Statistics, "Average number of trips by purpose and main mode", Table TSGB0104, Average distance travelled by purpose and main mode: England, from 2002, 17 December 2020.
[336] Department for Transport Statistics, "Domestic freight transport, by mode: 1953 to 2019", Table TSGB0104, Goods moved (billion tonne kilometres), 17 December 2020.
[337] Department for Transport Statistics, "Road lengths (kilometres) by road type in Great Britain, 1914 – 2020", Table RDL0203, 4 February 2021.
[338] Department for Transport Statistics, "Public expenditure for transport by function", Table TSGB0118, UK Public Expenditure on Transport by function: from 2005/06, December 2020.
[339] Department for Transport Statistics, "Maintenance expenditure by road class, in England, from 2005/06 to 2018/19", Table RDC0310, 16th December 2019.

between 2 and 4% of main roads and motorways and 4 to 9% of non-principal roads should be considered for maintenance in 2018/2019.[340]

Modal split in comparison to EU27 (before Covid-19)

Passenger cars and alternative fuels

Car stock in the U.K is almost exclusively composed by petrol and diesel vehicles (97.6%). Alternative vehicles are still marginal.

*Table 4 – Licensed cars in the U.K per propulsion/fuel type (2019) **

Propulsion/fuel type	Registered cars (thousands)**	Share (%)
Petrol	19.236	58.5
Diesel	12.852	39.1
Hybrid Electric	521,9	1.6
Plug-in Hybrid Electric	146,5	0.4
Battery Electric	90,9	0.3
Range extended Electric	9,9	--
Fuel Cell Electric	0,2	--
Gas	25,6	0.1
Other	0,3	--
Total	32.884	100.0

Source: Department for Transport Statistics[341]
*Table and figures reproduced by the author
**Figures have been rounded down to the nearest units

*Table 5 – Registered cars in the U.K per propulsion/fuel type (2019) **

Propulsion/fuel type	Share (%)	
Petrol	65.3	91.7
Diesel	26.4	
Hybrid Electric	4.9	8.4
Plug-in Hybrid Electric	1.5	
Battery Electric	0.3	
Range extended Electric	1.7	
Fuel Cell Electric	--	
Gas	--	
Other	--	
Total	100.0	100.0

Source: Department for Transport Statistics[342]
*Table and figures reproduced by the author
**Figures have been rounded down to the nearest unit

[340] Department for Transport Statistics, "Principal and non-principal classified roads where maintenance should be considered (categorised as red), by Region in England, 2007/08 to 2018/19", Table RDC0121, 03 October 2019.
[341] Department for Transport Statistics, "Licensed cars by propulsion or fuel type: Great Britain and United Kingdom", Table VEH0203, 09 December 2020.
[342] Department for Transport Statistics, "Cars registered for the first time by propulsion and fuel type: Great Britain and United Kingdom ", Table VEH0253, 09 December 2020.

In 2019, alternative fuels (all vehicles powered by other source than petrol and diesel) constituted 8.4% of registrations. However, it counted for 18.4% of vehicles registrations in 2020 (Q4 not included yet).

Cycling and walking

In 2019, according to national statistics, **cycling represented 2% of all trips made and 1% of the distance travelled in England**. 36% of cycling trips were for commuting and 34% for leisure purposes. Over one on ten cycled at least once a week.[343]

In 2019, according to national statistics, **walking represented 26% of all trips made and 3% of the distance travelled in England**. 24% of walking trips were just for walking and 21% for education purposes. At least seven citizens out of ten walked at least once a week.[344]

Mobility behaviours considering the COVID-19 pandemic

General data

The Transport Committee of the U.K Parliament is working on the implications of COVID-19 pandemic on transport issues. The Independent Transport Commission, a research charity[345], released a written evidence in October 2020. According to this Commission, **the COVID-19 crisis accelerated pre-existing trends** in the transport field:

- ***As teleworking increased**, fewer commuters needed to travel to the office five days a week*.
- ***Increased take-up of active travel options**, including walking and cycling, as well as semi-active modes such as e-bikes and e-scooters.*
- ***A significant increment in online shopping**, causing increased use of Light Goods Vehicles (LGVs) in urban areas, and a corresponding fall in retail visits and bus use (for which shopping is the main journey purpose).*
- ***The provision of sophisticated real-time journey information systems**, e.g. to show train/bus loading, timetable changes and alternative travel choices".*
- Fear of infection encouraged the use of private transport means to the detriment of public transport. Make public transport more attractive is an issue in the upcoming months, as highlighted in the report: "..*the longer people avoid public transport, the harder it will be to prevent long-term modal shift towards the car*.."
- It is not sure that the increase of walking and cycling use will become permanent in long-term, considering winter conditions. Semi-active means of transport could be a better shift for some journeys compared to private cars.
- Urban and spatial planning concerns are observed, notably in terms of redefinition of urban areas to lower the attractiveness of private vehicles use and to encourage active modes (walking, cycling), especially through "***changes in road space design***".

For a broader perspective in the policy area, the Commission indicated that "…***investment in transport infrastructure will be essential to help our public transport networks recover from the crisis*** [and that] *transport operators will also need public sector assistance to recover from*

[343] Department for Transport, Statistical Release, "Walking and Cycling Statistics, England: 2019", 05 December 2020.
[344] Department for Transport, Statistical Release, "Walking and Cycling Statistics, England: 2019", 05 December 2020
[345] Transport Committee (U.K Parliament), Coronavirus: Implications for transport, "Written evidence n°CIT0238", 16 December 2020.

the worst crisis in recent history with a massive reduction in passenger numbers travelling. Otherwise, the risk is a rapid contraction in the travel services provided…". Those policy recommendations target mainly public transport issues.

Alternative fuel vehicles

According to the European Automobile Manufacturers Associations (ACEA), alternative fuels vehicles registrations **rose by 70.5% between 2019 and 2020**, from 246 thousand units to 394 units, comprising mainly electrically chargeable vehicles and hybrid electric vehicles[346]. It is a bit below the EU-17 average (+76.1%).

On public charging points, the U.K knew a 17.87% increase of normal charging points and a 24.22% increase on fast charging points between 2019 and 2020. In absolute numbers, the U.K is one of the best countries when it comes to charging points deployment compared to its EU neighbours (France, Germany).

Table 6 - Evolution of the number of available public charging points (normal and fast) in the EU and the UK (2019-2020)

Countries	Normal power public recharging points (<=22kW)		Variation		High-power public recharging points (>22kW)		Variation		Total normal and high-power public recharging points		Variation
	2019	2020	Absolute variation	(%)	2019	2020	Absolute variation	(%)	2019	2020	(%)
EU-27	**148,880**	**199,250**	**50,370**	**25,28**	**15,136**	**25,288**	**10,152**	**40,15**	**164,016**	**224,538**	**26,95**
U. K	22,359	27,222	4,863	17,87	4,735	6,248	1,513	24,22	27,094	33,470	19,05

Source: European Alternative Fuels Observatory

Collective mobility

Public transport was the most impacted mean of transport by the COVID-19 pandemic, due to fear of contagion and mobility restrictions. The use of national rail and London Tube transport decreased by **75% up to 95% at spring 2020**. It never recovered its 'normal' occupancy rate above 50%, except between September and December 2020 for London Tube transport. Bus use in the rest of the country shows comparable figures.[347]

The Transport Committee of the House of Commons opened an inquiry in July 2020 entitled "*Reforming public transport after the pandemic*".

The main transport operator Transport for London (TFL) and the Government reached a deal in October 2020 to support TFL's services until March 2021. It mainly consists in a **£1.8 billion grant** from the Government to TFL. As said by the Mayor of London, Sadiq Khan, "*…the only reason TfL needs government support is because its fares income has almost dried up since March…*".[348]

[346] European Automobile Manufacturers Association (ACEA), "New Passenger Car Registrations by Fuel Type in The European Union Quarter 4 2020", 04 February 2021.
[347] Department for Transport Statistics, "Use of transport modes: Great Britain, since 1 March 2020", 07 April 2021.
[348] Greater London Authority 2021, "What has the impact of the pandemic been on TfL's finances?", Accessed on 14 April 2021.

The government also supported bus and trams services across the country, severely affected by the COVID-19 crisis as well, by giving an extra support of £256 million in August 2020 to keep those services running until September 2020. At this date, the total funding has reached about **£700 million**.[349]

Public transport operators depend mainly on fares paid by the users. The drop induced by the mobility restrictions and the private mobility preference due to health caution by the users severely impacted these operators, putting their financial situation at risk.

Cycling and walking

Cycling knew of course a rise in 2020 during lockdown periods. According to Cycling Scotland, cycle use was 43% higher between March and August 2020 compared to the same period in 2019[350]. Likewise, Transport for London counted a 7% cycling increase in inner London and 22% in outer London compared to spring 2019.[351]

According to the BBC, walking and cycling have increased in 2020 due to the COVID-19 pandemic. Through the latest data provided by Strava in February 2021, "*…there were 6.3 times more walkers in London and the South East compared to the same time last year…*" and "*…research suggests cycling has increased by more than 35% in London and by nearly 50% in the South East…*".[352]

Road freight transport

According to the latest statistics, road freight transport has been affected in 2020, probably by the COVID-19 context. From June 2019 to June 2020, for the **domestic road freight transport**, the amount of goods lifted and moved respectively **decreased by 8 and 10%. For international road freight transport**, the statistics show a **23 and a 26% decrease on the same items**.[353]

2. British Recovery Plan

As the **UK left the European Union on 1st January 2021**, following the 2020 transition agreement on the UK's exit from the EU, the country does not take part into the European Recovery Plan and its mechanisms.

Recovery Plan

The U.K as such does not disclose a national economic recovery plan. The government is currently working on it[354]. However, the Prime Minister Boris Johnson announced late June 2020 a "New Deal" with a "Build, build, build" slogan, putting infrastructure at the core of economic and growth strategy. **A £5 billion of capital in investment projects** was then

[349] Department for Transport, "Government extends coronavirus support for buses and trams, total funding tops £700 million", 08 August 2020.
[350] Cycling Scotland, "Six-month stats see cycling up 43% in Scotland", 23 September 2020.
[351] Transport for London, "Outer London sees 22 per cent rise in cycling as new data shows vital role in active travel", 27 January 2021.
[352] Tom Edwards, BBC, "Covid: Data shows rise in Londoners walking, running and cycling in lockdown", 26 March 2021.
[353] Department for Transport, "Road freight statistics: July 2019 to June 2020", 26 January 2021.
[354] Reuters, "British government working on COVID recovery plan for economy, says source", 31 January 2021.

proposed, including £1.5 billion for health infrastructure and **£100 million in 2020 for 29 projects in the British road network**.[355]

The Cabinet Office released its Covid-19 response for spring 2021 at the end of February 2021. The Government assumed to have "…***spent over £280 billion to support people's jobs, businesses, and public services across the UK***…" since the beginning of the Covid crisis in March 2020.[356]

Nations within the U.K already proposed some recovery strategies or guidelines:

- The Scottish government announced an economic recovery plan in August 2020 as well. Here again, core measures are to support employment and businesses through a **£50 million fund job guarantee for young people and a Transition Training Fund**.[357]

- The Welsh Government issued in October 2020 a policy paper, "*COVID-19 reconstruction: challenges and priorities*"[358] in which it established both short-term and long-term objectives. Concerning the recovery phase, several objectives were listed :

  - Reduce unemployment caused by the COVID-19 crisis
  - Focus education and employability for young people
  - Invest in social and quality housing
  - Channel investment in local town centres
  - Keep a strong decarbonisation and sustainable agenda – to be achieved according to a new Wales Transport Strategy
  - Develop an independent and resilient Welsh economic growth, considering the post-Brexit scenario
  - Support National Health Service (NHS)

- North Ireland's Department for the Economy proposed a £290 million economic recovery action plan for 2021-2022 as well, based on 4 pillars[359]:
  - R&D and innovation (£20 million)
  - Greener economy (£20 million) – filling transport demand with hydrogen technologies
  - Highly skilled and agile workforce (£50 million)
  - Investment, trade, and export (£200 million)

Climate objectives

The U.K passed a Climate Change Act in 2008 which sets binding objectives on climate policy in a broad sense for the country. The Act has been revised in 2019. The Act states that:

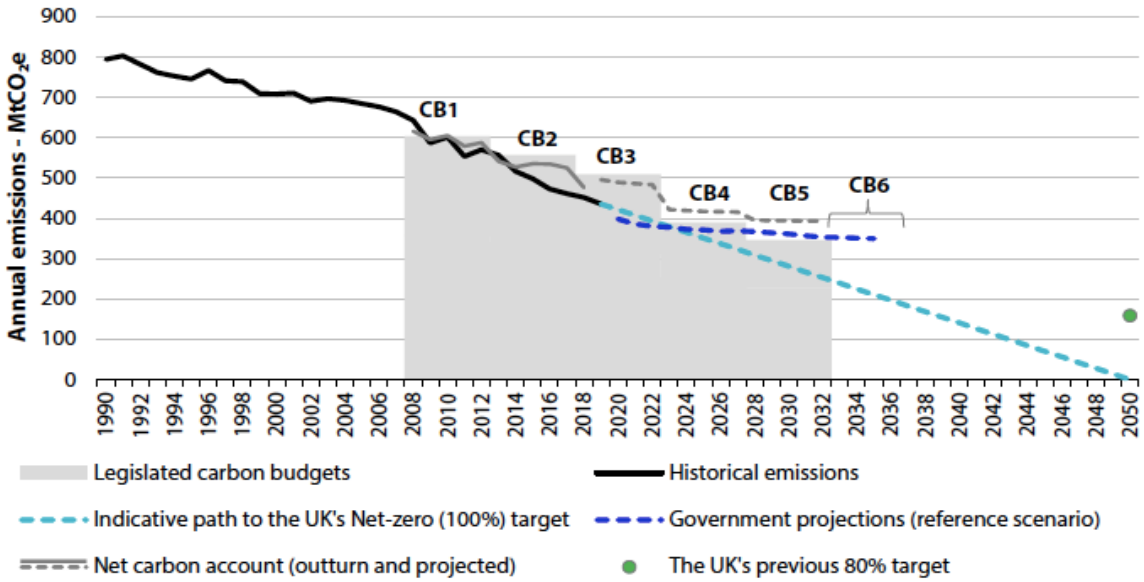
- **The U.K emissions in 2050 will be reduced by 100% compared to 1990 levels (Net Zero target acted in 2019)**
- To that end, the Government provides **5-years "carbon budgets"** which set the maximum carbon emissions allowed for each period which must not be exceeded.

[355] Prime Minister's Office, 10 Downing Street, "'Build build build': Prime Minister announces New Deal for Britain", 30 June 2020.
[356] Cabinet Office, "Guidance COVID-19 Response - Spring 2021", 22 February 2021.
[357] BBC, "Coronavirus in Scotland: Economic recovery plan announced", 05 August 2020.
[358] Welsh Government, "COVID-19 reconstruction: challenges and priorities", 06 October 2020.
[359] Northern Ireland Government, Department for the Economy, "Economic Recovery Action Plan", 25 February 2021.

- The **Committee on Climate Change (CCC)** was established through the Act. It advises the government, proposes carbon budgets, provides future policies and investment objectives for a decade in advance and reports yearly before the Parliament on progresses made.
- The government already agreed on 5 carbon budgets, from 2008 to 2032.[360]

Figure 1 – Emissions pathways to carbon budgets and the Net Zero target

Figure 1.1. Emissions pathways to carbon budgets and the Net Zero target



Source: CCC analysis based on BEIS (2019) *Updated energy and emissions projections 2018*, and BEIS (2020) *Provisional UK greenhouse gas emissions national statistics 2019.*
Notes: 'CB' = Carbon Budget'. The Sixth Carbon Budget period covers 2033-2037. Greenhouse gas (GHG) emissions are shown on a total ('actual') basis, while carbon budgets are assessed against the 'net carbon account' (Box 2.3). Emissions from International Aviation and Shipping (IAS) are not included in this figure, but would either also need to reach zero emissions by 2050 or will have to be fully offset by verifiable removals. Government projections are for total gross UK GHG emissions, not for the 'net carbon account', against which the first five carbon budgets are measured. Outturn GHG emissions are based on the latest BEIS publication and therefore do not account for forthcoming revisions to peatland emissions or global warming potentials.

Source: Committee on Climate Change

In its latest report presented before the Parliament[361] in which UK's progresses where highlighted, the CCC sat out several recommendations regarding transport and infrastructure policies:

- **Promoting active and public transport by investing in walking/cycling infrastructure**, public transport, supporting active modes of transport through grants schemes, set any measures to "*reduce car travel demand*" and "*improve infrastructure connectivity to lock-in positive behaviours that reduce travel demand (e.g. home-working)*"
- **Banning "*new petrol/diesel and plug-in hybrid car/van sales to 2032 at the latest*"**

[360] Energy and Climate Intelligence Unit, "How is the UK tackling climate change?", Accessed 15 April 2021.
[361] Committee on Climate Change, "Reducing UK emissions Progress Report to Parliament", 25 June 2020.

- Introducing **"*a Zero Emission Vehicle Mandate requiring increasing shares of sales to be zero-carbon, reaching 100% by 2032 at the latest*"** and **"*continue to support EV infrastructure*"**
- "*Set out and **implement a strategy to transition to zero-carbon freight, including stronger purchase incentives, infrastructure plans and clean air zones**. Evaluate schemes to reduce HGV and van use in urban areas (e.g. e-cargo bikes and use of urban consolidation centres), to reduce traffic and improve the safety of active travel."*
- ***Testing zero emission HGVs to establish which is the most suitable and cost-effective technology for the UK***."
- "*Ensuring that **the forthcoming National Infrastructure Strategy is fully consistent with the UK's Net Zero and climate adaptation objectives**, in particular on buildings' energy efficiency, where funding is likely to be needed beyond manifesto commitments*"
- "***Developing a strategy for low-carbon hydrogen use** (across power, industry, transport and buildings), production and infrastructure, aiming to start large scale hydrogen tests in the early 2020s*."
- "*Integrating Net Zero into all policy making processes, and **ensuring that procurement strategies are consistent with the UK's climate objectives***"

The British government proposed in December 2020 a new climate target aiming **to reduce at least UK's GHG emissions by 68% by 2030**[362].

3. Existing mobility strategies

On the road infrastructure side, the **Road Investment Strategy 2 (RIS 2)** has been released in April 2020[363]. It establishes a five-years plan and strategy in managing the national road network for 2020-2025. The RIS 2 covers the Strategic Road Network (SRN), composed of motorways and "A" roads, which are under national supervision by Highways England.

Main strategic objectives of the RIS 2 on the SRN by 2050 are:

- **Supporting the economy through SRN**: keeping and enhancing the road network service and quality in the whole country for commuters and freight transport where road service is at the core of economic growth.
- **Meeting green objectives**: delivering "*The Road to Zero*" strategy commitments (end the sale of new conventional petrol and diesel cars and vans by 2040 and steps to decarbonise freight), improving air quality, investing in active mobility (bus, cycling) notably in urban areas (Transforming Cities Funds, the National Cycling Network), supporting the deployment of a charging point network on the SRN and removing congestion key-points.
- **Increasing safety and reliability of the network**: continuing to reduce the number of road deaths and injuries near to zero by 2040 by preventing, analysing, and better understanding road collisions and human errors through road design, management and use of data.

[362] Department for Business, Energy & Industrial Strategy, Prime Minister's Office, 10 Downing Street, The Rt Hon Alok Sharma MP, and The Rt Hon Boris Johnson MP, "UK sets ambitious new climate target ahead of UN Summit", 03 December 2020.
[363] Department for Transport, "Road Investment Strategy 2 : 2020-2025", 16 April 2020.

- "***A more integrated network***": strengthening connections between the SRN and other parts of the transport network (urban connections, international journeys, freight, and logistics schemes) to understand and anticipate road users' expectations.
- "***A smarter network***": making the best use of technological trends and digital improvements to better connect the SRN to the local road networks and to ensure that highways will be ready for connected and autonomous vehicles.

The total investment's plan proposed by the government is propose in the chart below, in which maintenance remains an important part of the planned expenditure by 2025:

Figure 2 – RIS 2 Statement of Funds available

Item (£000's)		2020/21	2021/22	2022/23	2023/24	2024/25	RP2 Total
Operations, maintenance renewals and business costs	Resource	1,201	1,160	1,199	1,221	1,293	**6,074**
	Capital	1,098	1,145	1,113	1,276	1,193	**5,825**
Capital enhancements		2,475	3,076	2,980	2,885	2,702	**14,118**
Designated funds		159	169	174	184	184	**870**
Preparing for RIS3		39	59	107	142	124	**472**
RIS2 Total		**4,973**	**5,609**	**5,572**	**5,708**	**5,496**	**27,358**

Source: Department for Transport, "Road Investment Strategy 2: 2020-2025"

The government will also publish a complete plan for transport decarbonisation by 2050 called "**The Transport Decarbonisation Plan" (TDP)**. The plan aims to integrate the different transport systems and means in order to coordinate all existing and sectoral transport strategies and deliver a net zero transport sector in each transport area by 2050. A policy paper about the TDP development has already been released, highlighting how the plan will be proposed and designed in 2021. The policy paper also provides the current state of transport emissions and current policies on each transport mode. The final version will be released in autumn.[364]

Existing mobility and transport strategies from 2018 and 2019 target traditional modes of transport such as the Road to Zero Strategy, the Cycling and Walking Investment Strategy, the Urban Strategy, the Renewable Transport Fund Obligation (amendments in 2018).

The Department for Transport and the Department for Business jointly created the **Office for Low Emissions Vehicles** in November 2019 (now the Office for Zero Emission Vehicles) which deals and coordinates e-mobility policies. Within the same framework, the **Centre for Connected and Autonomous Vehicles (CCAV)** supports since 2015 the development of automated and connected mobility and leads the Future of Transport Strategy.

The Future of Transport Strategy is one of the four "Grand Challenges" identified in the UK's government Industrial Strategy. Its mission is to put "*the UK at the forefront of the design and manufacturing of zero emission vehicles, with all new cars and vans effectively zero emission by 2040*"[365]. It is updated of progresses made insofar in this Challenge. The most important elements are the Road to Zero Strategy and the clear support and funding to electric mobility.

[364] Department for Transport, "Decarbonising transport: setting the challenge", 07 December 2020.
[365] Department for Business, Energy and Industrial Strategy, "The Grand Challenge missions", 26 January 2021.

National Infrastructure Strategy

The Government presented the National Infrastructure Strategy in November 2020[366]. This wide Strategy takes into account all commitments for infrastructure upgrades and developments made by the Government, in coherence with related and sectoral existing strategies. Regarding the construction sector and road infrastructure, several assumptions can be made from this Strategy:

- The UK's government assumes that investing in infrastructure over the long-term is one of the keys in ensuring economic growth and put the Union on track in decarbonising several sectors. Working on the country's recovery, **£27 billion are proposed in economic infrastructure in 2021-2022**.
- As the recovery should benefit for all nations in the United Kingdom, **general commitments are made in the transport area**:
  - £5 billion to upgrade bus services and cycling infrastructure
  - £4.2 billion for large urban areas (outside London) to provide "*intra-city transports settlements"*
- On road infrastructure, the Strategy recalls that transport infrastructure is largely devolved across the Union (Northern Ireland, Scotland, Wales) and under local administration responsibility. Several local projects are proposed across the UK regarding transport policies and targeted plans.
- The aim of the Strategy is **to channel investments towards local infrastructure** through:
  - **£1.125 billion of local roads maintenance funding in 2021-2022**, of which £500 millions dedicated to potholes and resurfacing roads.
  - *"£260 million allocated to Local Authorities in 2021-22 for shovel-ready local transport schemes through the Integrated Transport Block, including public transport and active travel upgrades*".
  - *"£310 million in 2021-22 in upgrading the road network reducing congestion and making it better able to cope with demand by adding capacity"*
  - The Government assumes that it *"will make the largest ever investment in England's strategic roads - **£27.5 billion over this Parliament, a 60% increase on spending in the last five years**".*
  - Charging infrastructure on the A road network is also considered as a key investment in decarbonising road transport. The Strategy aims to deliver high and fast charging points in "*every motorway service*" installed by the private sector by 2023. In achieving this objective, "*the government will invest £950 million in future proof in grid capacity along motorways and key A roads to prepare for 100% uptake of zero emission cars and vans ahead of need*".
- Investments in digital infrastructure are to be noted as well where 16.000 additional kilometres of roads will be 4G covered by 2026.
- Roads are also considering as one of the investments to "*unlock*" housing in the £7.1 billion National Home Building Fund, unless it is not detailed in the Strategy.
- The Strategy highlights the willingness **to accelerate infrastructure projects process by pinpointing the A66 upgrade project,** an important freight transport corridor connecting North East and North West, by reducing the construction phase from 10 to

[366] HM Treasury, "National Infrastructure Strategy", November 2020.

5 years. From this example, the Government develops its "Project Speed" comprising several actions such as:

- "*Reforming infrastructure planning and better environmental regulations*"
- "*Simplifying procurement regulations and modernising the construction sector*": the Strategy deals more precisely on this point for the construction sector ans proposes a simplified procurement regime where main guidelines are exposed (before the publication of a green paper by the Government.
- "*More effective decision making*"

Forecasts on the construction sector

According to national statistics, the British construction industry has been severely hit by the pandemic. Between February 2020 and April 2020, **production dropped by 43.6%,** notably 24.1% in infrastructure works and 30.4% in repair and maintenance works excluding housing. By contrast, the production figures concerning the period between February 2020 and February 2021 are way less negative. Total construction production shows a **4.3% fall on the period**, but a growth of 4.0% for infrastructure works and 2.8% for repair and maintenance works excluding housing.[367]Even if the recovery is encouraging, some construction actors are worried, such as Gareth Belsham, director of property consultancy Naismiths, who stated in Construction News: "*Strong progress across the industry as a whole is creating growing pains, with materials prices surging as the supply chain struggles to keep up with demand*".[368]

Tables and figures

[367] Office for National Statistics - Construction Output and Employment, "Construction output in Great Britain: February 2021", 13 February 2021.
[368] David Price, "Construction News Construction growth resumes in February following dip", 13 April 2021.

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General Data

Political organisation: Constitutional monarchy and parliamentary regime	**Head of government**: Boris Johnson
Population (2015): 66 million	**Urban population** (2019): 83.65%

Economic indicators

GDP ranking (2019): 7/203	**GDP** (2019): 2.829,108 million USD
GDP growth (2019): 1.4%	**Expected GDP growth** (2020): 5.3%

Environmental indicators

Share in global CO_2 emissions (2018): 1%

Total CO_2 emissions (2019): 339MT

CO_2 emissions per capita (2019): 5.1T

Transport & Mobility sector

Modal share of passenger transport (2018):

- Private car: 86.3%
- Train: 8.9 %
- Bus and trolleys: 4.7%

Modal share of freight transport (2018):

- Roads: 90.5%
- Railways, inland waterways: 9.5%
- Railways: 9.4%

Construction sector

Construction sector GDP share (2018): 6.0%

Jobs in the construction sector (2019): 2.4 million

Businesses in the construction sector (2019): 343.000

Part III: Comparative analysis

Impact of Covid-19 crisis over transport and mobility sectors

The emergence of Covid-19 was first identified on 30 December 2019 and declared a global pandemic by the World Health Organization on 11 March 2020. Cases rapidly spread, initially mainly in China during January, but quickly expanding to South Korea, Japan, Europe (mainly Italy, France and Spain) and the United States between late January and mid-February 2020, before reaching global proportions by the time the pandemic was declared. Increasingly stringent measures were put in place by world governments in an effort, initially, to isolate cases and stop the transmission of the virus, and later to slow down its rate of spread. The measures imposed were ramped up from the isolation of symptomatic individuals to the ban of mass gatherings, mandatory closure of schools and also mandatory home lockdown[369].

The pause in non-essential activities in some EU member states and the decrease in retailing had a visible impact in certain segments of transport, distribution and logistics which will be summarized below.

Recovery perspectives

Demand for transport and mobility services will probably rebound once restriction measures are removed and activity gradually recovers. Nevertheless, the rate of recovery will vary across transport modes and member states and will depend to a large extent on:

- the **speed** of economic recovery.
- the **cost** of the measures to support it and the changes in the supply.
- the **demand** of transport services as a result of the direct and indirect impacts of the pandemic.

According to the European Commission, a clear picture of the full impacts will, most likely, not be possible before the end of 2021 and the repercussions will be probably still visible at least 3 years after the crisis[370].

Impact of health-related measures on passenger transport

At least for the first months of the gradual return to normality, limits to the number and density of passengers and personnel in vehicles, vessels and aircraft (and stations, ports and airports) should be expected. The drawbacks would be the cost increase and service limitations for transport operators, and the added inconvenience for transport users.

Based on a case study in the Netherlands, it is estimated that physical distancing is estimated to cut transit capacity to 15 to 25% of normal levels but use of personal protective equipment could increase capacity to 40% of pre Covid-19 levels[371].

Investment perspectives

A lower investment in transport infrastructure, equipment and services may be envisaged. Public budgets will be channelled towards the post-pandemic crisis mitigation and the private sector may be facing liquidity problems, in both cases limiting the amounts available for transport related investments. The construction of transport infrastructure and the technology-led innovation in vehicle manufacturing are two sectors with

[369] Le Quéré, C., Jackson, R.B., Jones, M.W. *et al.* Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement. *Nat. Clim. Chang.* 10, 647–653 (2020).
[370] European Commission 2020: Future of Transport: Update on the economic impacts of COVID-19. In: Science for Policy Briefs.
[371] McKinsey & Company 2020: Restoring public transit amid COVID-19: What European cities can learn from one another.

a large economic impact in the EU that may strongly be affected by a financial crisis. In addition, lack of funding or risk aversion may limit the prospects of innovation in a number of emerging technologies and applications in transport, including the start-up ecosystem of new mobility options and business models.

Environmental impact

Before the Covid-19 health crisis, it was already acknowledged that the improvement of transport governance and the development of innovative mobility solutions will be crucial to ensure that the future of transport is cleaner and more equitable than its car-centred present. The response to the Covid-19 pandemic and the recovery path in its aftermath can influence the evolution of the various factors and make the need for improved governance and innovativeness even more urgent.

Evolution of the traffic volume by modes of transport in the medium and long term (2030-2050)

The Covid-19 pandemic is projected to lead to **lower total passenger transport activity** of about 4% by 2030 and 2050 relative to the pre-Covid-19 pandemic situation, despite strong recovery starting in 2021:

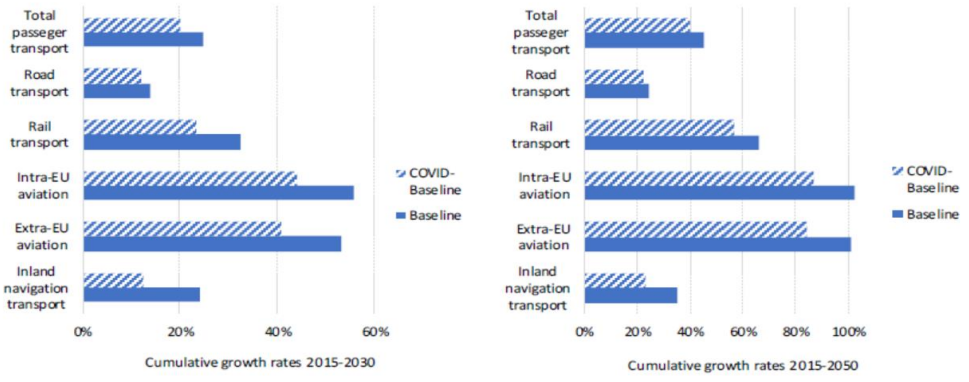
Air transport would be most affected, driven by the reduced business travel and more domestic tourism relative to the pre-Covid-19 pandemic situation.

Rail and public transport would be impacted by less commuting, and preference given to individual transport modes;

Road transport would be the least affected in the medium to long term.

Comparison between the growth in transport activity, by transport mode, in the Baseline and the Covid-Baseline scenarios[372]

Figure 8: Passenger transport activity in the Baseline and the COVID-Baseline scenarios (cumulative growth rates for 2015-2030 and 2015-2050)



Source: Baseline scenario, PRIMES-TREMOVE transport model (E3Modelling)

[372] **European Commission 2020**: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

Passenger car traffic

Figures defer according to the different studies. When looking at trends in the number of direction queries on Apple's and Google's navigation app (62 countries and 89 cities included), the drop in driving reached -65% during the first wave of the pandemic.

Recovery

Google's and Apple's data highlight that, by now, private car transport has more than recovered, and an increase in the use of private cars has been noticed, e.g., switching from public transport to cars for fear of catching the virus[373].

Zoom on the electric vehicle (EV) market

The EV market was less impacted as the market share of EVs rose in the EU. **The long-term outlook for the EV market is likely to remain positive** despite the Covid-19 crisis only if clean mobility remains a main policy priority, notably through ecological stimulus packages reflecting e-mobility as a driver of broader innovation. EVs would thus be conditioned by politically induced stimulus according to the International Transport Forum (ITF).

In the short-term, the implementation of policies aiming at transport decarbonisation may be delayed, as suggested by European Car Industry in a letter to the European Commission, because of the constraints for consumers to borrow capital and the fall in oil prices and the mobility restrictions that lower the cost of driving and make EVs less attractive. Car manufacturers may decide to reduce or delay investment in EV technologies.

In the long term however, self-reinforcing cost reduction of EV production will persist (increasing scale of battery production/technological improvements). Besides, it is expected that oil prices will recover.

It can be deduced that **increased public debt as a result of stimulus programmes can be compensated by policies designed to help recover government revenues** through taxes for carbon intensive vehicles, bonus, malus schemes, tax revenues on environmental performance, fixed charges for road use[374].

Zoom on ride hailing (Examples from the United States and Europe)

The use of shared mobility services decreased dramatically during and immediately after the first lockdown in the US and in Europe, while citizens prefer(red) private vehicles such as cars and bicycles, but also walking.

In the US for example, Lyft and Uber have seen ridership reduced by 70% to 80% since the pandemic began. This led Uber to report a US$1.8 billion loss during second quarter 2020. During that same period, Lyft lost US$ 0.4 billion. Both companies have also cut considerable portions of their

[373] European Parliament 2020: COVID-19 and urban mobility: impacts and perspectives. In: In-Depth Analysis requested by the TRAN committee.
[374] ITF 2020: Covid-19 Transport Brief. Electric mobility: Taking Pulse in Times of Coronavirus. 27 April 2020. In: OECD 2020.

workforces, with Uber letting go 14% of employees and Lyft letting go 17% respectively.

Recovery

Many rideshare companies have meanwhile focused on food delivery, but pockets of recovery in ridesharing are evident.

Between passenger car operators such as car-rental, ridesharing, and other parties (for example, car manufacturers, tech companies), **mobility will likely enter a new phase of partnerships and disruption amid Covid-19 consequences**. Car ownership has been declining in most major markets for many years now, but with increased worries of taking public transport, this might be reversed. In contrast, the advantages induced by Covid-19 of less congestion, quieter streets, and reduced air pollution could result in a harder push toward more environmentally friendly transportation alternative[375].

Public transport

When looking at trends in the number of direction queries on Apple's navigation app, **public transport reached the lowest point of -76% in Apr**il[376].

Public transport is likely to continue to be affected, especially in regions where quarantine measures have reappeared. As of 15 November 2020, the mobility trends for public transport hubs (subway, bus and train stations) were -46 % in Netherlands, -45% in Italy, -28% in Spain, Germany and -46% in France compared to the pre-pandemic baseline.

Nevertheless, most public transport companies – whether public or private – maintained a high level of service where possible (between 70 and 100% of the normal offer). Although there is new and growing evidence that public transport riders do not face higher infection risk than non-riders, public transport authorities have had to take supplementary measures for disinfection and mask provision to reduce risk for workers and passengers, incurring extra costs. In addition, the need to ensure physical distancing severely reduced capacity, which led the public authorities in several countries to appeal to citizens not to use public transport (for instance to keep it free for essential workers and those without alternatives). This appears to have contributed to a general public concern about the safety of using public transport during the pandemic.

Consequences on public transport activity

The Covid-19 pandemic **has led to a shift to individual modes of transport**, with walking and cycling often being the preferred mode in many cities.

Continued stagnation in public transport use in many cities.

New shared mobility services, such as e-bikes, e-scooters, shared cars, **experienced drastic reductions of service in quarantine areas** and in several cities have been slow to re-emerge even as movement

[375] Skift Research / McKinsey & Company 2020: The travel industry turned upside down. Insights, Analysis and Actions for Travel Executives.

[376] European Parliament 2020: COVID-19 and urban mobility: impacts and perspectives. In: In-Depth Analysis requested by the TRAN committee.

restrictions were raised. The business models of many companies offering shared mobility services already involved long periods of loss-making and some of them may be driven (close) to bankruptcy or to change their business model[377].

Passenger rail

High Speed and conventional rail face -to a certain extent- similar challenges than public transport. However, rail may benefit from the substitution effect of trips not realized by air. However, trips that require indirect connections through intermediate stations or combinations of more than one transport modes are likely to be less attractive to travellers.

Railways have experienced significant disruption due to the Covid-19 pandemic, with a huge drop in passenger mobility:

During the peak of the crisis **ridership went down by more than 90%** in several countries and many international connections were stopped.

After the drop of turnover by 35% observed during the first semester, there has been a significant improvement of the situation in July and August, but **pre-crisis levels are still far from having been reached** (July: -28% compared to same month of previous year; August: -27%).

However, **the trend is not maintained as demonstrated by the figures of turnover losses in September** with -29%, due to the second wave of the pandemic hitting countries across the EU and the expected impact on rail passenger travel. Smaller independent operators are particularly badly hit and, according to their association ALLRAIL, have so far not benefited from State aid to the same extent as incumbent operators.

Compared with the second quarter of 2019, **the number of rail passengers at least halved in a vast majority of EU**

Drop in rail passengers in the second quarter of 2020 compared to the second quarter of 2019 in the studied countries

[377] European Commission 2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

Member States with available data in the second quarter 2020[378].

Cycling and other forms of micromobility (shared mobility, walking etc.)

In April, walking decreased by -67% according to trends in the number of direction queries on Apple's navigation app on a global level.

Bike sales have experienced a boom almost everywhere: in the UK for example, year on year sales increased +677%. According to the Covid-19 Cycling Measures Tracker, a tool created by the European Cyclists' Federation[379], many cities are showing strong leadership in reallocating public space to active mobility and governments around Europe are offering financial incentives to encourage cycling. The Covid-19 Cycling Measurement Tracker analyses nearly 300 cities in 23 European countries. It has revealed among others that:

A total of 1,221 km of new cycling and walking infrastructure have been announced

545 km are already rideable

€823,167,400 were allocated for cycling promotion

As measures are being implemented in a quick and ad hoc way, it may be complicated collecting reliable, comprehensive information on the status of the improvements challenging and caution is required by using and interpreting this data.

However, approaches towards cycling have not been uniform. In some countries, cycling has been restricted to the minimum necessary to carry out essential trips. In others, leisure cycling has been encouraged. The World Health Organization has encouraged people to walk, bicycle or use other forms of micromobility for exercise and for essential travel, as have many local and many national authorities (e.g., in Belgium, Denmark, Germany).

Consequences on micromobiliy's activity

Cities have recorded increased use of shared micromobility: as people abandoned public transport before strict lockdown. Many shared systems have been made free for use by health sector professionals and other essential workers.

Light individual transport (LIT) infrastructure and "*tactical urbanism*" interventions: Many cities have repurposed streets to provide safe room for pedestrians, cyclists and other forms of light, active mobility. These "emergency cycle lanes", also "Corona lanes" have made essential travel possible and safe for those displaced from public transport. Such interventions mobilise existing resources such as traffic cones, plastic bollards, construction separators and temporary lane markings. They are usually deployed under the same rules applying to construction-related traffic diversion.

Development of "safe streets" or "slow streets": by giving pedestrians, scooterists and cyclists priority, banning through traffic and lowering speed limits[380].

[378] European Commission 2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

[379] https://ecf.com/dashboard

[380] European Commission 2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions:

At the same time, Covid-19 has also revealed limitations to shared micromobiliy's business models and the regulatory approaches towards them. The economic pressure on operators caused by the precipitous drop in demand in some markets has sometimes been amplified by poorly designed or unfair regulations and charges levied on electric scooter and bike operators. In response, most operators have scaled down activity or pulled their fleet out of cities in order to limit expenditures[381]. Besides, new individual solutions accessible for those with disabilities and reduced mobility have not yet materialised and existing ones are expensive and limited in offer.

Freight transport

Indicators for freight demand

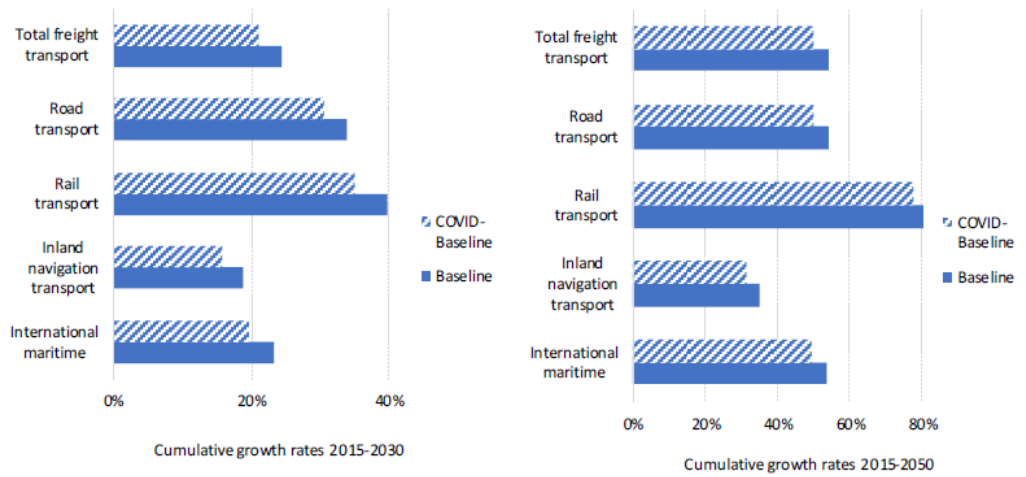
GDP growth: The growth of freight transport volumes tends to follow the rhythm of GDP growth. The volume of passenger-kilometres travelled in the EU-27 has grown quite steadily over the last ten years and picked up notably since 2014. The recovery after the extreme drop of activity due to the Covid-19 pandemic is projected to take a longer period of time, until pre-pandemic transport volumes are reached again.

Trade: The World Trade Organisation estimates world trade volumes to fall from 13 to 32% in 2020.

Road fuel use was down 11% for the year 2020, jet fuel down 33% and all other fuels down 7% in April compared to 2019, according to Rystad Energy[382].

The Covid-Baseline scenario forecasts lower contraction in the freight transport activity compared to the passenger transport activity. In the medium to long term, it also shows higher convergence to the pre-Covid-19 pandemic pace of growth compared to the passenger transport activity. **By 2030 and 2050, total freight**

Figure 9: Freight transport activity in the Baseline and COVID-Baseline scenarios (cumulative growth rates for 2015-2030 and 2015-2050)



Source: Baseline scenario, PRIMES-TREMOVE transport model (E3Modelling)

Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

[381] ITF 2020: Covid-19 Transport Brief. Re-spacing our cities for resilience. 3 May 2020. In OECD 2020.

[382] https://www.rystadenergy.com/newsevents/news/press-releases/covid-19-update-road-fuels-lead-global-oil-demand-recovery-in-2021-jet-fuel-still-feels-the-hangover/

transport activity would be less than 3% below its projected pre-Covid-19 pandemic levels. Furthermore, the projections show that the pandemic would not induce significant changes in the modal share's relative to the pre-Covid-19 pandemic. A comparison between the growth in transport activity, by transport mode, in the Baseline and the Covid-Baseline scenarios is provided in the figure below.

Focus on road freight transport

After major disruptions in road freight transport within the EU in the beginning of March, road freight transport gradually picked up starting in the second half of May 2020, according to real time indicators, such as German truck toll activity and pollution levels. By mid-July, German truck toll activity was already tracking closely its level over the same period of 2019 but has since failed to gain further momentum. Road traffic in France, Italy and Spain broadly flattened over July and September, stopping short of a full recovery. More recently, however, road traffic in both France and Italy has increased somewhat and now stands around 10% below its values for the same period of last year.

Focus on rail freight transport

Rail freight continued to run reliably throughout the pandemic, ensuring supply chains and suffering from much less disruption than other modes. Nonetheless, the impact of the Covid-19 pandemic caused an approximate **average decline in rail freight revenues of 15% across the EU-27** during the first half of 2020 and lost revenues of about EUR 48 million per week with a total estimated loss of EUR 1.25 billion accumulated over the first semester 2020.

Compared to pre-crisis levels, most Member States are still seeing important decreases in demand for road freight transport. **The International World Road Transport Union (IRU) estimates the goods transport losses to exceed EUR 800 billion globally.**

Consequences on freight transport activity

International supply chains may be shortened. In order to render them more robust against disruptions. **The widespread call for re-patriating value chains in the context of the Covid-19 pandemic might constitute another significant challenge for international trade flows in the near future**. Last mile freight distribution has proven to be an essential service during the lockdown.

E-commerce has been steadily growing and is predicted to increase further. In this context, **greater ease of purchase and returns can increase demand and foster a trend** towards more individualised, small-scale deliveries, leading to more freight transport.

Energy demand and the price of crude oil represent an important cost factor for the transport sector but can also have an effect on the choice of transport mode (depending on the oil dependency of different modes) and innovation, for example by affecting the economic attractiveness of alternative fuels or energy efficiency measures.

Rail infrastructure managers are as well impacted by the Covid-19 pandemic due to the reduction in traffic and the revenues it generates[383].

[383] European Commission 2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

Transport externalities

Reduction of CO2 emissions during the first lockdown

The findings are based on the evaluation of global mobility data from Google and Apple. The study assesses how 10 different greenhouse gases and air pollutants changed between February and June 2020 in 123 countries. They found that the drop off peaked in April, with CO2, nitrogen oxides and other emissions falling between 10-30% globally, mainly due to declines in surface transport.

The Covid-Baseline projections show that emissions from transport including international aviation but excluding international maritime would be 16% lower by 2030 compared to 2005, and 38% lower by 2050. Compared to 1990 however, this translates into 7% higher emissions by 2030 and only 21% lower emissions by 2050, due to high increases in transport emissions during the 1990s. This shows that after the sharp decline in CO2 emissions during the Covid-19 pandemic, existing policies would fall short in delivering the transport contribution to CO2 reductions under the European Green Deal and the 2030 Climate Target Plan[384].

Recovery: Surge in CO2 emissions

CO2 emissions have rebounded around the world as lockdown conditions have eased, raising fears that annual emissions of greenhouse gases could surge to higher than ever levels after the coronavirus pandemic. Emissions rebounded to within 5% of 2019 levels (range 1% to 8%) in early June as countries lifted or weakened their confinement policies. The impact on 2020 annual emissions depends on the duration of the confinement, with a low estimate of –4% (–2 to –7%) if pre-pandemic conditions return by mid-June, and a high estimate of –7% (–3 to –12%) if some restrictions remain worldwide until the end of 2020[385].

Examples of increased congestion levels

New car registrations in the UK rose by approximately 11% year-on-year in July with almost 175,000 sales, as the general public turned away from public transport in favour of personal vehicles. According to TomTom, the need for sudden regional lockdowns only increases the likelihood of congestion as roads are closed and traffic diverted. Ultimately, public authorities will have to step in to keep congestion under control and flatten the traffic curve[386].

Road fatalities

The number of road deaths fell by a third during lockdowns this spring where traffic was down by a half, according to indicative figures published by the International Transport Forum in its Road Safety Annual Report 2020. Reductions in traffic fatalities of 80% were recorded in three countries, and five countries saw crash fatalities fall by more than 50% in a comparison of April 2020 data with April 2019 for 20 countries.

In Europe, the strongest drops occurred in Italy (-79%). France reported a 40% reduction of road traffic deaths and a 44% reduction of serious injury crashes year-on-year for the month of March (the country

[384] European Commission 2020: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future.

[385] Integrated Carbon Observation System (ICOS) 2020: Supplementary data: Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement. Accessed: March 30, 2021.

[386] TTI 2020: The impact of Covid-19 on the future of mobility. September 2, 2020. Accessed: March 30, 2021.

went into a nationwide lockdown on 17 March).

ITF sees a relationship between sever lockdowns and highest numbers in drops. Eleven of the 20 countries included in the overview saw a reduction of 24% or more.

The drop in crash fatalities was steep, but not proportional to the fall in traffic. The number of road deaths fell by just under one third (32%) on average across all countries, while total kilometres driven decreased by more than half (-53%) in April 2020 compared to April 2019.

Experts consider a number of factors that could help explain this:

- Empty streets have led to more speeding and irresponsible behaviour. Several countries reported excessive speed as an issue during lockdown.
- While passenger cars were mostly off the street during lockdown, many trucks continued to operate. Crashes with heavy goods vehicle tend to be more serious than those involving cars.
- Enforcement of traffic rules may have been less strict, as the police focused on other pandemic-related priorities[387].

Economic consequences for mobility operators

Automotive industry

One the one hand drop in vehicle sales but the use of private car remains high. According to European Automobile Manufacturers' Association (ACEA), **EU-wide production losses due to factory shutdowns amount to at least 2,446,344 motor vehicles so far**. It includes passenger cars, trucks, vans, buses and coaches (status on 01/06/2020). Covid-19 led to a decline in car registrations across all major automotive markets.

However, many countries, fearful of the negative economic and employment impacts of the crisis on the automotive industry, are providing state aid to the sector.

This effectively means that the European Automobile Manufacturers' Association (ACEA) expects **car sales in the European Union to tumble by more than 3 million from 12.8 million units in 2019 to some 9.6 million units in 2020**.

Following the first shockwaves of the crisis between mid-March and May, the EU market has contracted by 41.5% so far this year. This situation is expected to ease to a certain extent in the coming months as lockdown and containment measures are lifted throughout the region. Nonetheless, in terms of volumes, ACEA's forecast for 2020 represents the lowest number of new cars sold since 2013.

Recovery perspectives

The European Automobile Manufacturers' Association (ACEA) and Eurelectric welcome the focus on infrastructure for electrically chargeable vehicles in the coronavirus recovery plan announced by the European Commission. The associations support **the goal of funding 1 million public charging points referred to in the plan**. However, they note that this objective was already part of the European Green Deal, and that it falls well below what will be required in reality. According to the Commission's own calculations, roughly **2.8 million publicly-available charging points will be needed by 2030 – some 15 times more than what is currently in place across the European Union**.

[387] ITF 2020: Covid-19 Transport Brief. Re-spacing our cities for resilience. 3 May 2020. In OECD 2020.

ACEA stresses the increasing urgency to revise the **EU's Alternative Fuels Infrastructure Directive (AFID).** This directive, which was adopted in 2014, is not in line with the technical development of electric vehicles or charging technologies and has also been suffering from poor implementation by member states. ACEA and Eurelectric are therefore calling on the Commission to accelerate its plans for the AFID review as part of the recovery plan for Europe. This revised directive should introduce **a much more ambitious approach for rolling out charging points and hydrogen refuelling stations across the entire European Union**. Infrastructure deployment (particularly across the TEN-T core and comprehensive networks and in urban areas) should be in line with the benchmarks for zero- and low-emission vehicles set by the EU for 2025 and 2030 and should consider the power classes of charging points and the charging capacities of vehicles. To boost demand after the dramatic collapse in vehicles sales seen in recent months, the EU recovery plan also foresees to promote '*clean fleet renewals*. A rapid action on infrastructure roll-out to give consumers confidence in purchasing an electric vehicle is needed, thereby ensuring that the fleet can be renewed in an environmentally friendly way[388].

Public Transport

The result will extend from the revenues generated by ticket sales and parking, to selling machines and transport fines. Transport for London for instance predicts that the financial implications of the coronavirus could be up to £500m. Deutsche Welle reports that the German taxi industry is reporting revenue losses of up to 40 percent and is responding by offering discounts to people with annual or monthly public transport passes[389].

What is considered safe by users

Apart from decreasing the trip frequency at individual level, the user preferences concerning transport modes and trip distances will also possibly change.

Public transport is especially vulnerable to the changing trends in society and technology. Emerging mobility technology and business models already threatened the role of public transport demand by shifting users to ride hailing services, shared mobility applications and micromobility solutions (electric bicycles, e-scooters, etc.).

In a post-pandemic situation, **it is possible that a part of the population will avoid public transport due to disease transmission concerns and opt for more individualistic forms of mobility**. Such behaviour can shift demand back to private cars, biking (conventional or electric), micro-mobility and even walking. But probably favouring own vehicles as opposed to shared mobility options.

"*Sharing economy*" services such as ride hailing, ride sharing and other emerging MaaS (Mobility as a Service) applications are therefore expected to face important viability problems as a result of the loss of income during the confinement period, and the decreased demand afterwards. Guidance provided by health authorities impact user behaviour as well[390].

[388] ACEA 2020: Auto makers and electricity sector call for rapid action on charging points under EU recovery plan. In: ACEA. June 9, 2020. Accessed: March 30, 2021.

[389] LAWRENCE, C. / GRANATH, E. 2020: What is the impact of Covid-19 on the public transport sector? In: Intelligent Mobility Experience. March 19, 2020. Accessed: March 30, 2021.

[390] European Commission 2020: Future of Transport: Update on the economic impacts of COVID-19. In: Science for Policy Briefs.

Future scenarios for urban transport

Scenario 1: The urban transport system returns to the pre-Covid-19 situation

This scenario is more likely to occur if the virus disappears soon, or if its viral load decreases significantly. In this case, without significant intervention by the authorities, people will return to their previous transportation habits, including movements to work and leisure places. Some will be resistant to using public transport, but others will be forced by the economic crisis. The increase of active modes, due to local measures such as new bike lanes, will have a residual effect given the low current share.

Scenario 2: Private transport demand prevails, especially car

If the situation remains uncertain, demand for private transport will continue to increase in the short-medium term. Its typology and scope will depend on the presence of subsidies or incentives for the purchase of cars, also electric, given the will of many governments to reinvigorate the activity of the automotive sector. The extent of policies supporting soft alternative modes, both for passengers and freight, will determine the modal share of private mobility.

Scenario 3: The demand for transport is overall reduced

Through integrated land-use planning and transport demand management, the need to travel and the trip length may be reduced. This approach would be suitable in case it is necessary to reintroduce restrictive measures to the movement of people (maintaining full or partial teleworking assets, flexible working (hours and stores' openings) that could reduce transport demand, overall or during peak hours. Moreover, the growth of e-commerce can lead to less trips for shopping or groceries. Furthermore, the pandemic has favoured the rediscovery of proximity shops and activities. Walking, the least impactful mode of transport, is predominant in this setting.

Scenario 4: Integrated multimodal mobility with active modes and PT

This scenario corresponds to the prevailing vision of sustainable mobility in recent years, which nevertheless has not experienced a satisfactory deployment so far. That is the promotion of a multimodal transport system, in which the most efficient and sustainable modes are prioritised, and the transport offer is integrated both from a planning and user experience perspective[391].

[391] European Parliament 2020: COVID-19 and urban mobility: impacts and perspectives. In: In-Depth Analysis requested by the TRAN committee.

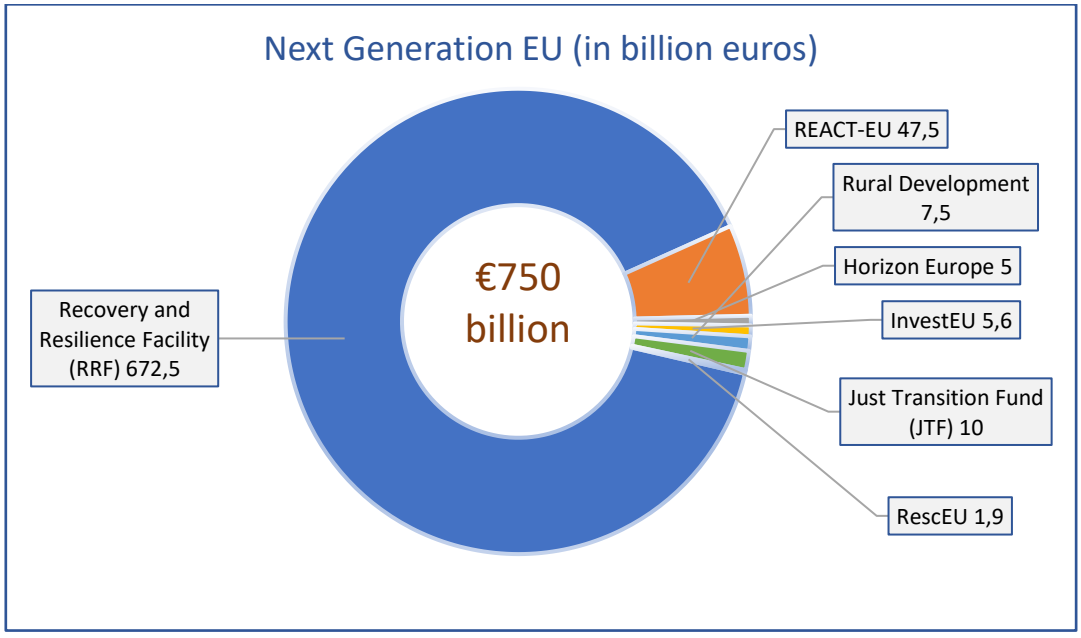
The European Resilience and Recovery Facility and the Multiannual Financial Framework

The European Recovery and Resilience Facility adopted on July 21, 2020

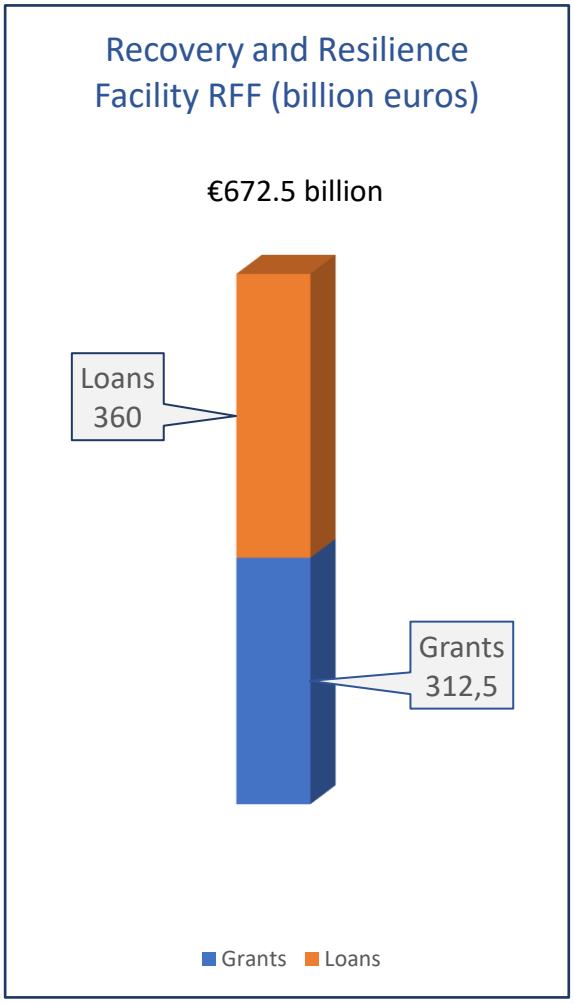
Figures

- Agreement of the Council on a multi-annual budget (Multiannual Financial Framework or MFF 2021-2027) of **€1,074 billion, plus an exceptional recovery plan of €750 billion, called "Next Generation EU", for an unprecedented total of €1,824 billion committed over the next seven years**.
- Borrowing on the capital markets, on behalf of the European Union, up to a maximum amount of €750 billion.
- The overall envelope of **€750 billion is composed by 7 programs: the Recovery and Resilience Facility or RRF (€672,5 billion), REACT-EU (€47,5 billion), Rural Development (€7,5 billion), Horizon Europe (€5 billion), InvestEU (€5,6 billion), the Just Transition Fund or JTF (€10 billion), and RescEU (€1,9 billion).** The RRF accounts for more than 90% of the Next Generation EU budget and therefore constitutes the key element of the EU recovery program. **The RFF breaks down into grants worth a total of €312.5 billion and €360 billion in loans.**
- In addition, the leaders of the EU-27 reached an agreement on December 11, 2020 **to reduce the EU's greenhouse gas emissions by "at least 55% of 1990 levels within 2030**". This justifies the direction taken in the sectoral public policies for the years to come, notably in transport-related policies.

European recovery package - Next Generation EU funding



Source : European Commission



Source : European Commission

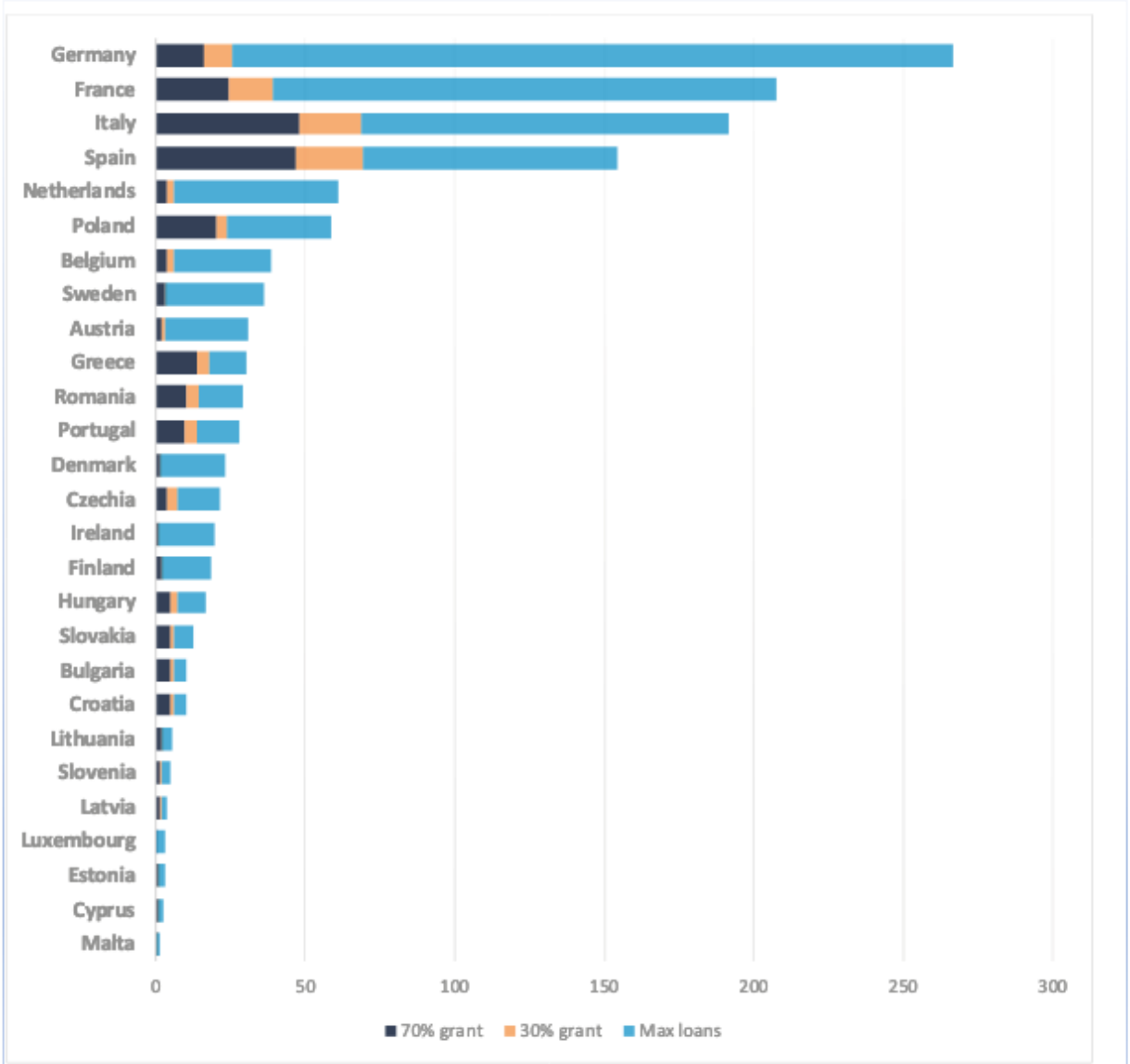
Allocation criteria of the RRF

- Allocation criteria: Population, GDP per capita and average unemployment rate over the last 5 years.
- For 2023, the distribution will be based on the observed decline in GDP in 2020 and 2021, to better reflect the post-coronavirus economic reality.
- Stimulus money should not be used to fund wage increases for health care workers or short-time employment.
- 37% of the expenditure committed by the States must be allocated to European environmental objectives, including carbon neutrality by 2050.
- 20% must be earmarked for the digitalization of the economy, including for SMEs.
- The Commission has also asked that governments consider the "recommendations" provided during the European Semester, which suggest structural reforms to be carried out.
- European funds shall be spent in compliance with the rule of law. For the first time Member States are requested to provide evidence in this sense. This clause will apply to both the Recovery Plan and the Multi-Annual Budget.

Ground rules on the disbursement of the European funds (period 2021-2023)

- Most of the amounts at stake (70%) are to be allocated in 2021 and 2022, the remaining 30% will be allocated by 2023.
- However, one rule remains applicable to all: the amounts received must not exceed 6.8% of the gross national income of each member state. Italy (€65 billion) and Spain (€59 billion) will receive the largest share of European aid, followed by France with €40 billion and Poland with €23 billion.
- Anything that is going to be financed under the recovery plan with EU financing is no longer eligible for structural funds.

Grants and loans per Member States (maximum amounts in billion euros)



Source: Commission (for grants) and Commission database AMECO for loans.

The main content of the RRF

The Facility (Art. 2) targets the following areas which are structured in six pillars:

1) Green transition.
2) Digital transformation.
3) Smart, sustainable and inclusive growth, including economic cohesion, employment, productivity, competitiveness, research, development and innovation, and a well-functioning internal market, with strong SMEs.
4) Social and territorial cohesion.
5) Economic, social and institutional health and resilience with the aim, among others, of increasing crisis preparedness and response capacity.
6) Policies for the next generation, children, and youth, such as education and education and skills.

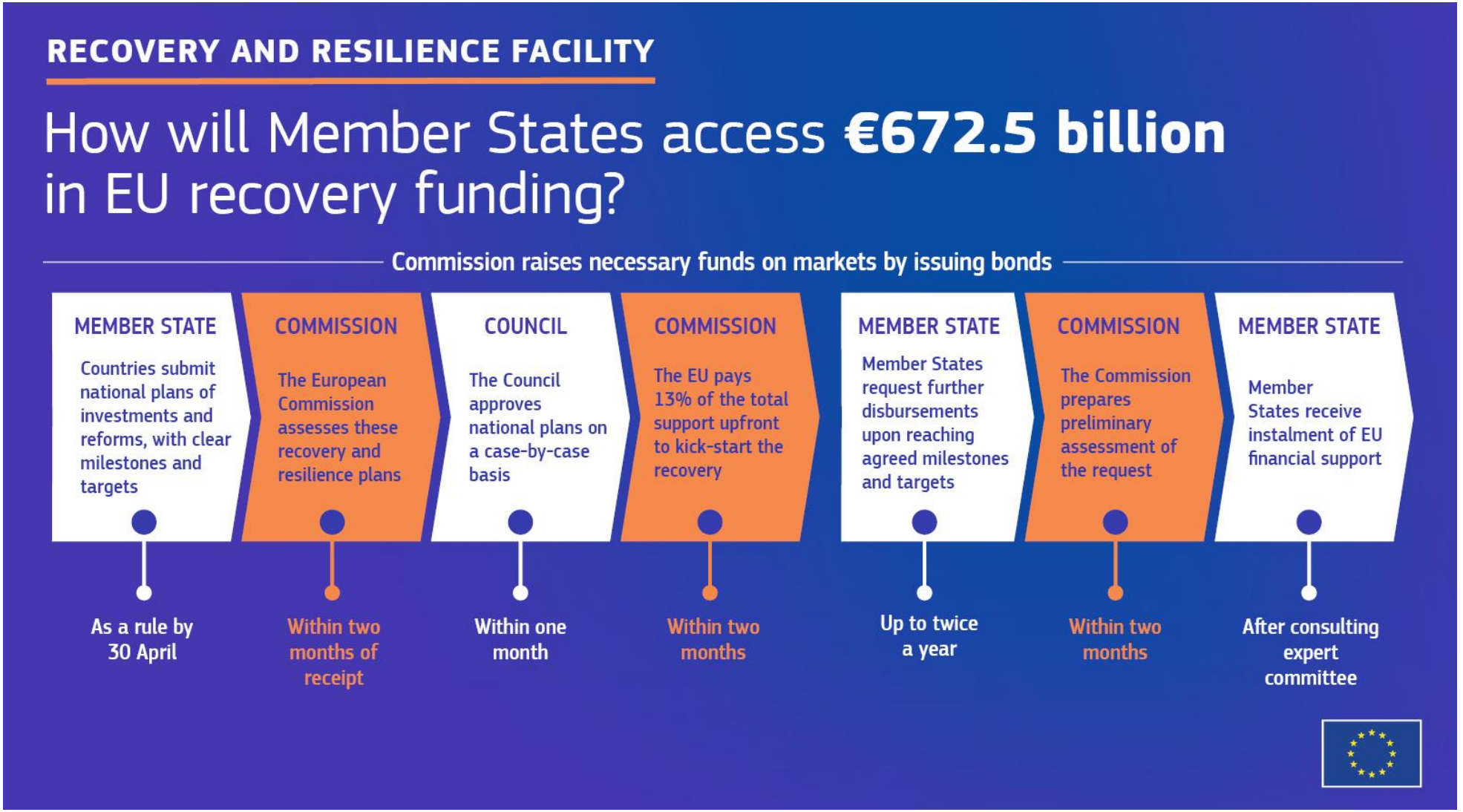
Interaction between the European Commission and the Member States

- Governments have been preparing their own recovery plans, detailing how they intend to use European

funds over the period 2021-2023 (Art.7 of the REEF).

- The national recovery plans can be submitted from January 1, 2021, to April 30, 2021. The Commission will then have two months to make an initial assessment of each application before submitting the file to the Council of the European Union, which will have to endorse it by a qualified majority.
- Following the European Parliament's vote on February 9, the Council adopted on February 11 the regulation establishing the Recovery and Resilience Facility. Published in the Official Journal on February 18, the ERRF comes into effect the following day, February 19, 2021.
- The Commission has now to wait for ratification by national parliaments before it can borrow the necessary funds on the financial markets.

Agenda and timeline of the Recovery and Resilience Facility



Source : European Commission

Multiannual Financial Framework (2021-2017) (MFF)

Amounts

- The overall ceiling of the 2021-2027 MFF is set at €1,074.3 billion (in 2018 prices) and will be gradually increased to €1,085.3 billion (+ €11 billion).
- This increase is the result of the European Parliament's negotiation efforts to strengthen 10 of the EU's flagship programs, including Horizon Europe (+ €4 billion), Erasmus + (+ €2.2 billion), InvestEU (+ €1 billion) and the Neighbourhood, Development, and International Cooperation Instrument (+ €1 billion).
- Negotiations for the budget allocation to European programs are currently subject to specific agreements between the European Parliament and the Council.

Approval of European programmes that can be linked to transport and mobility issues

- **Invest EU**

Representatives of the European Parliament and the Council of the European Union reached a provisional political agreement on 7 December 2020 on the revision of the InvestEU programme, which will succeed the 'Juncker' investment plan after 2020, in light of the Covid-19 pandemic.
The budgetary envelope agreed upon by the EU Council has been €26.2 billion and will be composed as follows:

- €9.9 billion (37% of the total) for sustainable infrastructure (covering the fields of multimodal transport, safety, renewal and maintenance of road and rail infrastructure, improving interconnection levels, digital connectivity, and access)
- €6.6 billion (25.1%) for research, innovation and digitization.
- €6.9 billion (26.3%) for SMEs.
- €2.8 billion (10.7%) for the social sector and skills.

- **Horizon Europe**

On December 11, 2020, an agreement was reached on the Horizon Europe program. The program will have a budget of approximately €95.5 billion (current prices).

- **European cohesion policy**

The European Parliament adopted, on 25 June 2021, the political agreements on the Cohesion policy legislative package 2021-2027 of €373 billion. This was the final step of the legislative procedure and allows for an entry into force of the Cohesion legislation on 1 July 2021.
The European Regional Development Fund (ERDF) (€226 billion ERDF) will focus its investments on several key priority areas, including support for the net-zero-carbon economy.
The Cohesion Fund (€48 billion) will support environmental infrastructure and priority EU projects in Trans-European Transport Networks. It will also cover projects of energy efficiency, use of renewable energy or sustainable urban mobility presenting clear environmental benefits.

- **Connecting Europe Facility**

The Regulation (EU) 2021/1153 establishing the Connecting Europe Facility (CEF) for the period 2021-2027 was formally adopted on 7 July 2021.

- €25.81 billion of this program will go to transport: €12.83 billion from the general envelope, €11.29 billion from the cohesion funds (Cohesion Fund) and €1.69 billion from the budget for military mobility.

- €5.84 billion and €2.07 billion are allocated to energy and digital infrastructure respectively.

In the transport sector, the programme will promote interconnected and multimodal networks in order to develop and modernise rail, road, inland waterway and maritime infrastructure.
Priority will be given to further development of the trans-European transport networks (TEN-T), focusing on missing links and cross-border projects with an EU added value.

Transport and mobility priorities in National Recovery and Resilience Plans

Introduction

As widely assessed in this report, mobility has been one of the most impacted sectors during the Covid-19 crisis. Consequently, the strategies to boost the recovery of Europe must give the appropriate importance to these sectors, given also that they are essential for the overall recovery of the European economy.

Looking at the design of the European Recovery framework, and in particular to the Recovery and Resilience Facility within the Next Generation EU, it is clear that mobility and transport are an important concern of the European Commission for the recovery and the evolution of the European economy. It is important to notice that policies and investments addressing mobility and transport are mostly framed within the strategies related to the European environmental policy. In fact, these sectors are considered playing a key role in meeting the ambitious objective of the European Green Deal, a carbon-neutral continent by 2050. In 2019, road transport accounted for the 28% of total European greenhouse gas emissions. Both the total amount of emissions and the share of the transport sector are supposed to decrease in order to meet the Green Deal goals. To some extent, the pandemic has created room to boost this process. As already said, the Commission provided two main conditions to access the RRF funds: a minimum of 37% of expenditure in green transition and a minimum of 20% of expenditure in investments fostering the digital transition. Not surprisingly, almost all the investments covering mobility and transport fall in the first category, while most of the remaining ones fall into the second one, and notably in the deployment of the 5G Network. Few exceptions are framed in territorial and social cohesion interventions. The European Commission also provided 7 European Flagships to channel and harmonise the investments funded with the RRF. Even though the inclusion of policies covering the Flagships is not compulsory, many Member States followed the Commission's guidelines while writing their National Recovery and Resilience Plans. The second Flagship, "Power UP – Sustainable Transport and Charging Stations", directly targets transport and mobility. The third one, "Connect – Roll-out of Rapid Broadband Services", also significantly impacts the sector.

National Recovery and Resilience Plans: main trends in transport and mobility

Preliminary Considerations

Comparing the National Recovery and Resilience Plans of the countries analysed in this report, some general and cross-country trends emerge. Two main remarks can be made in this sense:

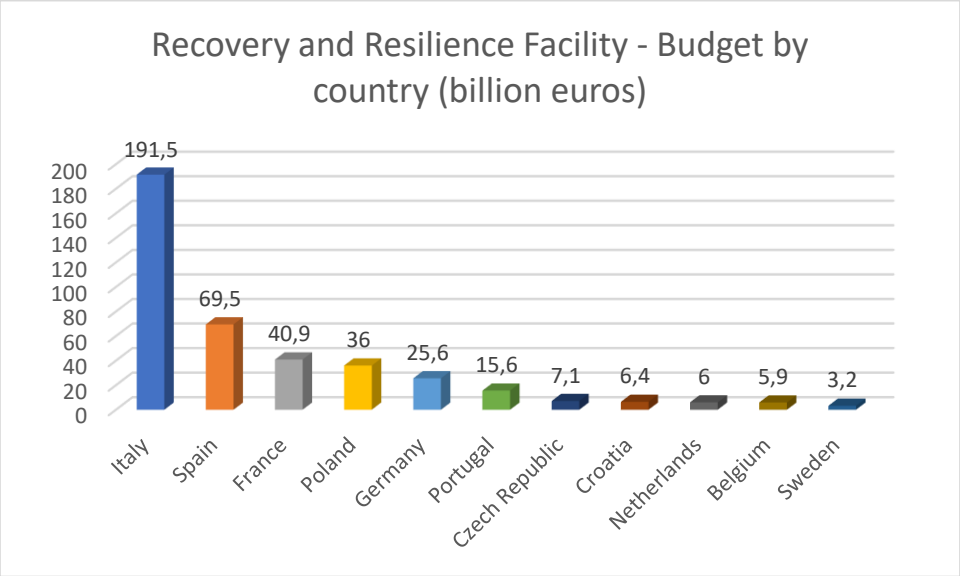
1) The European Recovery strategy seems to have fostered a will of convergence among the Member States. The main trends of the investments addressing mobility and transport are found in almost all countries, in a measure which is strictly related with the budget of the Plans. Another factor that plays an important role is the starting point of each country in the different aspects of mobility and transport, given that significant divergences still exist. Nonetheless, a more integrated, resilient, and greener transport network is a goal that will be reached through similar policy strategies across all countries.
2) The Recovery phase is not conceived as an opportunity to get back to the pre-pandemic status quo. By contrast, the National Recovery and Resilience Plans is seen as the unique opportunity to transform, sometimes even radically, the mobility and

transport habits of the EU Member States. The climate objectives and to less extent the digital transition constitute the conceptual framework for an innovative renewal of the face of these sectors in Europe.

It is finally important to notice that despite the innovative momentum created by the Next Generation EU, the vast majority of the policy strategies proposed in the National Recovery and Resilience Plans are consistent with pre-existing or new national programs. In this sense, transport and mobility issues tackled in the NRRP are often backed by national strategies such as the National Strategies for Climate and Energy or other specific national policies. In the cases of the countries benefitting from a larger share of the RRF (Italy, Spain, France, Germany), investments on transport and mobility are often ground-breaking and comprehensive, tackling all the major issues of the subjects. By contrast, the countries which will have access to a smaller budget from the RFF (Sweden) are insisting on specific issues, not covering all the transport and mobility modes. In these cases, the investments planned within the NRRP framework reinforce pre-existing policies, either broaden their scope. Therefore, it is important, when analysing the National Recovery and Resilience Plans, to also consider the other national and European strategies insisting on the same subjects.

RRF budget and share of the analysed countries

The graph shows the budget of each National Recovery and Resilience Plan of the analysed countries[392]. Both grants and loans are considered.



Main trends in transport and mobility: a comparative analysis

The European Commission provided Flagships concerning, inter alia, transport and mobility. In addition, a general will of convergence among Member States is clearly outlined in the NRRP framework. These two factors combined allow to identify cross-country similar strategies and main trends.

[392] *Nota Bene*: at the present day, the Netherlands did not submit to the European Commission its National Recovery and Resilience Plan, therefore the budget is shown in the graph, but the investments are not considered the comparative analysis, as a final version of the Plan has not been provided yet. Moreover, given that the UK has left the EU in January 2020, it is not included in the European Recovery Strategy, even though the country developed its own recovery plan.

1) **Electrification of mobility infrastructure, replacement of public and private fleet with electric and alternative-fuelled vehicles, development of the recharging infrastructure**

The use of electricity in mobility and transport is highly encouraged in all Recovery Plans, with the aim of reducing emissions and cleaning the carbon footprint of one of the most pollutant sectors. This shift towards electric mobility concerns both passengers and freight transport via different policy proposals and investments projects. Regarding passenger transport, the progressive replacement of private cars, car e bus fleets is addressed in several Plans. For instance, Germany allocates €2.5 billion as an incentive to promote sales of electric vehicles, whereas France allocates €1.9 billion in a similar measure, also encouraging the dismission of fossil fuelled cars for new electric ones. Spain implements a similar policy. Belgium will force companies to replace their car fleet with greener vehicles, while France will replace the State's vehicle fleet. In order to support the substitution of vehicles, notably of private cars, a huge effort is put in the development of an efficient network of charging stations. Germany plans to deploy a network of 50 000 charging stations by 2025 with an investment of €7.1 billion, while France allocates €100 million in a similar initiative as well as Italy, with a budget of €740 million. Concerning freight transport, the main effort in terms of electrification targets railways. Electrification of railways is present in almost all Plans, and in particular in the Belgian, Czech, and Italian ones.

2) **Focus on public transport in the urban context to replace individual cars and development of the cycling infrastructure**

When it comes to urban mobility, the underlying logic of all National Recovery and Resilience Plans is to shift a modal split that still mostly relies on private cars towards collective modes on transport and alternative mobilities. To this end, investments and reforms aim to make public transport and cycling the fastest, smartest, and most convenient mobility options. This vision is also backed by the need of reducing greenhouse gas emissions to meet the climate goals. Concretely, the construction of new tramways and undergrounds are the subjects of many investment projects, such as in Belgium, where €274 million are allocated to the extension of the tramway in Liège and other €60 million to the metro in Charleroi. In Italy, €3.6 billion are allocated to an ambitious intervention in public transport which also includes the construction of €240 kilometres of new lines among metro, tramways, trolleybuses, and cableways. In addition, important investments aim to reinforce and strengthen the existing public transport network by the purchase of new vehicles and therefore increasing the frequency of the journeys. France will invest €1.2 billion in development of public transport, notably in the Paris region (Ile-de-France). Italy plans the purchase of more than 3500 low-emission vehicles.

Cycling as an alternative mode of transport is becoming a prior subject in urban mobility strategies. Cycling infrastructure is the subject of many investment projects within the recovery strategies. Belgium will spend €345 million to reinforce the cycling infrastructure in the Flanders region. Italy plans to build more than 1700 km of cycling paths both in urban and touristic areas.

3) **Focus on railway, notably for freight transport, to enhance and better integrate the modal split**

Rail is the main infrastructure targeted in Recovery Plans, with almost no exception. Extensions, reinforcement, and maintenance of railways, as well as purchase of new trains are

the main investments in this sense. These interventions mostly aim to shift the freight transport modal split, which still mainly relies on road transport. The leading country in rail investments is Italy, with a budget of €24 billion dedicated to rail in a broad sense, which will be used to build new high-speed lines, notably in the South of the country and in cross-border links, to strengthen urban and suburban joints, and to increase the number of journeys in regional lines. Belgium allocates €275 million to modernise and electrify railways and to optimise rail freight strategic points (Gent, Atwerp). Czech Republic will also act to shift its modal split in favour of the rail, notably via the electrification and digitalisation of railways. Spain developed a rail infrastructure strategy to anticipate, and plan needs in rail infrastructure. Sweden has dedicated an entire pillar to rail transport, seen as the key infrastructure to strengthen in the national context.

4) Incentives to reduce the use of private cars in line with existing national policies

In general, the investments in the development of public transport couple with measures aiming to reduce the use of private cars, notably in the urban context. This is mostly done throughout reforms and car free zones in the city centres. This trend was already ongoing before the pandemic, notably in capital cities and other big urban centres. The Recovery strategy seems to be in continuity with those pre-existing regional and national policies. For instance, the Climate and Resilience Bill in France aims specifically to the creation and the enlargement of low-emission Zones in cities, whereas a reform project in Spain aims to reduce the use of conventional private vehicles.

5) Digitalisation of the infrastructure and development of the 5G Network

Highly encouraged by the third Flagship proposed by the European Commission, “Connect – roll-out of Rapid Broadband Services”, the deployment of the 5G Network is a priority in several National Recovery Plans. For instance, Croatia will accelerate the development of the network thanks to the RRF funds, as well as Czech Republic, with a budget of €228 million. Italy will spend €6.7 billion to deploy the broadband along 12000 kilometres of highways and suburban roads.

A general infrastructure digitalisation trend is remarked in most of the Recovery Plans. It must be noticed that digitalisation mainly concerns the rail infrastructure. In fact, Germany will reinforce its national strategy “Digital Rail Germany” with €500 million of the RRF funds, while Italy includes the digitalisation in its robust railway strategy.

6) Development of the hydrogen technology applied to the transport sector

When it comes to research and innovation applied to transport and mobility, hydrogen clearly emerges as the prior technology. Many Member States plan to use a significant amount of their RRF budget both in research and in construction of the support infrastructure needed to implement the use of hydrogen in transport. France will develop, in accordance with its National Energy and Climate Plan, a national sustainable hydrogen industry aiming to, inter alia, decarbonise mobility, notably heavy vehicles. Germany will boost the Important project of Common European Interest on hydrogen with €1.5 billion from the RRF. Italy will spend €230 million euros to create hydrogen fuelling stations to support the market penetration of hydrogen fuelled vehicles in road freight transport. In addition, €300 million are allocated to develop hydrogen fuelled passenger transport options on rail.

7) Road network considered to be of lower priority, focus on the TEN-T

Road is probably the most neglected infrastructure in the National Recovery Strategies. Almost no investments are mentioned neither in the construction of new roads nor in a logic of maintenance. The only investments that imply intervention on roads are strictly related to the digitalisation and the deployment of the broadband network. It must be noticed that the few investments covering the road infrastructure itself focus on links belonging to the TEN-T network (Central and Eastern Europe). The European Parliament in its resolution of 20 January 2021 on the TEN-T review also stresses the importance of improving the quality of TEN-T road infrastructure throughout the Union.

8) **Simplification reforms for procurement and Public Works**

Besides investments and reform projects, in order to reach a true convergence among Member States, a harmonisation of public procurement procedures is needed both at the national and European level. This feeling seems to be widely shared by the Member States analysed in this report: almost all National Recovery and Resilience Plans mention that the projects funded through the Recovery and Resilience Facility will be subjected to a simplified procurement procedures in order to accelerate the implementation of the projects. The reforms are intended to make the procedures converge at the European level, depending on the national specificities. In a broader vision, several countries, such as France with its Public Action Acceleration and Simplification Act enabled in 2020, are planning to simplify procurement for the infrastructure sector also beyond the Recovery framework. A similar reform project is being developed in Germany.

Recommendations and Conclusions

- Even with massive incentives and policies targeting new motorisations, alternative fuels, new mobility, and modal transfers, it is important to remind that **the road will remain preponderant**.

- Road infrastructure is available 24/7, **its flexibility and adaptability were proved during the first waves of Covid-19 pandemic** through the implementation of new traffic regulation measures in large urban areas and the creation of temporary and permanent cycling paths. In addition, **the transport of goods has been almost totally ensured via road over spring 2020**.

- Regarding green transition, or rather this transformation, public works companies and public and private research laboratories are focusing on the notions of ecological, energy and digital transition, which means that **the industry is not lagging behind in innovation**. Indeed, road infrastructure is crucial to enable the transition to a low-carbon and smart mobility.

- Road infrastructure is also a **massive economic and social asset that needs to be properly funded, maintained, and adapted in accordance with its role**. It is therefore to be feared that if governments do not remedy the failure of not taking into account that a well-maintained road that is sustainable, safe, and smart, and do not provide for sustainable budgets, we will inevitably have an increase in grey debt, or even green debt, and the objectives of reducing greenhouse gases will not be achieved.

- In order to benefit from the Recovery Plans and to serve both the economic and job recovery and the Green Deal purpose**, the European countries shall intervene on roads with maintenance and rehabilitation projects through simplified procedures.** This would allow road infrastructures, largely neglected by investments and policies over the last 10 years, to catch up, notably in the light of the green transition. In fact, it is proved that **a well-maintained road decreases vehicles' emission by 10%.** Finally, as maintenance is something that must be carried out periodically, it is desirable that those allocations of **investments become permanent thanks to performance-based multiannual contracts**.

- Finally, the operational implementation of the European Recovery Plan has been long and tedious. However, it has illustrated the strong interest of Member States in undertaking national recovery plans, aligned with common constraints, in relation to the ecological and digital transition. In view of the huge need for public investment in Europe, particularly to maintain and adapt road infrastructure, **it might be appropriate to consider public investment programmes common to Member States in the same spirit as the Recovery and Resilience Facility**. These could be ad hoc programmes dedicated to the **maintenance and adaptation of infrastructure, especially in the TEN-T Core Network**, in addition to existing financial instruments.


Polisport