

COVID-19 and urban mobility: impacts and perspectives

Rapid-response briefing



Transport and Tourism



RESEARCH FOR TRAN COMMITTEE

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Abstract

The briefing provides an overview on the state of play and trends of urban transport since the outbreak of the COVID-19 pandemic. It outlines four scenarios, the prevalence of one or the other depending on the priorities established by policy makers and service providers. The briefing delivers general recommendations for a post-COVID-19 smart and sustainable urban transport and a set of desirable actions on how to integrate EU response into existing policy priorities.

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KEY FINDINGS

- Authorities and operators all over the world had to respond quickly to the pandemic and find rapid and efficient solutions to guarantee safe mobility.
- The use of public transport and shared mobility services decreased dramatically during and immediately after the lockdown, while citizens prefer(red) private vehicles such as cars and bicycles, but also walking.
- Last mile freight distribution has proven to be an essential service during the lockdown, providing grocery and goods to households. E-commerce is likely to keep growing.
- The evolution of urban mobility trends will depend on the pre-COVID-19 situation of each city and country and on policies that will be promoted at the European, national and local level. Four scenarios have been identified.
- All EU interventions for a full recovery of mobility and connectivity should be aligned with the strategies already in place and should not overlook the challenges identified therein.
- Multimodality and radical modal shift will occur if policy-makers integrate the offer of new and traditional mobility services within local transport policies.
- Data sharing and interoperability is needed to manage safety-related aspects such as physical distancing, contactless transactions, and flexible timetables.

1. STATE OF PLAY: EFFECTS OF THE LOCKDOWN ON URBAN MOBILITY

On March 11, 2020, the World Health Organisation (WHO) declared COVID-19 a global pandemic. The pandemic has greatly impacted a number of different economic sectors, including transport, travel and mobility. The emergency has obliged several governments to prohibit unnecessary mobility circulation, and to adapt the mobility of essential workers and goods in order to safeguard health and contain the spread of the virus. Authorities and operators all over the world had to act quickly and find rapid and efficient solutions to guarantee safe mobility. All of these measures have had a significant impact, perturbing the traditional assets of mobility (roads, kerbside, sidewalks, public transport and shared mobility services) and shaping new trends.

1.1. Mitigation measures during lockdown

The overcrowding of public transport (PT) stations and vehicles represents a high-level risk of contagion, therefore governments and local authorities implemented restriction measures to limit their use. The main priority has been to guarantee safety and protection of staff and infrastructures. In most cases, drivers and personnel have been provided with specific training and personal protective equipment (face mask, gloves etc.)¹. In general, many initiatives have been directed at avoiding contacts between personnel and passengers, for example, by forbidding ticket sales by drivers and incentivising e-ticketing, as well as closing front door access, thereby ensuring that people board at the back of the bus only. Measures have also been taken with regard to the safety and health of passengers. With the core concern being physical distancing, several transport authorities limited the

¹ Examples: Portugal, The Netherlands, Czech Republic, Luxembourg, France, Germany, Spain, United Kingdom, Italy, Greece, Romania, Austria, Lithuania, Slovakia, Slovenia.

capacity of the vehicles in order to guarantee safe distances between people (for example [Milan and Barcelona](#) reduced occupancy to a maximum of 25% and 50%, respectively, [Ireland](#) to 20%, [Portugal](#) to 2/3, etc.), and passengers were obliged to wear personal protective equipment (PPE). Regarding demand management, there has been no substantial challenge during phase 1² due to the fact that in many countries passengers were limited to [essential workers or specific categories due to restrictive measures](#), while all the others were asked to stay home and telework, where possible.

Shared mobility systems faced challenges too. The high-level risk of sharing vehicles with other people pushed many firms to halt their services. [Uber](#) stopped pooling rides in some markets, and Lyft did it in all of its operational areas. The [latter also](#) tried to face the collapse of work by offering its drivers to work for Amazon as shoppers, warehouse workers or as drivers. [The virus had an impact on micro-mobility](#) (bike sharing, scooter sharing, etc.) too: Lime stopped its services in 23 out of the previously served 30 countries, and Uber (Jump) and Bird (Circ) stopped their operations in almost all European countries. Contrary to this, [Budapest](#) introduced temporary nearly-free fares for their [MOL Bubi bike sharing service](#), limited to the first harder phase of lockdown.

Regarding urban freight distribution, the primary critical issue had to do with the lack of staff and stocks due to reduced or cancelled productions during the lockdown. However, movements of goods have not stopped. In particular, last mile distribution had a fundamental role providing food, medications and fast-moving consumer goods (FMCG)³ to people confined in their homes. Many countries, such as [Italy](#), adopted protocols providing behavioural measures for logistic personnel to safeguard them and the consumers. The main recommendations were: contactless interactions between operators and drivers during loading/unloading activities, contactless deliveries without signatures, and encouraging shifts and separated groups of warehouse workers. In [Saragoza](#), authorities permitted loading and unloading of goods 24h a day, 7 days a week, in order to help logistic operators, and reduce pressure on one of the most important essential facility during the lockdown. Due to the demand for groceries being higher during lockdowns, authorities in [Eindhoven](#) allowed supermarket distributors to operate 24h per day, facilitating a better and safer distribution throughout the day and avoiding traffic jams. For the same reason, in London, the Mayor asked [Transport for London](#) to postpone the enforcement of the low emission zone (LEZ) for freight vehicles. In [Paris](#), an electric van sharing service has been strengthened for businesses tasked with goods delivery services. Access regulation into stores has also been widely established in many countries, implying purchasing time limitations for customers, and self-protective measures such as masks, rubber gloves, hand sanitisation, etc.

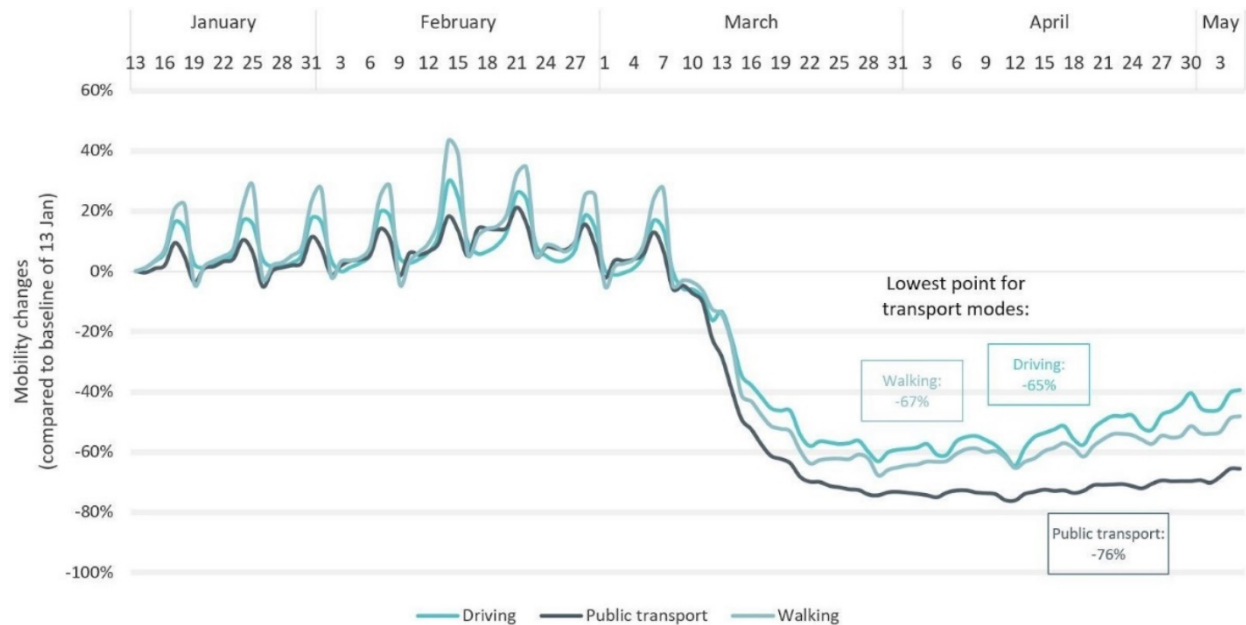
1.2. Overview of the mobility trends

The data-sets from [Google COVID-19 Community Mobility Reports](#) and [Apple's Mobility Trends Reports](#) are important sources providing trends on people mobility during the pandemic. The data highlights that high-income countries experienced the highest levels of mobility reduction in term of PT station access. For what concerns [transport modes across the world](#) (62 countries and 89 cities included in the analysis), PT reached the lowest point of -76% in April, whereas the drop in driving reached -65% and walking -67% based on trends in the number of direction queries on Apple's navigation app.

² Phase 1, or epidemic phase, consisted of national lockdown measures, which in many European countries have meant an almost total closure of non-essential commercial activities and a reduction in people's freedom of movement. Phase 2 consists of a progressive reduction of the containment measures of phase 1. For an overview of global lockdowns [click here](#).

³ FMCG refers to widely sold consumer goods such as food, toiletries, soaps, cosmetics, detergents and other non-durable products such as light bulbs, batteries and disposable plastic household products. Source: <http://www.fmcg.be/fast-moving-consumer-goods/>

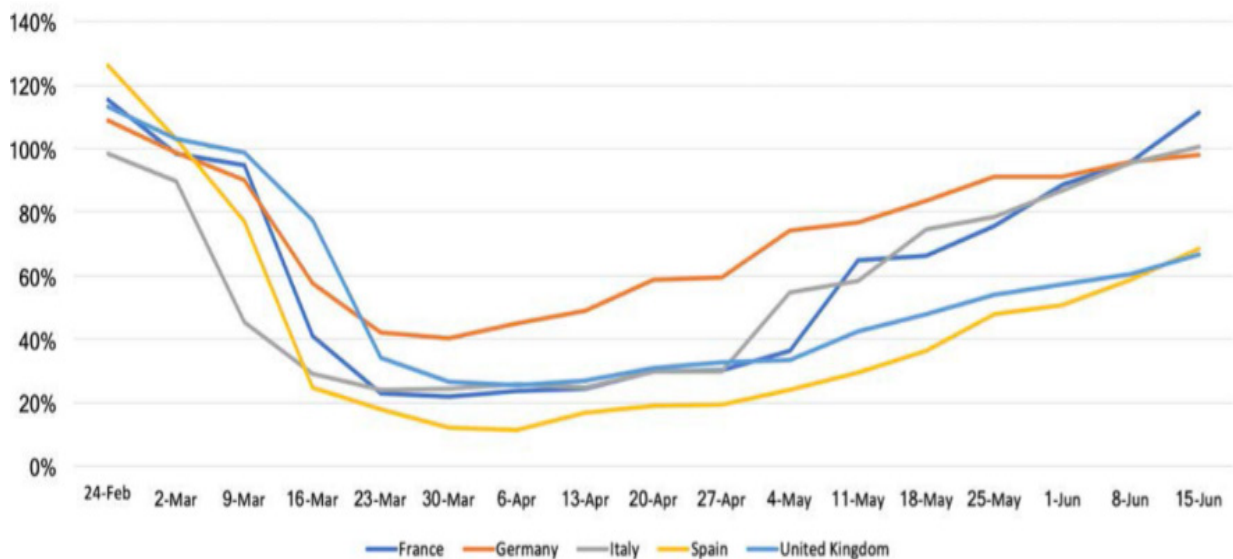
Figure 1 - Requests for direction queries by transport mode



Source: [SLOCAT analysis based on Apple \(2020\). COVID-19 Mobility Trends Reports](#). Baseline date (13 Jan) established by Apple.

[INRIX](#) assesses mobility trends on the basis of the average Jan-Feb baseline in term of vehicles-miles travelled (VMT), and compares outcomes between selected European countries. Data shows that Italy was the first country to experience the reduction of VMT due to the early lockdown. Spain experienced the highest drop, reaching a level of only 12% VMT compared to pre-COVID-19 time.

Figure 2 - Vehicle-miles travelled, Western Europe



Source: INRIX - European Passenger Travel Response to COVID-19

Moreover, some [studies](#) on Google's and Apple's data highlight that by now private car transport has more than recovered from the January situation – possibly also due to holiday travel, deferred trips (shopping for non-essential items, visiting relatives, running errands, doctor visits etc.), and switching from PT to cars for fear of catching the virus – while PT and walking are trundling along.

Additionally, the pandemic deeply influenced urban freight transport trends, particularly during lockdowns. The fact that goods had to continue circulating in such a difficult situation and with completely changed trajectories generated a strong pressure on the entire supply chain. 60% of e-commerce firms announced delivery delays due to several obstacles along the chain. Indeed, the higher demand for e-commerce products generated novel challenges for logistics and service providers, notably limited logistic staff, lack of production and new safety rules.

In Paris, although around 75% of B2C delivery companies reported a drop in activity, the increase in e-commerce, in particular for the food sector, has been [between 10% and 40%](#) compared to the pre-crisis levels. Bpost, the Belgian company responsible for postal services, recorded a [sharp increase in parcel deliveries](#) (+ 60% all types of sectors combined). The areas that observed the major increase in revenue were groceries, personal prevention equipment and medicines. In China, [Carrefour](#) registered increments up to +600%, and the [Chinese online retailer JD.com](#) up to +215% in revenues between January and February, while in France e-groceries grew 38% in the week following March 12. In [Spain](#), according to the logistic operator SEUR, the demand for 1-2 hour rapid deliveries for groceries increased by about 50%. In [Italy](#), grocery and supermarkets witnessed online revenue increases of +300%, to the point that many retailers limited purchase options to first-necessity goods, and, due to the high demand, they set long virtual queues, up to 1-2 hour waiting time. [Several branches](#) of the main logistic operators were closed, and from the end of March even Amazon opted for delivery rationing solutions.

[Road deaths decreased to an unprecedented level](#), but not to the same degree as traffic volume. Since roads were empty during the lockdown, many drivers have adopted reckless driving. Speeding habits and other offences increased in several countries as the police was busy enforcing lockdown restrictions.

Case study: COVID-19 and impact on urban mobility: analysis of the measures taken in Rome

RSM, the mobility agency of Rome, along with the support of the city's three public universities, has set up a monitoring system for the analysis of the impact of anti-COVID-19 measures on mobility. The analysis frames a clear picture of the current situation, but also provides a tool for assessing and, for the near future, prospectively valuing physical distancing mobility trends. In order to reach a picture as realistic and complete as possible, and to analyse all types of mobility (private, public and pedestrian), the following data sets are assessed:

- **Measurement stations** of RSM: sections on main roads where the amount of vehicular traffic per hour is measured (red view and traffic lights);
- **Ticket barriers of the subway**: counting of entrances to the subway stations of Rome;
- **Bluetooth devices**: RSM has deployed antennas capable of intercepting the Bluetooth signals of pedestrians and vehicles, read anonymously;
- **Floating Car Data (FCD)**: vehicles, both private and commercial, release information on their positioning in the municipal area when equipped with geo-localisation devices.

Figure 3 - Heatmap of Floating Car Data in Rome



Source:
<https://romamobilita.it/it/covid-19-impatto-sulla-mobilita>

2. SHORT TERM TRENDS AND MEASURES AFTER LOCKDOWN

The easing of lockdown measures generated some new challenges for urban environments. Although in the short-term streets did not experience the same pre-COVID-19 levels of movement, activities slowly resumed. Local authorities had to act to guarantee physical distancing and safety standards, and often the solutions tested during the emergency proved to be also suitable to pave the way for greener mobility, such as speed reduction measures, pop-up bike lanes, open streets and kerbside management. However, transports' financial performances have been deeply affected, pushing the EU and its Member States to act by means of financial and other support measures.

2.1. Reopening and reactive measures

In the first period following the lockdown phase, cities had to face the challenges stemming from the partial recovery of mobility. The reopening of several economic activities represented a high risk of congestion, principally in relation to PT. Overcrowding of vehicles and stations could cause contagion rates to rise again. Cities like Beijing started testing digital booking solutions to control flows and avoid excessive demand. Additionally, [Catalonia](#) accelerated the deployment of the Autocorb app, which provides users with the occupancy level of approaching buses in real time, making it possible to balance supply and demand without overcrowding. Other cities, such as [Hamburg](#), adopted a flexible approach, providing more rides on the busiest routes and reducing services with lower demand. The [City of Rotterdam](#), together with some micromobility partners, provided 1,500 shared bikes and 1,500 electric shared scooters, available in 25 transit hubs to prevent crowding on public transit.

Cycling has been one of the main responses at global level; its role was prominent already during the lockdowns but increased further with the easing of measures. Cycling could represent an alternative to PT, but also to private car rides. Bike sales have experienced a boom almost everywhere: in the [UK](#), year on year sales increased +677%; in the [U.S.](#), the uplift of demand caused shortages already at the end of April. In general, [bike supply struggles to adapt to demand in many countries](#). Use of cargo bikes, i.e. bikes used for freight delivery, increased too in 2020: the results of the first [European Cargo Bike Industry Survey](#) show that the sector expects a market growth of 53% compared to 2019. Many countries, like [Denmark and Germany](#), put forward public recommendations to avoid private car use and PT in favour of cycling or walking. [Italy](#) offers a 60% cash back up to €500 for bicycle or e-bike purchases to incentivise this shift, while in [France](#) the government allocated an individual €50 incentive to repair bicycles. In [Amsterdam](#), the municipality provided 1,600 bikes for students to ensure safe travel and to discourage the use of PT. [Lisbon](#) allocated some funds to the purchase of bikes, and also for creating additional bike lanes. Some cities such as [Austin and San Francisco](#) even permitted bike shops to stay open during restriction measures as yet another essential facility.

The [European Commission guidelines on restoring transport post-lockdown](#) include considerations for active travel. In relation to space reallocation, the guidelines specify that “*urban areas could consider temporary enlargements of pavements and increased space for active mobility options*”. The guidelines also recommend “*reducing speed limits of vehicles in increased active mobility areas*”.

In different countries, cities such as [Berlin](#), [Leeds](#), [Paris](#), [Brussels](#) etc., created temporary pop-up bike lanes to provide safer space for cyclists and to relieve the PT system. In Italy, the city of [Bologna](#) has accelerated works for an additional 348 km of cycle paths, with their construction being already foreseen as part of their Sustainable Urban Mobility Plan (SUMP), and it counts on completing 60% of them before the end of 2020.

Other types of measures are broader, addressing urban space and alternative usage of kerbsides that have been lifted from car usage and assigned to pedestrians and cyclists. The COVID Mobility Works

database maps over [170 of these so-called “open streets” initiatives](#). [Brussels](#) implemented a mobility plan changing usage priorities of public space in the Pentagon, an area of the city centre where pavements have been opened to the transit of cyclists and pedestrians, and the speed limit for cars has been reduced to 20 km/h to safeguard active travellers in the shared space. Something similar has happened in [Edinburgh](#), where *Creating Safe Spaces for Walking and Cycling initiative* was launched to give priority, during lockdown, to active mobility instead of private transport, and to facilitate PT recovery. [Vienna](#) opened 14 “temporary encounter zones” to pedestrian transit in areas where density is particularly high and sidewalks are narrow. In May, [the city of Milan](#) released its *Open Streets project*, which seeks to prioritise movement on foot and by bike. In [Dublin](#), a number of parking lots have been replaced by new cycle racks, whilst in [Oxford](#) parking lanes have been turned into rest areas. Some cities allowed cafes and restaurants the occupation of additional kerbside space for external hospitality service, whilst in [Cardiff](#) kerbsides have been converted into shop queue line spaces.

The pandemic has also fostered [contactless deliveries, thus reducing the risk of virus transmission](#). In Wuhan (China), the epicentre of the pandemic, where the lockdown was particularly strict⁴, JD made [use of autonomous vehicles for delivering](#) supplies to hospitals, and made use of drones to provide goods to nearby villages. The emergency is boosting the [drone delivery market](#): kiwibot, a delivery robot startup, increased its fleet from 20 to 50 and serves two cities in California, and two in Colombia and Taiwan, while another 500 units are in production. Japan will carry out some trials of rolling out drones next September, and [France](#) carried out trials in Montpellier, testing Twinswheel’s droids for mail deliveries. [Wing](#), Google’s drone delivery service, observed a remarkable peak in interest during the coronavirus pandemic, with a demand increase of +350% globally from February to April, whilst at the same time diversifying more types of goods eligible for delivery. In [Ohio](#), the robotised food delivery initiative helped students carrying supplies into the University campus, and helped providing consistency to the “stay home rule”.

2.2. Behavioural and attitudinal trends

The most significant change in behaviour, which had an impact not only on mobility but on people's lives during the lockdown period, was staying at home and therefore working remotely, when possible. As a result, commuting trips in many countries have been limited (mainly) to those of essential workers, such as doctors and nurses, supermarket employees, freight forwarders, etc. In the short to medium term, many employers, encouraged or impelled by the authorities, have continued to require their employees to work from home so to avoid crowding the roads and PT networks during peak hours. The general trend, according to the preferences of a vast amount of [workers](#), is a combination of working from home and going to the office at flexible times, to foster better demand management and a flattening of the critical peaks.

When in need of moving, people favoured ways that guaranteed adequate physical distancing, such as walking, cycling or the use of private cars, while there was a drop in the use of PT and shared transport. In particular, the use of bicycles, as evidenced by the boom in purchases in the lockdown and post-lockdown phases, has been chosen by citizens as a means that can combine safety and physical activity, longed for by many during the closure of all sports activities. However, it must be considered that although many countries display consolidated cycling habits, in other countries the advent of winter could discourage users.

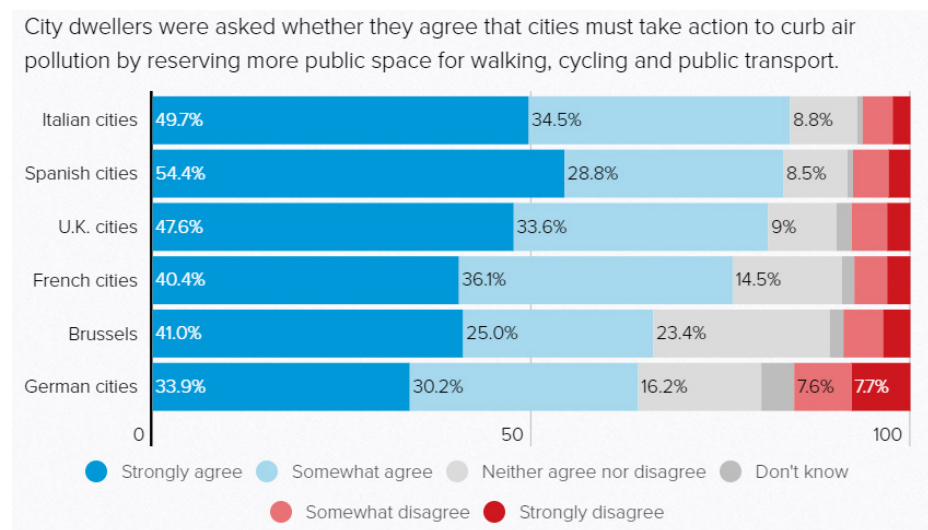
⁴ The Chinese government ordered to shut down all non-essential companies, including manufacturing plants, and all schools in Hubei Province, where Wuhan is situated.

The [increase in the use of private cars](#), associated with an indisputable high level of safety, is not sustainable neither at an environmental level, nor at the level of stress on the transport network, and therefore of congestion. If the purchase of cars during the lockdown was impossible, advertising and marketing campaigns are now highlighting the safety advantage of buying a private car. Furthermore, many countries, fearful of the negative economic and employment impacts of the crisis on the automotive industry, are providing state aid to the sector (see section 2.3).

Online shopping continues to grow, and the outbreak of the pandemic has favoured significant acceleration and penetration into previously unconcerned customer segments. [51% of Belgians](#) who have bought food online for the first time say they will continue to do so after the pandemic. The way of delivering parcels is partly shifting from home (in pre and during lockdown), to automatic lockers, [preferred by both logistics service providers and consumers](#) as a consequence of their contactless delivery methods.

The pandemic and the relative lockdown measures highlighted a new consciousness that an increasing number of citizens have about their cities' pollution. The emissions drop all over the world during the quarantines have made people reconsider health as a priority. A [YouGov survey](#), carried out between 14 and 21 May 2020 and covering 21 cities across 6 European countries (France, Germany, Italy, Spain,

Figure 4 - YouGov survey responses per country



Source: [YouGov survey](#)

the U.K. and Belgium), shows that 64% of respondents do not want to return to pre-pandemic air pollution levels, and around three quarters (74%) of respondents believe cities must take effective measures to protect citizens from air pollution. 68% of them said they agree with fighting air pollution through policies such as car restrictions, and 78% said they want safer spaces for active mobility such as cycling and walking, and for PT. As shown in Figure 4, these attitudes differ depending on the country: over 80% of Italian and Spanish dwellers, who have experienced the harder lockdown, agree that their cities must take action to curb air pollution by giving more space to walking, cycling and PT. [Similar surveys also provide parallel results](#), and all this aggregated data represents a first significant evidence of the citizens' attitude-change in favour of more liveable and healthier cities.

2.3. State aids and financial support to the transport sector

Article 107(3)(b) TFEU of the [Treaty on the Functioning of the European Union](#) foresees that, in case of particularly severe economic situations, EU State aid rules allow Member States to grant support so to remedy to a serious disturbance to their economy. On 19 March, the EC adopted the [Temporary Framework for State Aid measures to support the economy in the COVID-19 outbreak](#). This provides

some exceptions to the EU regulations regarding State aid in different sectors particularly affected by COVID-19, with a dedicated section of rules applicable to transport and tourism. All schemes relating to the transport sector must be assessed on a case-by-case basis. To address urgent liquidity needs in particular of small and medium-sized enterprises in a rapid way, Member States may provide support up to the nominal value of €800,000 per undertaking in the form of direct grants, loans, tax and payment advantages, or other forms such as guarantees on loans covering 100% of the risk. Many [countries](#) like Austria, Belgium, Denmark, Cyprus, Finland, France, Norway, Hungary, Portugal, Sweden and Germany provided assistance to national companies. [Most of them specifically addressed the air transport system](#), due to the huge negative impact in term of revenues that this sector experienced so far. Some countries approved state aid packages to stabilise and support firms operating in the transport of people and goods. [Lithuania introduced a direct grant scheme to support small and medium size enterprises](#) working in road freight transport that contributes to managing financial risks, paying loans and maintaining financial stability. [The Netherlands adopted a €160 million scheme](#) to compensate companies offering alternative rides to PT to specific categories of passengers particularly affected by the virus outbreak. [Germany implemented a €6 billion scheme](#) to compensate PT companies for damages suffered due to coronavirus outbreak. More cases are [available here](#).

Moreover, many countries adopted dedicated policies, including financial support, for the relaunch of mobility in their cities. [UK Department for International Development](#) established a £1 million “COVID-19 Response & Recovery Transport Research Fund” to support research on innovation, technology and guidelines for the recovery of the transport sector. Several countries are allocating a significant amount of funds to address dwellers behaviours and transport assets towards a greener orientation. [Italy](#) allocated funds to reimburse PT passes to passengers that could not make use of the service during the lockdown (€5 million), to incentivise the transition to sustainable solutions, such as electric vehicles, e-bikes and e-scooters (€100 million) through an eco-bonus, and to compensate revenue drop of PT (€500 million). In the attempt to back the temporary initiatives taken by the cities, some countries have financed temporary solutions such as pedestrian areas and pop-up bike lane, paving the way for them to be the base for the long-term recovery of mobility. The [Île-de-France Region](#) allocated €300 million to support the RER Velo Project, providing more kilometres of bicycle lanes to connect the major hubs of the region. [Scotland](#) allocated £10 million to support pop-up active travel infrastructures for bike lanes and pedestrian area improvements.

3. THE “NEW NORMAL”: CHALLENGES AND OPPORTUNITIES FOR POST-COVID-19 SCENARIOS

In a post-lockdown “new normal” world, mobility solutions must tackle critical aspects, such as ensuring safe and healthy commuting modes. Future interventions should encourage modal shift and the reallocation of urban space, in line with what is already envisaged in local sustainable mobility plans and in the European guidelines and targets (e.g. Green Deal, see section 4). For example, by reducing the use of private and polluting vehicles and encouraging soft mobility, i.e. any human powered (non-motorised) or small e-mobility modes (e.g., e-bike, e-scooter etc.). This is even more important considering that studies [highlight the potential role of particulate matter in the spread of COVID-19](#), and argue that [long-term exposure to nitrogen dioxide \(NO₂\) pollutant may be one of the most important contributors](#) to fatality caused by the COVID-19 virus. Interventions should also ensure that the most affected modes, namely PT and shared transport services, regain consumer trust as they are essential elements for a sustainable multimodal transport system. Cities that already had pre-existing strategies for a more sustainable mobility are facilitated since they can react faster to the crisis and with full knowledge of the facts.

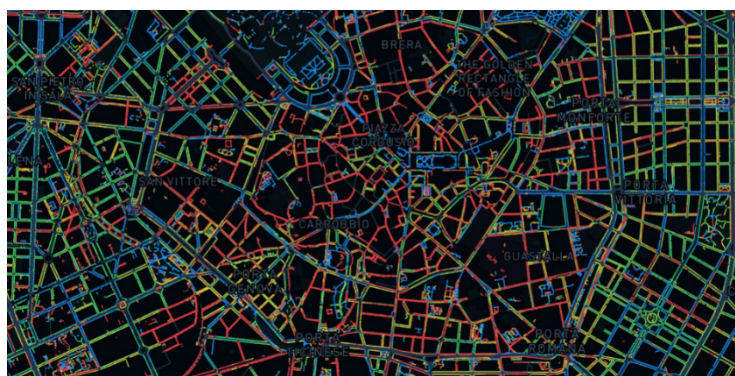
3.1. Challenges and opportunities for different transport modes and freight

3.1.1. Cycling, walking and urban space allocation

Before the outbreak of the pandemic, many European cities had already begun to introduce measures that favoured soft modes and a remodeling of the urban space in favor of active mobility and to the detriment of motorised transport modes. This is encouraged also at the European policy level⁵ through various guidelines and policies. However, a recent [report from the European Court of Auditors \(ECA\)](#) found these efforts to be so far inadequate.

The current emergency represents an opportunity to accelerate a radical rethinking of space and the ways for moving in it. In terms of distance undertaken for commuting, [36.2% of Europeans travel fewer than 10 km](#), therefore making a switch to walking and cycling for this segment a feasible option. However, the space and infrastructure dedicated to these modes is not adequate: a [recent GIS analysis](#) of street space in Milan shows that many streets in the city do not provide enough space for safe physical

Figure 5 - Mapping sidewalk width in Milan



Source: Systematica

distancing for pedestrians (corresponding to orange and red streets in the map, Figure 5). This highlights the need for wider footpaths that provide more space for people to move, but also the necessary space for lining up on the sidewalks, given the access restrictions to shops and public places. Many measures have already been tested on a temporary basis in the immediate post-lockdown phase

⁵ Read more in the forthcoming EP study on “Sustainable and smart urban transport”

(see section 2). The challenge is to make them permanent and compatible with the urban transport system. Temporary elements, such as [tactical urbanism planning](#)⁶ tools, foster a [co-creation process with residents and stakeholders](#)⁷. However, implementation on a permanent level must be foreseen from the beginning. Stricter speed limits (20 or 30 km/h) can permanently support the establishment of residential areas and streets in which priority is given to pedestrians and cyclists.

Access regulation, parking fees or congestion charges allow regulators to modulate the usage of space and the transport demand, segmenting it outside peak hours. New technologies can influence real-time demand and enable dynamic and flexible use of curb space, considering also the need by logistics operators, often under pressure from increased e-commerce-related movements.

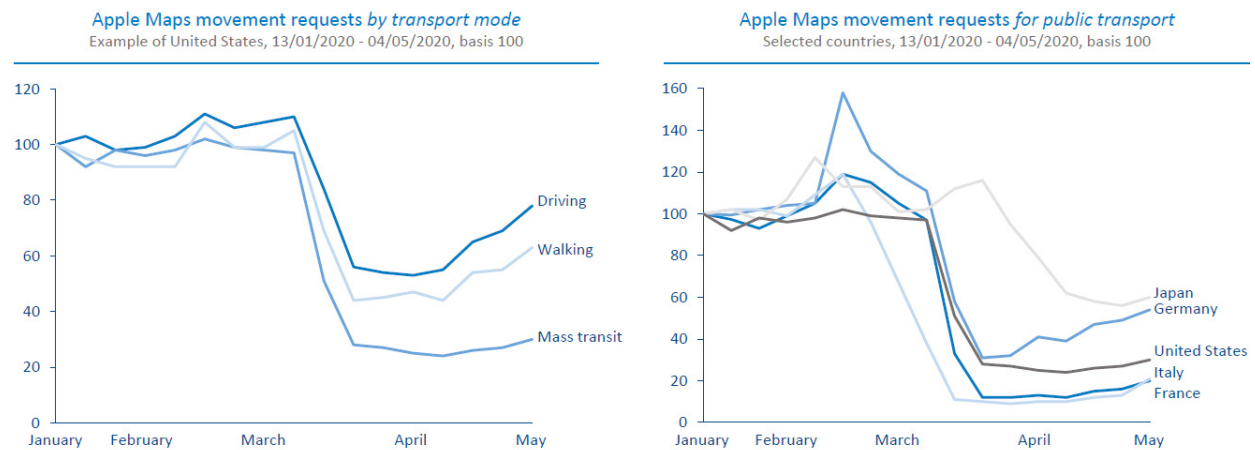
3.1.2. Public transport

PT represents the backbone of sustainable urban mobility, moving millions of citizens. As of 2018, [more than 51 billion total annual journeys](#) were made by local PT in European countries. PT is preferred by residents in large cities because of the high concentrations of people and activities. Although there are significant differences in modal share in European cities, PT generally represents an important mode. It allows local and transport authorities to plan, manage and directly monitor the movements in the network, and to work in favour of accessibility, equity and efficiency of the service for all citizens. During the lockdown, PT has generally been running in EU cities in order to assist non-motorised workers who were required to go to work. However, PT is the mode of transport that has suffered the most from the crisis, given the physical proximity of its users, thus the risk of contagion it entails. For the same reason, it is also the one that has struggled the most to regain market shares in terms of users once the restrictive measures were relaxed – as shown in Figure 6. However, epidemiological studies carried out in [Austria](#), [France](#) and [Japan](#) and data from [New York](#) and [Singapore](#) suggest that, if preventive measures are in place, the risk of contagion on PT is very low and PT vehicles are potentially safer than other enclosed spaces. In France, for example, data shows that only 1% of COVID-19 clusters are linked to transport, i.e. land, air and sea)⁸

⁶ Tactical Urbanism is a type of low- cost, temporary changes to the urban environment, intended to improve local neighbourhoods and public places. Best-known examples are Living Streets in [Ghent](#) and [Rotterdam](#).

⁷ The principle of co-creation is the process of creating new public policies and services *with* people and not *for* them. The [EU Quality of Public Administration “Toolbox”](#) further elaborates the principle in section “User-centered consultation and co-responsibility (co-creation)”

⁸ They mainly come from workplaces (24%), health care venues (16%), family gatherings (14%), public events (9%), social accommodations (8%), etc.

Figure 6 - Reduced mobility demand by transport mode and by country during the COVID-19 crisis

Source: Apple Maps mobility trends report

The restrictive measures and the negative perception of the potential risk associated with the use of PT have entailed [serious losses for PT companies](#): on the one hand, the lockdown measures first, and the distancing measures to prevent new infections afterwards, caused reductions in vehicle capacity up to 25-50% and therefore revenue losses in terms of ticketing (corresponding to 50% of total revenue); on the other hand, additional health and hygiene measures entail increased operational expenditures.

According to the above-mentioned YouGov survey, more than 80% of PT users are willing to regain previous PT habits if the right precautions are in place. Therefore, it is important that public and transport authorities, despite all the difficulties they are experiencing, take a leap in quality to ensure a safe and comfortable experience for their passengers.

The most immediate and intuitive intervention, being already the case in a significant number of European urban centres, concerns PT systems re-establishing trust with their staff and the users through important sanitation measures, by guaranteeing physical distance and obliging passengers to use masks, etc. All PT related assets should be constantly cleaned and disinfected, and these operations should be visible to commuters.

To make the long-term sustainability of PT's offer possible, [more flexible and modern contractual forms should be included in future tender procedures](#): for example, the introduction of more service flexibility, e.g., allowing flexing up or down the volume of services; temporary replacement of some routes with on-demand services; the introduction of more dynamic governance mechanisms to improve "real time" decision making; and the inclusion of insurance requirements in the contract to mitigate the financial risk of collapses in demand in the case of crisis. In particular, the general approach requires moving from a customer-supplier relationship to a more fluid public-private partnership (PPPs), in order to share choices, risks and benefits.

While the offer of the service will have to be increased, given the lower number of seats available per vehicle/coach, the partial replacement of traditional PT by on-demand PT, also in conjunction with shared mobility services, will accelerate and support the deployment of new business and operational models. These are made easier by the application of new technologies accessible via smartphones, and they can guarantee a more effective use of the resources that operators have at their disposal. Their

potential evolution into Mobility-as-a-Service (MaaS⁹) systems is discussed in section 4. The change in the travel habits of citizens, who as a consequence of smart working will move less, and will be encouraged to do so outside peak hours and more locally, should contribute to reducing pressure on PT. Furthermore, as underlined by the [Motiv project](#), the increased comfort deriving from traveling in uncrowded buses and metros can play a key role in attracting more users. Nevertheless, PT authorities/operators (PTAs/PTOs) should reassess the number of passengers allowed to be onboard and reconfigure the inside layout of vehicles, so to ensure physical distancing and minimise the risk of contagion (e.g. reorganisation of passengers inflows and outflows).

3.1.3. Shared mobility services

Shared mobility services were also affected by the crisis, namely during lockdown (see section 2). If on the one hand the use of shared vehicles such as e-scooters, bicycles, mopeds and cars facilitates physical distancing, in fact, the risk of contagion due to the contact of different users with the same surfaces has discouraged their use. Being private players often in the midst of investments, many operators have had to shut operations down (see 1.1). Some have managed to reinvent themselves and diversify their revenue streams by [using their passenger vehicles for delivery services](#).

By strengthening multimodal and complementary integration with PT, shared mobility service markets could be significantly revived. After all, [several local authorities Europe-wide had begun to encourage this leaning](#) well before the outbreak of the pandemic. In fact, these services require careful integration into the local transport system, thus avoiding risks such as the increase of unnecessary travel. Given the PT's need to reorganise itself more flexibly, shared vehicles, such as electric cars, bicycles, e-scooters, can become part of the PT offer. This integration can be organised through new forms of PPPs, providing privileges and subsidies for the operators who adhere to the scheme and in exchange share selected data with the public authorities, useful for planning and monitoring the transport system. In order to facilitate the emergence and participation of small and local startups, local authorities might promote [user-oriented subsidies](#), such as paying part of the price of bikeshare trips to the users, rather than providing company-based support.

3.1.4. Freight and logistics

The pandemic has highlighted the role of urban logistics as an essential public service for the city, similar to passenger transport. Public authorities should not delegate its management to private companies, but rather take responsibility when it comes to the regulatory and planning aspects. Fragmentation in loads and trips is accentuated by [the recent expansion of e-commerce and instant deliveries](#) and further accelerated by the COVID-19 lockdown, contributing to an increase in the number of deliveries and in terms of environmental impact, and adding new types of soft modes (cargo-bikes, scooters) for freight movements. The sector is struggling to manage this excess of demand due to the lack of workforce, assets and resources. Local authorities could consider encouraging collaboration between operators by supporting the integration and partnership of business networks, not only vertically but also horizontally, and favouring the sharing of resources (infrastructures - e.g. warehouses, transit points, etc. - vehicles, information systems, etc.) to rationalise and optimise delivery, collection times and spaces in cities. Technological and organisational

⁹ The MaaS concept promotes the combination of different transport services into one single mobile platform

innovations, such as Augmented reality and Digital Twins¹⁰, blockchain and Physical internet (PI)¹¹ will allow an even greater integration of the supply chain, with significant benefits in terms of last mile logistics services.

Increased demand also requires new spaces for more frequent stops of logistics operators. Clear policies on loading/unloading areas must be developed, integrating freight into the planning of a more dynamic and flexible use of curb space. Parking and kerbside management guidelines are popping up, especially from North America (see [NACTO](#), [Pembina Institute](#), etc.), and addressing also freight needs. It is necessary, with an integrated approach, to [intervene on the cities' time-schedules](#) and encourage smart working (also in public offices) to avoid concentration flows during peak hours.

Digitalisation can support the further development of “contactless” delivery of goods and services to final consumers. This is desirable to minimise the risk of contagion and increase efficiency of the deliveries by significantly shortening the time the driver takes to manually bring the parcel to the receiver.

Riders, together with couriers, have played a fundamental role especially during the lockdown period. These workers must be assured of greater safety and contractual guarantees. Moreover, logistics companies must ensure safer working areas – there have been several cases of clusters of infections initiated in logistics dispatching centres, such as in the [U.S.](#), [Germany](#) and [Italy](#).

3.2. Post-crisis scenarios of the urban mobility system

The identification of challenges and opportunities is necessary to understand how urban mobility scenarios can evolve. The ambition of the sector depends on the amplitude of the economic crisis and the resources made available for the recovery, as well as the level and quality of investments that will be made. The resources allocated for the Green Deal implementation and the Recovery Fund can provide a reference, but the specific action plans and measures that will be implemented in the short and medium term will outline future developments. Although the virus and its evolution bring a certain degree of uncertainty, a greater understanding of the patterns of contagion and of the impacts of the restrictive measures imposed during lockdown provide evidence on how to take action in the transport sector. The evolution of urban mobility trends will also depend on the pre-COVID-19 situation of each city and country, and on policies that will be promoted at the European, national and local level. The outcome will probably be a mix of four scenarios, but the prevalence of one or the other will follow from the priorities established by policy makers and service providers.

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 the PT, 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

¹⁰ A Digital Twin is a digital replica of a complex real-world urban environment and represents the different processes, actors and their interaction. This approach is useful to test new measures and anticipate their impacts before actually implement them.

¹¹ Smart contracts offered by blockchain technology can support more efficient and secure collaboration among logistics players, and enable PI deployment. PI aims at realising full interconnectivity (information, physical and financial flows) of several (private) freight transport and logistics services networks and make them ready to be seamlessly usable as one large logistics network.

If, on the other hand, 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. For example, maintaining full or partial teleworking assets, flexible working hours and stores' openings can reduce transport demand, overall or during peak hours. Moreover, the growth of e-commerce can lead to less trips for shopping or groceries, although the potential negative effects of increased freight movements and fragmentation of deliveries should be considered. Furthermore, the pandemic has favoured the rediscovery of proximity shops and activities, as theorised by the [15-minute city concept](#). 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. Consequently, it would be desirable to continue on this path with some key adaptations, for example by integrating the positive trends described in scenario 3 to decongest the PT while redesigning it with strengthened security measures.

4. RECOMMENDATIONS

Some recommendations per mode and for different levels of governance have already been provided in section 3. Here, these are briefly recapped also in light of the outlined scenarios. On the basis of these, we suggest EU-policy makers a set of desirable actions, and an operational framework aimed at effective and coherent implementation.

4.1. General recommendations for a post-COVID-19 smart and sustainable transport system

If accompanied by a wise and bold reallocation of space, soft modes such as walking and cycling can benefit from the momentum experienced during the crisis of the past months. However, **PT remains the backbone of sustainable transport, moving large numbers of passengers over long distances.** A decongestion of the PT was desirable even before the outbreak of the pandemic, given that, during rush hours, buses and subways in many cities were packed – with [negative effects on both the customer experience and the health of passengers](#). Sharing systems with a view to flexible integration of the PT service were already being defined, both in terms of technological development (MaaS¹²), definition of business and operational models, and creation of [PPPs between the PTAs/PTOs and shared mobility service providers](#). Accompanied by serious sanitising measures, **the flexibility deriving from on-demand and sharing services complementary to the PT can counteract the otherwise inevitable preference for private means of transport.**

Among these, car use should be discouraged as it significantly contributes to congestion and pollution, given the [still-limited \(6.8%\) market share of e-cars sales](#). Nevertheless, the purchase and use of private bicycles, both traditional and electric, e-scooters and e-mopeds can alleviate the demand for PT. **In order to avoid conflicts between these soft modes, it is necessary to adapt the infrastructure and reorganise the management of the spaces, possibly in a flexible way.** Technology improvements now allow these small vehicles to reach a 25-30 km/h speed. If the separation from the sidewalks for pedestrians seems obvious, the opportunity to design separate lanes and spaces between normal bicycles and electric soft vehicles should also be considered. Alternatively, an increasingly widespread network of secondary roads with speed limits between 20-30 km/h (see example of [Brussels](#)) makes it possible to make room for faster soft modes on the roads. This would prevent, at least in the short term, interventions on the infrastructure, which require extended times and a commitment of resources that are difficult to find in times of crisis.

Overall, **developing a close and continuous link with virus' propagation modelling experts is fundamental for providing the most accurate and appropriate interventions** in terms of use of different transport modes. The virus is constantly evolving, and the reactions should be timely developed and modified.

All new interventions should be integrated into a coherent and balanced transport mix. It is necessary to distinguish between short-term buffer measures and long-term strategies. Taking the example of encouraging active travel, if on the one hand it provides benefits (physical distancing, active citizens, less pollution), this also implies costs (less space for other modes, contraction of the automotive market, etc.). **An appropriate cost-benefit analysis, integrating other sectors such as health, should accompany the introduction of new transport measures.**

¹² The MaaS concept promotes the combination of different transport services into one single mobile platform

In cities, people and freight – which has proven to be an essential service during the lockdown – often share the same road and parking infrastructure, competing for the same space. Nevertheless, planning and management are organised in silos. **Greater integration of passengers and freight planning and infrastructure** ensures greater efficiency and minimises the use of scarce urban space.

4.2. Recommendations for EU policy-makers: integrate EU response into existing priorities

All EU interventions for a full recovery of mobility and connectivity should be aligned with the strategies already in place¹³ and should not overlook the challenges identified therein, namely climate change, air pollution, social inequities in urban accessibility, road deaths and injuries, among others.

On 13 May, the EC published a [package of guidelines and recommendations to help Member States to gradually lift transport restrictions](#). The Communication encourages and supports the development and implementation of new urban mobility solutions and measures to facilitate active, collective and shared mobility in a safe manner, and to ensure trust among citizens. According to the EU Treaties and for the protection of the Single Market, national and local interventions must not create discriminatory effects between EU transport operators and service providers, nor discriminate between EU citizens or workers on grounds of nationality. The EC also underlines the importance of sharing best practices, ideas and innovations for safe mobility in urban and sub-urban areas. This facilitates cooperation and knowledge exchange. **Improved multi-level governance cooperation mechanisms are needed to establish a continuous dialogue, ensure policy coordination, and undertake joint actions.** This is needed both vertically (with different levels of governance, from the EU to local communities) and horizontally (with different authorities in the same cities, and with private stakeholders). In this regard, the EC also intends to coordinate the response of local authorities and stakeholders active in the field of urban mobility, using this challenge as an opportunity for a new, more sustainable mobility in the EU, in line with the [European Green Deal](#). This is the aim of the [COVID-19 SUMP Practitioner Briefing](#), endorsed by the EC. In fact, from many points of view **the responses to the scenarios described above are in line with what is already foreseen in the strategies and guidelines of the EC¹⁴.**

The European Green Deal aims at making Europe the first climate-neutral continent by 2050. [According to the President of the Commission, Ms. von der Leyen](#), it is the “*motor for the recovery. By using the European Green Deal as our compass, we can turn the crisis of this pandemic into an opportunity to rebuild our economies differently and make them more resilient*”. For it to succeed, the Green Deal strategy must be corroborated by ambitious and concrete action plans with well-defined targets and integrated with other policies at national and local level. So far, as also reported by [the European Court of Auditors](#) (see section 3.1), there has been no significant reduction in private car usage, and air pollution in many cities still exceeds the legal limits. The European Court of Auditors claims that no substantial improvement is possible without Member States’ commitment and further EU coordination. It is therefore a question of giving priority and further thrust to existing plans, with a particular eye on the **strengthening of, and integration between PT and shared mobility services**, which to date are those showing the greatest difficulties in recovery. [A green restart is an opportunity](#) for sustainable and smart transport strategies to regain momentum.

¹³ Further detailed in the forthcoming EP study on “Sustainable and smart urban transport”

¹⁴ Read more in the forthcoming EP study on “Sustainable and smart urban transport”

The EU should strongly support the development of financing schemes for the purchase and procurement of zero-emission vehicles and other non-polluting technologies. EU funding instruments such as [InvestEU](#) and [CEF](#) could steer private and commercial investments into zero-emission vehicles and deployment of related charging infrastructure. Scrappage or purchase subsidy schemes should be extended to electric bicycles, possibly with reciprocal approaches at European level, as they have been successfully applied in Germany, France and Italy. For buses and city fleets, prices of clean vehicles remain prohibitive. **Aids for the recovery of the automotive sector could be conditioned to a shift towards zero-emission mobility,** and not simply by reinvigorating the traditional pre-COVID-19 market.

This crisis represents an opportunity for [accelerating the rollout of the MaaS concept](#). This can support multimodality and modal shift if it integrates the offer of new and traditional mobility services with city and regional transport policies. MaaS and LaaS (Logistic-as-a-Service, applicable to goods mobility) could enable alternative ways of moving people and goods, thus enhancing the flexibility, reliability and overall efficiency of the mobility network, joining the forces and resources of PT and shared mobility services through solid PPPs. To facilitate this process, **the EU should encourage the use of common EU standards and specifications to establish an interoperable and efficient open data network,** merging information from all mobility services and modes. These include interoperable payment and ticketing, information on charging and refuelling points, access to in-vehicle data, continuity of traffic management services, etc. These technical aspects are addressed in the **ITS Directive**¹⁵, currently under implementation scrutiny. Nevertheless, guidelines on data-sharing principles are also needed to systematise the approach for data and information exchange between the public and private sector, which in turn enables an evidence-based policy-making process: **these data are also important to manage safety-related aspects such as physical distancing, contactless transactions, and flexible timetables.** For example, information regarding the crowdedness of a PT line at certain hours can facilitate the optimisation of the offer, or intelligent ticketing can reduce the risk of contagion by avoiding the usage of counters and vending machines at stations.

The crisis has shown that radical behaviour changes are possible, even in the short term. However, these cannot be entirely delegated to the initiative of citizens or single companies. **Behaviour changes should rather be induced (or guided) by bold public policies, in the interest of – and agreed with – the community.** The challenges for the development of resilient, smart and sustainable urban transport systems have been made more evident by the outbreak of the pandemic, but have not changed. They need to be addressed through agile and inclusive governance mechanisms and integrated policies. These are outlined in the forthcoming EP study on “Sustainable and smart urban transport”.

¹⁵ [Directive 2010/40/EU](#) of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport

The briefing provides an overview on the state of play and trends of urban transport since the outbreak of the COVID-19 pandemic. It outlines four scenarios, the prevalence of one or the other depending on the priorities established by policy makers and service providers. The briefing delivers general recommendations for a post-COVID-19 smart and sustainable urban transport and a set of desirable actions on how to integrate EU response into existing policy priorities.
