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Common - COVID-19 response and transport: Initial reflection on the impact of the COVID-19 pandemic' s first wave on public transport in the EU and the example of Germany

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【概要 : Summary】

Public transport is the backbone of urban mobility and contributes to achieving the sustainability objectives in the transport sector. In the EU, the European Commission strongly encourages the use of public transport within the modal split of passenger transport in order to reduce congestion and air pollution in urban areas. It aims at improving the sustainability of urban environment, with public transport using alternative, cleaner fuels. However, public transport has been strongly hit by the COVID-19 pandemic, as people feel less comfortable using public transport for commuting and use more frequently private cars instead, as well as bicycles. At this point in time, it is not entirely clear if the current crisis in the use of public transport will be temporary and will end the moment the COVID-19 pandemic will come to an end. The COVID-19 pandemic has the potential to change the daily life of people due to the changes in the working environment and social habits. However, the commuting and living behaviour could change for a part of the population in the long-term and it could also cause a permanent decline in the use of public transport. The decline of public transport in German and other European cities is still not

clear in its entirety, as data will become only available during 2021 and 2022. However, in a post-pandemic situation, it is possible that a part of the population will continue to avoid public transport due to disease transmission concerns or a shift in the commuting needs. It could lead to an increase in the demand to use private passenger cars or bicycles as the preferred transport means or others. The public transport companies will have to adapt to the new challenges. Although it can be expected that public transport will remain a key sector for both the economic recovery and the achievement of the European Green Deal objectives, adjustments will have to be made in order to improve again the commuter' s acceptance. It will be of great importance that the EU prioritises political and financial support for the sustainable modes of urban transport, in particular public transport.

【記事 : Article】

1. The EU-27 motorisation rate and public transport in pre-pandemic time

According to Eurostat data, the motorisation in the EU stood at 237 million passenger cars in the EU-27 Member States in 2018. The highest number of vehicles were found in Germany (46.5 million),

followed by Italy (39.0 million) and France (32.9 million). Based on 2015 data, the EU-27's motorisation rate, meaning the average number of passenger cars per inhabitant reached 503 per 1,000 inhabitants, or about one car for every two persons in the EU.

However, the increasing demand for urban mobility has created severe congestion and parking difficulties, pollution and noise, among others, in many urban areas. In regions characterised by efficient, extensive public transport systems, especially the case in capital and metropolitan regions of western and Nordic Member States the motorisation is lower than in other regions. Instead, higher motorisation rates are often found in suburban, rural and peripheral regions, especially when these lack alternative modes of passenger transport.

According to Eurostat, the German capital Berlin has one of the lowest motorisation rates in the EU, at 330 passenger cars per 1,000 inhabitants in 2018. Relatively low motorisation rates with less than 450 passenger cars per 1,000 inhabitants were also reported in the capital regions in Austria, Hungary, Sweden, Denmark, Belgium, France, Ireland and the Netherlands.

Instead, the highest motorisation rates in the EU with at least 650 passenger cars per 1,000 inhabitants in 2018 are located in the eastern and southern parts of the EU. The regions with the highest motorisation rates are principally located in Italy (13 regions), Poland (five regions) and Finland (four regions).

2. The COVID-19 pandemic's impact on public transport and urban mobility

Willingly or forced by circumstances, cities across Europe have slowly started to change their vision about urban mobility in the past years.

“Towns built for people not for cars” is a concept that was introduced before the outbreak of the COVID-19 pandemic.

In contrast to private passenger car transport,

urban public transportation is a system of transport means including bus, light rail transit, metro, regional railway and several other systems, which have the potential to offer sustainable transport, available for use by all persons. Public transport is the backbone of urban mobility and can reduce congestion and health-harming emissions in urban areas while improving the environment - especially with public transport using alternative, cleaner fuels.

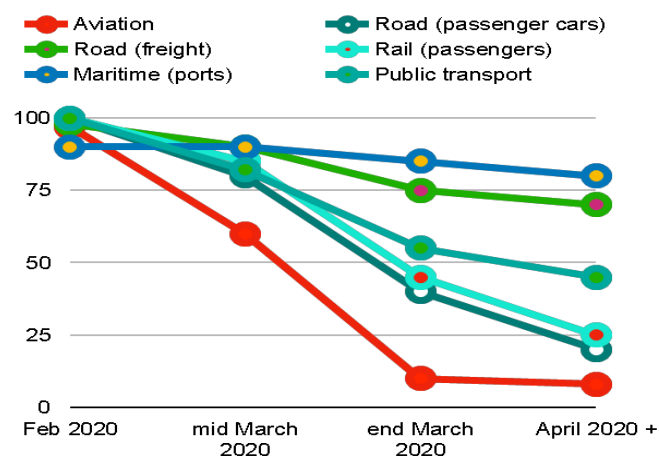
Therefore, public transport is strongly supported in the EU and the European Commission strongly encourages the use of public transport as part of the mix of transport modes.

However, due to the COVID-19 pandemic's impact which very quickly re-shapes mobility in the cities, due to the necessity of social distancing, public transport has suffered a decline in passenger volumes in 2020. Since the new SARS-CoV-2 virus spreads primarily through aerosols, public transport systems are considered being a high-risk environment due to high number of people in a confined space with limited ventilation and a variety of other risks related to the transmission of the virus.

However, on the other hand, during the COVID-19 pandemic in 2020 and 2021, the public transport in the EU Member States has been and still is a factor of stability during the several lockdowns, with operators continuing to provide an essential service for people that still need to travel and commute. There are mainly visible two developments in urban transport. At European level, the transport modes have been hit differently by the COVID-19 pandemic. While aviation suffered most, with a reduction of transport activity towards 90%, the other transport modes have suffered less, with freight transport on road and maritime transport showing the lowest levels of changes during the pandemic. Public transport shows a reduction of transport activity of more than 50%. Although this is a significant reduction of more than half, with

this result, public transport is in the middle range of the decline in transport activities in the EU-27.

This negative impact is not only based on the people's fear to catch a COVID-19 infection while using public transport. It is also based on the fact that many people do not have to commute to their offices in the city centres, due to the possibility to telework in their home offices during the lockdowns. Furthermore, those people still commuting to their offices in city centres, have partially changed transport modes, towards cycling or walking or using their private cars.



Source: https://ec.europa.eu/jrc/sites/jrcsh/files/202005_future_of_transport_covid_sfp_brief_.pdf

Figure 1: Changes in transport activity, EU-27, from February to April 2020 (baseline = 100)

On the one hand, this is a positive effect of the COVID-19 pandemic, as the use of bicycles has increased, in particular in the cities. The social distancing imposed by the pandemic has led many municipalities to offer their citizens new travelling ways. This has often meant the introduction of new cycle paths, such as the instant introduction of so-called "pop-up" cycling lanes and the introduction of 30 km/h speed limit zones to keep road traffic speeds down and boost so called soft mobility. On the other hand, a negative impact of the pandemic has

become visible due to a modal shift away from public transport towards the use of private cars.

3. Current negative impacts of the COVID-19 pandemic on public transport

Public transport and aviation are particularly vulnerable to the impacts of changing in user choices, worsening economic conditions and the COVID-19 pandemic. The public transport sector faces current and probably also future challenges in the post-pandemic era. Considering the impacts on the sector, the UITP (Union Internationale des Transports Publics) joined forces with other organisations including CER (Community of European Railway and Infrastructure Companies) and IRU (International Road Transport Union) by sending an open letter to the European institutions' representatives, including the President of the European Commission, Ursula von der Leyen, President of the European Council Charles Michel and David Maria Sassoli, President of the European Parliament in order to call for more support for the public transport in the EU. In the EU, air transport is the sector affected most by the COVID-19 pandemic, with more than 90% of programmed flights in EU27 cancelled, while public transport and passenger rail decreased by more than 50% in most EU Member States. Instead, the freight sector was more resilient, since supply chains were mostly kept open to support the continuing productive operations.

Therefore, public transportation, particularly urban networks, have been seriously weakened during this COVID-19 pandemic. It now seems increasingly essential for the European Commission to urgently set up a fund to support public transportation activity in Europe. This fund is expected to enable operators to continue operating during the crisis but could also help economic growth once the pandemic has ended.

According to the Joint Research Centre (JRC), the EU's policy priorities in the post-pandemic challenges will to a large extent shape how the

transport sector will further evolve. As part of the post-pandemic recovery measures, it will be important to maintaining the ambitions of the European Green Deal, as those recovery measures could stimulate the EU's transport sector to improve towards achieving the European Green Deal's net zero emission target of 2050. Furthermore, it can be an opportunity to promote micro-mobility and clean transport modes to improve the environmental quality but also support innovation.

The JRC expects that also in post-pandemic times and regardless of how soon the COVID-19 pandemic ends, the uncertainty concerning new waves of the virus or other pandemics will remain and will probably lead to a higher risk aversion towards transport and travel.

4. The development of public transport during the pandemic - Germany as an example

In Germany, the use of public transport declined significantly in the first half of 2020, which includes the first three months under the COVID-19 pandemic. According to the Federal German Statistical Office Destatis, in January and February 2020 the usual passenger volume comparable to the years before was reported for all local and long-distance rail traffic.

The commuting employees and the education sector (distance learning versus face-to-face teaching in schools and universities) have strong impacts on the development of mobility. Due to the pandemic related lockdown in March 2020, the passenger volumes decreased significantly in Germany by around 40%, compared to March 2019.

In the 1st half of 2020, the passenger volume in long-distance buses and trains in Germany declined by 46% compared to the same period of the previous year. The COVID-19 pandemic led to an even more pronounced decline in the number of people travelling on long-distance buses and trains in the 2nd quarter from April to June 2020, as the number of people travelling on long-

distance buses and trains decreased by 75% compared to the same period in 2019. However, due to the uncertainties in the reporting data of the transport companies, the Federal German Statistical Office Destatis additionally evaluated experimental mobile phone data for analysing the travel behaviour of passengers regarding the means of transport they used. According to this experimental data of Destatis, in April 2020, daily long-distance rail journeys showed an 88% decline on a year-on-year basis.

At the beginning of August 2020, the number of daily journeys in long-distance rail transport increased. However, it still was around 30% lower compared to August of 2019. A further significant decline of around 50% compared to the previous year's level occurred in October 2020.

In Germany's local transport, the decline for the 1st half of 2020 cannot yet be conclusively measured, according to Destatis. However, preliminary results for the 1st half of 2020 suggest that 874 million passengers travelled on local rail services, which is a decline of -37% compared to the 1st half of 2019. In the first quarter of 2020, passenger numbers fell by -15% in local rail transport, including suburban trains. The current data for local bus passenger numbers showed a decline of -22% in the first half of the year and -36% in the second quarter alone. Tram passenger numbers fell by -24% in the first half of 2020 and -41% in the second quarter of 2020 alone. However, it can be expected that these figures do not fully reflect the actual declines that occurred in 2020. This is partially due to the fact that many passengers in local services hold seasonal tickets, which were probably already purchased before the onset of the pandemic, although these commuters might meanwhile work from their home office. In Germany, on average, about 56% of the employed can potentially work in a home office. Therefore, it can be assumed that the passengers with seasonal tickets did use their tickets only comparatively

infrequently during the COVID-19 pandemic.

In a representative survey, Hagen et.al. of the Research Lab for Urban Transport of the Frankfurt University of Applied Sciences asked 2,000 people about their current and future mobility and shopping behaviour between 17th August and 21st August 2020. They were also asked to explain to what extent their travel and commuting behaviour has changed as a result of the COVID-19 pandemic. The results confirm that during the pandemic, there was an overall lower level of mobility. The results of the survey also show that the relative “winner” in the modal split due to the COVID-19 pandemic is the bicycle. While in 2019 in Germany 8.8% (5.2% in the Federal State of Hesse) mainly used the bicycle to get to work, the value is currently 9.3% (6.5% in Hesse). Furthermore, 10.3% (7.8% in Hesse) of respondents intend to use the bicycle to get to work due to the COVID-19 pandemic, according to Hagen et.al. The same applies to trips to shopping/errands, leisure activities/hobbies and friends/acquaintances/family. It remains to be seen whether this trend actually continued in the pandemic’s second wave and lockdown during the winter season 2020/21, which also included a stricter lockdown from December 2020 to March 2021. However, while the data is not available yet, it can be expected that the general modal shift away from the public transport continued.

Furthermore, interviews with 19 experts in the field of transportation showed that most of the experts predict that the volume of motor vehicle traffic will increase again in the post-pandemic era and transport companies will have to consider a long-term lower demand for public transport.

According to findings of Hagen et.al., at the end of March 2020, only 55% of employed persons in Germany who were already employed in January 2020 were “at their place of work” but more than half of them were working from their home office. In addition, there were employees who took time off work or were in short-time work or they were

unemployed (marginal). In July 2020, 62% were at their usual workplace. The results confirm that during the COVID-19 pandemic, there was an overall lower level of mobility, and especially a reduction in commuting, especially with respect to the use of public transport.

Although the German public transport suffered during the pandemic, it is less significant than the decline in the EU-27, with a decline in public transport of more than 50%.

People have more often worked from home and on short-time work and business trips have been reduced. Students learned from home and did not attend schools or on-site university courses because of the lockdown. However, although there is a switch from public transport to cars and from office to home office, this cannot fully explain the decline in public transport.

5. Possible short-term and long-term effects of the pandemic on public transport

Considering the development in public transport, a distinction is necessary between the short-term effects observed during the COVID-19 pandemic with the several lockdowns on the one hand and the possible medium to long-term effects in the post-pandemic phase on public transport on the other hand.

In this respect, the reduction in the utilisation of public transport in Germany is comparatively “milder”, at least in the first wave of the COVID-19 pandemic in spring and summer 2020. However, although the decline is less pronounced in Germany, with a decline of 37% in local rail services in the first half of 2020 and a -59% decline in the second quarter 2020 respectively, and a decline in tram passenger numbers of -24% in the first half of 2020 and of -41% in the second quarter of 2020 alone, compared to the first half year 2019, the currently reported data is not expected to fully reflect the actual declines in public transport. It is also interesting that not all modes of public

transport systems are affected by the decline to the same extent.

According to Hagen et.al., the lower mobility during the COVID-19 pandemic can be explained by the increasing home office activity, short-time work and unemployment. People are also less mobile due to the reduction of leisure activities and (large) events like concerts. The survey underlines that the use of public transport remained also lower in the summertime when the pandemic situation was more relaxed in Germany. Hagen et.al. interpret this development as an indication that there has been a loss of confidence in public transport.

According to Hagen et.al., the modal split has changed with the COVID-19 pandemic crisis. With a lower overall traffic volume, the demand for private cars and bicycles has increased. On the one hand, these could be seen as a short-term impact of the pandemic only, which would end the moment that the pandemic comes to an end. On the other hand, in part, there could also arise long-term changes in mobility behaviour.

In fact, there could be a long-term trend that more people will more often work from home offices and there could be fewer business trips for companies in the future. The increase in home office reduces the need to commuting to the companies' offices in the city centre. However, what could have changed during the pandemic is the people's confidence in urban public transport modes, which is more related to their emotions of feeling comfortable in choosing certain means of transport. In their survey, Eisenmann, Kolarova, Nobis et.al. were particularly interested in analysing the choice of means of transport of the respondents during the COVID-19 pandemic and how comfortable they felt about certain means of transport. The aim was to see how mobility behaviour in the areas of shopping, travel, work and leisure had changed as a result of the pandemic. Eisenmann, Kolarova, Nobis et.al. found changes in the behaviour of

people regarding in how far they felt comfortable in certain transport means. They concluded that the private passenger cars and the bicycles have gained users during the pandemic compared to other means of transport. Furthermore, the respondents who frequently used public transport in local or long-distance traffic in the past associated greater discomfort in using public transport in the current pandemic situation than infrequent and non-users of public transport. At the beginning of the pandemic, many passengers and transport companies were unable to assess the risk of infection in public transport. No precise statements could be made because the risk of COVID-19 infections in public transport had not yet been sufficiently investigated at that time. Therefore, due to the unpredictable situation and uncertainty at the beginning of the pandemic, public transport suffered also from a loss of passenger confidence, which could potentially also have long-term consequences in the post-pandemic era.

However, these findings made during the first phase of the pandemic would have to be validated with survey during the second wave und lockdown from November 2020 to March 2021. The results could be different and new studies would be need in order to assess the changes in commuting behaviour over a longer time.

6. Conclusion

The COVID-19 pandemic is considered being one of the greatest shocks for societies since the end of WWII, also strong enough to change future needs and social values - and to modify transport needs as a consequence. As an immediate impact of the COVID-19 pandemic, a significant reduction in passenger volumes has become visible in the use of public transport. This could lead to changes in the transport needs and travel demand not only in the short-term but also in the long-term. The real decrease in the number of passengers using public transport in European and German cities

and its impacts can still not be evaluated in its entirety, due to the lack of data, which will only become available over time.

In 2021, the pandemic can be expected to continue and also lockdown measures will continue their impact on the people's daily life for most of 2021 in wider parts of the EU. Accordingly, the public transport can be expected to continue to suffer of a lowered acceptance also in 2021.

However, the increased use of private cars and the lower demand for public transport during the pandemic could pose a threat to the environmentally necessary modal shift towards public transport, away from the use of private cars in the mid-to long-term. Public transport operators will have to find ways to restore the citizens' confidence in public transport in order to recover also from the financial losses during the pandemic.

Ultimately, public transport is and will remain a key sector for both, the economic recovery and the realisation of the European Green Deal objectives. It will remain a central long-term aim to making urban mobility sustainable, and the EU but also its Member States will have to prioritise their political and financial support for the public transport systems.

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