

COVID-19 and public transport: insights from Belgium (Brussels), Estonia (Tallinn), Germany (Berlin, Dresden, Munich), and Sweden (Stockholm)

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**Marcus Finbom, Wojciech Kęłowski, Wladimir Sgibnev,
Louise Sträuli, Peter Timko, Tauri Tuvikene, Tonio Weicker**

COVID-19 and Public Transport

Insights from Belgium (Brussels), Estonia (Tallinn),
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(Stockholm)

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Executive Summary

As we are submitting this report in December 2020, COVID-19 has had a complex and multifaceted effect on public transport (PT) and its use. The emergence of the virus altered both who used PT and how these users experienced their journeys. This study complicates the fear-focused narrative that often framed PT during the COVID-19 crisis. It highlights diverse experiences of PT, which yet are often socially unequal.

This report details the design and outcome of a multi-sited study investigating PT during the initial months of the COVID-19 pandemic. The study began in March 2020 as part of PUTSPACE, an international research project supported by the Humanities in the European Research Area (HERA). It consisted of an online survey (n=1095) and series of semi-structured follow-up interviews (n=49). The survey and interviews solicited information about PT users' mobility behaviour after the outbreak of COVID-19 as well as their experiences on and perceptions of PT during the initial months of the pandemic. Responses came from four geographical regions; Estonia (Tallinn), Sweden (Stockholm), Belgium (Brussels) and Germany (Berlin, Dresden, Munich). It is significant that most of our insights produced in the survey and interviews echoed similar observations across the studied regions.

From this analysis, the study produced key insights into how PT changed during the pandemic:

1. During the first wave of COVID-19, high income and high education groups could avoid PT and seek alternatives while other groups remained dependent.

While many avoided PT, the avoidance was not the same across socio-economic groups. The capacity to actually have access to an alternative transport mode is not only a choice but also a privilege. Flexible work arrangements as well as teleworking is more available to those with higher income.

2. People who continue to use PT find the risk of infection lower than those who completely avoid it.

Survey results showed that people who continued riding PT generally found the PT to be about as safe or even safer than other shared spaces such as grocery stores or shopping centres. Nearly 40% of regular riders found PT to be "much more safe" than grocery stores. In contrast, nearly 50% of people who completely avoid PT find it to be "much less safe," with only 9% judging PT to be safer than grocery stores.

3. Remaining passengers reported hypersensitivity to their material surroundings and the behaviour of others.

A prominent thread running throughout interviews conducted in all regions is a series of negative affects generated in relation to other passengers, sometimes leading to suspicion, distrust, or irritation. With the spread of COVID-19, passengers became increasingly aware of dependence on fellow passengers and their behaviour. A common anxiety has been that of coughing. The desire of distance required constant vigilance and mounting stress which sometimes led to complete avoidance of PT.

4. PT users will face challenges in balancing existing practices with new norms about appropriate behaviour in public space.

Respondents reported feeling hesitant about interacting with each other. However, new practices like distancing are seen as politeness and passengers feel compelled to adhere to a more present etiquette focused on respecting personal space. Newly introduced social norms and expectations come with numerous uncertainties and struggles, such as in relation to whether one should help others (e.g., to board a bus) or not. It is significant how interview respondents experienced the diminished interactions of PT as if it was a lively place before COVID-19 outbreak.

5. Empty vehicles and more careful social interactions gave PT spaces a calm yet eerie atmosphere.

The new preoccupations with elements like distance and personal space had contrasting implications for interactions between passengers. The conditions of transport under COVID-19 reinvigorated a type of mutual respect of shared etiquette on board, with indications of more comfort of riding as vehicles were emptier and calm. At the same time, passengers indicated the sociality of transport as icy and demure with atmosphere being eerie. It is yet significant that the key term describing the atmosphere of PT by survey respondents was the neutral word “distance”, closely followed by “calm” (Figure 2-1).

Introduction

This report presents information on the changing nature of public transport (PT) and PT use during the initial months of the COVID-19 pandemic in the spring of 2020. It highlights both shifts in PT ridership as well as the evolving experiences and sensorial aspects of PT. This study is based on 49 interviews and a survey which collected detailed information from more than 1,000 respondents (see Methods below).

The interviews demonstrated what is often argued in existing research: for many, PT appears first and foremost a pragmatic and technical system (Kębłowski & Bassens, 2018). In general, when asked about their experience of PT prior to COVID-19, many participants offered detailed assessment of their local transport networks as a system and assessed its quality from a general instrumental and techno-managerial perspective. However, deeper investigation revealed that PT also has emotional and affective characters which have been affected by the circumstances of the pandemic.

With this study, our intention was to gain a better understanding of how the COVID-19 pandemic has changed the users' experience of PT. We designed our survey and interview protocol to solicit information about people's thoughts, feelings, and perceptions of transportation. At the outset, we expected a uniformly negative narrative characterized by fear, anxiety, and distrust. While these elements were definitely present, yet our study also revealed a much more diverse set of reactions. While many did regard PT as a potential site of infection and arranged to avoid using it by reducing mobility and finding alternatives, this was not the only response. Others welcomed the additional space afforded by "social distancing" measures and observed a renewed sense of orderliness between passengers.

Nevertheless, the pandemic may have heightened social and class divides among PT users (Tirachini, et al., 2020). Those with more financial means were the most likely to

avoid transportation use while others continued to ride throughout the pandemic. This divide also informs who remains wary of PT—those who continue to ride do not perceive transportation as particularly dangerous while those who stay away remain sceptical of its safety. How these differing experiences and perceptions of PT will influence transportation use going forward remains to be seen. Future surveys following up on these results are already being planned.

Previous Studies

The outbreak of COVID-19 has been met with a flurry of research into how the pandemic may intersect with PT issues. Many of these studies have focused on how the outbreak has altered travel behaviour with most noting a significant downturn in PT ridership numbers. For instance, an online study conducted by Espaces-Mobilité/ Maestro-mobile at the end of April 2020 found 50% of passengers within Belgium avoiding PT out of safety concerns. Meanwhile, a study from TU Dresden of participants throughout Germany found nearly 60% of respondents have changed mobility behaviour, usually in favour of walking or driving (Anke, Schaefer & Franke, 2020). The MOBIS-COVID-19 research project by ETH Zurich and University of Basel, had similar results, noting a 60% decrease in PT ridership within Switzerland (Molloy, et al., 2020). These types of findings were common around the globe, including additional studies conducted on ridership in Sweden (Jenelius & Cebecauer, 2020), South Korea (Park, 2020), and Australia (Beck, Hensher & Wei, 2020).

Other research has looked into how PT is perceived since the outbreak of COVID-19. Tirachini & Cats (2020) suggest a widespread perception that PT is "poorly transitioning to post-pandemic conditions" and that PT will continue to be seen as a vector of disease transmission going forward. Some studies, such as one survey

from DLR Verkehr, find that while PT is perceived to be less safe than private car travel, passengers feel positively about safety measures such as disinfecting vehicles and contactless ticketing (DLR Verkehr, 2020). A similar survey conducted in London finds 62% of respondents unwilling to ride PT without safety measures such as social distancing enforced (Coward, 2020).

Such attitudes are buttressed by epidemiological studies attesting that, without any mitigating interventions, PT does in fact have structural characteristics conducive to spreading COVID-19 such as high passenger density and poorly ventilated air (Shen, et al., 2020). Case studies from China locate COVID-19 spreading events to both intercity high-speed trains (Hu, et al., 2020) and long-distance buses (Liu & Zhang, 2020) with the likelihood of contracting the disease higher depending on the duration of the journey.

However, these studies also find the risk of transmitting the virus can be significantly curtailed by enforcing social distancing measures and consistent, correct use of masks and other personal protective equipment (PPE). Moreover, there is little evidence that intra-city PT is particularly risky—contact tracing efforts in Japan, France, and Austria have not isolated any COVID-19 super-spreading cluster to PT networks (Joselow, 2020; Schive, 2020). This is possibly due to the difficulty of tracing PT passengers or due to the relatively short duration of most PT trips allowing little time for infection. In the face of such findings, *The Journal of Transportation Health*, has argued that suspending local mass transportation will do little to slow the spread of COVID-19 within a population (Musselwhite, et al., 2020).

Finally, there have also been calls to acknowledge the unequal distribution of risk posed by the COVID-19 outbreak. Patel et al. (2020) note that a “purely medical model” of disease risk elides the social determinants of health outcomes such as socio-economic status, going on to note that low-income individuals are less likely to be able to work from home, leading to increased exposure in

spaces such as PT. Other studies echo this concern that low-income workers face increased risk through PT (Burström & Tao, 2020). One study examining these dynamics in New York City finds a positive correlation between membership to marginalized groups, continued reliance on PT, and high rates of COVID-19 (Cordes & Castro, 2020).

Issues of gender also come forward, as Assoumou Ella (2020) suggests that in Belgium women’s greater mobility during the pandemic due to work and family obligations has contributed to unequal risk. Complicating this is a study from Santiago, Chile showing women having fewer trips during the pandemic which the authors relate to a disproportionately negative effect on women’s employment opportunities and child-care obligations (Tirachini, et al., 2020). Our findings below add depth and nuance to these studies—while we also find that educational background and income level correspond to differing relationships to PT during the pandemic, we did not find such stark differences between genders.

Report Outline

In the following report, we build on the findings of these previous studies with data collected from four different European countries. In doing so, we contribute a so-far overlooked focus on the shifting experience in PT and the changing perception of transport provision among those who avoid local services. After discussing the method and city cases, the report’s results are divided into two broad sections. The first section looks at how the participants adjusted their transport use after the onset of the pandemic in terms of avoidance, alternatives, and dependency of PT. The second section unpacks the experiences of using transport during the outbreak, paying special attention to altered sensations of PT space, the novel interactions between passengers, and the overall atmospheres these changes engendered. This section addresses PT as public space and the implications that COVID-19 has for this as creating new norms and altering previous ones.

City Reports

PT service, use, and regulations during the first wave (spring 2020)

City	Tallinn (Estonia)	Berlin (Germany)	Brussels (Belgium)	Stockholm (Sweden)
General COVID-19 related rules	<ul style="list-style-type: none"> • State of Emergency (13 March to 16 May) • 2+2 rules (max 2 persons, 2 metres apart) • Closure of schools, theatres and cinemas, also supermarkets, restrictions on public gatherings, sports events and restrictions on country's borders. • Closure of outdoor spaces such as playgrounds • No further mobility restrictions 	<ul style="list-style-type: none"> • Closure of kindergartens and schools (13 March) • Closure of national borders (15 March) to most neighbouring states. • Prohibition of crossing federal state borders without proper reason (22 March) • Prohibition of physical contact with more than one person from outside one's household (22 March), thus drastically reducing mobility behaviour of citizens. 	<ul style="list-style-type: none"> • Belgian government begins enforcing strict 'lockdown' measures (17 March) • Public gatherings are cancelled • Closure of shops, restaurants, and markets • Prohibition of non-essential travel • Social distancing measures are implemented on public transport 	<ul style="list-style-type: none"> • Recommendations to stay at home and limit non-essential travels • Social distancing measures of 2 meters. • Limitation of gatherings to a maximum of 50 persons. • Closure of high schools and universities, while schools for younger children remain open.
COVID-19 spread in the countries	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p style="text-align: center;">Covid-19 Outbreak evolution for Estonia, Belgium, Sweden and Germany</p> </div> <div style="flex: 1; padding-left: 20px;"> <p>Data Source: ECDC (26.11.2020). Daily update of new reported cases of COVID-19 by country worldwide. https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide</p> </div> </div>			

City	Tallinn (Estonia)	Berlin (Germany)	Brussels (Belgium)	Stockholm (Sweden)
COVID-19 spread in the city	<p>Covid-19 Outbreak evolution for Harju Maakond (Tallinn Region)</p>	<p>Covid-19 Outbreak evolution for Berlin</p>	<p>Covid-19 Outbreak evolution for Region de Bruxelles-Capitale</p>	<p>Covid-19 Outbreak evolution for Stockholms Lan</p>
Service frequency	<ul style="list-style-type: none"> City-run public transport was not reduced in Tallinn Regional train service was reduced 	<ul style="list-style-type: none"> Density of the train frequency of the metro and suburban trains was reduced on 23 March Most bus lines were limited to 20-minute intervals Operator returned to the previous standard schedule (4 May) 	<ul style="list-style-type: none"> In the initial weeks of the lockdown, bus, tram, and train services were reduced by half Noctis bus service was completely cancelled 	<ul style="list-style-type: none"> 23rd March the PT was more or less halved (23 March) This led to crowded buses, and was aborted after a short time
Ridership numbers	<ul style="list-style-type: none"> Indications that 80 per cent at the start of the established State of Emergency 	<ul style="list-style-type: none"> Local operator estimates that passenger numbers were reduced by 75% in April 	<ul style="list-style-type: none"> By March 25, ridership was down to 7% of normal levels 	<ul style="list-style-type: none"> Ridership numbers dropped by 75% between 23rd of March and 20th April
PT regulations	<ul style="list-style-type: none"> No compulsory masks Ticket sales on vehicles discontinued Closure of front door and sealing off first row of seats behind driver 	<ul style="list-style-type: none"> Passengers were obliged to wear masks during the ride (27 April) Cash fares suspended 1.5m social distancing enforced Barriers between passengers and drivers 	<ul style="list-style-type: none"> Masks were obliged on board vehicles and in stations Cash fares suspended 1.5m social distancing enforced Barriers between passengers and drivers Half of all seats cordoned off on buses and trams 	<ul style="list-style-type: none"> Not compulsory masks, but recommended in situations where proper distance cannot be kept, e.g. in a crowded PT Front doors closed and first rows are sealed off since mid-March

City	Tallinn (Estonia)	Berlin (Germany)	Brussels (Belgium)	Stockholm (Sweden)
Service provider recommendations on PT use	<ul style="list-style-type: none"> No public message by PT providers asking public to withdraw from PT Public Health Authority suggesting avoiding PT use (in March) 	<ul style="list-style-type: none"> Operator did initiate campaigns to promote the safety of public transport usage despite increasing cases, ensuring the safety of public transport usage 	<ul style="list-style-type: none"> PT only for essential travel, defined as work, food shopping, assistance to an isolated person, medical care Give priority to hospital staff, staff of food stores etc. Ride off of peak times 	<ul style="list-style-type: none"> PT only for essential travel Ad spaces are now used to inform on safety guidelines and recommendations The travel planner flags all trips during rush hour, with extra info to avoid these trips
2nd wave	<ul style="list-style-type: none"> Protective measures to drivers (11 September): closing of the front door, making a sanitary zone behind the driver and increasing the frequency of cleaning Masks compulsory on PT (23 November) 	<ul style="list-style-type: none"> Federal government reinforced a so-called <i>lockdown light</i> on 1 November Masks still required on PT 	<ul style="list-style-type: none"> Strict lockdown (2 November) Masks still required on PT Contactless payment only Operating at normal levels (night services are cancelled) Curfew between 10 p.m. and 6 a.m. for non-essential travel 	<ul style="list-style-type: none"> Maximum 8 persons can gather together (24 November)

Survey Methodology and Sample Composition

The report is based primarily on a qualitative study examining the experiences, behaviours, and perceptions of PT users in the months following the onset of the COVID-19 (coronavirus) pandemic. The collected data consists of 49 semi-structured interviews conducted across four different countries between March and August 2020. Participants were solicited via an online survey. In the survey, 2164 responses were received (from which 1095 completed the survey) and the analysis of these supports the current study (with 758 from Tallinn, 141 from Brussels, 187 from Berlin/Leipzig/Munich, and 229 from Stockholm). In all, 17 participants were located in Belgium, 12 in Estonia, 10 in Germany, and 10 in Sweden. The interviews were conducted remotely through (video)telephony calls or regular phone calls, and were carried out by five researchers, following the same interview protocol (Annex 3). Afterward, the interviews were transcribed and coded using roughly 45 preselected codes (See Annex 1). The aim of this process was to identify and highlight commonly recurring themes throughout the interviews as well as any points of contrast between different sites.

The COVID-19 pandemic put unique constraints on the research process. In order to comply with the lockdown measures instituted by various countries and municipalities, and to adhere to suggested social distancing guidelines, the study relied on entirely online methodologies. While such an approach has its benefits as it allows for high return rates at a reasonably short time period, the applied research tools to investigate social change in PT usage and encounter clearly imply excluding components. As such, the participants included were necessarily individuals with internet access; who frequented the social media networks where the original survey was distributed; and who had the time and inclination to fill out an online survey and participate in an online interview (many also were positive of PT, see Figure 0-1).

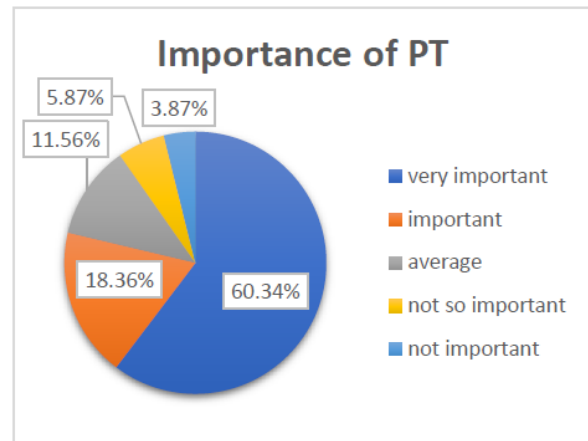


Figure 0-1: In your view, how important is it generally to maintain the operation of PT during the COVID-19 outbreak? (From 1: not so important to 5: very important) (in %; n=1085)

One of the advantages of the online survey is that it enables research into the change of PT perception across national borders in a European framework. Thus, the survey allowed us to collect data in four different countries forming part of the PUTSPACE project, mainly focusing on the PT usage in the respective capitals. While this invites for insightful cross-comparisons and may serve to start a discussion about European publics perceiving an international crisis as the COVID-19 pandemic, it must be mentioned here that such a heterogeneous panel clearly affects the quantitative generalization of the results.

Thus, the study does not accurately represent the average demographics of any of the regions covered nor cover the full spectrum of PT users. Due to above mentioned methodological limitations, the average survey respondent, as compared to the population in the investigated cities, is younger (60% of respondents are between 18-39), majorly female (66%) and holds a higher education degree (76%). Besides, our

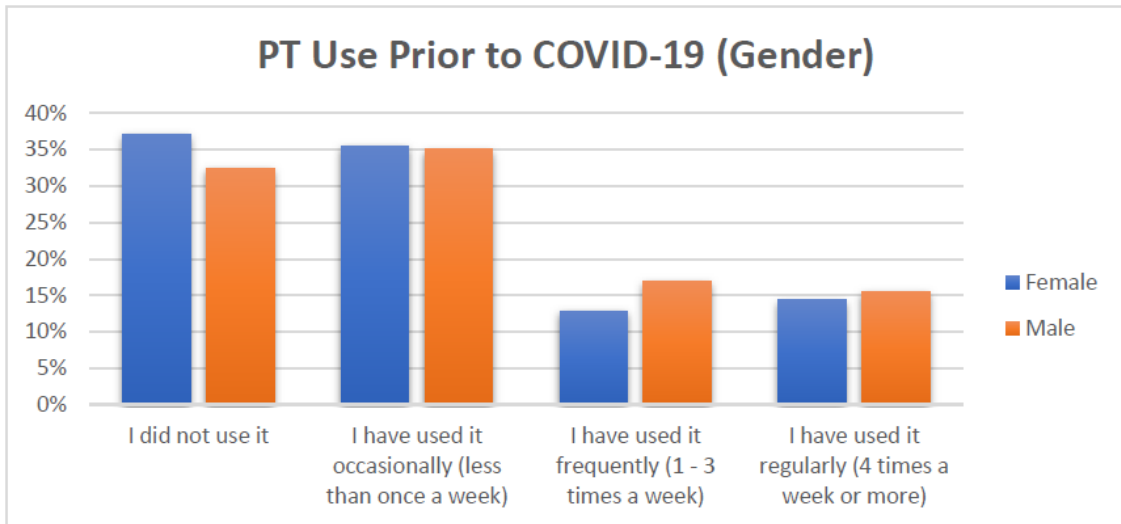


Figure 0-2: How often have you used PT since you have learned about the COVID-19 outbreak? (in %; n=1085)

online survey respondents tend to use PT services significantly more often than average citizens (48% of respondents use PT on a regular basis (more than once a week), while the average, for instance in German cities, amounts to 21% (Ecke, et al., 2020, p.28). At the same time, frequent car users are underrepresented in our survey (only 40% of the survey respondents use a car more than once a week). Another disadvantage of online service is the high rate of incomplete questionnaires, leading to different degrees of validity in the analysis.

Despite the detected imbalances of the sample, the great return of filled-in questionnaires allows to conclude certain tendencies about changes of behaviour in PT especially in combination with the qualitative analysis of this study. In this sense, the survey results are founded on a reliable data base to estimate statistically significant trends regarding changes of PT usage before and since the outbreak of the pandemic (subdivided to income class, age and gender) as well as shifts in perception about the safety of PT usage.

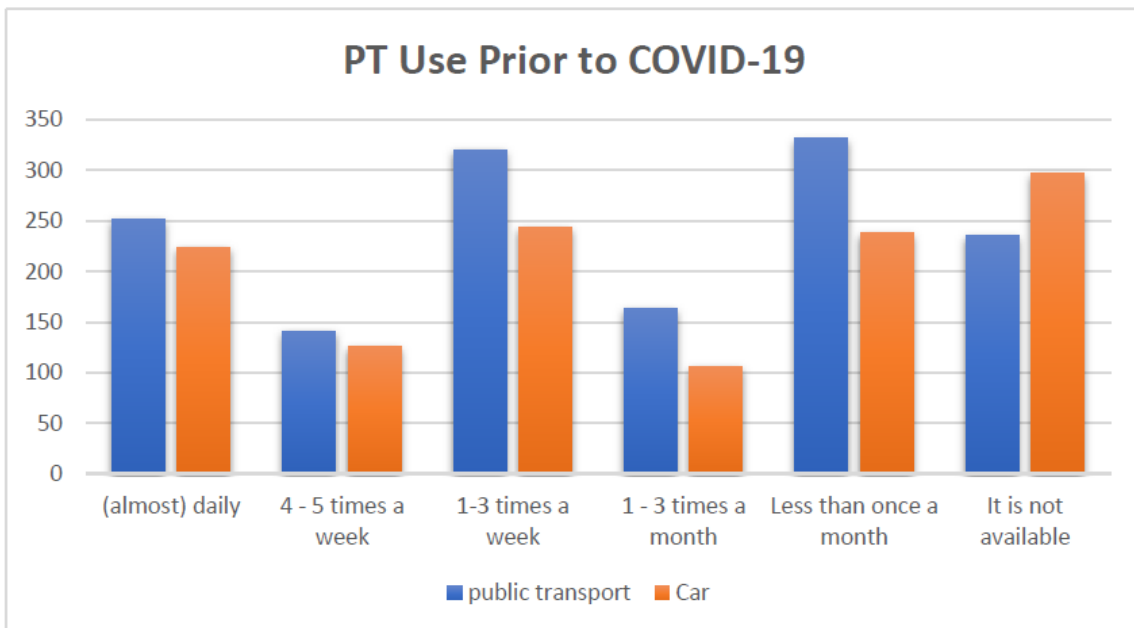


Figure 0-3: How often did you use PT in your daily life before the outbreak of COVID-19? (in %; n=1099)

However, despite these contingencies, the 49 individuals interviewed do present a moderate range of backgrounds and circumstances. The age of interview participants ranges from 18 to 70 years old with a roughly balanced distribution of genders. Though, it should be noted that data collected through the initial surveys showed no significant variation between genders in any responses (see Figure 0-2 for one example). Still, in interviews, this is complicated as respondents give more personal accounts of their own experiences.

In contrast, differences in income and education did correlate to significant differences in survey responses, which will be expanded on below. Within the interviews, the income status of participants was varied—including students, freelancers, white collar workers, and pensioners—yet, there is most likely an overrepresentation of middle class office workers and an underrepresentation of less affluent service workers. Thus, within this range, the majority of participants were not compelled by financial exigencies to continue riding PT and were instead able to work, attend classes, or simply remain at home when necessary. Finally, all of those interviewed live within or close to major metropolitan areas (Brussels in Belgium; Tallinn in Estonia; Stockholm in Sweden; and Berlin, Munich, and Dresden in Germany). For interview participants, the majority of respondents in Belgium, Estonia, Germany, and Sweden were occasional to frequent users of PT for both commuting and leisure with many reporting daily or near daily use. In contrast, survey data shows a greater variability in transport use prior to the COVID-19 outbreak (see Figure 0-3).

Mobility during COVID-19: Avoidance, Alternatives, and Dependency

This section highlights the use practices of PT during the COVID-19 pandemic in the spring of 2020. The section notes the practices of avoidance and use of alternatives but also highlights the social differences in making use of these alternative modes of transport.

Avoidance of Public Transport

Key insight: During the first wave of COVID-19, high income and high education groups could completely avoid public transport while other groups continued to ride when necessary

At its onset, the COVID-19 pandemic drastically altered the mobility patterns of respondents across all regions with many people reducing their PT usage. However, data collected through surveys shows that this dip in ridership was not consistent across all regions and demographic groups.

First, there was a distinct geographic divide. Survey results show drastic drop offs in PT ridership for Belgium, Germany, and Estonia, but noticeably less changes in PT usage in

Stockholm. For comparison, after the COVID-19 outbreak, only 8% of respondents in Brussels reported using PT “regularly” (four times a week or more), while in Stockholm, 26% of respondents reported regular use (Figure 1-1). This is most likely connected to Sweden’s comparatively less strict approach to lockdown measures (see city reports).

38% of those with higher education degrees reported not using PT at all, while only 17% of those with a primary education reported a similar level of avoidance

Additionally, there was a significant pattern in who made changes to their mobility. In all regions, those with a higher income and higher education were much more likely to stop using PT, while those with lower income and lower education were more likely to continue riding PT after the COVID-19 outbreak. For example, 38% of those with higher education degrees reported not using PT at all, while only 17% of those with a

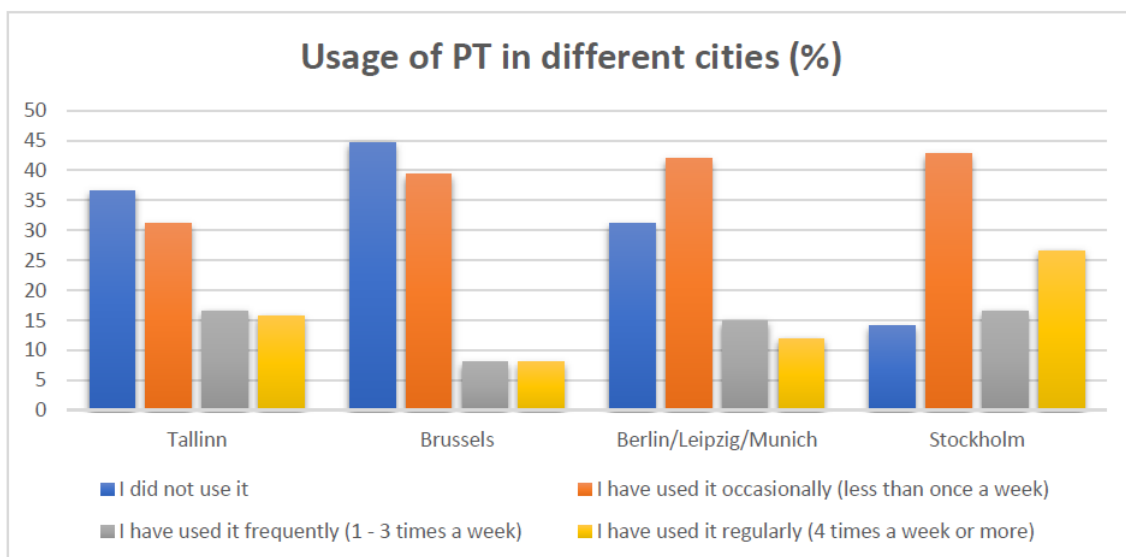


Figure 1-1: How often have you used PT since you have learned about the COVID-19 outbreak? (in %; n=1099)

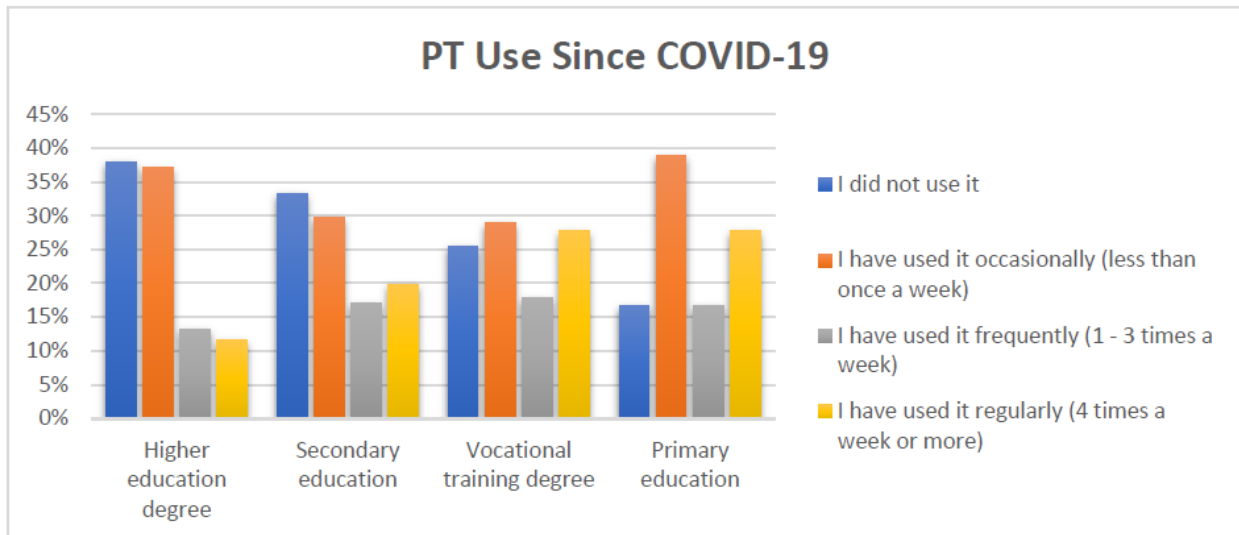


Figure 1-2: How often have you used PT since you have learned about the COVID-19 outbreak? (in %; n=1051)

primary education reported a similar level of avoidance (Figure 1-2).

Thus, while Europeans started to avoid PT it yet took place unevenly. Those with means to avoid were more likely to do so whereas many with lower education (Figure 1-2) or income (Figure 1-3) reported their incapacity to actually avoid PT.

In interviews, respondents in Belgium, Germany, Estonia, and Sweden reported

either significantly reducing their PT use or even ceasing to use it at all. While there are respondents indicating less use of all different modes of mobility, car, walking and cycling have also experienced increased use at the same time as PT is used significantly less (Figure 1-4). One respondent from Stockholm explains, "Now I avoid it totally. Haven't used PT since March." (S_04). This is echoed by a response from Brussels stating, "So I used a lot of public transport up until a week ago [laughs] because now everything stops and I

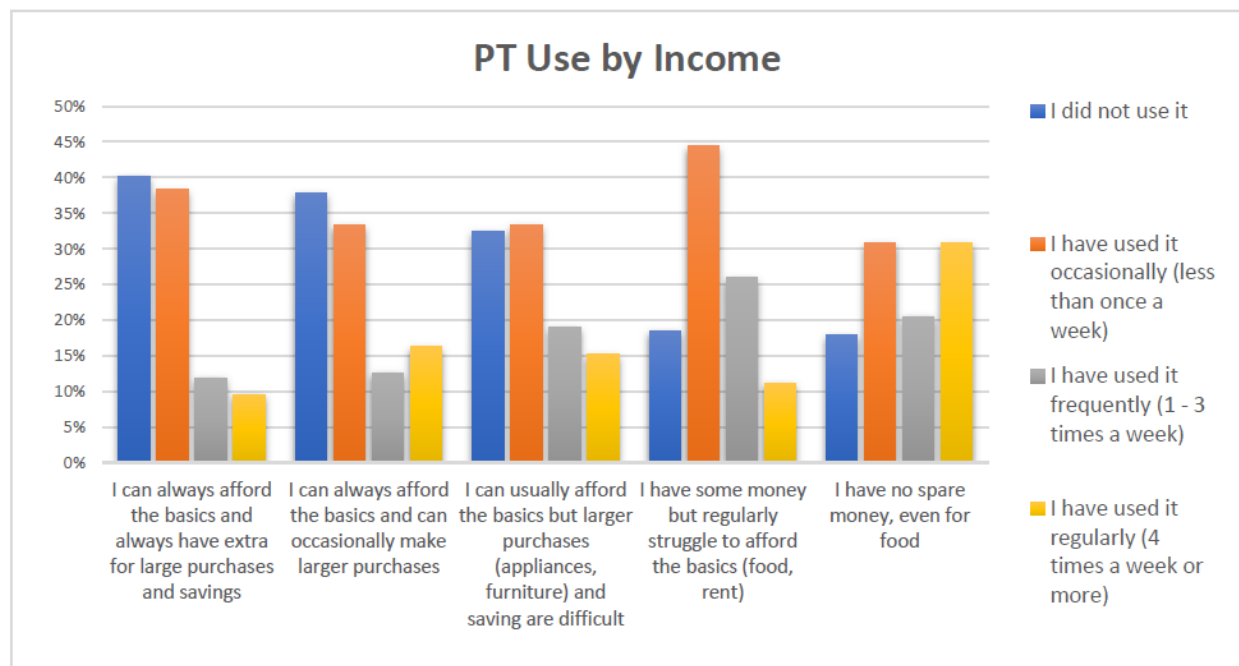


Figure 1-3: How often have you used public transport since you have learned about the COVID-19 outbreak? (in %; n=945)

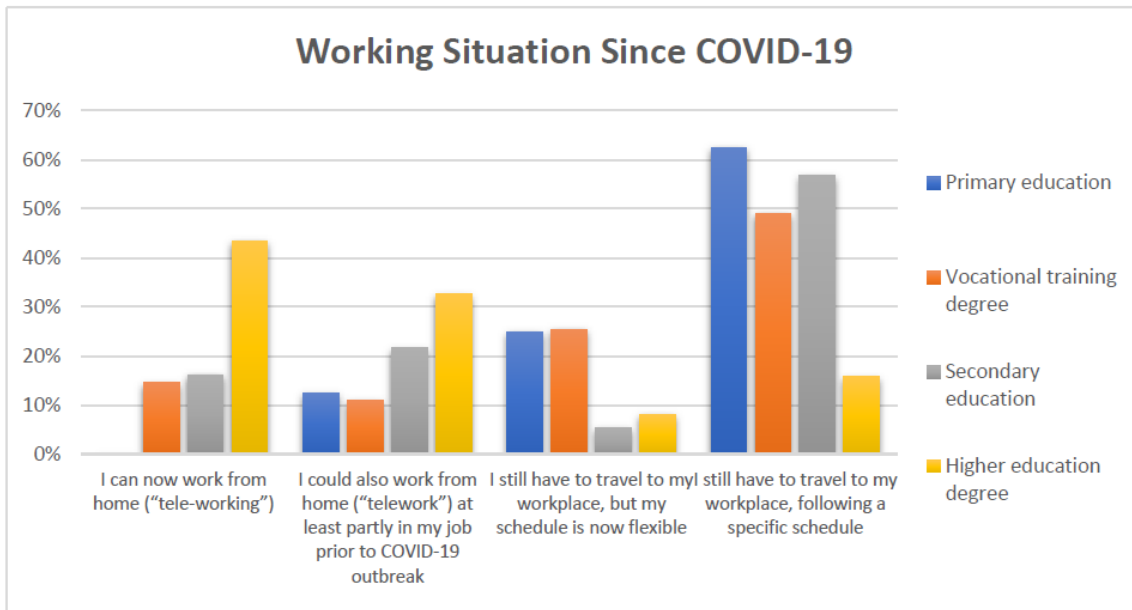


Figure 1-4: How is your working situation since the outbreak of COVID-19? (n=744)

think I haven't taken any single public transportation since 10 days ago" (B_04).

A common motivating factor for this reduction in use is simply having fewer places to go due to changes in their working and social arrangements. Teleworking and working from home removed the need for commuting – which, for many interview participants, was the primary reason for riding PT.

However, also the shift to telework has not been uniformly distributed across social groups.

In surveys, the shift from commuting to a work site to teleworking was most pronounced in groups with higher education degrees and higher incomes (42% high education respondents reported teleworking).

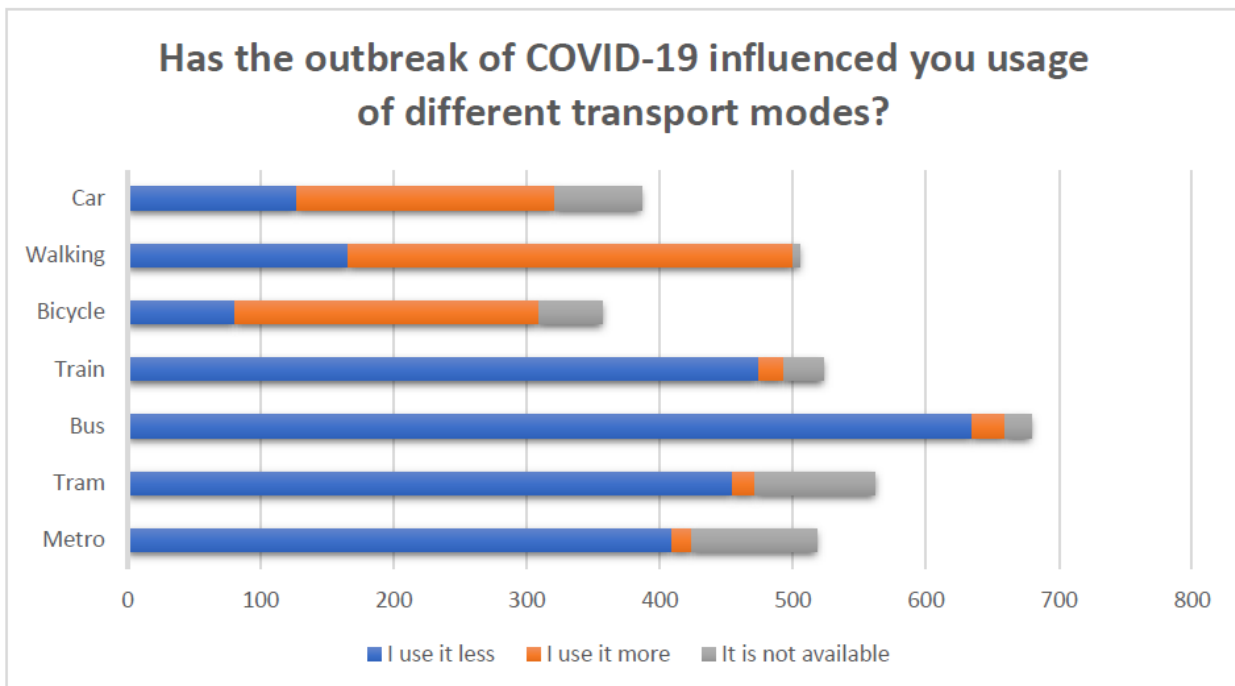


Figure 1-5: Has the outbreak of COVID-19 influenced your usage of different transport modes? (n=878)

42% of high education respondents reported teleworking, compared to 12% of those with a vocational degree

In contrast, those with a primary or vocational education were more likely to continue travelling to work on PT, with only 12% of those with a vocational degree reporting a shift to teleworking full time (Figure 1-4). Interestingly, while there is a clear correlation with education and income regarding those who can telework, there are no clear results on the correlation with gender (though, teleworking for female respondents might still equate to worse working conditions than for men considering the share of housekeeping and childcare duties in families) or even age despite some indication that younger respondents can work more from home.

The importance of teleworking was discussed by many interview participants. Many adopted work-from-home arrangements which removed the need for daily commuting. Others who used PT to visit friends and family also reduced their use of it because attending to these social occasions was no longer allowed or desired. According to one respondent from Dresden

“Well, everything used to be closed. There were no more pubs, there were no more other stores where I normally would go by public transport. So, I only used the public transport to ride three stops to the next supermarket.” (G_04¹)

While personal safety was one of the reasons for avoiding PT use, there were also other factors.

One common reason for avoiding PT is a desire to stymie the spread of the virus. Responses from all regions suggest that some users consider PT spaces such as trams, buses, and trains as potential sites for disease transmission and arrange their use accordingly. This same finding is common in previous studies. Yet, survey results present a

more nuanced picture of this sentiment, expanding on in section 3.4.

Even more than fear of personal infection, many users claim to be avoiding PT more out of concern for the wellbeing of others

In the interviews, other aspects of avoidance came to the fore. Even more than fear of personal infection, many users claim to be avoiding PT more out of concern for the wellbeing of others. Typical responses showcasing this attitude come from Brussels:

“For two weeks was very careful with how I travelled and also how I interacted, in general, with the outside world to make sure that I wasn't being one of those people that was infected without actually exhibiting symptoms” (B_07)

“I simply think that many people will be afraid to use public transport. So, if I can, if I have another solution, I prefer to use other solutions to give my place to other people who would have no choice. [...] I am young, I am healthy, so I see that the mortality rate of the virus is low for me. So, I don't see any danger for me on public transport.” (B_013)

In the case of Brussels, many respondents followed this line of argument and further stated that their reason for avoidance was the official discouragement of doing anything outside the house. One respondent put it this way:

“I am also conscious of the fact that the public transport service is primarily running to facilitate essential workers, like healthcare workers, so I am reluctant to use public transport unless I really have to.” (Survey respondent, 40-49 years, female, Brussels, 27.04.2020)

¹ A full list of interview participants can be found in Annex 2. Throughout the text, respondents are labelled according to their location.

These comments mirror emerging findings that people are more likely to follow public health recommendations when they're framed as means to protect others rather than means to protect oneself (Jordan, Yoeli & Rand, 2020).

This raises the question as to how much of PT avoidance is rooted in successful government communication programmes which played on notions of solidarity, self-sacrifice, and other pro-social themes to keep people off PT. Such messages were ubiquitous at bus and tram stops in Brussels under the slogan "tous ensemble contre le COVID-19" [all together against COVID-19]. Berlin's local transport authority BVG adopted a similar slogan with "Gemeinsam gegen Corona – gemeinsam sicher unterwegs" [Together against COVID-19 – Safely on the move together].

Alternatives to Public Transport

Key insight: In place of public transport, users adopted alternative modes of mobility including bicycling and automobile use which felt safer and more secure

In all regions, the desire to avoid PT had users adopting other alternative modes of transport. To move around their cities, regular PT users turned to more private modes of transport, most commonly bicycle and car (Figure 1-5). In Germany, Brussels, and Sweden a number of the interviewees were able to compensate PT usage by bicycle:

"The first change is that I move around a lot less and the second change is that I still do as much walking. On the other hand, I cycle more and use public transport less." (B_013)

"Since then I have more or less not used public transport, but I bought a bike that I use instead." (S-08)

According to interview respondents, the reasons for the switch is that bicycles are perceived to be "safer", as they allow one to

stay outdoors, and at a distance from others. As one respondent from Brussels explains:

"I've been thinking of getting a bike because then obviously you don't have to be in close contact with other people. You can kind of do whatever... I have a friend who actually does go out and he loves it like he goes running and biking and there's no one on the road and he feels relatively safe doing that." (B_05)

Interestingly, four participants from this city noted that they were not using their own personal bicycles but rather Villo! the city's public-private bicycle share system. Of course, shared bicycles are also handled by multiple different people throughout the day which might spread the virus through surfaces. Therefore, their perceived safety advantage likely comes from their use in the open air than a lack of shared surfaces.

In many cities in Europe the planning and introduction of several new bike lanes across these cities and reduction of car traffic have taken place during the lockdown and since then. In Berlin, for instance, temporary bike lanes were branded as 'pandemic resilient infrastructure', which inter alia led to the 56% increase of local bicycle usage in spring 2020. Similar pop-up bike lanes were introduced during the lockdown all over the globe (Schwedhelm, Li, Harms & Adriaola-Steil, 2020). In Brussels, 30 km of new bike lanes were installed in the first month of lockdown throughout the city, with another 10 km more in place until the end of September. Subsequently, use of bicycles increased during the first months of lockdown 44% (in comparison to previous year). Additionally, during the first lockdown period, the roads through the Bois de la Camber ("lungs of Brussels") were closed for car traffic, inciting the 'Battle for the Bois'. (Harding, 2020). Though, this initiative has since ended, indicating the city may return to a pre-COVID-19 status quo. Apart from switching to bicycle, however, some respondents noted also increased use of cars:

Apart from switching to bicycle, however, some respondents noted also increased use of cars:

“Actually, we use our car much more than usual at the moment. So, my boyfriend drives us around with the car. I guess he was waiting for such an opportunity to put his car in operation again without a bad conscience and now we drive around in the car all the time.” (G_03)

been using these modes before. Instead of fully changing to a totally new mode of transport, they rather increased their use of available alternative transport modes. Such reduction of PT use to alternatives led to concerns by various interview respondents who fell to the group of PT supporters.

While some alternative modes of transport are gaining appeal in the context of COVID19, private automobiles still have the appeal of secure and protected bubbles

Indeed, the survey results indicate that not only has walking and cycling increased but so was car use if assessed in comparison to PT (Figure 1-5). For many respondents, this change to alternatives was relatively painless even for previously avid users of PT. So, most people found switching to alternative modes quite easy. Most of the respondents with whom we discussed alternative transport modes in the interviews and who changed to more use of feet, bikes or cars had already

In Sweden, for instance, one respondent, who described herself as “pro public transport”, was worried that this widespread dynamic would lead to an overall drop in transport use in favour of cars. However, not just a worry, the shift to alternative modes led also to satisfaction that the change allowed them to feel more safely and as if they were doing their part to limit the spread of the disease:

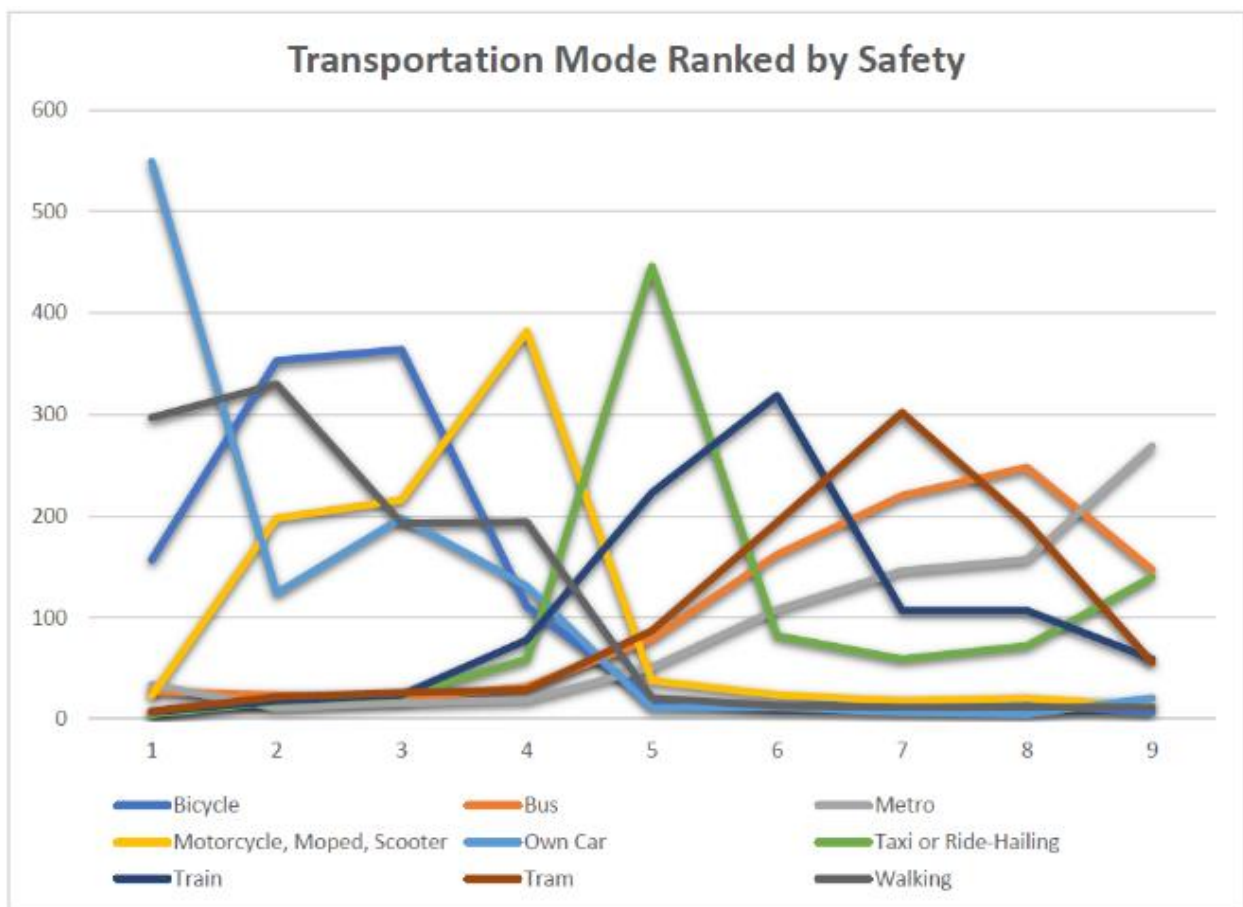


Figure 1-6: Please rank these transport modes from safest to least safe during COVID-19 outbreak (with regard to the risk of

"You could say, kind of feels like... That's like you're just doing it for the group. But to be honest, it's just a very tiny feeling. It's just honestly there aren't a lot of places to go either way right now. So [public transport] was just an easy thing to cut off. And be like, yeah, it's not really a big deal. I'm not taking public transport anymore, especially if I just had the bike." (B_011)

Thus, the avoidance of PT and using other modes of transport even if this mode was car had an appearance of being beneficial for the society as a whole. Additionally, and worryingly, some respondents indicated their struggle to use PT. Especially, as care workers, they indicated a sense of social stigmatisation because of their profession and in order to avoid such negative experience, were back to using private cars for their daily commute:

"Working for the hospitals in Brussels, the buses passing in front of the stop near work no longer stopped, knowing our profession. I did the test, I walked to the next stop and when the bus arrived it was "full" so I didn't try to get on, the driver told me I could get on because I was alone at the stop. I counted the number of people with me it was only 7. So after 12 hours of work and 55 years, I got back in the car and would not be back on public transport until May 4th." (Survey respondent, 50-59 years, female, Brussels, 30.04.2020)

These responses from interviews are consistent with data collected in the surveys (Figure 1-6). When asked to rank the relative safety of various modes of transportation, respondents consistently ranked walking and cycling as more safe than PT. Importantly, both these modes were outranked by private cars, which was seen as the safest option for transportation across all regions. However, ridesharing and taxis did not have the same aura of safety as walking, cycling or own private car and are ranked between these and modes such as tram or metro. Nevertheless, these results show that while some alternative modes of transport are gaining appeal in the context of COVID-19, private automobiles still have the appeal of secure and protected

bubbles. This reflects already established literature on automobility which shows how the material separation afforded a private car often provides a sense of safety, security, and insulation from the stress of public space (Sheller & Urry, 2000; Wickham, 2006). Many observers of COVID-19 effects on mobility note the danger of such revival of automobility and are concerned with finding ways to move back to the previous path of automobile use reduction (WCTRS, 2020).

Dependency on Public Transport

Key insight: While many felt dependent on public transport prior to COVID-19, it was mostly low-income earners who remained dependent throughout the outbreak

However, not everyone could simply avoid PT or shift to alternative modes of mobility. For some, the COVID-19 restrictions on transport use highlighted their dependency on PT. As one respondent from Berlin explained, the mere discussion of cutting PT services emphasized their dependency:

"There was a point when politicians discussed to reduce or even to stop bus services in the city. Well, I live in a neighbourhood which is very difficult to reach without buses. This was a moment when I pricked my ears up [begin paying more attention] and there was already a certain feeling of being dependent on public transport." (G_01)

Another respondent in Tallinn showed similar distress at the thought of transport being suspended, although PT was not cut in Tallinn. Again, the spectre of transport services being curtailed brought to fore the importance of transport access for managing daily life:

"A person needs to get to move around and s/he needs to get to a shop, a pharmacy. In the city of the size of Tallinn it is not imaginable [that one can disband public transport]. I don't

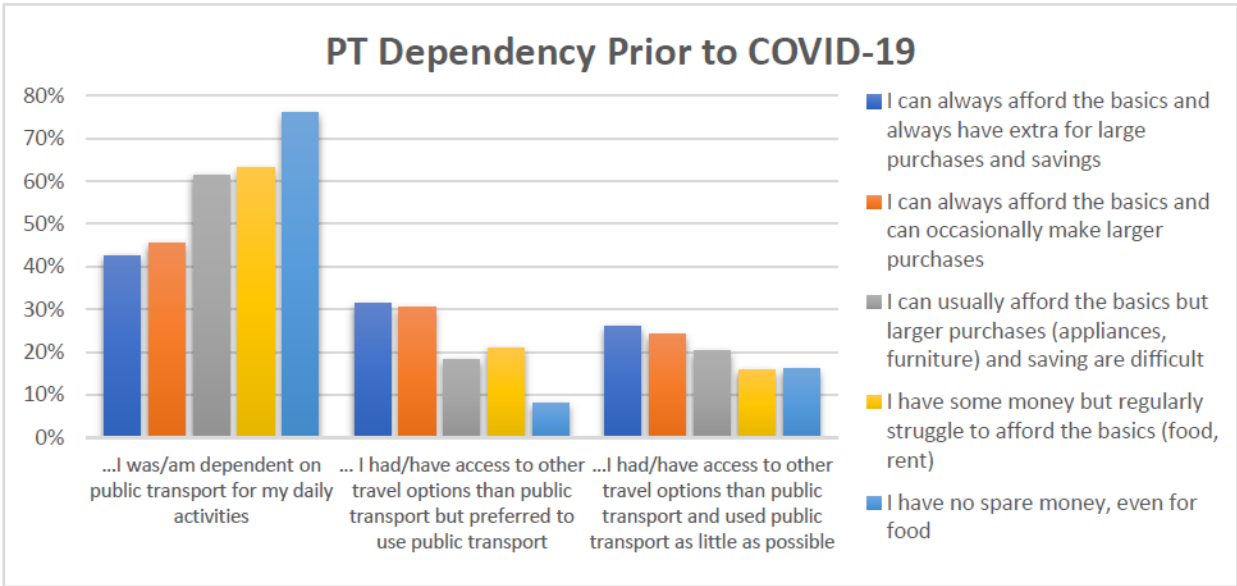


Figure 1-7: Please indicate below which statement applies the most to your situation, “Before the COVID-19 outbreak...?” (in %; n=586)

have a shop even near to my home and I would need to take a hell of a hike to reach one.” (T_08)

Both these reflections recall the classic maxim about infrastructure remaining invisible until it breaks down (Star, 1999). Here, the exigencies of the COVID-19 outbreak reaffirmed the importance of PT for many.

Yet, here again, survey results found that self-reported dependency on PT broke down along different social divisions, especially after the outbreak of the virus. The survey results indicated gender as an insignificant factor explaining PT dependency. Interestingly, also age is not that big of a factor, even though

younger respondents are somewhat overrepresented in not using PT at all whereas older respondents show at least some PT use. One interesting aspect of age differences relates to the age group between 18 and 49 that seems to be more flexible to adapt (dependent on PT before COVID-19 but not dependent after COVID-19 outbreak).

However, education and income are important explanatory factors (see Figure 1-7 and 1-8). Low education significantly correlates with regular usage of PT whereas high education corresponds with no or little usage of PT. Similarly, while there is somewhat low or middle correlation between low income and regular PT usage since outbreak, there is a

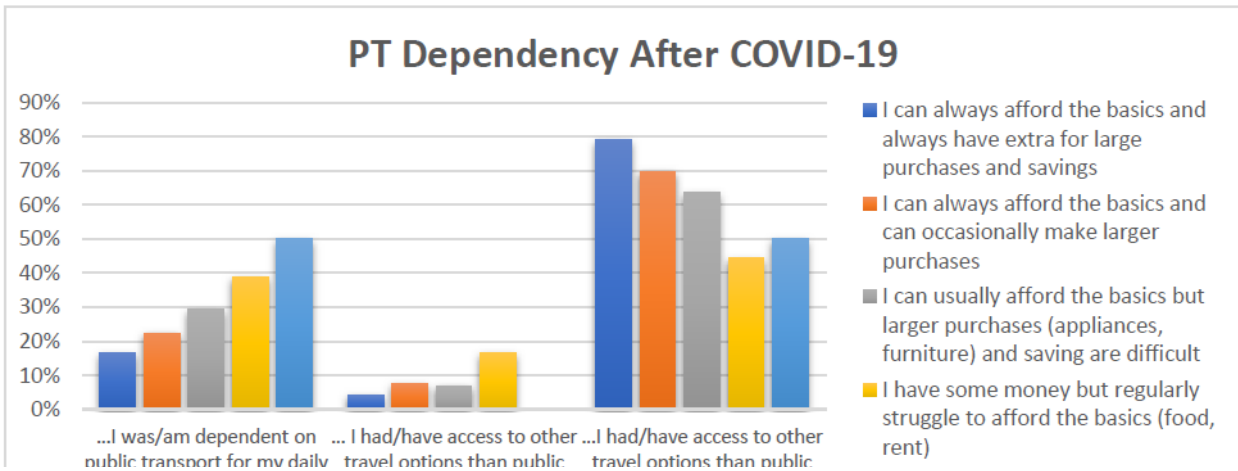


Figure 1-8: Please indicate below which statement applies the most to your situation, “After the COVID-19 outbreak...?” (in %; n=555)

clear significance of high income and no PT use or just having occasional PT usage.

Before COVID-19, 42% of the most financially secure respondents reported as being dependent on PT. After the outbreak, this statistic dropped to about 16%. The pattern is different for people with “little spare money.” Before COVID-19, 75% reported being dependent on PT. After the outbreak, that number remained high at 50%. Thus, it appears that those with financial resources were actually much less dependent than they realised, or alternatively, were much more capable of accessing alternative means of transport once the pressure of COVID-19 provided enough motivation (or an excuse) to make a change. COVID-19 outbreak has shown who is really dependent and who just took the decision not to use other options.

The discussion here gives support for the already well established – although yet not with wider audience – observation that COVID-19 has had an unequal effect on people, with care and other essential workers who need to go to commute to work suffering the consequences of the crisis (Burström & Tao, 2020).

Section Conclusion

To conclude about the usage practices of PT, there are clear indications of unequal effects of COVID-19 on users. While our survey data is not fully representative of society and, as with all Internet-based surveys, many of which were conducted during the first wave of COVID-19, is skewed towards higher income and higher education respondents, even this data indicates inequalities. These inequalities include dependency on PT for lower income and lower educated whereas those with higher income and higher education could work from home or more easily shift to other modes of mobility.

Public Transport as Public Space: User Practices and Changing Norms

While the immediate response of interviewed respondents to questions about PT was to start talking about quality aspects of PT service, we directed respondents to start discussing practices, norms and emotions of PT space. For some, PT is not a public space because it is purely a means to an end. That is, for them, transport is to get somewhere else in the city and beyond this instrumental purpose, the transportation space does not have value. The interview process, however, offered the opportunity to have participants discuss their opinions as to whether PT is a public space. Across all regions, the majority of participants did consider PT as a form of public space to at least some degree. Such an immediate perception of PT as public space was a bit surprising, underlying then, potentially, that it has been the COVID-19 that, for better or worse, made people aware that PT is a public space where they encounter others and share space.

Despite the widespread adoption of avoidance and alternatives, not all respondents were able or willing to eschew PT completely. While many respondents reported that they found PT “comfortable” or “quite relaxing” (Brussels), the most common complaint was that some PT stations were “dirty.” Negative experiences on PT were usually due to crowding or having to interact with rude passengers. For instance, respondents from Brussels and Tallinn spoke of the occasional stress of sharing space with drunk and boisterous crowds at night. Similar dynamics are present in responses from Germany: some frequent PT users indicate that trains are usually overcrowded during the rush hours and that they strongly disliked squeezing into overfilled buses even before the pandemic. Thus, they hope for technological solutions to appear:

“How do I know from the outside how occupied a vehicle is? At the platform, I might be sitting in an area that is overcrowded and 50 metres further – there is enough space. Recently, there have been attempts to indicate on the platform which part of the train is full or not. But somehow, I have the impression that those things are repeatedly announced in the press, but never really followed up. However, under the given circumstances, I believe that you simply have to make an offer to the passenger as quickly as possible, so that they feel comfortable, reasonably safe and are no longer afraid.” (G_07)

Meanwhile, in Estonia, respondents welcomed the relative emptiness of PT carriages that became common during the COVID-19 pandemic. The ample space was compared favourably to the standing-room-only crowds of pre-COVID-19 commutes.

The major recurring theme was an overall heightened sensitivity to the surroundings and an increased attention to the actions and perceptions of others

For respondents that continued to use PT, the experience of riding a bus, tram, or train was altered by new practices and precautions adapted in response to the COVID-19 pandemic. Speaking of these instances, people described travelling as feeling significantly different than before COVID-19 arrived. The major recurring theme on this topic was an overall heightened sensitivity to the surroundings and an increased attention to the actions and perceptions of others. In cities like Brussels, this change in disposition was often accompanied by strong feelings of unease, anxiety, and annoyance.

Many respondents did not stress the fear and danger of PT but instead indicated the calm and convenient atmosphere of empty rides

Yet, while this was prominent, it was by no means universal. Just as often, especially in cities such as Tallinn, interviewees reported experiencing relief, reassurance, and feelings of calm as PT became less crowded and having less boisterous fellow passengers. Importantly, these seemingly contrasting elements were not mutually exclusive. Many interviews reported an ebb and flow of tension and tranquillity, with transport sometimes feeling stressful and other times feeling quite calm, sometimes within the same journey.

This chapter unpacks the changing sense of experience in using PT at the time of COVID-19. Many respondents did not stress the fear and danger of PT but rather drew attention to the calm and convenient atmosphere of empty PT rides. But the chapter also highlights the fear of others, surfaces as well as changing sense of PT as public space where previously accepted norms contrast with new emerging norms of behaviour.

Materials, Surfaces, and Barrier

Key insight: During the first wave, a major concern was the potential risk presented by touching shared surfaces.

After the outbreak of COVID-19 in their respective cities, some PT users reported an increased sense of alertness to the material and social aspects of PT. For one, the mundane surfaces of PT spaces are now seen as potential vectors of diseases. Meanwhile new barriers and spatial restrictions put in place by transport authorities serve as a constant reminder of the new conditions on transport and are met with mixed feelings.

For instance, in Brussels, participants report being extremely cognisant of everything they touch in the course of a typical journey such as stop buttons (B_02b) door handles (B_04), support bars (B_09). In response, participants adopted new behaviours, such as seeking seats instead of standing (B_06) or using their elbows and the backs of hands to touch surfaces (B_02). These small adjustments in people's physical comportment were very noticeable

"It was still business as usual in public transport, but like the next morning, people were wearing masks and gloves. Nobody wanted to touch the door handles... like nobody! For the last two weeks, let's say, I took the metro like nobody wanted to touch the Metro handles like to open the door to push the button. Like some people were even willing to almost miss their stop because they didn't want to open the door. It was that bad." (B_06)

The sentiment is also apparent in responses from Germany where interviewees mused on the many surfaces enrolled in PT use and the potential for infection they present. Respondents welcomed the increased cleaning measures of operators and the availability of automatically opening doors, both of which eased the need to touch surfaces:

"Well, there are just so many infectious things you have to touch on the train. Or you don't have to, but you do so subconsciously because you don't think about it at that moment that you should use your elbow to open the door and not all trains have doors that open automatically." (G_08)

"Just one example: In the S-Bahn, the doors are basically all opening and closing automatically. Simply to avoid that passengers have to press the door button. This is a trivial example, but I think it helps to reduce fears." (G_05)

Similarly, in Tallinn the doors of trams previously opened when someone pressed the button, now opened automatically. At the same time, there was no need to press the button that would indicate drivers that the passenger wants to go off next stop

Touching the surfaces was a concern for passengers potentially more than it is during the second wave when the concern has shifted more to the aerial spread of the virus

In some cities, new materials were added to transport spaces in order to adjust the behaviour of passengers. For instance, in Brussels, a sticker was put on every second seat in trams and buses, indicating that passengers should not sit down. For some, this type of restriction was reassuring as it provided order while others felt it was less than effective, as illustrated here:

"I remember two trips made standing up to avoid sitting down and possibly bringing virus on my clothes. I am sceptical about the markings prohibiting 3 out of 4 seats as they could encourage people to use only the same seats during the day, increasing the risk of contact." (Survey response, 18-29 years old, male, Brussels, 28.04.2020)

Sentiments with regard to the touching of surfaces also differ. While almost all respondents in Tallinn evoked concerns about touching handrails or buttons, some preferred to sit in order to limit the necessity to touch surfaces, and others equated seats as particularly dangerous for infection. Illustrated in the following two, opposing statements:

"I try to sit in order not to hold onto a handrail. To avoid touching the surface with hand." (T_02)

"Anyway, I've started to do it so that I put my hand in the pocket and sit, to as

little as possible [touch surfaces]." (T_05)

Another respondent, however, noted the perceived danger of seats:

"I do not sit at all anymore. /.../ for me sitting seems particularly the place of contact." (T_09)

This perceived infectiousness of seats could be tied to the general sense of PT cleaning with some distaste towards soft seat covers and concerns whether they are cleaned enough.

Touching the surfaces was a concern for passengers potentially more than it is during the second wave when the concern has shifted more to the aerial spread of the virus. Nevertheless, both factors have played a role in limiting entrance from the first door in Tallinn: avoiding the use of paper money but also close contact with passengers and drivers. In Sweden, similar material interventions became a point of conflict between passengers, transport workers, and transport authorities. The main disagreement came regarding the closing of the front doors of the buses, mainly from PT workers but not only (see text box below).

There is thus a sense of other passengers on the PT, a sense that generates anxiety and concern:

"You meet many people when you go [with PT] and it's these meetings that you can get infected by anything. I hadn't really thought about this before. Previously you met people all the time, at work, in public transport, so it hasn't mattered [for me]. But I think I will continue to bike more because of this insight." (S_08)

These concerns also fuelled one of the most noticeable changes to PT during the pandemic, the new emphasis on personal space and "social distance."

Distancing

Key insight: A new preoccupation with social distance made crowded public transport carriages especially stressful

In addition to a newfound aversion to contacting inanimate objects, many respondents discussed an equally strong aversion to contacting other people. This manifested in the highly pervasive practice of “social distancing”, the imperative to avoid being in close physical proximity to other people.

For many respondents, this practice manifested before even entering a PT vehicle. Some interviewees proactively rearranged their travel schedules to avoid peak times. This practice is made easier with travel-planning apps which show occupancy rates of different lines and official online guides directly issued by transport authorities like STIB-MIVB in Brussels. Other respondents

reported more on-the-fly adjustments such as carefully assessing the capacity of carriages and declining to board if there was insufficient space to maintain distance. Two respondents from Tallinn illustrate this process:

“Wouldn’t really enter a very full bus, perhaps would look for the next one, perhaps would think if I have time to walk or go somehow differently.”
(T_07)

“I look out that if the bus is too full, I let it pass and wait for the next one.”
(T_01)



Figure 2-1: Top 25 answers on “Following the COVID-19 outbreak, how would you describe the atmosphere in PT? Please provide any keywords that come to your mind”

Moreover, once inside a PT carriage, maintaining distance required a new type of alertness to the presence and proximity of others. In Brussels, nearly everyone interviewed commented about the

appearance of “social distancing” behaviour onboard PT carriages, “In the tram or the metro, you can see people keeping distance. That’s... I think that’s obvious” (B_03).

Bus Drivers in Stockholm

As essential workers, bus drivers were very directly confronted with the virus. In Stockholm, this reality resulted in these workers demanding more physical barriers. Several bus drivers were interviewed unanimously described a sense of fear in the initial stages of the pandemic.

“Before you got used to it, the first times I took public transport, it was like being in a movie. Especially when I was going to work. ‘Now I’m risking my life!’ I didn’t feel like that when I was working, but when I was putting on the uniform I had a little sense of doomsday, a kind of small threat.” (S_07)

“In the initial stage we were terrified, we who drove the buses. People were pouring in. We wanted the front doors closed, but the bus companies said no, since SL [transit authority] said no [...].” (S_05)

During the first weeks of March the bus drivers put up tape and handmade posters at first to seal off the front rows. Management then claimed that the front doors were an emergency exit and these tapes could hinder people from getting out. So instead bus drivers used toilet paper as a line that could easily be walked through. This fear was based on the fact that they saw dozens of colleagues get ill at an increasing speed and wanted the front doors closed immediately.

“Then we closed them off ourselves so no one could use the front. [...] At that point there were ten bus drivers seriously ill at my bus garage.” (S_05)

Management reacted to this with sending out guards to certain bus stops. The guards took down the toilet paper and forced the bus drivers to open the front doors for the passengers. This continued until 15 March when the transit authority gave permission to close the front doors. The late reaction from management was connected to financial reasons by one bus driver.

“Since the bus companies lost revenue when people didn’t swipe their tickets at the front door, and this is a big portion of the bus companies’ revenues, [...] they didn’t want to lose this. But eventually they realised that the health of the bus drivers was more important. [...] Also pressure from the unions made it possible to close the front doors for our safety.” (S_07)

Bus drivers handled this experience in different ways. Some worked less, some took a leave of absence, and some continued to work as usual.

“Before we could close the doors I experienced being a bus driver as threatening. I felt vulnerable in a way when they looked in my direction or asked a question, and accidentally happened to spit. My situation feels less vulnerable now [in June] than before.” (S_07)

“Because I don’t think they are following the requirements they should and they aren’t listening to us bus drivers. So I asked for a leave of absence to try another job.” (S_09)

Respondents from Estonia corroborated this dynamic, noting that many passengers adopted the strategy of constantly moving about and changing place within a carriage to maintain distance.

"I don't know. Perhaps at the beginning it seemed to me that people keep more distance. I cannot prove it factually but it felt so indeed [...] It is indeed so that a stranger won't come to sit right next to you. That's what I've observed and I wouldn't also go myself [to sit next to someone]." (T_06)

"You can see that people keep away from one another. If I sit at the front, (someone) comes on at the stop... I watch where s/he sits, s/he looks at me and goes to the back. But sometimes it happens that it is impossible to avoid, necessarily have to be near one another, then you turn your head away." (T_01)

One respondent in Germany expanded on the challenge of holding distance in PT given the compact spatial restrictions of vehicles:

"It's a bit like molecules in a chemical system, like in a closed system, all people try to stay as far apart as possible to actually fill the space of the bus, the closed space of the bus. So, the space can become narrower and the space can become wider between the passengers depending on how many are fixed in space." (G_01)

For many, the failure to have enough personal space was an enormous source of stress and anxiety. Respondents in all regions articulated experiencing elevated discomfort from unwanted closeness.

One respondent from Stockholm described his partner's distress of travelling on a packed rush hour train, "But then, when she's going home, there are moments when it's not possible any other way. She just feels: I'm trapped with a lot of people that are too close."

(S_02). Another respondent from Berlin speaks of similar stress instances where distancing is no longer possible:

"It is rather this feeling of social shaming. I personally don't have a problem with people sitting next to me or having close contact. I don't know whether this is actually real or whether it's only in my mind, but my perception is that this practice of always trying to stay at distance still works for people, and if it happens to be impossible to keep distance, I find it to be a stressful atmosphere." (G_07)

Finally, from Brussels, a short vignette is illustrative of how the desire of distance requires constant vigilance and mounting stress which eventually lead to completely avoidance of PT:

"I took the bus. They had closed off the front door so I had to come in through the middle door. And I tried to walk, you know, back to the front to see like a place to find a place to sit. Then I heard someone cough in that area of the bus and so I turned back to go to try and go further towards the back. And I rode for about 12 minutes... But then after 12 minutes, like a lot more people like maybe about like again as many people as there already was on the bus, entered. And then I got increasingly nervous and I exited the bus just before the doors closed.... Before that I was already trying to try to figure out okay like where am I? How close am I to these people or those people? And is there like a... What's there next to me to protect me? Like the pane of glass and so on. But yeah then it was like it getting a bit more crowded and then I thought that I should... probably not risk it." (B_010)

Distancing as Comfort

Key Insight: Social distancing contributed to a calmer atmosphere despite feelings of anxiety and insecurity.

In contrast to the moments of stress when distancing fails, respondents report that when distance is achieved, it actually makes the experience of PT more pleasurable.

In Estonia, respondents noted that the bus use became more comfortable, "... and buses were empty, it was comfortable to ride" (T_10). Compared with the experience of standing on full buses prior to COVID-19 times, struggling to maintain posture when the bus rapidly speeds and breaks and

"... then at the time of COVID-19 there were a lot less people on buses and one get to sit always. There were just 3-4-5 persons apart from the bus driver and then there was no more this danger, that there would be traffic jams and, well, everything went smoothly." (T_03)

The same respondent wrapped up her experience of PT after COVID-19 times to a researcher's question about what has changed:

"Yes, a lot more pleasurable and comfortable. Buses are on the schedule. It's possible to sit always. They are not in traffic jams. Very comfortable." (T_03)

In Germany, regular users, dependent on PT to commute to their working place during the lockdown, also mention the calm atmosphere in a bus or a train:

"In other words, when I commute to work the buses are clearly noticeable less frequented. As I have indicated my reluctance towards overcrowded public

transport vehicles before [in pre-pandemic times], I naturally find it pleasant right now." (G_01)

Indeed, the general assessment from Tallinn was that increased distance between passengers was combined with an overall downturn in ridership that led to fewer instances of conflict to disrupt a journey:

"I think actually that there are less such conflict situations as people are a bit more careful and somewhat, at least subconsciously, keep distance." (T_06)

Some explanations for less conflictual encounters were given in relation to the closure of bars as there are less social events involving alcohol, fewer events organised outside and thus less drunk people on PT. While a few moments of conflict resulting from COVID-19 situation were also pointed out it is important to stress that there were few such examples and the general sentiment was the decrease in the number of conflicts. However, as the following Section 3 will elaborate, a lower number of explicit conflicts conceals an undercurrent of tension as passengers slowly work out new social norms.

Atmospheres: Caution, Calm, and Eerie

Key Insight: While public transport is often not seen as social space, the emptiness of vehicles during the outbreak felt abnormal. The lack of activity, talking, and non-verbal socialisation was experienced as both calm as well as eerie.

The elements mentioned above—the increased apprehension of surfaces, the new focus on maintaining distance, the changes in social interactions, and the affects of suspicion and annoyance, among others—all accumulate to produce pervasive

atmospheres within public transit spaces. These atmospheres do not have strict borders and do blend into each other, but three primary motifs are that the atmosphere feels at the same time tense and cautious, calm, and eerie.

The atmosphere of tense caution can be attributed to transport users' heightened sensitivity to their surroundings and each other as well as the increased restrictions on space enforced by transport authorities. In general, participants seem to agree that transport spaces have a diminished conviviality and passengers seem more formal and deliberate in their dispositions. Participants worry about where to place their hands, concentrate on suppressing coughs, and no longer encounter boisterous crowds returning home from bars. As one respondent from Stockholm put it, "I experience a somewhat tense atmosphere," (S_01). Another respondent from Tallinn describes this more reserved quality as a particular "distant" atmosphere:

"No, actually I haven't [overheard conversations about the virus], because [people] ride alone. And anyway, while before there was talk, when there were more people and they knew each other, one could hear all sorts of talks from the side, what happens around and there were sometimes very interesting conversations one could hear. But now, well, they all ride alone." (T_08)

This distant feel also contributes to another layer of the atmosphere: calmness. Many of the respondents stress positive aspects of the new experience of PT: they enjoy the new emptiness, the space and the calm and quiet that has resulted from the fact that far fewer people travel by PT. As one respondent from Brussels put it, "Calm and quiet, less used, suspicious atmosphere [...] Solidarity. Politeness. A certain mistrust" (Respondent to survey, 70 years or older, male, 26.04.2020).

Yet, while comfort was a way to perceive PT, one respondent also echoed similar sentiments. Importantly, they tempered the pleasure of the calm feelings by tying them back to an overall sense of caution:

"It is indeed more comfortable in this sense that when you have fewer people it is more comfortable to ride on the bus than on the full one. But comfort is not the right word for me. The COVID-19 made PT still constrictive." [ahistav, in Estonian]" (T_04)

Another common refrain from participants was the uncanny and conspicuous absence of people from normally crowded spaces like PT. For many, this emptiness congested an uneasy sense of eeriness. One participant from Brussels, noted that empty trams were one of the more salient changes they noticed after the outbreak, "Well, when I see trams moving in Antwerp, there's hardly anyone in them. And everything is just really quiet," (B_04).

People really associate PT spaces as being more crowded and lively than it is often assumed

Another described the situation as "apocalyptic" and offered "we went into the Louisa metro station. And yeah, it was really empty. It was weird. It's like, are we even allowed to be here? Did we miss something?" (B_02). A third participant, described their own experience as:

"It was really grim. I remember the end of March, beginning of April... going for a bike ride around the City Centre in Brussels from Schaerbeek, just to get like a feeling you know? [...] the streets were empty. Same thing here in Schaerbeek. Especially in the beginning of that which was really, really empty. Um... So yeah, it felt quite eerie. Also felt quite real and in your face... I think also not as much public transport so it felt like a ghost town. Yeah, I think it's more

tense. Not really threatening, just tense about.” (B_011)

In short, people really associate PT spaces as being more crowded and lively than it is often assumed. PT is not particularly seen as a public space and a space for social interaction, something which the PUTSPACE project seeks to unpack and potentially also challenge. When the outbreak took hold and these spaces became sparsely populated, the change was very obvious and “eerie.” Indeed, various respondents from Tallinn also corroborated this feeling. They spoke of the “eerie” or “suspicious” atmosphere on PT: “... now there is this feeling of keeping away or this attitude. A bit eerie.” This thus indicates that the space can be even less social than the already imagined un-social qualities of PT, indicating then that PT is potentially not that un-social at all as usually perceived.

What stands out from interviews is a sense that all these novel atmospheres are the result of a certain state of exception

Importantly, one of the interviewees also emphasises that it is precisely this emptiness and calm that leads to a personal feeling of insecurity:

“While I am relieved that there are so few people using public transport whenever I take a metro/bus/tram, it also feels very disconcerting. I feel more self-conscious about my personal safety, about the risk of being mugged in a metro or at the metro station due to it being so quiet, but at the same time I feel relieved that there is a lesser risk of contracting Covid-19 with so few customers on board.” (Survey response, 40-49 years old, female, Brussels, 27.04.2020)

What stands out from these interviews is a sense that all these novel atmospheres are the result of a certain state of exception. People are very clear that the COVID-19 pandemic has

had an effect on the feel of PT spaces and the experience of using PT. This is sometimes conceptualised as a crisis with an indefinite end point, as this response from Brussels indicates:

“In my opinion, it is provisional. We are living through a serious crisis, much more serious than the crises of terrorist attacks. We will return to normal, but it will take time. When you say normal, it will be different, probably, but it will take time. One year, two years, five years, I don't know. We will see.” (B_012)

Still, as the pandemic continues, some muse that this state of exception will erode into just “a new normal.”

In Sweden, respondents started talking about a shift in the reaction, from the initial stage as compared to later on, when they got used to the new situation. It was still viewed as a crisis, but a new normality that differed from the previous order of things.

Thus, it is important to understand the changing norms of PT use.

Changing Norms of Public Transportation Use

This section positions PT as a space with norms. While encountering and sharing are key characteristics of the space, the feelings are also characterised by suspicion, shame and anger transforming the ways in which the PT space is understood. There is an increased awareness of other passengers and related threats (Ocejo & Tonnelat, 2014). However, new norms have started to be established throughout the COVID-19 pandemic.

Encounters and Sharing Space

Key Insight: Public transport is perceived as public transport by most respondents

For many, PT was described as a form of public space. A common justification for this viewpoint was that PT brings many people together into the same space and has few barriers to entry. Respondents from Tallinn offered that PT brought (T_01), “many people together [...] the being together of people [...] strangers”. It is defined by being open: “commonly used, so that everyone can enter there.” (T_10), “everyone has access” (T_09), which, however, takes place for a moment as PT “gathers people together and lets them go again” (T_05). PT is a public space as it is “commonly shared” (T_07), where one “encounters strangers” and where “no choice is made of who can come and who go” (T_08).

Most respondents from the other regions make similar points. One respondent from Sweden describes their reasoning with this short description, “A space that is not private, that many share. That is the public space.” (S_011). Confronted with the question to define public space, interlocutors in Germany also highlighted collective encounters as a defining quality of public space, one that is shared by PT:

“Public space is where, so to speak, society shows itself. Where the unforeseen shows itself. Where of course the foreseen also shows itself. Somewhere, where I am quasi a part of many. Well, I am actually a big fan of public space, I have to say. I also like riding the subway because I find it interesting to observe people. And I also like being in the park, which is public space par excellence.” (G_07)

In Brussels, of those who agreed, the general consensus was also that the “publicness” of

transport came from the fact it was shared with others — per one respondent, “Anyone could go there. It's... Yeah, it's not, it's not private space, right?... So, I'm among strangers, so it's, for me, that's public space” (B_010).

PT is shared but also a space that is forced. It is a space constraining passengers and limits them to be on the move from a place to place. For some respondents it was so to the extent that PT is not really a public space. As a respondent from Brussels replied to a question whether PT is public space that:

“At first blush, without thinking too much, I would tend to say no, since my conception of public space is a space where you stop, a space which you share. So, for me, public transport is a space of transit. It allows you to go from one public space to another. I don't see them as a proper public space.” (B_013)

However, constraining is much about norms and being forced to a certain position and behaviour as respondents from Estonia explained:

“It is in the sense that you have in a way constrained space and secondly you are forced to use it or be there. In beach or a park, I don't have to necessarily be. A shopping centre I can also choose, where I go, which one or not at all. But public transport is like that you are forced to use it exactly the distance you need.” (T_03)

“It is smaller, gathers a lot of people to one place. A person is in some kind of forced position, forced situation – they have to go somewhere from one place to another. They lack this freedom to exit at random moments. They have a destination, an aim.” (T_04)

That is, the incapacity to leave from PT gives the sense of it being not as public as one might want.

For most of the respondents, then, PT is public space for the way in which it is a site of encounters and sharing. Equally, however, PT is also constraining behaviour and thus associated with less freedom than other supposedly “public” spaces.

Suspicion, Shame, and Anger

A prominent thread running throughout interviews conducted in all regions is a series of negative affects generated in relation to other passengers. Previous research has shown that such misanthropic dispositions are already part of the PT experience (Bissell, 2010; Lobo, 2014). With the spread of COVID-19, these qualities emerged from the stigma of being infected and the potential for becoming infected.

Participants report being more alert to and suspicious of behaviours that would normally remain in the background. For instance, coughing, a much-publicised symptom of COVID-19, is repeatedly mentioned throughout interviews. Usually, people displaying this behaviour were regarded as a risk, and their presence was a source of anxiety and suspicion. A representative observation from Germany:

“A feeling of fear because despite the large number of passengers wearing masks and gloves, there are some who don't respect anything and stick to others. A person coughs or blows his nose and everyone looks at him with fear or changes metro cars.” (Survey response, 30-39 years, female, Brussels, 01.05.2020)

In Brussels, there was also frequent reference made to other passengers coughing in the enclosed PT space.

“I've seen people who don't respect the standard of distance, and a gentleman who has coughed a lot.” (Survey

response, 18-29 years, female, Brussels, 25.04.2020)

“A man was eating on the tram and then he started coughing into his hand and then wiped his nose with his hand and then on his clothes.” (Survey response, 30-39 years, female, Brussels, 27.04.2020)

Such sentiments also appeared in Tallinn:

“And here was an incident last week when on the other side of the aisle, one woman a bit coughed. I cannot say he coughed, she just cleared the throat and she was not wearing a mask. But half of the bus looked at her immediately.” (T_08)

Another participant from Brussels talked of being on the receiving end of this unwanted attention and wariness for coughing on the tram, “I coughed in my arm. And then this guy looked behind him. He looked at me and he's like, dude, like, he was, like that kind of behaviour” (B_02b).

A pervasive suspicion constructs everyone as a potential vector of the disease feeds into many negative affects

Another rider in Germany also mentions this social sanctioning and mistrust for certain behaviour even if they do not feel responsible for it:

“In the afternoon I entered public transport and ate a sandwich. Suddenly, I had to cough terribly. So, first of all I felt very uncomfortable and obviously the people around me felt the same, because the lady next to me moved away from me and looked at me very reproachfully. That's really a bit strange now and you feel a bit guilty, although I coughed into my scarf.” (G_02)

This pervasive suspicion that constructs everyone as a potential vector of the disease feeds into other negative affects. Namely, respondents reported feeling annoyance or anger with other passengers who failed to act with adequate caution. Conspicuously among many answers are many references to how other passengers comply or do not comply with the prescribed measures, such as wearing masks or sitting only on permitted seats.

In Brussels, a participant described such a negative reaction to coughing without a mask, “actually, I still see people sneezing just in the air, or coughing just in the air. And I think, come on, now's the time to stop that,” (B_03). Similar comments from the same city highlight the annoyance triggered by the perceived misbehaviour or nonchalance of other passengers:

“Young girls in an underground car without gloves or masks and sitting in a four-seater as if nothing had happened.” (Survey response, 30-39 years, female, Brussels, 01.05.2020)

“More stress, people who take little or no precautions, avoid touching surfaces.” (Survey response, 18-29 years, male, Brussels, 28.04.2020)

The emergence of consideration and anxiety among some passengers, are creating new social norms on PT

Overall, the increased attention to how other passengers behave in relation to the prescribed rules raises the question of whether the new sanitary measures are effective, but also the emergence of consideration and anxiety among some passengers, are creating new social norms on PT. As an expression of this, one respondent mentions the activity of shaming:

“People ‘shame’ other passengers for not wearing masks (even though it's mandatory) by moving away from them

quite deliberately. [...] I had to ‘shame’ two girls who didn't put on masks when they sat near me.” (Survey response, 30-39 years old, male, Brussels, 25.05.2020)

Another respondent from Munich, using PT during the pandemic mainly to visit her ill father, continues the discussion of social responsibility highlighting the animosity that emerges when others fail to uphold their duties:

*“This week, there were two girls on the subway and they wore the mask below their faces, so it wouldn't ruin the make-up or anything else. [...] The situation was as follows, it was a full subway, they sat down in a four-person compartment with someone else, also directly opposite to me and then I thought to myself, I am on my way to the hospital right now. And then, I felt anger because at that moment I thought: “S***, I'm dependent on others to collaborate. And for me the risk increases if everyone behaves like these two girls.”* (G_06).

This is especially true for interlocutors who perceive themselves as exposed to a greater risk. One pregnant respondent states:

“And I literally hate these people. I feel really bad about it, because in the U8 almost nobody puts on the mask. So not even every tenth. That really makes me aggressive. [...] I simply have no understanding that they don't take it seriously. I have great understanding that they don't want to wear these masks. I do not want that either. I am short of breath when I walk up the stairs in the subway station and I have the mask on, then I am out of breath. I think it really sucks. Of course no one wants to wear it, but I can't understand why people don't take it seriously.” (G_08)

New Social Norms of PT Use: Constraints and Sociality

Key Insight: Public transport users face challenges in balancing new norms about appropriate socially distant behavior and existing practices which allow for close interaction in order to socialise and assist others

A recurring theme on the topic of public space are non-monetary constraints such as social etiquette passengers are compelled to follow when on transport. For example, a respondent in Estonia qualified his assertion that transport is public space by noting that while everyone can use it, there's also "some sort of public order." (T_06). Two responses from Brussels also gave attention to the fact sharing transport space with others came with a duty to act in certain ways and follow certain etiquette.

"It is a public space. Although it is public space where you behave differently, say to a normal public place, like a park or a square or something. Um, I think on public transport there's, there's unwritten rules... I think on public transport, you're probably more aware of that even of people have spaces, spacing between people because you're enclosed in a way that you know, you only are if you're sharing a house with other people." (B_09)

While some agree that PT was public space, there was a degree of nuance in their reasoning. Some feel these shared responsibilities made transport public while others felt transport was public despite these constraints, as if true public space was one where people could do exactly as they wanted at all times.

Some may see these new regulations and restrictions as limitations which are at odds with their conception of public space

This distinction really frames how different people might come to vastly different understandings as to how the COVID-19 measures affect the publicness of PT. Some people may feel the new preoccupation with rules, etiquette, and sharing highlight the fact that transport is public. After all, if public space is about encountering others, an additional emphasis on the practicalities of negotiating those encounters is not a detriment, but an inherent part of the experience. However, others locate publicness in a lack of restrictions. These people may see these changes as limitations which are at odds with their conception of public space. Thus, it is important to understand how COVID-19 changes existing norms and creates new ones considering that the changing norms alter the ways in which our urban surroundings are encountered and interpreted.

Uncertainty about how to approach previously unconscious or unremarkable interactions amounts to a degree of social austerity

The new preoccupations with elements like distance and personal space had contrasting implications for interactions between passengers. For some, the conditions of transport under COVID-19 reinvigorated a type of mutual respect of shared etiquette on board, while others saw the sociality of transport becoming more icy and demure. Many respondents commented on how maintaining distance required nonverbal communication with others beyond what was previously necessary. Participants described making more eye contact to ensure they were mutually aware of each other's space, with varying degrees of success,

"But sometimes I tried to, like, signal that I would like distance. And you

know, some people pick up on it and some people don't." (B_05)

However, when these interactions went smoothly, it created a positive feeling, like everyone was doing their best: "But the mood... I have to say it feels one of solidarity to me, you know? Everyone's trying to do what they need to do and go about their day, but mostly trying to respect others" (B_09).

In this way, new practices like distancing are seen as politeness and passengers feel compelled to adhere to a more present etiquette focused on respecting personal space. One respondent from Estonia describes the outcome:

"No, I've rather seen that people keep away from one another. But what has changed perhaps is that as the Balti jaama stop is often full of people /../ that at least in the beginning people frequently stepped aside and let others to alight and board, what didn't happen before. Before everyone forced your way in or out. This is perhaps one thing that has changed but it seems to me that it has slowly started to disappear again. People have become braver." (T_09)

The majority of respondents talked about maintaining distance and adherence to other new regulations as a matter of politeness

This reflects the majority of respondents, who talked about maintaining distance and adherence to other new regulations as a matter of politeness. In Brussels, one respondent framed abiding by distance guidelines was a matter of "respect." Respondents from Sweden jokingly summarised a similar uptick in courtesy in the character of even fleeting interactions:

"This is Stockholm, we joke about that people don't wait for people exiting the

bus before entering. This has improved a lot now." (S_06)

"When they get on the bus people are more considerate, even when people are exiting, they move to the side." (S_09)

It seems that newly introduced social norms and expectations come with numerous uncertainties and struggles

Related to such perspective, one recurring theme was the added friction of having to navigate new social norms that were not always clear. In Germany, participants observed how behaviour and perception of PT changed over the last months. In their assessment, it seems that newly introduced social norms and expectations come with numerous uncertainties and struggles. For instance, a respondent finds troubles in contradictory norms of expected 'politeness' in various encounters on PT:

"And yesterday a woman suddenly asked me if she could sit next to me. And I was quite irritated at first, because I didn't expect that. But then I saw that she was pregnant. And then I thought to myself that it makes sense that she sits down. And then there was a short moment when I thought, should I get up now to keep my distance? Or not?" (G_07)

A similar experience was told by the following interview respondent:

"One already has the impression that people behave more carefully as a whole, no matter whether they are on the road or shopping or whatever. But there are such tricky things now, so for me it was always clear that when I see someone on the platform who is blind, for instance, I give them my arm and ask where they want to go. Or I simply keep my arm out so that he can hold on to it. But that is of course a difficult question

now: Do I keep doing that? Or is the person worried that I will try to force the virus on him? I haven't found a solution for this, how to deal with it. Well, that does not happen every day, but there were already two, three

situations, where I considered: Do I do it now or do I not do it? (G_05)

This uncertainty about how to approach previously unconscious or unremarkable interactions occasionally amounts to a degree

Free Fares and the Cost of Public Transport During the Pandemic

Before the Covid-19 pandemic, in at least 120 localities passengers could benefit from full fare-free PT (FFPT) (Kębłowski, 2020). The Covid-19 pandemic led several hundred municipalities worldwide — of which at least 60 are located in Europe, and 270 in the United States — to temporarily suspend the fare regime. In this way, PT operators aimed at protecting both passengers and workers, as using and controlling fare payment infrastructure was assessed as increasing the risk of contagion. In particular, PT vehicles and modes (e.g. buses) that involve fare payment and validation upon entry involve close physical proximity between drivers and passengers — suspending fares, and limiting access to the front part of the vehicles would increase the physical distance between PT users and staff. Another reason for abandoning fares in the midst of the pandemic relates to the idea of providing PT as a universal service, unconditionally available to all users in these troubled times. In a plethora of further municipalities, FFPT was provided to specific groups of key, “essential” workers, especially those working in medical services.

The pandemic thus became an opportunity to test FFPT, while providing evidence that fare-free regimes, often criticised for supposedly destabilising PT network due to reduced income revenue, may actually make PT networks more resilient to sudden crises. It is too early to tell whether these experimental FFPT programmes are there to stay. The question of fare pricing and FFPT emerged in several responses received in our study. The cost of PT was often the primary reason why the respondent refused to identify it as public space. For many, the requirement to pay a fare limited access to transport spaces, thus making them less public. One respondent was wondering if the price makes it impossible to call PT a public space at all.

“It can't be a public space if you pay for it? It has to be something where you can move around freely and unrestricted not depending on your monetary resources. The fact that you pay for travelling in PT almost makes it per definition to something other than a public space.” (S_04)

Another interviewee from Brussels also recognised that the need to pay for access somewhat limits the actual publicness of PT:

“But it is a space where everyone has the right to go more or less freely. Okay, you have to pay to go there. But for me it remains a space open to the public. You can meet everyone there. Everyone has the right to go there.” (B_015)

For many in Germany, public space is also defined by inclusivity and accessibility. Thus, some respondents from this region also wonder whether PT should be described as public space given the cost of a fare:

“Yes, [public transport space] is a bit semi-public, because you need a ticket and that excludes a certain group of people. On the other hand, it is of course public in the sense that anyone with a ticket can get in.” (G_04)

The main reason for not seeing public transport as truly public space is the need to have a ticket (the high number of those who perceive public transport as public space in Tallinn can be justified with the existence of fare-free public transport).

of social austerity which comes off as being seen in negative ways. Participants across regions noted that a type of mutual warmth or openness to interact that was often previously present between passengers was now missing. For instance, one respondent from Estonia, echoing similar concerns to the respondent from Berlin, discussed how passengers were now unlikely to extend help towards each other:

"I: Do you feel that there is even less of such helping than before [the COVID-19 outbreak in March, 2020]?"

T_08: Yes, I'm afraid so, nobody knows [what could happen] when it's a stranger." (T_08)

An analogous observation was also made by participants in Brussels:

"There was an elderly person without a mask, all the people present moved away even though there would have been benevolence before." (Survey

response, 18-29 years, female, Brussels, 29.05.2020)

However, despite this, some participants still noted some rare examples of social moments on PT. Even if there is an expectation of having less interactions with fellow passengers, people are often social beings and find it very difficult to stay away from interactions. A respondent from Estonia offered a vivid description of a social moments despite the general sense of carefulness and distancing on PT:

"Oh yes! When the virus came, everybody started to behave more carefully. I remember that elderly people... ok not elderly, something like 50, 60. I sat behind their back, could see they were old. And they had masks on and tried to sit so on the edges. You could see that they try to maintain distance. But then a girl, a young one, entered the bus. She was short for some reason, had two kids with her. I couldn't understand, perhaps she was a sister, and older sister or was simply with

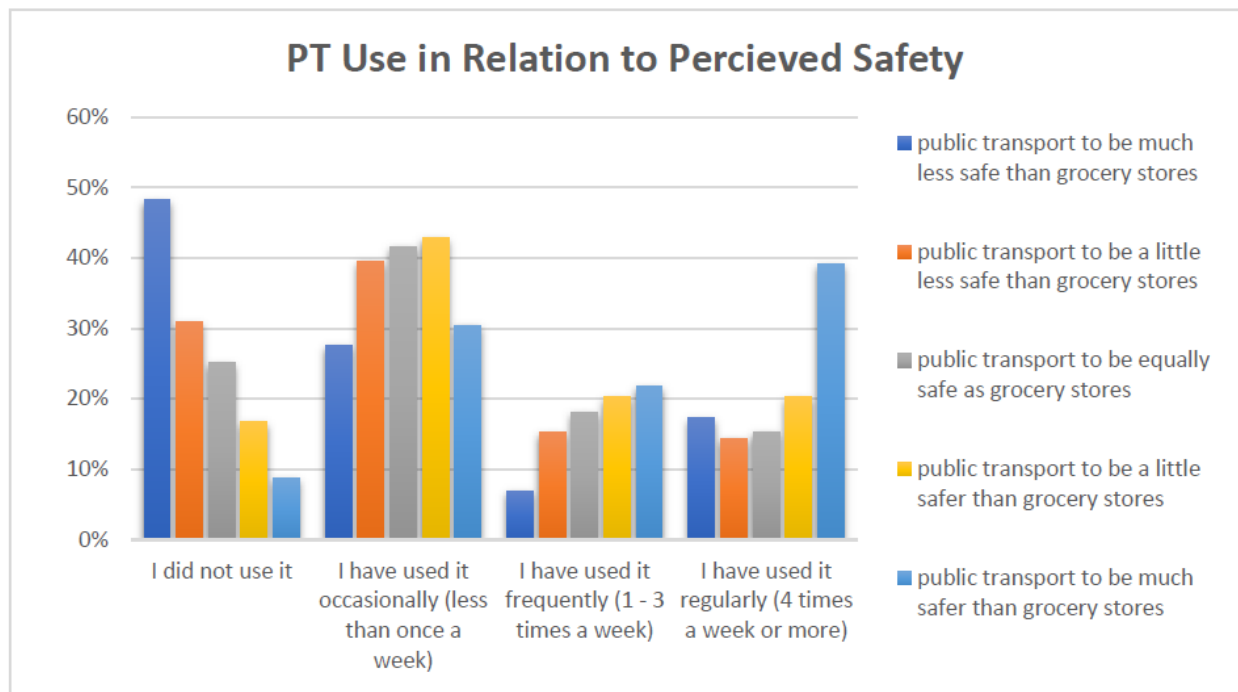


Figure 2-2: I find public transport to be... * (n=780)

similar face as them, a nanny... I don't know. But seemed like not a nanny, someone closer. Anyway, then the children were climbing there and you can see that she is very irritated and yelling that come here and what are you yelling... very nervous, so that it makes you sad. And children all the time looked, they wanted to come sit there, grab from somewhere all the time. But this mother or sister suddenly... was so nervous, didn't help. And then these older women, the 60 years old, the risk group, right. As it was told that children are carriers of the virus and they get by better. But don't forget, they are carriers of the virus. Anyway, they stood up and helped to sit by the window, sat next to them themselves. They helped. You could see that they maintain distance, stood up and looked that women as if 'how could you, this kid is small, your task is to help them, you cannot behave so that you yell at them, they can't even understand what you yell there.' This was so lovely how these women approached on either side and put them to sit right next to themselves by the window and then talked to them while being themselves risk group." (T_05)

Who is Afraid of Public Transport

Key Insight: People who continue to use public transport find it more safe than those who completely avoid it.

As the previous sections show, it is clear that the COVID-19 pandemic has altered the experience of riding PT for most passengers. However, such changes are obviously not exclusive to PT. Other public spaces, such as markets, have also been affected by the outbreak. In interviews, respondents would occasionally digress to express how the

atmospheres of these spaces have changed as well.

Respondents from Tallinn showed mixed feelings about whether PT was more or less safe than other places of public encounter.

Some found any shared spaces to be equally threatening, preferring to avoid any crowded space:

"they are quite the same. I have avoided entering both because there are too many people there. Either waited for the next PT vehicle or did not enter this shop at this moment." (T_09)

Other respondents in both Tallinn and Germany assessed spaces like grocery stores to be riskier than everyday commuter transport:

"In shops there is also this option that the goods there are touched and lifted and put [back] so the danger of catching the disease is higher than in public transport." (T_10)

"No, I find the supermarket around the corner much more stressful than the bus at the moment. I live near some parks, which are pretty full at the moment. And I think the public places I use during the pandemic are just incredibly empty and I don't feel so insecure about it." (G_03)

Only 17% of regular PT users judged PT to be "much less safe" than supermarkets and grocery stores

While these individual responses vary, our survey data uncovers a significant pattern in how people perceive the relative danger of PT compared to other spaces (Figure 2-2). Those who have continued to use PT since the COVID-19 outbreak generally have a positive perception of PT's safety in regard to contracting the virus. Only 17% of regular PT

users judged PT to be “much less safe” than supermarkets and grocery stores. In fact, nearly 40% of regular riders found PT to be “much safer” than grocery stores. In contrast, nearly 50% of people who completely avoid PT find it to be “much less safe,” with only 9% judging PT to be safer than grocery stores. The same pattern holds true for shopping centres, and, to a lesser extent, public parks.

These differing perceptions raise important questions about who is actually most afraid of PT. A primary finding from our survey is that avoidance of PT largely breaks down along the lines of class and education. Wealthier and more educated individuals tend to avoid trains, buses, and trams, while less affluent, working class individuals are more likely to remain as regular users. This suggests that those who feel most unsafe about PT are actually the well-off individuals who are no longer riding. Meanwhile, those with fewer resources who remain regular transport users have found PT to be much less threatening.

It is yet not possible to assess with confidence whether those not seeing PT as that dangerous were simply accepting the need to use it while still feeling emotional some heightened anxiety

It is yet not possible to assess with confidence whether those not seeing PT as that dangerous were simply accepting the need to use it while still feeling emotional some heightened anxiety. We also did not interview respondents who might be struggling more with the COVID-19 situation owing to the method of the study (web-based survey and follow-up interviews), which is something for the oncoming studies to investigate. Nevertheless, COVID-19 brought new challenges, but most of the insights from our study indicate still that the people who are most reliant on PT are mostly undeterred and not ready to abandon it.

The one using PT indicated in interviews also other concerns associated with PT ride apart

from COVID-19—such as worries of falling—thus giving a complex picture of PT use. Even if there are concerns of COVID-19 spread, there are also other things that matter for PT users. While some of these concerns were eased with the pandemic as diminished number of riders allowed more seating space, other concerns were underscored with the social distancing creating emptier stations with increased sense of danger (of mugging, for instance) for some of the passengers. Such diverse perspectives should also not be forgotten when attending to the pandemic conditions.

Section Conclusion

The COVID-19 pandemic and subsequent response changed the experience of using PT. During the initial weeks of the first wave, many riders felt particularly cautious about contacting the shared surfaces of PT spaces. Additionally, concerns about maintaining proper physical distance became paramount—when distance was possible, many riders enjoyed the additional space, and when it they felt stressed or vulnerable.

The circumstances also changed how passengers regarded each other. Respondents reported feeling hesitant about interacting with each other and a noticeable increase in general politeness. These experiences were complicated by feelings of wariness toward any passenger appearing sick and irritation with passengers who failed to abide by public health guidelines (keeping distance, wearing masks).

Despite these changes, survey results showed that people who continued riding PT generally found the PT to be about as safe as or even safer than other shared spaces such as grocery stores or shopping centres. However, those who completely avoided PT remain circumspect. Survey results also indicate that one’s continued use or avoidance of transport is correlated to class and education backgrounds. Interviews further revealed the

various senses of PT ride of those who have continued using it, ranging from eerie atmospheres to calm and more comfortable experience of PT use. ☯

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Annexes

Annex I: Interview Analysing Codes

PUTSPACE study of public transport and COVID-19 survey and interviews

Combined version of coding approaches

/you can add additional categories to any place in the structure in order to capture the meaning that this framework fails to capture/

/Categorize interview passages under lower level categories - "Price", "Quality" etc. And not directly under "Infrastructure aspects", "Material sensations" etc./

- **Infrastructure aspects**
 - **Price** - reflections on high price, need to reduce, free public transport ride options
 - **Quality** - general comments on PT quality (frequency, comfort, etc)
 - **Technologies** - ability to swipe/tap card v pay cash, presence absence or HVAC systems
 - **Network_System** - general comments on the PT system (coverage in the city, frequency of service)
 - **Inevitability of PT** - general comments about the necessity of PT for cities
- **Material sensations**
 - **Cleanliness** - assessment of PT cleanliness, its effect on usage
 - **Surfaces_Touch** - avoiding touching surfaces, cleaning hands afterwards.
 - **Colour_Decoration** - reference to the colours and decoration used on PT vehicles or stations
 - **Comfort** - Remarks on whether PT and if which aspects are perceived as comfortable, pleasant or not
 - **Smells** - Perception of pleasant, unpleasant, disturbing or new odours in PT
 - **Temperatures** - the sensations of PT temperatures, effects on decisions to use
- **Atmosphere**
 - **Careful** - the general sense of careful behaviour by passengers
 - **Suspicious** - noting the suspicious anxieties by PT travellers, suspicion is "in the air"
 - **Eerie** - strange and frightening atmosphere
 - **Calm** - the atmosphere is described as relaxed, peaceful...
 - **Distant** - particularly mentioned about the atmosphere, not other persons
 - **Danger_not danger** - references to the atmosphere as evoking danger or vice versa, feeling not dangerous
- **Mobility practices**
 - **Avoidance** - of crowded places / peak hours of PT
 - **Distancing** - mentioning practices of keeping distance from others, practiced by him/herself or other people
 - **Necessity_Dependency** - need to use public transport, potentially even dependent
 - **Alternative transport options or usage** - using other modes instead of public transport (deciding to walk, cycle, use car more)

- **Consideration of others** - taking account of other passengers when riding (sitting elsewhere, turning oneself, avoiding coughing)
- **Risk assessment** - being alert, staying aware of threats in situ (in contrast to zoning out)
- **Embodying change** - making changed behaviour a common practice
- **Coughing** - references to coughing by oneself or by others and the sentiments and feelings about that
- **PT experiences**
 - **Strong feelings/emotions** - informants describe with vivid and strong words their/others feelings or emotions
 - **Expectations** - Certain dispositions of the situation, not always what was exactly experienced
 - **Conflictual encounters** - descriptions of encounters with other passengers with different levels of conflict (from lighter ones to more serious ones)
 - **Social interactions** - noting various social interactions, including non-verbal and micro-interactions, as well as more substantial conversations and socialisations
 - **Unsocial moments** - lack of social interaction
 - **Noise_Silence** - When informants particularly stress the quietness or vice-versa, note the noisy ride
- **Publicness of PT**
 - **Art** - references to art as what makes public transport public; other references to “art” in interviews
 - **Passenger numbers** - notes on the number of passengers including empty or emptied PT vehicles
 - **Infrastructural elements** - Infrastructural argument for the publicness of PT. E.g., references that PT is not public space because of entry barriers, closed entrance of PT at certain times etc.
 - **Public_private** - general notifications on the ways in which public transport is public or is not public and how it relates to private spaces
 - **Other spaces** - explicit comparisons with other supposedly public spaces
- **Reaction to Covid-19 in general**
 - **Fear** - mentioning of fear or anxiety due to Covid-19 situation or measurements
 - **Crisis** - Covid-19 is understood to be a crisis situation, extraordinary or challenging
 - **Solidarity** - reference to feelings of solidarity or solidarity activities due to Covid-19 situation
- **Governance and safety measures**
 - **Mask wearing** - obligation, habit, expectations or willingness to wear masks on PT
 - **Restrictions of space** - different restrictions on the PT use (distancing requirements, taping off seats, setting up barriers, closing of front door entrances)

(Dis)agreement with measures - agreements or satisfaction with imposed measures in the city as well as disagreements or dissatisfaction with these

Annex II: List of Interviews

Respondent	City	Gender	Age	Interview Date
B_01	Brussels	M	40s	March 22, 2020
B_02 (B_02b)	Brussels (Leuven)	M/F	20s	March 22, 2020
B_03	Brussels	M	30s	March 23, 2020
B_04	Brussels	F	20s	March 23, 2020
B_05	Brussels	F	30s	March 24, 2020
B_06	Brussels	M	20s	March 24, 2020
B_07	Brussels	F	40s	March 25, 2020
B_08	Brussels	M	30s	March 30, 2020
B_09	Brussels	F	50s	April 04, 2020
B_010	Brussels	M	20s	April 11, 2020
B_011	Brussels	M	40s	June 09, 2020
B_012	Brussels	M	60s	May 13, 2020
B_013	Brussels	M	30s	May 14, 2020
B_014	Brussels	M	40s	May 15, 2020
B_015	Brussels	F	30s	May 27, 2020
B_016	Brussels	F	30s	July 14, 2020
B_017	Brussels	M	20s	August 18, 2020
G_01	Berlin	M	30s	May 03, 2020
G_02	Munich (1)	F	30s	May 18, 2020
G_03	Munich (2)	F	20s	May 18, 2020
G_04	Dresden	M	20s	May 19, 2020
G_05	Munich	M	50s	May 20, 2020
G_06	Munich	F	20s	May 27, 2020
G_07	Berlin	F	30s	June 16, 2020
G_08	Berlin	M	30s	June 19, 2020

G_09	Berlin	M	20s	May 14, 2020
G_10	Berlin	F	20s	May 14, 2020
S_01	Stockholm	M	30s	May 28, 2020
S_02	Stockholm	M	50s	May 29, 2020
S_04(3)	Stockholm	M	30s	June 1, 2020
S_05	Stockholm	F	50s	June 4, 2020
S_06	Stockholm	M	30s	June 4, 2020
S_07	Stockholm	F	60s	June 5, 2020
S_08	Stockholm	F	20s	June 5, 2020
S_09	Stockholm	F	50s	June 17, 2020
S_10	Stockholm	M	40s	June 17, 2020
S_011	Stockholm	F	50s	June 23, 2020
T_01	Tallinn	F	70s	May 14, 2020
T_02	Tallinn	M	40s	May 15, 2020
T_03	Tallinn	F	40s	May 15, 2020
T_04	Tallinn	F	60s	May 19, 2020
T_05	Tallinn	F	20s	May 21, 2020
T_06	Tallinn	M	20s	May 22, 2020
T_07	Tallinn	M	30s	May 26, 2020
T_08	Tallinn	F	50s	May 27, 2020
T_09	Tallinn	F	30s	May 28, 2020
T_10	Tallinn	F	70s	June, 3, 2020
T_11	Tallinn	F	40s	May 22, 2020
T_12	Tallinn	F	40s	May 22, 2020

Annex III: Interview Structure

Interview Schedule

COVID-19 AND PUBLIC TRANSPORT MOBILITY

Interview questions

(not shared with respondent, to be used by the interviewer)

Questions are tailored following responses in the survey. The proposed length of interview is 45 min but it might take longer depending on the conversation and the readiness to answer by respondent.

Use of PT before and since Covid-19

1) What public transportation was like for you before Covid-19?

Probes:

- In general, how did you feel about taking public transportation?
- Let's talk about [a specific type of trip] like your commute etc. what was that like? Can you walk me through how it usually went (don't worry about being too detailed, try to really get into what it's like being there)? Arriving, waiting, boarding, sitting, moving, looking, departing... How did you spend your time as a passenger? What were your interactions with fellow passengers like? Are there any sensory experiences or sensations (sights, smells, textures, etc.) that stand out to you?

2) Do you think the Covid-19 situation has had any major change in how you experience public transport today? Please elaborate.

Probes:

- Do you take different modes of public transport more often than before?
- Does public transport have a different atmosphere now than it had before? Please elaborate on this atmosphere.
- Do you do different things on public transport now than you did before? Does that make you feel differently?

Experience of the COVID-19 Outbreak

3) When did you first start hearing about Covid-19? Do you remember what your first impressions were, how much attention did you give to Covid-19 news and what are your current thoughts on the Covid-19 outbreak?

4) What made you feel that Covid-19 outbreak was really there?

Probes:

- Can you remember any specific changes to public transport that made Covid-19 feel more present? E.g., signage, behaviors, different feelings in public space
- How did noticing these changes make you feel? Did they affect your behaviours?

Experiences of PT since COVID-19

5) How have you felt while riding public transport since Covid-19 has taken off?

Probe:

- Talk through your most recent journey. What did you do differently than before Covid-19? How did you feel? What did you see? Can you think of any specific moments that brought the reality of Covid-19 into focus? Where were you, what was happening, how did others react, how did it make you feel?
- How would you describe the overall mood in public places? Scared? Paranoid? Helpful? Resilient? Quiet? Have you been more sensitive to anything? Are new things standing out to you?
- Have you taken any pictures in the past couple weeks? What were they? Why did it seem interesting to you?

Instances of conviviality or conflict on PT

6) Have you seen instances of conviviality at public transport?

Probes:

- Are people talking about the situation?
- Do you see any shared glances and moments?

7) Have you come across instances of conflict in public transport at the times of Covid-19 related restrictions? What happened?

Public Transport as Public Space

8) Do you think public transport is public space? Could you explain?

Probe:

- What makes places something that you would call “public space”?

9) Has Covid-19 times in any way changed how public transport is public space? Could you explain?

Probes:

- Does public transport space feel very different from others?
- Why do you think they feel different?

Public transport policies in times of Covid 19

10) What is your opinion on the policy measures / responses taken to the public transport during the outbreak? Do you think the governing authorities have responded reasonably? Is there something else that should have been done / something not done?

Probes:

- Can you recall certain policy measures affecting public transport during the outbreak (Fare decreases / fare increases, change of controlling, about passenger behaviour on PT)? How do you evaluate them?
- In case of a further local outbreak, would you agree to close down public transport systems in highly affected areas in order to contain the spread of the virus?
- Are you for or against masks in pt?

11) Some say “public transport will not recover from Covid 19 as people lost trust in the system and will avoid proximity long after the pandemic is over”. What do you think about it?[1]

Probes:

- Would you be willing to agree to fare increases following the loss of income pt providers have to face as a consequence of the pandemic? If not, who should compensate? (could be combined with questions of fare-free public transport)

Additional Topics

[RELEVANT QUESTIONS FOR EACH RESEARCHER]

Wrapping up: Is there anything related to public transport and Covid-19 I haven't asked about? Do you have anything you'd like to add? Do you have any questions for me?

Thanks!

Annex IV: Survey Structure

COVID-19 and Public Transport Mobility

[* Mandatory Questions]

In this survey, we are interested in how the uses, experiences and understanding of public transport may have changed following the outbreak of Covid-19 (commonly referred to as “coronavirus”). We invite you to answer some questions regarding your use of public transport before and after the Covid-19 outbreak. We will also ask some questions regarding your social profile. Completing the questionnaire takes about 10 to 15 minutes.

The survey is conducted as part of the PUTSPACE research project (<https://putspace.eu/>). If you have any questions regarding the questionnaire, please contact Dr. Tauri Tuvikene (tauri.tuvikene@tlu.ee). The questionnaire was prepared by Peter Timko, Wojciech Kęłowski, Louise Sträuli, Tauri Tuvikene, Marcus Finbom.

The data collected in this form will be anonymised and securely stored at the server at Tallinn University. The data may be downloaded by the PUTSPACE research group for further analysis. The anonymised data may also be used by researchers outside the PUTSPACE team. The project “Public transport as public space in European cities: Narrating, experiencing, contesting (PUTSPACE)” is financially supported by the Humanities in the European Research Area (HERA) Joint Research Programme (www.heranet.info) which is co-funded by AKA, BMBF via DLR-PT, ETAg, and the European Commission through Horizon 2020.

Please note that by clicking the link below, you agree that you have understood the above description of the project, are at least 18 years old and agree to take part in the research. The data can be used in research publications and presentations in anonymised form.

I: GENERAL INFORMATION ABOUT THE USE OF PUBLIC TRANSPORT

Q_1-1 Which city or town did you live in the months before the COVID-19 outbreak?*

- _____ [Open field]

Q_1-2 Which city do you currently live in?*

- [tick box if the same as before the COVID-19 outbreak]
- _____ [Open field]

Q_1-3 How often do you use the following modes of transport and how has the outbreak of COVID-19 changed your use?*

	Prior to COVID-19	After COVID-19

Q_1-4 In your view, how important is it generally to maintain the operation of public transport during the Covid-19 outbreak? *

- Not important 0 1 2 3 4 Very important
- I have no opinion

Q_1-5 How often have you used public transport since you have learned about the Covid-19 outbreak?*[SINGLE CHOICE]

- I did not use it
- I have used it occasionally (less than once a week)
- I have used it frequently (1-3 times a week)
- I have used it regularly (4 times a week or more)

II: PERSONAL EXPERIENCES OF PUBLIC TRANSPORT DURING COVID-19

Q_2-1 Following the COVID-19 outbreak, what have been the main reasons behind your use of public transport? *

- Work
- Leisure
- Shopping
- Seeing family or friends
- Other:

Q_2-2 Please indicate below which statement applies the most to your situation: *

	Before the COVID-19 Outbreak...	Since the COVID-19 Outbreak...
...I was/am dependent on public transport for my daily activities		
...I had/have access to other travel options than public transport and used public transport as little as possible COVID-19 Outbreak		
... I had/have access to other travel options than public transport but preferred to use public transport		
No answer		

Q_2-3 With regard to the risk of contracting COVID-19, I consider public transport to be... *

	much less safe than...	a little less safe than...	equally safe as...	a little safer than...	much safer than...	I have no opinion
Public parks						
Residential streets						
Inner city boulevards and squares						
Grocery stores and supermarkets						
Shopping centres						

Q_2-4 Please rank these transport modes from safest to least safe during COVID-19 outbreak (with regard to the risk of contracting COVID-19)

(If you consider all these transport modes equally safe chose option "I consider all these transport modes equally safe" and continue to the next question)

- Metro
- Tram
- Bus
- Train
- Bicycle
- Walking
- Own Car
- Taxi or Ride-Hailing
- Motorcycle, Moped, Scooter
- I consider all these transport modes equally safe

Q_2-5 Following the COVID-19 outbreak, have you taken any of the following precautions when using public transport? *

- Wearing face mask
- I have not been taking any precautions

- Keeping distance from other passengers
- Avoiding touching surfaces
- Avoiding opening doors (e.g. by using elbows)
- Wearing gloves or other protective accessories
- Other:

Q_2-6 Following the COVID-19 outbreak, when using public transport have you experienced any of the following on board of public transport: *

Please choose **all** that apply:

- More people using public transport
- I have not experienced any of the above.
- People are exhibiting negative reactions to other passengers or staff
- People are more caring towards other passengers or staff than before
- Increased presence of cleaning staff
- Increased tickets controls
- Increased policing of public transport (e.g. check points, police presence)
- Conversations about Covid-19 or related topics
- Passengers transporting bulk purchases or other signs of "stocking up"
- Transmission prevention behaviour (e.g. people opening doors with elbows, avoiding touching surfaces)
- Signage encouraging hygiene (e.g. hand washing, covering one's mouth)
- Passengers wearing face masks, gloves, or other protective accessories
- Passengers coughing, sneezing, or showing other signs of illness
- Fewer people using public transport
- Other:

Q_3-1 Following the COVID-19 outbreak, how would you describe the atmosphere in public transport? Please provide any keywords that come to your mind

_____ [Open field]

Q_3-2 What types of positive, negative, or mixed emotions and sensations have you experienced while using public transport during the COVID-19 outbreak? Are these different than before the outbreak? *

_____ [Open field]

Q_3-3 Could you describe a specific experience in public transport during the COVID-19 outbreak that you remember? *

_____ [Open field]

Q_3-4 Do you have any additional comments about the use of public transport since the COVID-19 outbreak? Please provide any keywords that come to your mind *

_____ [Open field]

III: QUESTIONS ON THE SOCIO-ECONOMIC PROFILE

Q_4-1 How old are you? *

- Between 18 and 29 years old
- Between 30 and 39 years old
- Between 40 and 49 years old
- Between 50 and 59 years old
- Between 60 and 69 years old
- 70 years old or older
- I prefer not to say

Q_4-2 What is your gender? *

- Female
- Male
- I prefer not to say
- Other

Q_4-3 What degree of education do you hold? *

- Primary education
- Secondary education
- Vocational training degree
- Higher education degree
- I prefer not to say
- Other

Q_4-4 What is your occupation (several answers possible) *

- Student
- Retired
- Unemployed since the COVID-19 outbreak
- Unemployed since before the COVID-19 outbreak
- On parental leave
- Houseman, Housewife
- Volunteering, in civil or military service
- Employed full-time
- Employed part-time
- Self-Employed
- Prefer not to say
- Other:

Q_4-5 What sector do you work in? *

- Business and Finance
- Legal sector
- Administration
- Research
- Arts, Design, Entertainment, Media, Architecture

- Education, Training and Library occupation
- Healthcare
- Personal care, Cleaning
- Hospitality industry (Hotels, Restaurant, Cafes, Catering, Food preparation)
- Retail
- Other

Q_4-6 How is your working situation since the outbreak of COVID-19? *

- I can now work from home (“tele-working”)
- I could also work from home (“telework”) at least partly in my job prior to COVID-19 outbreak
- I still have to travel to my workplace, following a specific schedule
- I still have to travel to my workplace, but my schedule is now flexible
- I took a paid leave
- I took an unpaid leave
- I was instructed to take a leave
- Prefer not to say
- Other

Q_4-7 What is the economic status of your household? *

- I have no spare money, even for food
- I have some money but regularly struggle to afford the basics (food, rent)
- I can usually afford the basics but larger purchases (appliances, furniture) and saving are difficult
- I can always afford the basics and can occasionally make larger purchases
- I can always afford the basics and always have extra for large purchases and savings
- I find it difficult to answer this question
- No answer
- Other

IV: FOLLOW-UP INTERVIEW

Q_5-1 Would you be interested in participating in a short online interview (via Skype or similar service, or via phone) about your experience using public transport during the COVID-19 outbreak?

- Yes
- No
- Maybe

If you agree to participate in a follow-up interview or wish to stay informed about the survey, please provide your e-mail address

Please write your answer here:

We would like to inform you that this online form automatically saves the provided e-mail address with the answers from the survey. In the further processing, however, the e-mail addresses will be strictly separated from the collected data and will under no circumstances be used for analytical purposes. This guarantees the

anonymity of the participants. However, if you do not wish to provide your e-mail address via this form, but would still like to stay informed about the survey or participate in an online interview, you can contact us by e-mail at tauri.tuvikene@tlu.ee.

Thank you very much for your participation!

Submit your survey.

Thank you for completing this survey.