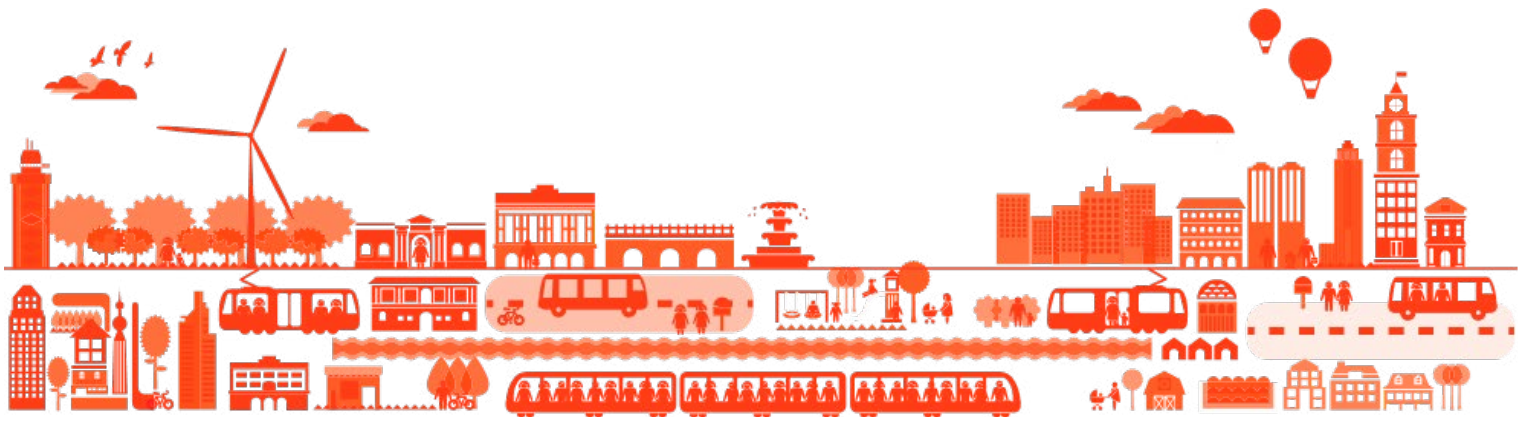
K2 WORKING PAPER 2021:12

Public transport funding under pressure

Challenges, opportunities, and new pathways caused by the Covid-19 pandemic in Sweden

John Hultén, Claus Hedegaard Sørensen, Elisabeth Lång, Fabio Hirschhorn Zonana and Jens Alm



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Foreword

Covid-19 has had profound consequences for public transport. The immediate effect has been a sharp reduction in travel, but also other and more long-term consequences can be expected. However, the pandemic is not a threat only, it can also be an opportunity for change, transforming mobility in a more sustainable direction. Within K2, the Swedish knowledge center for public transport, several research projects have been initiated to study the consequences of the pandemic for public transport in Sweden. This report was made within a small-scale project focusing on changed conditions for public transport funding as a consequence of the pandemic. The project was managed by John Hultén. Researchers involved were Elisabeth Lång, Jens Alm, and Claus Hedegaard Sørensen from VTI, the Swedish Road and Transport Research Institute, and Fabio Hirschhorn Zonana from TU Delft. We would like to extend a big thank you to people in the Swedish public transport sector for contributing with data, for participating in interviews and for engagement in a scenario workshop. A big thanks also to people at Västra Götalandsregionen and Västtrafik for providing valuable comments. In addition to this report, the project has produced a short memo analyzing the situation in the Amsterdam region. The memo is titled “Public transport funding under pressure – the case of Amsterdam” and is available at k2centrum.se, where also this report can be found. The research project was funded by K2 with additional support from Västra Götalandsregionen.

Lund, August 2021

John Hultén

Director K2

Summary

Covid-19 has affected the supply, demand, and image of public transport in unprecedented ways. This report aims to investigate the short- and long-term effects of Covid-19 on public transport and its funding models, with specific focus on the Swedish context. Three research questions are in focus: How does Covid-19 impact on revenues and costs for public transport? What measures have public transport agencies made in response to these challenges? How does changes or stability in public transport due to Covid-19, in the longer run impact on the possibility to reach regional political aims of sustainable transport? The research questions are approached with both quantitative and qualitative methods, including interviews and a scenario workshop with mobility actors in Sweden. The three Swedish metropolitan regions, Stockholm, Västra Götaland and Skåne, are used as cases.

The report shows very clearly how farebox revenues drastically decreased in all three regions, as many people listened to the recommendations from authorities to avoid public transport. At the same time, costs remained largely unchanged. This resulted in a widened gap between costs for operating the system, and revenues that could finance those costs. To compensate for the loss of ticket revenues, earmarked state contributions were introduced on several occasions on an ad-hoc basis. Even with state contributions, regional subsidies to public transport increased. The so-called cost-recovery ratio declined in unprecedented ways. Thus, the share of public subsidies coming from tax-money, both regional and national, increased.

The three regions responded in similar ways to the funding challenge, but with some variations. Region Skåne was the only region that downsized operations at an early stage to reduce costs, which caused some political turmoil. Stockholm and Västra Götaland decided to maintain operations unchanged. Increased problems with fare evasion added to the problem of reduced revenues. To meet changes in demand, with more people working from home, new tickets were introduced. Several other measures were implemented to reduce congestion and transmission of disease, such as dispersed school start and improved traffic information. Such measures can impact costs in the longer-term perspective if adopted at larger scale and over longer time.

Future implications of the pandemic on public transport and its funding are difficult to assess. The report includes an analysis based on four different scenarios developed within the project – “Downward spiral”, “Return”, “New mobility systems” and “Public transport as backbone”. The analysis indicates that he public transport actors in particular should try to avoid and be prepared to handle the scenario of “Downward spiral”, but also “Return” and “New mobility systems”, since these scenarios are judged to include difficulties.

Based on institutional theory, three more general reflections are made concerning the impact on future funding models. A first reflection is that the national level has stepped in as an important funder of public transport in Sweden. If demand for public transport

remain on a significantly lower level compared to the pre-pandemic situation, continued national funding might be needed to prevent a development in line with the "Downward spiral" scenario. If so, national funding may be part of a new institutional equilibrium that influence power relations and actor's behavior in the future.

A second observation is that the pandemic might change ideas about public transport's role in society in ways that transform the existing institutions from within. A larger focus on individual, demand responsive solutions, and measures to reduce crowding will impact funding models. Increased working from home change the basic idea of a public transport system serving a rather fixed commuting behavior. More flexibility will be needed for public transport to remain relevant. We have already seen examples of institutional adjustments in ticket regimes, which is something that may continue at a larger scale.

A third reflection is that the widened funding gap change the cost-benefit equation in public transport. This may have repercussions for the institutional frameworks. In the "Downward spiral" scenario institutions may change mainly from within, with a shift from a focus on societal development and sustainability towards a more budget oriented way of thinking, with cost reductions, revenue maximization, increased ticket prices, and similar measures. To avoid such a development, the national level may need to take a more active role in funding, but also take a more active role as a "meta-governor" that steer the direction of public transport actors. The scenarios, "New mobility systems" and "Public transport as backbone" will require larger institutional makeovers where new funding models are needed to support other forms of shared transport modes. This may in more fundamental ways change the perception of what public transport is and how it should be funded.

Sammanfattning

Covid-19 har påverkat såväl efterfrågan på som bilden av kollektivtrafiken på ett unikt sätt. Denna rapport undersöker effekterna av Covid-19 för kollektivtrafiken och dess finansieringsmodeller på både kort och längre sikt, med särskilt fokus på den svenska kontexten. Tre forskningsfrågor är i fokus: Hur påverkar Covid-19 intäkter och kostnader för kollektivtrafiken? Vilka åtgärder har kollektivtrafikmyndigheterna vidtagit som svar på finansiella utmaningar? Hur kan förändringar av kollektivtrafiken, till följd av Covid-19, påverka möjligheten att uppnå regionalpolitiska mål om hållbara transporter? Forskningsfrågorna hanteras med både kvantitativa och kvalitativa metoder, inklusive intervjuer och en workshop där olika scenarier analyserats med mobilitetsaktörer i Sverige. De tre svenska storstadsregionerna Stockholm, Västra Götaland och Skåne används som fall.

Rapporten visar tydligt hur biljettintäkterna drastiskt minskade i alla tre regionerna, eftersom många resenärer följt myndigheternas rekommendationer att undvika kollektivtrafik. Samtidigt har kostnaderna för kollektivtrafiken varit i stort sett oförändrade. Detta resulterade i ett ökat gap mellan kostnader för driften av kollektivtrafiken och intäkterna som behövs för att finansiera kostnaderna. För att kompensera för förlusten av biljettintäkter infördes öronmärkta statliga bidrag vid flera tillfällen på ad hoc-basis. Trots statliga bidrag ökade även regionala subventioner till kollektivtrafiken. Således ökade andelen både nationella och regionala subventioner till kollektivtrafiken. Den så kallade kostnadstäckningsgraden minskade dramatiskt.

De tre regionerna svarade på finansieringsutmaningen på liknande sätt, men med vissa variationer. Region Skåne var den enda regionen som i ett tidigt skede minskade utbudet för att minska kostnaderna, vilket orsakade viss politisk diskussion. Stockholm och Västra Götaland beslutade att behålla utbudet oförändrat. Ökade problem med plankning bidrog ytterligare till minskade intäkter. För att möta efterfrågeförändringen, med fler resenärer som arbetade hemifrån, introducerades nya biljettyper. Andra åtgärder genomfördes i syfte att minska trängsel och smittorisk, till exempel spridda skolstarter och förbättrad trafikinformation. Sådana åtgärder kan påverka kostnaderna på längre sikt om de genomförs i större skala och över längre tidsperioder.

Framtida konsekvenser av pandemin för kollektivtrafiken och dess finansiering är svåra att bedöma. Rapporten innehåller en analys baserad på fyra olika scenarier som utvecklats inom projektet - "Nedåtgående spiral", "Återgång", "Nya mobilitetssystem" och "Kollektivtrafik som ryggrad". Analysen indikerar att kollektivtrafikaktörerna särskilt bör försöka undvika och vara beredda att hantera scenariot med "Nedåtgående spiral", men också "Återgång" och "Nya mobilitetssystem", eftersom dessa scenarion bedöms innehålla svårigheter.

Baserat på institutionell teori görs i rapporten tre övergripande reflektioner om effekterna på framtida finansieringsmodeller. En första observation är att den nationella nivån har gått in som en viktig finansiär för kollektivtrafiken i Sverige. Om efterfrågan på

kollektivtrafik förblir på en betydligt lägre nivå, jämfört med situationen före pandemin, kan fortsatt nationell finansiering behövas för att förhindra en utveckling i linje med "Nedåtgående spiral" -scenariot. I så fall kan nationell finansiering vara en del av en ny institutionell jämvikt som påverkar maktrelationer och aktörers beteende i framtiden.

En andra observation är att pandemin kan förändra idéer om kollektivtrafikens roll i samhället på ett sätt som förändrar de befintliga institutionerna inifrån. Ett större fokus på individuella, efterfrågestyrda lösningar och åtgärder för att minska trängsel kommer att påverka finansieringsmodellerna. Ökat arbete hemifrån förändrar grundtanken om ett kollektivtrafiksystem som servar ett ganska fast pendlingsbeteende. Mer flexibilitet kommer att krävas för att kollektivtrafiken ska förbli relevant. Vi har redan sett exempel på justeringar i biljettutbudet, vilket är något som kan fortsätta i större skala.

En tredje reflektion är att det ökade finansieringsgapet ändrar kostnads-nytto-ekvationen inom kollektivtrafiken. Detta kan få konsekvenser för de institutionella ramarna. I scenariot "Nedåtgående spiral" kan institutioner förändras huvudsakligen inifrån, med en förskjutning från fokus på samhällsutveckling och hållbarhet mot ett mer budgetorienterat tankesätt, med kostnadsminskningar, intäktsmaximering, ökade biljettpriser och liknande åtgärder. För att undvika en sådan utveckling kan den nationella nivån behöva ta en mer aktiv roll i finansieringen, men också ta en mer aktiv roll som en ”meta-governor” med ambitionen att påverka riktningen för kollektivtrafikens aktörer. Scenarierna, "Nya mobilitetssystem" och "Kollektivtrafik som ryggrad" kommer att kräva större institutionella omställningar där nya finansieringsmodeller behövs för att stödja andra former av delade transportsätt. Detta kan på mer grundläggande sätt förändra uppfattningen om vad kollektivtrafik är och hur den ska finansieras.

1. Introduction

1.1. Background

Covid-19 has affected the supply, demand, and image of public transport in unprecedented ways. In this report, we shed light on an issue that has gained a lot of attention from public transport administrations, but not so much from research (exceptions are e.g. Vickerman 2021 and Marsden and Docherty 2021), namely how public transport costs and revenues have been affected during the pandemic, and what this means for public transports ability to contribute to sustainability in the longer-term perspective.

Costs and revenues are two sides of the same coin, equally important to the funding of public transport. They are factors embedded in broader institutional contexts that determine who pays, how much and in what way. These institutions, taken together, make up the funding models for public transport, although it is not so much a concrete model than a wide array of different policy instruments, rules, and organizational routines.

Funding has importance beyond the obvious need to cover expenses for operating buses and trains and for investing in new infrastructures. It shapes, in both explicit and implicit ways, the behavior and power relations of public transport actors (Hultén 2020). Funding is the sharp edge of public transport organization as it reveals prevalent views on public transport and its role in society (comp. Sclar and Lönnroth 2014). It is one of, if not the most decisive elements of public transport governance regimes, affecting most decisions made on the development and operation of public transport.

The institutional setup differs between, as well as within, countries. The Swedish funding model, further described below, is based on a shared responsibility between taxpayers (mainly at the regional level) and the users. This report shows that the Covid-19 pandemic has shaken that balance. Whether that is temporally only, remains to be seen.

1.2. Public transport funding in Sweden

Funding of public transport in Sweden has developed, from predominantly private funding in the early days of public transport, to a mixed model where costs are shared between users and taxpayers on a 50-50 basis for the country as a whole but with large regional variations. In 2020, because of the pandemic, the cost coverage-ratio changed dramatically as the share paid for by users dropped with 14 percent on average (Trafikanalys 2021a).

Public subsidies to bus services outside cities were introduced in the 1960s as many operators struggled to survive the increased competition from private cars. In the 1970s a large organizational reform placed more responsibility for public transport at the

regional level, with the aim to integrate services and tickets. The reform led to an increase in both supply and ridership. Also, the costs went up due to an increased public commitment. The cost-coverage ratio, which is a measurement of how much of the costs for operations that are paid by the passengers, went up from 38 to 42 percent in the years 1980-1984. A model with mixed regional and local funding emerged, but where tickets remained an important source of revenue (Ringqvist 2016).

In the 1990s public procurement was introduced in Sweden, which gradually led to fewer but larger market actors. Publicly owned bus companies dropped from 40 in 1989 to 21 in 1995. Only nine companies remained in 2004 (ibid). In the years following deregulation and procurement, costs for public transport were substantially reduced, but after some time costs started to increase and have continued to do so (Lidestam et al. 2016). In 2008, a government investigation proposed a more market-oriented system, where private firms should operate commercial services, and public support only be used for lines without commercial potential. The proposal was never adopted, but commercial bus services were allowed. With the new legislation that went into force in 2012, a more strategic role was introduced mandating regions to make strategic public transport plans (Hultén 2020).

In the past decade, public transport in Sweden has increased both in terms of number of boardings and as market share of travel with motorized transport (Svensk Kollektivtrafik 2020). An overall aim for the sector in recent years has been to double the ridership to 2020 compared to the situation in 2006. The growth in public transport has to a large extent been achieved through investments in services, vehicles, and infrastructure, which has also led to increased costs with 29 percent between 2011 to 2020 (Trafikanalys 2021a). Consequently, the funding of public transport was on the political agenda also prior to the pandemic.

1.3. Aim, research questions and methodology

This report aims to investigate the short- and long-term effects of Covid-19 on public transport and its funding models. Three research questions are in focus:

- How does Covid-19 impact on revenues and costs for public transport?
- What measures have public transport agencies made in response to these challenges?
- How does changes or stability in public transport due to Covid-19 impact on the possibility to reach regional political aims of sustainable transport in the longer run?

As mentioned above, the Covid-19 pandemic is a truly unique situation. In addition to answering the research questions above, this report contributes to the documentation of what took place in Swedish public transport during the initial year of the pandemic. An empirical documentation made in close proximity to the actual situation can be of value for future research in general and for international comparisons in particular.

The study is based on case studies of the three Swedish metropolitan regions - Stockholm, Västra Götaland and Skåne. Of all public transport boardings in Sweden, more than 80

percent takes place in one of these regions. Stockholm is the largest, both in population and in public transport. The market share (of motorized transportation) for public transport in Stockholm was 56 percent in 2019. In Skåne and Västra Götaland the market share was 32 percent in each region in the same year (Svensk Kollektivtrafik 2019).

The report is based on a mix of quantitative and qualitative methods. Descriptive statistics are based on data from the regions, qualitative data on interviews and documents. The future oriented part of the project draws on scenario methodology and a workshop carried out with people representing public transport agencies, operators, national administrations, municipalities, and other transport operators. Focus on the report is on traditional public transport, excluding demand-responsive transport, school transportation etc.

1.4. Disposition

In chapter two we discuss literature that can inform us about possible long-term impacts on public transport demand and supply from the Covid-19 pandemic. The literature review is based on previous research on crisis and disruptions. We also introduce some concepts related to institutional change, to understand possible changes to public transport funding. Chapter three, four and five are empirical, but with very different approaches. Chapter three is mainly based on descriptive statistics on costs and revenues in the three Swedish regions. It addresses research question one. Chapter four is based on elite interviews and is an attempt to describe important decisions made during different phases of the pandemic, and the reasoning behind. Here, research question two is in focus. Chapter five differs from the previous two, as it looks at the future. Here we present four scenarios and the results from a workshop. In chapter six, finally, we try to answer the research questions in a more coherent way and discuss possible implications for changes of public transport funding models in the long-term perspective.

2. Crisis, public transport, and institutional change

To assist our analysis, we draw on previous research on crisis and public transport. We also make use of literature on institutional change to better understand possible future pathways for public transport funding. We acknowledge that the effects from a crisis on public transport and related institutions are heavily dependent on contextual factors. However, in this chapter we try to establish a more theoretical understanding independent of contexts, to sift out key concepts and insights that can advance our understanding and assist us in answering our research questions.

2.1. Crisis and public transport

Based on previous research we can distinguish between two categories of effects on public transport from a crisis or major disruption. The first category relates to changed travel behaviors, which in turn affect costs and revenues. The second relates to different strategies for policy change in response to a crisis.

Changed travel behaviors

The Covid-19 pandemic has had an enormous and unprecedented impact on travel behavior. Previous research points at four types of strategies that individuals can adopt when faced with disruptions to their normal transport options. They can reduce, re-mode, re-route, and re-time the way they are travelling (Parkes et al. 2016). Studies also indicate that individuals with a more multi-modal travel pattern are more adaptable compared to those that are more dependent on single modes, such as car travelling. The capacity to adapt also varies depending on availability to transport options, physical or mental capacity, financial ability, and number of children in the household (Marsden et al. 2020). These factors may very well coincide with multi-modal travel patterns. Studies indicate that people who changed their travel behavior due to a temporary disruption tend to relapse to previous behavior when the disruption is over (Parkes et al. 2016).

Previous research show that terrorist attacks (e.g. Madrid train bombing 2004, London underground bombing 2005) and pandemics (Sars 2003) affect people's willingness to use public transport due to changed risk perceptions. The perception of risk varies between individuals and is not always rational from an objective point of view, as people tend to overestimate small probabilities and underestimate large ones (Prager et al. 2011). A “fear” for using public transport seems to be more important in the shorter time perspective, prevailing 4-8 months after the event (ibid).

Travel behavior can also change due to social distance regulations or recommendations that e.g. command people to work from home or to avoid certain modes of

transport. Increased distance work will, everything else being equal, most likely mean less travel with public transport. However, it does not necessarily mean reduced travel all together. Previous research points at possible rebound effects and induced traffic, in particular car traffic. The rebound effect is explained by the association between distance working and sub-urbanization, which means that people locate further away from their workplaces and in locations that are less accessible by public transport and cycling (Melo and e Silva 2017).

Macroeconomic consequences of the Covid-19 pandemic, such as increased unemployment (Coibion et al. 2020, Fairlie et al. 2020, Petrosky-Nadeau & Valletta 2020), decreased aggregate spending (Andersen et al. 2020a, 2020b, Baker et al. 2020a), and increased financial market risk (Baker et al. 2020b, Zhang et al. 2020), has already been observed during the Covid-19 pandemic. Although each pandemic is different, and thus may have varying impacts on society, Jordà et al. (2020) argues that the (negative) macroeconomic after-effects of pandemics can persist for decades. If the macroeconomic effects will be long-lasting, relatively deep economic crises can be expected. Logically, overall demand for transport should decrease during tougher economic conditions, a relationship that also have been confirmed historically (e.g. Alonso et al. 2018, and Cascajo et al. 2018).

Thus, economic downturns and crises affect the demand and supply of public transportation, but the directions of the estimated relationships are ambiguous, with varying results across studies and countries. On the one hand, two reasons for public transport use to fall during an economic crisis is (1) decrease in work-related travel since people lose their jobs and (2) decrease in personal travel since the demand for leisure and entertainment activities decline when the economic conditions are less prosperous (e.g., Pellot 2009). On the other hand, when incomes fall, public transport use may increase since it is the cheaper alternative compared to car use (Pourbaix 2009). Alonso et al. (2018), analyzing six Spanish cities, find that the number of trips with public transport increases with economic growth and decreases with economics decline. In contrast, Cordera et al. (2015) find evidence of an increase in the demand for public transport (in particular bus travel) when the unemployment rate increase. They also find (weak) evidence of an increase in the demand for public transport when income decreases, implying that public transportation is an inferior good. Holmgren (2007) finds similar results of negative income elasticity on public transportation in a meta-analysis of public transport demand. However, the author shows that this relationship is highly sensitive to model specification. Pucher (2002) found that public transit in the United States, in particularly New York city, increased drastically with the economic boom in 1995–2000.

Crisis as driver for policy change

Disruptions to public transport caused by a crisis can be a driver for policy change. It can be viewed as a window-of-opportunity (see e.g., Morfoulaki, Myrovali, & Kotoula 2015 and Lyons & Davidson 2016). D'Acierno et al. (2014) find that there are two main approaches to replan public transport services during or following a crisis with less financial resources: Change the Least Possible (CLP) and Change the Framework (CFR).

CLP aims to change current services to a minor degree and seek to comply with budget constraints but keeping network framework or routes. Possible measures are reducing line frequency where nocturnal and off-peak runs can be cut, cutting runs with lower utility;

ensuring current frequencies only where demand is higher and reduce frequencies where demand is lower to match demand more closely with supply; and removing services in low-demand-areas and changing them with Dial-A-Ride system.

With regards to CFR the aim is to change the current network significantly. In contrast to CLP the system is barely in beforehand satisfactory and D'Acierno suggest, when the resources are scarce, to maximize the level of service where and when the demand is higher and measures include e.g. provision of feeder lines towards main lines and (if present) rail/metro lines; and provision of Dial-A-Ride systems in low-demand areas, as a minimum in off-peak.

Problems in relation to budget restrictions may not only result in reductions in frequency and removing of services, but it may also result in solutions with long-term benefits. Pucher and Kim (2015) argues that a financial crisis also may come with opportunities that result in long term improvements. They find that the emerging financial crisis in Seoul in the beginning of 21st century was the driving force behind reforms within public transport. Budget constraints made transport planners and public officials find new ways to be cost-effective, provide best possible service to the most passengers at the lowest possible fares and subsidies from government. One solution was to prioritize Bus rapid transit (BRT) at the expense of expansion of the metro and/or new Light rail transit (LRT) to comply with above mentioned arguments and that the investments in BRT only cost a fraction of the budget of a new metro construction. Also, Cascajo et al. (2018) emphasize that public transport agencies, in times of financial uncertainty, may try to strengthen alternative revenue streams as a complement to ticket revenues.

Hirschhorn et al. (2020) also examine how public transport policy change is influenced by the existing governance environment. Whilst examining factors influencing the overall attractiveness of public transport in Oslo and Amsterdam in recent decades, they note that in the Dutch case, the approach to public transport service supply taken in response to the 2008-2010 financial crisis was decisive to put Amsterdam in a positive path. Rather than resorting to cost scrapping, the alderman for transport from Amsterdam promoted further investment in public transport to make it more attractive and, as such, able to cater for more passengers and generate more revenues. In the context of budget pressures, the network was revised to improve intermodal connection with trains. In addition, the concession in the main city was renegotiated to amplify the operator's freedom in service design so that the company could focus resources on increasing the frequency of high-demand lines.

Research based on the analysis of six metropolitan areas in Spain, indicate that the reduction in public budgets – i.e. lower subsidies – combined with falling demand forced public transport authorities to implement a variety of measures to increase extra-operational revenues or reduce operating costs (Cascajo et al. 2018). These included new advertising campaigns, renting of public spaces for commercial activities in metro and bus stations, and cross-subsidies between parking and public transport. However, most decisions aimed at reducing public transport supply (closing some low demand routes, reducing service frequencies, and operating hours) to decrease operating costs. Fare prices were also raised in some of the studied areas.

2.2. Understanding institutional change

As pointed out in the introduction, public transport funding models can be regarded as institutions. Institutions are "…formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity or political economy" (Hall & Taylor 1996). Institutions are critical to our understanding of modern societies as they provide stability over time in ways that prescribe, proscribe and permit individual's behavior. Thus, they place bounds on rationality of actors (Peters 2005).

An underlying question in this report is if funding models might change due to the Covid-19 pandemic. To better understand possible institutional pathways, we seek inspiration from the general literature on institutional change. It should be emphasized that institutions often change for other reasons than a crisis (see e.g. Koning 2016 and Kingston & Caballero 2009). However, here we take a narrower perspective focusing on unforeseen and exogenous events.

According to research in historical institutionalism institutional change happens when a crisis punctuates an existing equilibrium (Peters 2005). New institutions that emerge during or after a crisis, eventually forms a new equilibrium. Thus, according to this perspective, the roots of institutions can often be traced to a crisis or a period of turbulence – sometimes referred to as a critical juncture. This is important, since the institutional change made during or in close vicinity of a crises may stay around for a long time, structuring actors' behavior also after the immediate crisis is long gone. Thus, a period of punctuated equilibrium is followed by a period of path-dependency. The pandemic might be such a critical juncture that reshape the funding framework of public transport.

A different and more recent strand of institutional research emphasize that exogenous shocks, such as the pandemic, not necessarily replace existing institutions, but rather transform the way in which they function. Institutions change when ideas about them change, and this might happen due to an unpredicted crisis or period of turbulence. "When existing institutions fail, actors need ideas to reduce uncertainty about possible courses of future action, because before agents can institutionally respond to a crisis, they must have some idea about what the crisis is and what caused it" (Koning 2016). Organizational solutions can be seen as rationalized "myths" about how an organization should act and be designed (Christensen et al. 2004). A related concept is that of "isomorphism", emphasizing the diffusion of ideas and how actors copy solutions from elsewhere.

Yet another type of explanations of institutional change in times of crisis draws on more rational explanations. According to this literature, institutions change as an effect of one or several of the following reasons: 1) changed cost-benefit equation, 2) changed power distributions, or 3) changed preferences among people in powerful positions (Koning 2016). A crisis, such as the pandemic, might impact on all these set of factors, but perhaps most clearly the first one related to costs and benefits.

We will return to the different perspectives on institutional change in chapter six, when discussing possible implications of Covid-19 on the Swedish funding model.

3. A widened funding gap

This chapter describes how costs and revenues for public transport agencies developed in the three regions during the pandemic, with focus on 2020. It is complemented with comments on the development also in the spring 2021.

3.1. Stockholm

The monthly number of public transportation passenger journeys (by bus, underground, commuter train, tram, and ferry) in Stockholm Region decreased considerably in 2020 compared to 2019, amounting to a monthly average of -42 percent for the period of March to December (Figure 3.1.1). The largest relative drops in passenger journeys seem to coincide with peaks/increases in the number of confirmed Covid-19 cases in the region. Note, however, that the data on passenger journeys only include paid passenger journeys. The proportion who travels without a valid ticket in public transport is likely to have increased during the Corona pandemic as Stockholm Lokaltrafik (SL) temporarily stopped the ticket control (see Section 4.1). The number of passengers who traveled by public transport in Stockholm Region in 2020 is therefore probably higher than what Figure 3.1.1 suggests. How many people who travel with public transport without a valid ticket is impossible to measure but is estimated to have doubled in 2020 compared to 2019 according to Region Stockholms transport administration (Johansson 2020). For buses, there may be as many as eight out of ten who travel without a valid ticket, according to estimates based on staff reports and inspections (ibid.).

Figure 3.1.1 Stockholm Region: average number of passenger journeys per weekday and number of Covid-19 cases per month

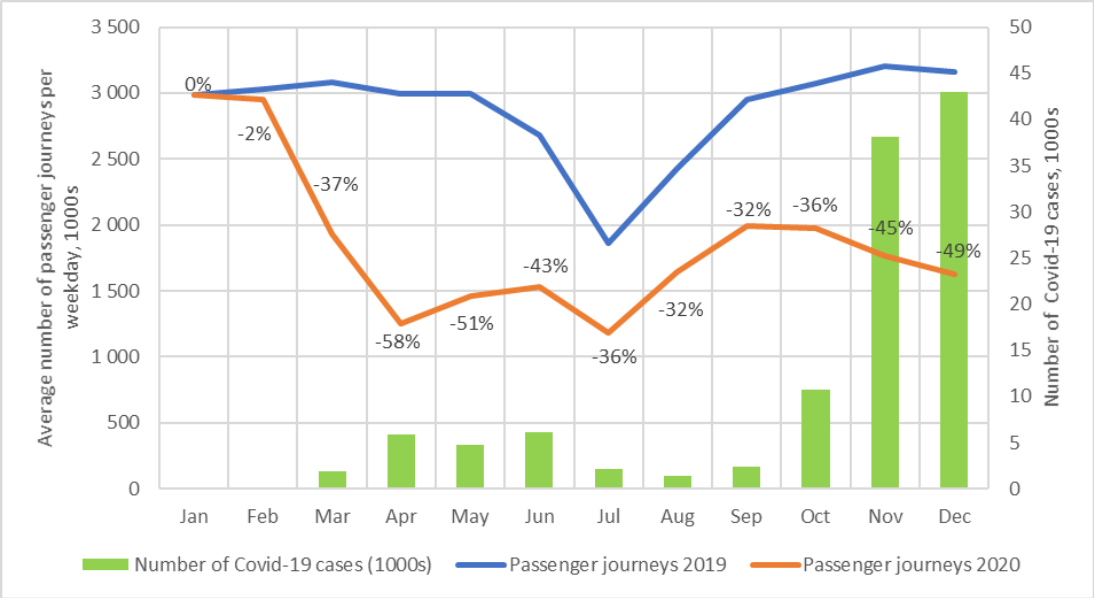

Figure 3.1.1 presents the monthly average number of (paid) passenger journeys per weekday, including the percentage change between 2019 and 2020, and the number of confirmed Covid-19 cases per month in Stockholm Region during 2020. Passenger journeys includes travel by bus, underground, commuter train, tram, and ferry. The number of confirmed Covid-19 cases is based on laboratory-confirmed cases reported in accordance with the Swedish Communicable Diseases Act and is reported in accordance with the reporting date, including positive samples taken within the sentinel sampling. Data source: SLL (Region Stockholm) and Public Health Agency of Sweden.

The large drop in passenger journeys in March–April coincides with a drop in ticket revenue (Figure 3.1.2).[1] Even though the relative decrease in passenger journeys in 2020 recovered somewhat after April, the drop in the ticket revenue seems to have remained around the same level for the rest of the year. In total, this resulted in a 39-percentage decrease in Stockholm Region's (SLL) ticket revenue compared to 2019. Operating appropriations and other subsidies/grants and other revenue would have been quite similar in 2019 and 2020 if it was not for two big events: the sale of Hornsberg's bus depot, amounting to MSEK 682 (MSEK 686 in 2020 nominal value), in July and an extra government grant of MSEK 1,325 (MSEK 1,332 in 2020 nominal value), to compensate for lost revenue due to the Corona pandemic, in October. Total yearly revenue decreased by 6 percent between 2019 and 2020. However, excluding the sale of Hornsberg's bus depot and the government grant, total revenue would have decreased by about 15 percent.

[1] Note that all revenues and costs used and presented in the descriptive statistics have been adjusted to 2019 price level, using the monthly consumer price index (1980=100) available at Statistics Sweden: https://www.scb.se/hitta-statistik/statistik-efter-amne/priser-och-konsumtion/konsumentprisindex/konsumentprisindex-kpi/pong/tabell-och-diagram/konsumentprisindex-kpi/kpi-faststallda-tal-1980100/

Figure 3.1.2 Stockholm Region: revenues 2020 (2019)

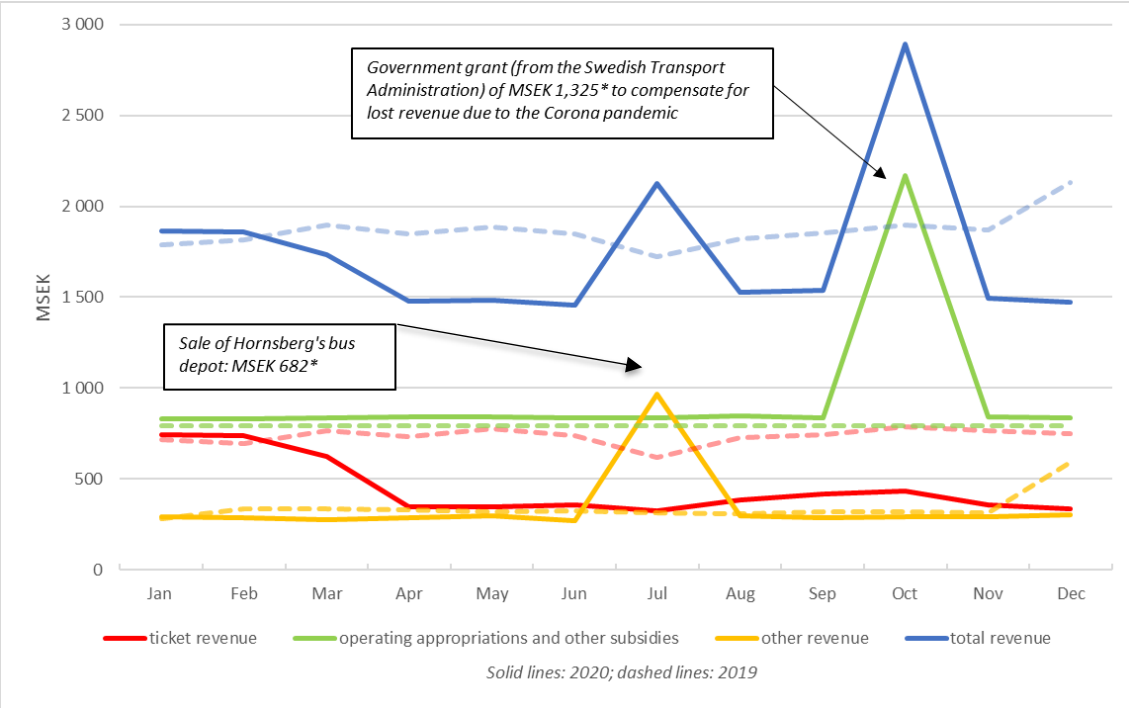

Figure 3.1.2 presents monthly ticket revenue (all types), operating appropriations and other subsidies and grants, other revenue and total revenue for Stockholm Region (Trafikförvaltningen, AB SL, SL Finans, SL Älvsjö and Waxholmsbolaget) in 2020 and 2019. All revenues (including grants*) are measured in 2019 price level. Data source: Region Stockholm.

Taken the loss in ticket revenue together with that the costs did not significantly change between 2019 and 2020 (Figure 3.1.3), the yearly net profit (including financing and depreciation costs) decreased from 569 MSEK in 2019 to a net loss of -1,087 MSEK in 2020.

Figure 3.1.3 Stockholm Region: costs 2020 (2019)

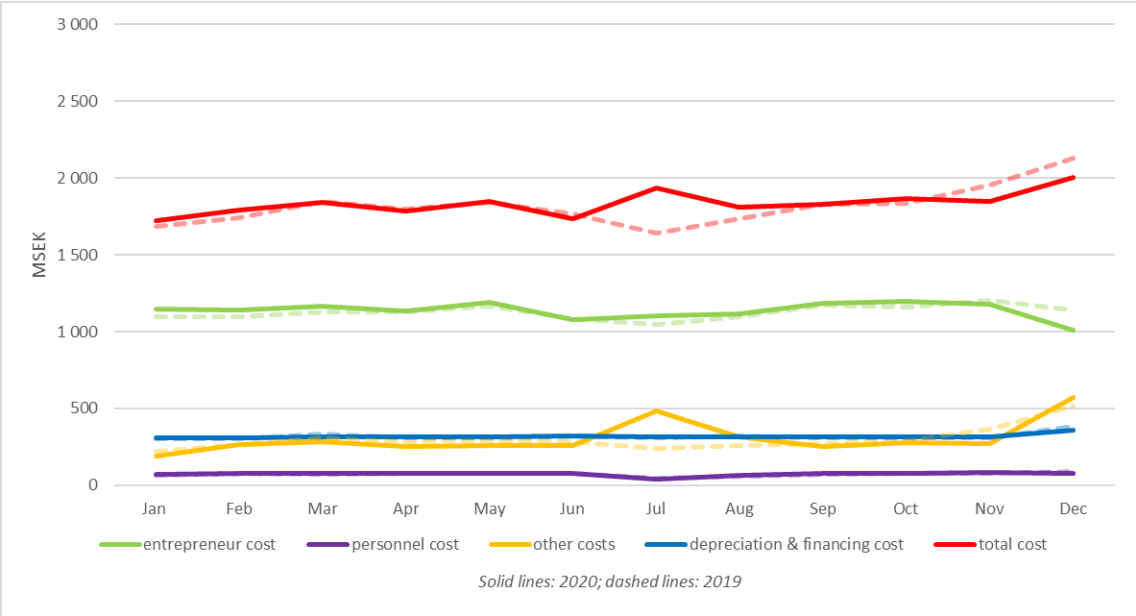

Figure 3.1.3 presents monthly entrepreneur cost, personnel cost, other costs, depreciation and financing cost, and total cost for Stockholm Region (Trafikförvaltningen, AB SL, SL Finans, SL Älvsjö and Waxholmsbolaget) in 2020 and 2019. All costs are measured in 2019 price level. Data source: Region Stockholm.

Figure 3.1.4 Stockholm Region: net profit 2020 (2019)

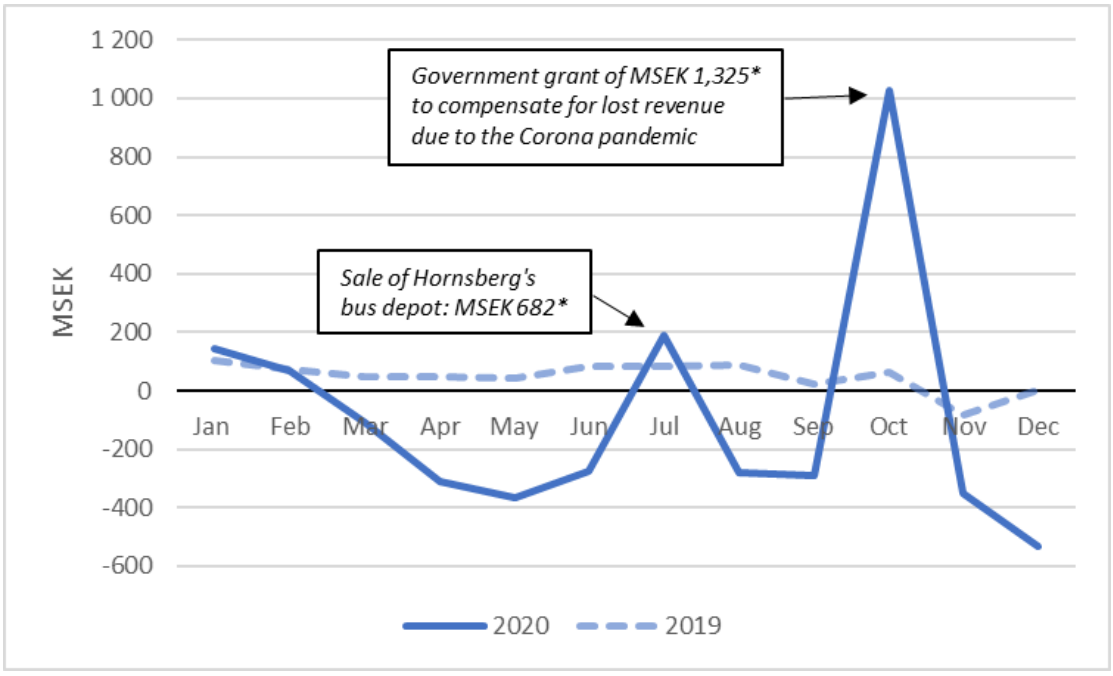

Figure 3.1.4 presents monthly net profit (including depreciation and financial costs) for Stockholm Region (Trafikförvaltningen, AB SL, SL Finans, SL Älvsjö and Waxholmsbolaget) in 2020 and 2019. All revenues and costs (including grants*) are measured in 2019 price level. Data source: Region Stockholm.

3.2. Västra Götaland

As can be seen in Figure 3.2.1, both the drop in the number of passenger journeys and the number of Covid-19 cases in Västra Götaland follow a similar pattern as the respective relationships in Stockholm region (Figure 3.1.1). The average monthly drop in passenger journeys was -37 percent for the period March to December 2020 compared to the same period in 2019.

Figure 3.2.1 Västra Götaland Region: number of passenger journeys

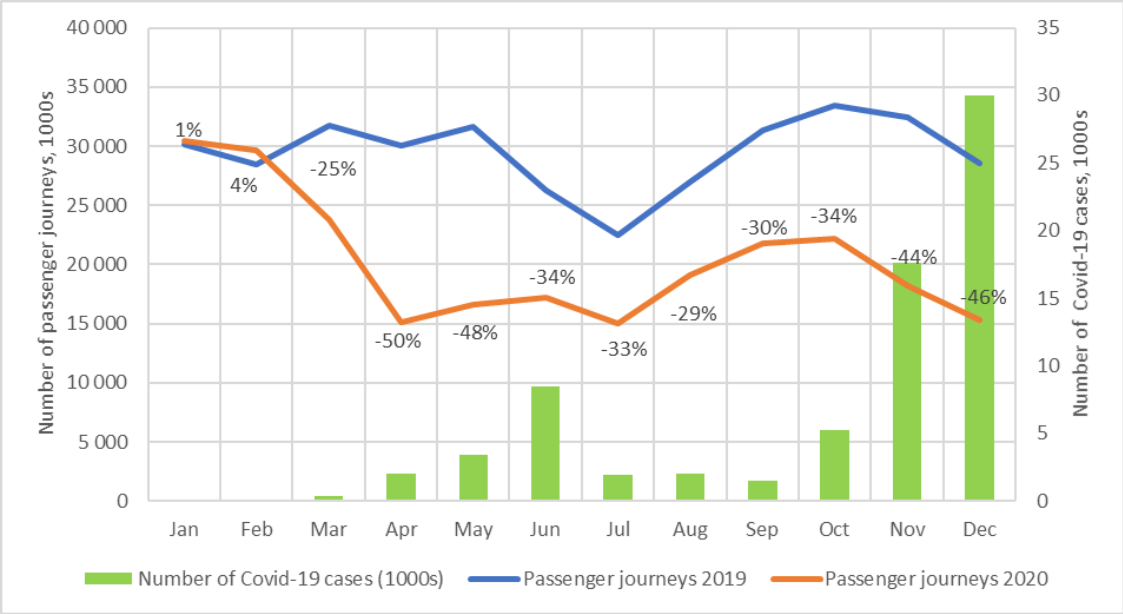

Figure 3.2.1 presents the monthly total number of (paid) passenger journeys, including the percentage change between 2019 and 2020, and the number of confirmed Covid-19 cases per month in Västra Götaland Region during 2020. Passenger journeys includes travel by bus, train, tram, and ferry. The number of confirmed Covid-19 cases is based on laboratory-confirmed cases reported in accordance with the Swedish Communicable Diseases Act and is reported in accordance with the reporting date, including positive samples taken within the sentinel sampling. Data source: Västtrafik and Public Health Agency of Sweden.

Ticket revenue in Västra Götaland decreased by 31 percent in 2020 relative to 2019. For the period of January to November, operating appropriations and other subsidies and grants as well as other revenue where basically unchanged between 2019 and 2020 (Figure 3.2.2). However, due to the loss in ticket revenue, total revenue decreased by 9 percent during that period. To compensate for lost revenues due to the Covid-19 pandemic, Västra Götaland (Västtrafik) received an extra government grant of about 721 MSEK (MSEK 725 in 2020 nominal value).[2] Therefore, the yearly total revenue did not decrease more than 2 percent between 2019 and 2020.

[2] Of the government grant, 406 MSEK were an earmarked state contribution to public transport, while 300 MSEK came from general grants that regional decision-makers decided to allocate to public transport. A small part of the total earmarked grant was transferred to Region Halland (information from e-mail correspondence with Björn Jägesten, Västra Götalandsregionen and Sara Frank, Västtrafik, August 2021).

Figure 3.2.2 Västra Götaland Region: revenues 2020 (2019)

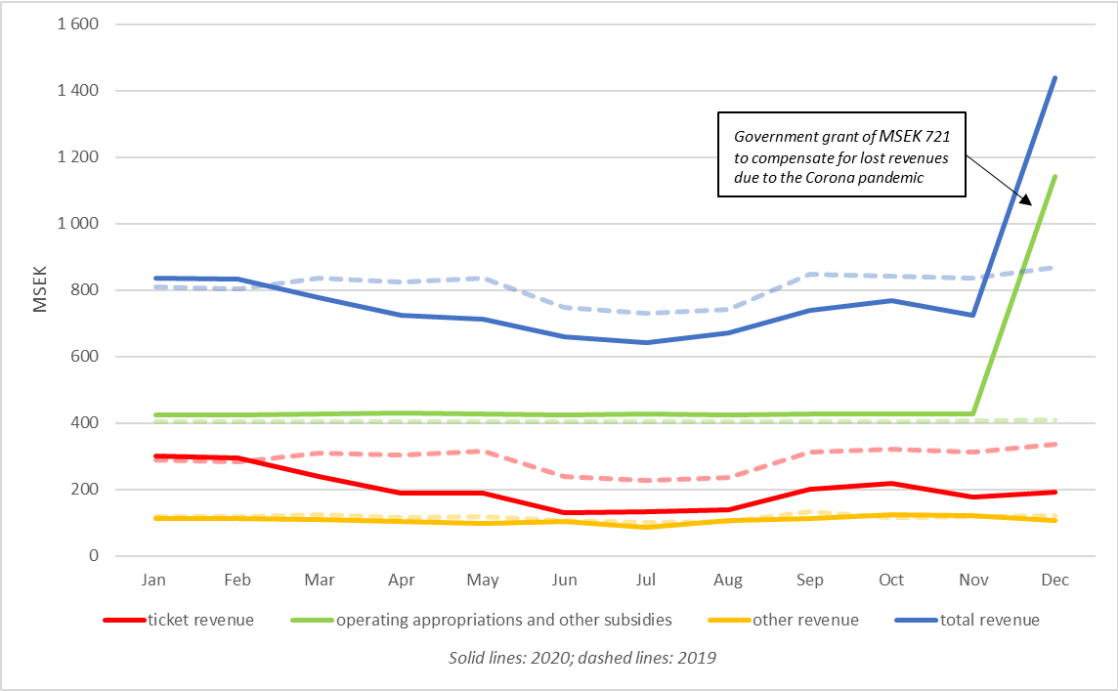

Figure 3.2.2 presents monthly ticket revenue (all types), operating appropriations and other subsidies and grants, other revenue and total revenue for Västra Götaland Region (Västtrafik) in 2020 and 2019. All revenues (including grant*) are measured in 2019 price level. Data source: Västtrafik (2020a).

Due to the decrease in ticket revenues and basically unchanged costs (Figure 3.2.3), Västra Götaland had monthly net losses over the entire period of March to November in 2020 (Figure 3.2.4). The extra government grant in December mitigated the negative effects on the yearly net profit, which finally amounted to a negative loss of MSEK -21 for 2020. The net profit in 2019 was MSEK 107.

Figure 3.2.3 Västra Götaland Region: costs 2020 (2019)[3]

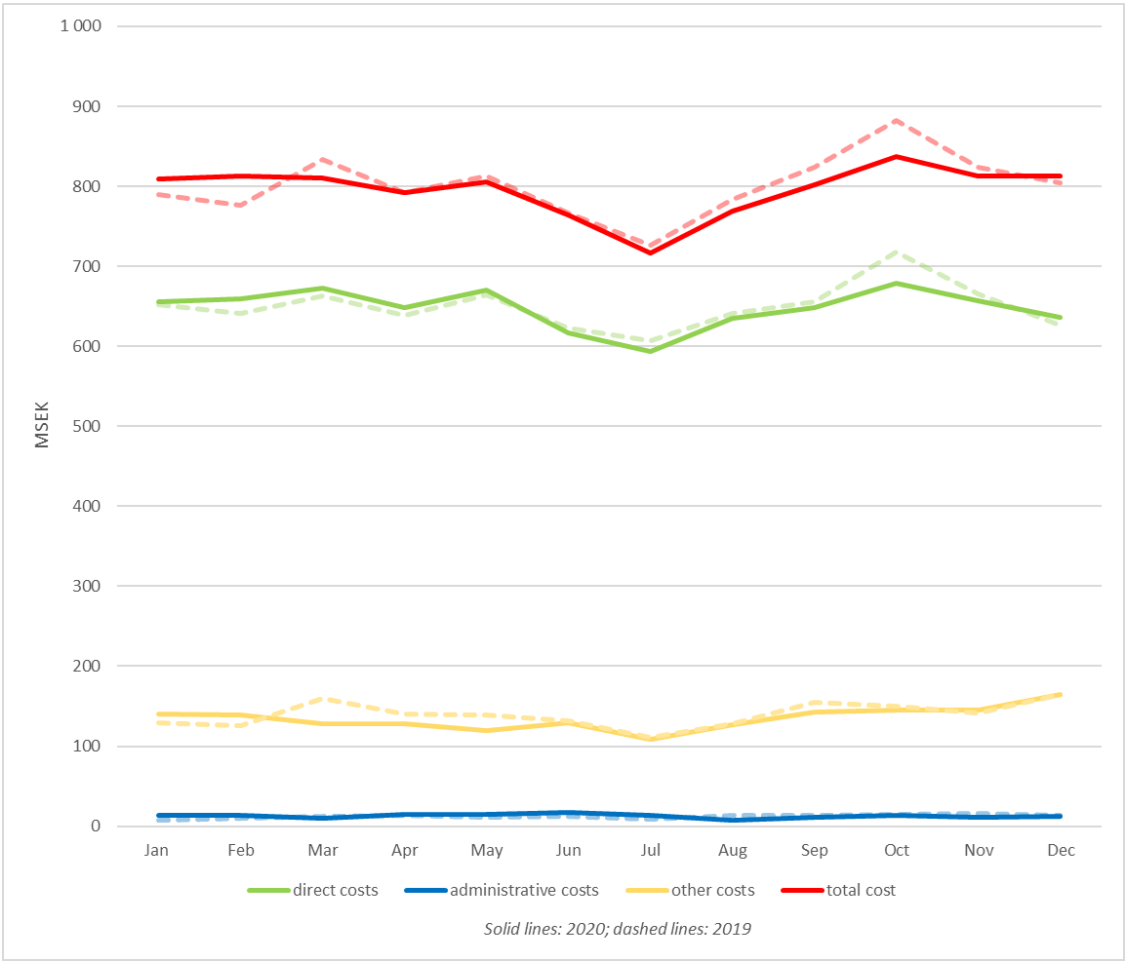

Figure 3.2.3 presents monthly direct costs, administrative costs, other costs, and total cost for Västra Götaland Region (Västtrafik) in 2020 and 2019. All costs are measured in 2019 price level. Data source: Västtrafik.

[3] The data on costs for Västra Götaland Region (Västtrafik) is divided and presented in different categories than the costs for Stockholm Region (Region Stockholm) and Skåne Region (Skånetrafiken).

Figure 3.2.4 Västra Götaland Region: net profit 2020 (2019)

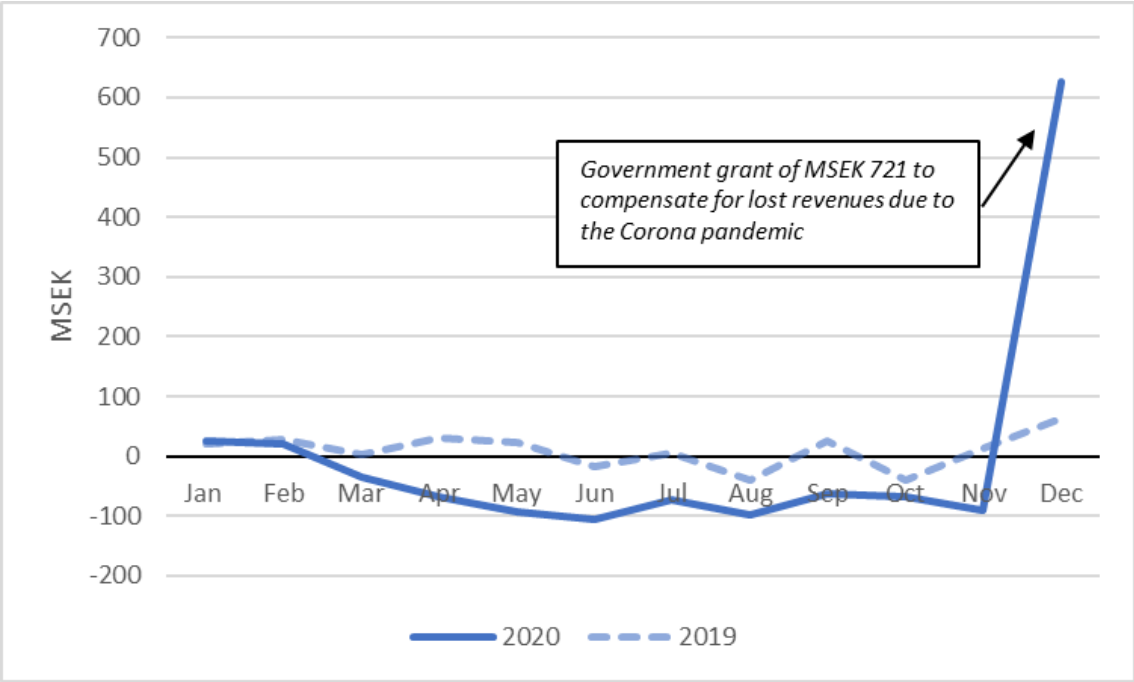

Figure 3.2.4 presents monthly net profit (including depreciation and financial costs) for Västra Götaland Region (Västtrafik) in 2020 and 2019. All revenues (including grant*) and costs are measured in 2019 price level. Data source: Västtrafik.

3.3. Skåne

The number of Covid-19 cases was relatively low up until October 2020 in Skåne compared to Stockholm and Västra Götaland (see Figure 3.1.1 and Figure 3.2.1). Still passenger journeys dropped drastically in March–April and remained at low levels for the rest of 2020 (Figure 3.3.1). The largest drops in monthly passenger journeys seem to coincide with national, rather than regional, peaks/increases in number of Covid-19 cases. The average monthly drop in passenger journeys during the period of March to December was -45 percent in Skåne region. Again, the data on passenger journeys only include paid passenger journeys. The proportion who travels without a valid ticket in public transport have also increased in Skåne region during the Corona pandemic (Ankarvik 2020; see also Section 4.3). Hence the number of passengers who traveled by public transport in Skåne region in 2020 could be higher than what Figure 3.3.1 suggests.

Figure 3.3.1 Skåne Region: number of passenger journeys (bus and train)

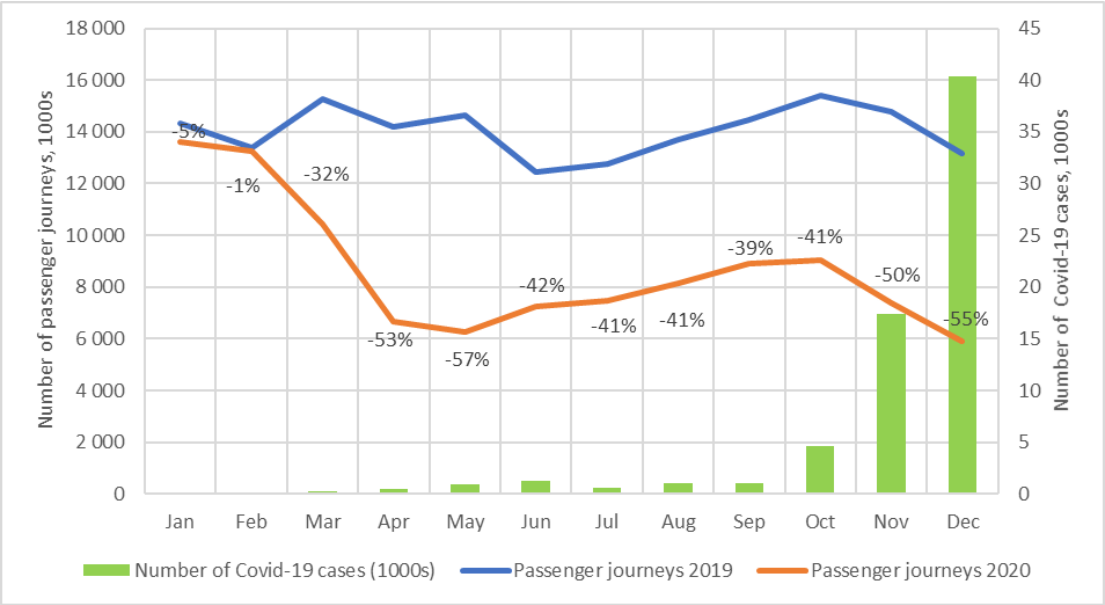

Figure 3.3.1 presents the monthly total number of (paid) passenger journeys, including the percentage change between 2019 and 2020, and the number of confirmed Covid-19 cases per month in Skåne Region during 2020. Passenger journeys includes travel by bus and train. The number of confirmed Covid-19 cases is based on laboratory-confirmed cases reported in accordance with the Swedish Communicable Diseases Act and is reported in accordance with the reporting date, including positive samples taken within the sentinel sampling. Data source: Skånetrafiken and Public Health Agency of Sweden.

As for Stockholm and Västra Götaland, ticket revenue decreased in March–April and remained at this lower level for the rest of 2020 (Figure 3.3.2). For the period of January to November, the decrease in ticket revenue resulted in a 16-percentage decrease in total revenue. However, due to extra grants of in total MSEK 728 (MSEK 731 in 2020 nominal value), the overall total revenue for 2020 only decreased by about 5 percent.

Figure 3.3.2 Skåne Region: revenues 2020 (2019)

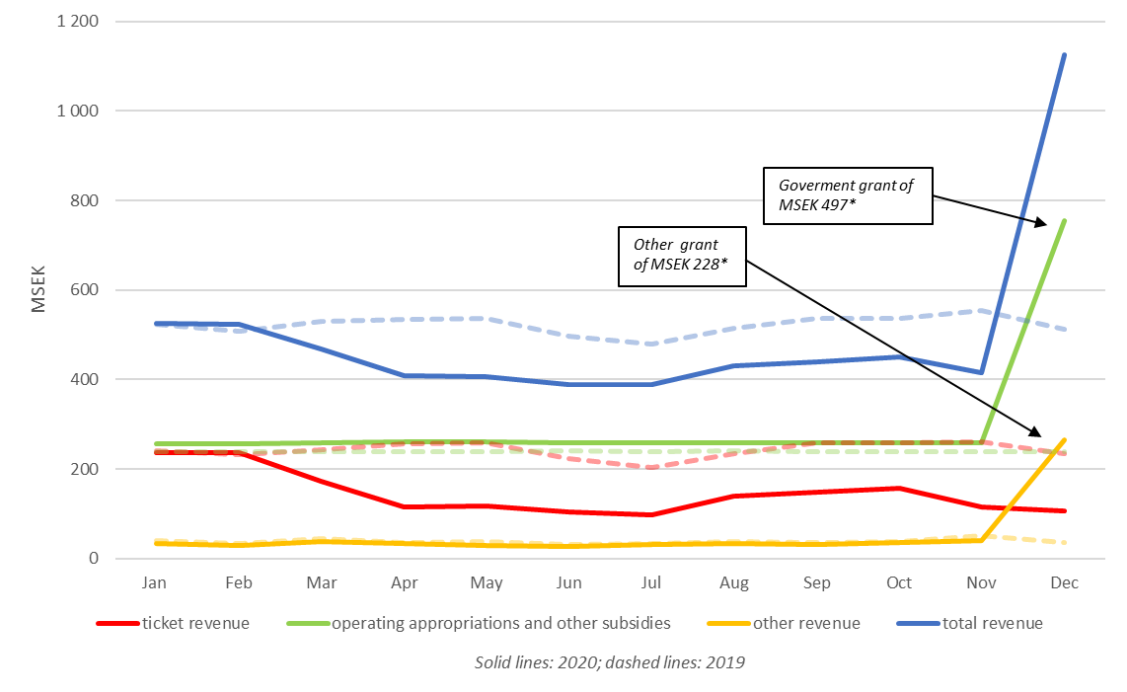

Figure 3.3.2 presents monthly ticket revenue (all types), operating appropriations and other subsidies and grants, other revenue, and total revenue for Skåne Region (Skånetrafiken) in 2020 and 2019. All revenues (including grants*) are measured in 2019 price level. *Skånetrafiken also received smaller extra government grants earlier in 2020, amounting to about MSEK 3 in 2019 price level. Data source: Skånetrafiken.

The costs were basically unchanged between 2019 and 2020 for Skåne region (Figure 3.3.3). Taken together with the drop in ticket revenue this resulted in monthly net losses for the period March to November 2020 (Figure 3.3.4). Due to the extra grants, however, the yearly net profit ended up at MSEK -89 rather than MSEK -817. In 2019 the yearly net profit was MSEK 110.

Figure 3.3.3 Skåne Region: Costs 2020 (2019)

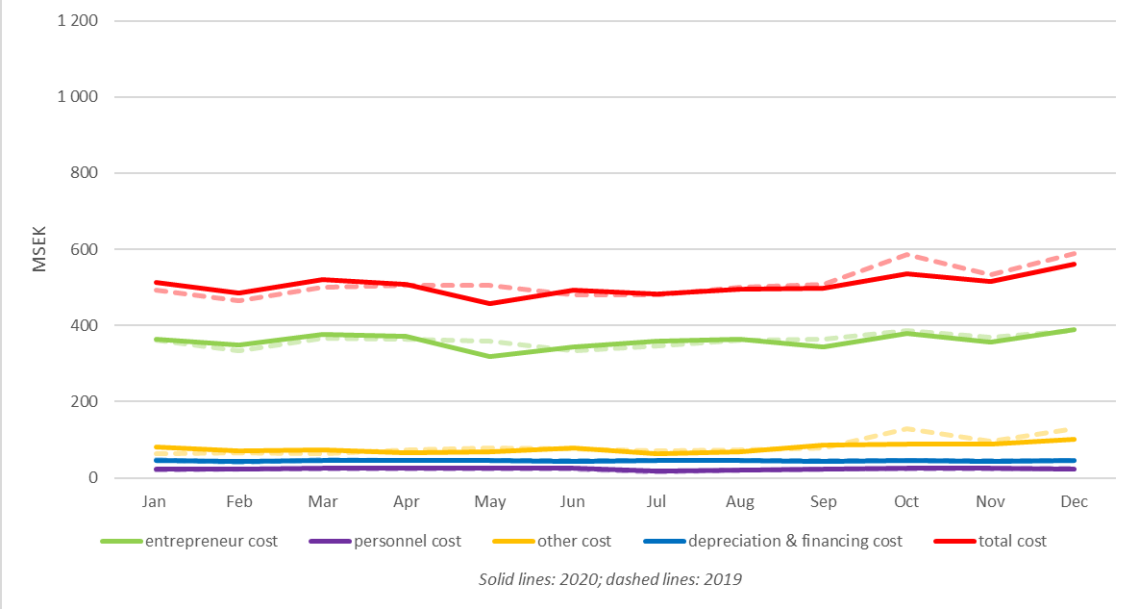

Figure 3.3.3 presents monthly entrepreneur cost, personnel cost, other costs, depreciation and financing cost, and total cost for Skåne Region (Skånetrafiken) in 2020 and 2019. All costs are measured in 2019 price level. Data source: Skånetrafiken.

Figure 3.3.4 Skåne Region: net profit 2020 (2019)

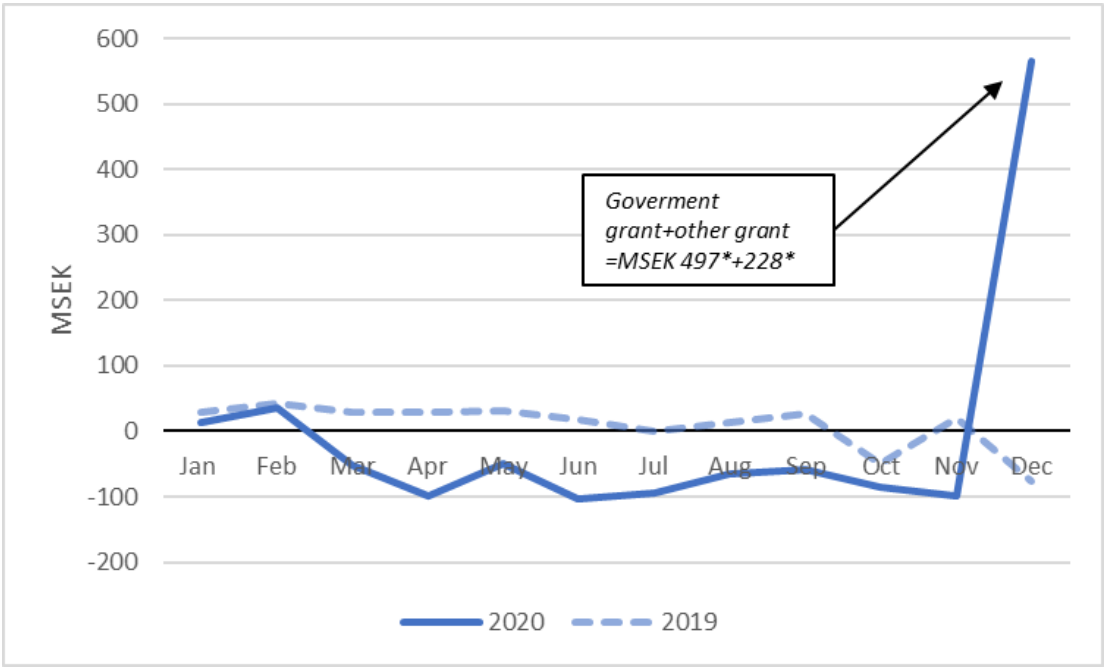

Figure 3.3.4 presents monthly net profit (including depreciation and financial costs) for Skåne Region (Skånetrafiken) in 2020 and 2019. All revenues (including grants*) and costs are measured in 2019 price level. *Skånetrafiken also received smaller extra government grants earlier in 2020, amounting to about MSEK 3 in 2019 price level. Data source: Skånetrafiken.

3.4. Regional similarities and differences

Since the first reported Covid-19 case in Sweden (February 4th, 2020), the spread of the virus has drastically increased – particularly at the end of 2020 (and the beginning of 2021). The regional total number of confirmed Covid-19 cases was largest in Stockholm for most of 2020, which is not very surprising considering that Stockholm also is the largest metropolitan region in Sweden. The number of confirmed Covid-19 cases per 100,000 inhabitants have in fact been quite similar in Stockholm Region and Västra Götaland Region. For Skåne Region, the number of confirmed Covid-19 cases were relatively low for most of 2020. However, this significantly changed at the end of the year: the number of Covid-19 cases per 100,000 inhabitants increased to almost twice the corresponding numbers for Västra Götaland and Stockholm in December 2020.[4]

Even though some dissimilarities in the spread of the virus as well as regional responses to the pandemic, the resulting effects on passenger journeys, revenues and costs are similar across the three regions of Stockholm, Skåne, and Västra Götaland (Table 1). The number of passenger journeys and ticket revenue decreased by around 30–40 percent whereas total cost where close to unchanged between 2019 and 2020 for all three regions. The extra government grant to compensate for lost revenue due to the Corona pandemic where lower for Stockholm Region relative to the size of the decrease in ticket revenue. Hence, Stockholm experienced the largest relative drop in net profit between 2019 and 2020.

Table 1

Region	**Stockholm**		**SkåneVästra**		**Götaland**	
Year	***2019***	***2020***	***2019***	***2020***	***2019***	***2020***
Percentage change in passenger journeys compared to 2019		-35%		-38%		-31%
Ticket revenue *(%-change 2019–2020)*	8 811	5 405 *(-39%)*	2 905	1 742 *(-40%)*	3 481	2 398 *(-31%)*
Total revenue *(%-change 2019–2020)*	22 380	20 936 *(-6%)*	6 255	5 974 *(-4%)*	9 721	9 524 *(-2%)*
Total cost *(%-change 2019–2020)*	21 811	22 023 *(1%)*	6 145	6 063 *(-1%)*	9 614	9 545 *(-1%)*
Net profit *(%-change 2019–2020)*	569	-1 087 *(-291%)*	110	-89 *(-181%)*	107	-21 *(-120%)*

Notes: Table 1 presents the yearly percentage change in passenger journeys and yearly ticket revenue, total revenue, total cost, net profit, and net profit excluding extraordinary government grants (e.g., to compensate for lost revenues due to the Corona pandemic), for Stockholm Region, Skåne Region, and Västra Götaland Region. All revenues, costs, and profits are measured in MSEK in 2019 price level. Note that all values in Table 1 are based on calculations for the entire year, January–December, of 2020.

*This net profit also excludes the sale of Hornsberg's bus depot for Stockholm Region.

As the Corona pandemic continued into 2021 and is still ongoing as this report is being written (August 2021), the negative effects on public transportation have persisted as well. The number of travelers using public transport has continued being much lower than what it was before the pandemic in all three regions considered in this study, implying

[4] Source: own calculations based on publicly available data from Public Health Agency (2021) and Statistics Sweden (2021).

that ticket revenues are still far below what it was in 2019 as well. For instance, the number of passenger journeys by public transport in Skåne region was around 5 500–7 000 thousand during the period January to April in 2021. These low numbers correspond to the lowest level of monthly passenger journeys measured for 2020. Moreover, the number of passenger journeys in 2021 is about half or less than the corresponding number of passenger journeys during the same period in 2019 (Region Skåne 2021a). As of March 2021, total ticket revenue was MSEK 313, which was about 44 percent lower than the budget, 52 percent lower than 2020, and 56 percent lower than 2019. The budget for 2021 did not consider a 'second wave' of Corona. Other revenues and costs, mainly entrepreneur costs, were also lower than budget for this period. Even though the decrease in costs, the prognosis for the total yearly profit of 2021 is MSEK 765 lower than budget (Region Skåne 2021b).

The prognosis for Västra Götaland region is that public transport passenger journeys will continue to be lower than before the pandemic, with recovery starting during the period 2022–2024. Due to new traveling habits and digitalization, the estimated new level of public transport passenger journeys is around 10–20 percent lower compared to before the pandemic. To be able to continue to offer a high-quality public transportation, Västra Götaland region will most likely need higher operating appropriations than previously estimated: including already planned investments, the operating appropriations for 2022–2024 needs to be increased by about MSEK 595 (around 3.5 percent) per year (Västtrafik 2020).

For the period January to April 2021, public transportation in Stockholm region experienced a loss of MSEK -973, which corresponds to MSEK 864 lower than the budget (Region Stockholm 2021). The main reason for this is decreased ticket revenues. The negative effect on the public transport passenger journeys, and thereby ticket revenue, in Stockholm region is expected to persist for at least 2021–2023. To be able to maintain high quality public transportation, including avoiding crowding, the Traffic Administration in Stockholm region will need an increase in operating appropriations of MSEK 333 (3.4 percent) compared to 2020. This, along with cost control and prioritizations is also expected to support ticket revenues in the long-term (Region Stockholm 2020).

4. Regional responses to the funding challenge

The previous chapter clearly showed how ticket revenues plunged during the pandemic, while costs remained unchanged. In this chapter we direct our attention to the deliberations and decisions within the regional public transport agencies as they struggled to respond to the situation. We focus on four themes that have been particularly important from a funding point of view: 1) cost reductions, 2) contractual relations 3) fare evasion, and 4) tickets, additional revenues, and other measures.

4.1. Stockholm

Region Stockholm is the public transport authority for the Stockholm metropolitan area which includes 26 municipalities with a total population of more than 2,3 million. Region Stockholm plan, develop, commission and market public transport. Transport services are run under the trademark SL (Stockholms lokaltrafik) by both private and public companies. Supreme decision-making body is the Regional Assembly (Regionfullmäktige). The Assembly appoint a Regional Executive Board (Regionstyrelsen) as well as committees responsible for different areas of activity, such as the Traffic Committee (Trafiknämnden). The committee is supported by the Public Transport Administration (Trafikförvaltningen) that consists of approximately 850 civil servants.

The Transport Administration went into a mode of increased alert in early February 2020 due to the Corona pandemic. The initially recommendation from responsible state agencies was to acquire a contingency plan to operate with reduced traffic because of expected high sick leave rates among public transport staff. At first, they followed the recommendations. But after only a few days and with crowding in public transport, they decided to change direction and operate as much traffic as possible to reduce crowding on buses, trains and in the metro (Interview K. Tamsons October 15, 2020). While maintaining aims of low crowding, focus within the Transport Administration gradually shifted to deal with long-term financial challenges caused by the pandemic.

Cost reductions

In June 2020, the Regional Executive Board instructed the committees, including the Traffic Committee, to come up with proposals for increased efficiency in response to the Covid-19 pandemic. An interim report from the committee showed that three areas were in focus. First, recovering ticket revenues. Second, cost reductions in administration, traffic supply, and maintenance. Third, prioritizing planned assignments and activities in the business plans for 2020 and 2021 (Trafiknämnden 2020a). These focus areas were largely repeated in the budget for 2021 (Blågröna koalitionen 2020).

The Traffic Committee has during the period emphasized the importance to focus on immediate measures coping with the pandemic and measures that contributes to regain passenger's confidence in public transport in the longer term (Regionrevisorerna 2020). The priority resulted in downgrading other measures. For example, planned investments of 11.5 billion SEK were proposed to be cancelled. This included inter alia the European rail signaling system ERTMS (Blågröna koalitionen 2020), the installation of platform barriers on a trial basis, as well as an investigation on having an operator develop a station commercially (Trafikförvaltningen 2020e).

Contract relations

Region Stockholm has a long history of incentive-based contracts. In some contracts 100 percent of the renumeration is based on passenger incentives (so called VBP[5] agreements). In others the degree of passenger incentives is lower.

According to the liberal-conservative chairman of the Traffic Committee, they understood quite early that the incentive-based contracts were impossible to maintain when many passengers opted out of public transport due to the pandemic (Interview K. Tamsons, October 15, 2020). There was therefore an obvious need to sign supplementary interim agreements that regulated operational and remuneration issues with the private operators during the pandemic. Such agreements were introduced between the Transport Administration and private operators in April 2020 (Regionrevisorerna 2020). All operators accepted the supplementary agreements after individual adjustments, which entailed a negotiation procedure between the parties concerned (Trafikförvaltningen 2020a).

The decision to use supplementary contracts as a measure meant a return to a more traditional contractual model with fixed renumeration based on traffic supply (Trafikförvaltningen 2020a) and that the administration was given full responsibility for planning and ordering the traffic (Regionrevisorerna 2020; Trafikförvaltningen 2020a). The contracts were initially valid for six months with the possibility of a 6-month extension, which was utilized (Trafikförvaltningen 2020a). The interim contracts were extended for another six months April 1, 2021, with the possibility to prolong them until March 31, 2022 (Trafikförvaltningen 2021).

In addition to existing contracts, future procurements have also been affected due to the pandemic. For example, the deadlines for tenders have been extended and some planned procurements have been postponed (Regionrevisorerna 2020). The Transport Administration have also proposed that new procurements should be designed with a renumeration model largely focused on production as this is considered to be less sensitive to future variations in travel demand. However, they also declared that a return to a remuneration model with incentives is desirable when feasible (Traffic Administration 2020b).

[5] Verified paying boardings.

Fare evasion

To reduce spread of the virus and to protect bus drivers, boarding through front doors of buses was stopped in mid-March 2020 (Trafiknämnden 2020b). A consequence was that passengers no longer could validate their tickets since SL-buses in Stockholm only have validation machines at the front doors. In addition, ticket inspections were temporarily stopped in April and inspectors were instead instructed to inform travelers about keeping distance, denounce obvious fare dodging and report crowding in the buses (Trafikförvaltningen 2020c).

Thus, boarding through rear doors has, according to the administration, contributed to a perception among many passengers that a valid ticket is no longer needed. An official statement states that almost 3,500 penalty fees were issued in August 2020, which is to be compared with just over 2,500 during the corresponding period in 2019. This even though the proportion of inspections in 2019 was just over 400,000 compared to just over 80,000 in 2020 (Trafikförvaltningen 2020d). Thus, fare dodging became a prioritized issue and measures to counteract 'pandemic dodging' were highlighted in the budget for 2021 (Blågröna koalitionen 2020).

The problems with increased fare evasion have caused some political controversies. The Left Party stated that more should have been done, also prior to the pandemic, to enable boarding through all doors of the buses with associated validation options (Trafiknämnden 2020). Also, the Social Democratic Party meant that the administration should have invested in validation machines in rear entrances a long time ago (Interview J. Sjöström, September 25, 2020).

Tickets, additional revenues, and measures

In addition to cost reductions and measures against fare evasion, ideas about additional revenue streams have been discussed. The Traffic Committee decided on a development strategy for supplementary services and additional revenues from renting premises as well as introducing more advertising in public transport environments (Trafikförvaltningen 2020e). Moreover, in order to reduce crowding, but also to manage costs in the longer run, a dialogue was initiated with municipalities regarding flexible school starts and distance education (Regionrevisorerna 2020).

However, more important in the short run was funding from the national government, as was shown in the previous chapter. Work began at an early stage, through The Swedish Public Transport Association, which is a national association of public transport agencies, to make demands on the national government. However, public transport and its financial challenges were not, according to the chairman of the Traffic Committee in Stockholm, part of the national debate at the time. Nor were there any knowledge within the national agencies responsible for the crisis management about the way public transport works and how it is financed. The issue was first raised on the agenda when the state agencies wanted to limit crowding in public transport as part of combating the spread of the virus. Thus, both the government and the crisis-leading authorities during the pandemic have received 'new' knowledge on how public transport is organized and financed (Interview K. Tamsons, October 15, 2020).

4.2. Västra Götaland

Västra Götaland is a geographical area that consists of 49 municipalities with a total population of approximately 1,6 million. Gothenburg is the largest city. Västra Götaland Region is the public transport authority. As in Stockholm, the organization is made up of a Regional Assembly (Regionfullmäktige), a Regional Executive Board (Regionstyrelsen), and a Public Transport Committee (Kollektivtrafiknämnden). The committee is supported by the Department of public transportation and infrastructure which is a small unit of approximately 15 civil servants working mostly on a strategic level. The concrete tasks to plan, develop, commission and market public transport is instead the responsibility of Västtrafik, which is a public company owned by the Västra Götaland Region. The company has approximately 420 employees. Transport services are carried out under the trademark Västtrafik by private and public operators.

At the beginning of March 2020, Västtrafik, requested status reports from the private operators on how they were affected by the Covid-19 pandemic. The reports indicated virtually no impact on public transport (Västtrafik 2020b) but already a few weeks later the situation became more strained (Västtrafik 2020c). Västtrafik went into a situation with increased alert and worked on plans for reduction in services, but at the same time emphasized the importance of maintaining their key societal function. To maintain this function, the Regional Assembly decided in mid-May to issue a guarantee to all regionally owned companies (incl. Västtrafik) in order to ensure the maintenance of important societal functions (Regionstyrelsen 2020a; Regionfullmäktige 2020a).

Cost reductions

The Västra Götaland Region made it clear at an early stage that Västtrafik should carry out the traffic to a normal extent, despite the pandemic. To complete this assignment, reinforcement and replacement traffic, communication to the customer and strategy for summer traffic became important issues. Specific measures have also been developed to prevent driver shortages (Västtrafik 2020d). The 2nd vice chairman (Social Democrat) of the Public Transport Committee, emphasizes that the Regional Executive Board stated that they must do everything to achieve cost recovery and that there should be no drastic movements in one direction or another, which according to him, meant that the ideological differences between parties disappeared when the committee should not rock the boat (Interview A. Bergström, September 29, 2020).

The strained financial situation for public transport resulted in extra funds in the budget for 2021 corresponding to SEK 227 million in beginning of June (Regionfullmäktige 2020b). Later in June, the Regional Executive Board emphasized that there is a risk that Västtrafik's financial situation will be strained in the coming years. Therefore, decisions were made that Västtrafik should not make any investments that increases current traffic and also develop dimensioning scenarios for 2021 based on reduced travel and produce a basis for possible efficiencies (Regionstyrelsen 2020b).

The need of joint priorities from the owner (Regional Executive Board), buyer (Public Transport committee) and contractor (Västtrafik) about which measures that had to be taken to reduce costs was discussed during presidium deliberations in June 2020 (VGR, 2020a). In the same deliberation, Västtrafik presented two different scenarios based on reduced travel. Possible measures that were highlighted included scaling down traffic

instead of withdrawing individual lines; that the existing rural strategy should not be changed; that areas should not be left completely without traffic; and that all traffic established during 2020 should be considered for potential reductions. In this context, Västtrafik pointed out that there can be strong customer reactions following such measures, and that they come with a high risk for negative reactions from municipalities and complicated contract discussions with partners (VGR 2020b).

Because of decreasing revenues, the Public Transport Committee recommended that Västtrafik's untaxed reserves should be used in 2021. According to the committee, this provided conditions for a gradual adjustment to a lower travel demand avoiding cuts that could risk damaging citizens confidence in public transport (Kollektivtrafiknämnden 2020c).

Contractual relations

Similarly to the situation in Stockholm, contracts in Västra Götaland included renumeration based on passenger incentives. The initial attitude from Västtrafik was that the operators should bear the costs according to original contracts, but this approach was later changed when the pandemic seemed to be long-lasting (Interview A. Bergström, September 29, 2020). At Västtrafik's board meeting at the end of April 2020 it was decided to offer supplementary contracts with contractors, which meant that they were guaranteed compensation corresponding to 80 percent of the budgeted level during March until July/August (Västtrafik 2020d). At the end of August, the Regional Executive Board decided to extend the agreements (Regionstyrelsen 2020c).

Moreover, Västtrafik decided to pay travel incentives for the period March-December 2020 based on 85 percent of the number of journeys in the period March-December 2019. Västtrafik's compensation for completed traffic during the period has exceeded the agreed compensation linked to the travel incentive part with increased costs for Västtrafik by SEK 150–200 million (Vahnberg 2020). According to the chairperson of the Public Transport Committee (Green Party), there will probably be a closer review of the incentive contracts in the future as there already before the outbreak of Covid-19 were some doubts about how much travel they generated (Interview U. Frick, October 2, 2020).

Fare evasion

Like Stockholm, there was information that the proportion of fare dodging increased in the region during the pandemic. Similar to Stockholm, suggested possible reasons for the increases were the closing of the front doors and that the ticket inspectors were assigned other tasks during the pandemic. The problem had been discussed in the Public Transport Committee throughout the term of office and the fare dodging had intensified with Covid-19. The 2nd vice chairperson of the Public Transport Committee emphasized that the Social Democrats found that the ticket controls had to be started even if it had not previously been a priority for the party (Interview A. Bergström, September 29, 2020). Like the process with financial aid package from the national government, the chairperson of the committee (Green Party) emphasized that The Swedish Public Transport Association has played a significant role in raising awareness of the problem and that they worked to enable boarding in the front doors, but also with a long-term change of attitude among those who travel without a ticket (Regionfullmäktige 2020c).

Tickets, additional revenues, and measures

Västtrafik emphasized that priorities and adjustments will be required in the future to regain a balanced economy, but also that the pandemic can mean new opportunities such as increasing the proportion of sustainable journeys and developing a more cost-effective traffic system. More flexible working hours, more people cycling and walking as well as the opportunity to shift start and end time for high school students are examples highlighted (Kollektivtrafiknämnden 2020a).

Changing start times for schools was raised during a meeting in mid-June. In the same month Västtrafik also had dialogue with the region's high schools about dispersed school start (Västtrafik 2020e) and at the beginning of August, the Committee of Education in the City of Gothenburg decided to delay the start time for high school students as much as possible and that decisions on distance education in the municipality were delegated to the respective principal (Utbildningsförvaltningen 2020a). According to Västtrafik, the measures of delayed school start reduced crowding during rush hour, and they therefor requested the Committee of Education to extend the recommendations until 31 December 2020 (Utbildningsförvaltningen 2020b), which the Committee decided on in the end of September (Utbildningsnämnden 2020). Work with measures in relations to the schools continued during the autumn 2020, with Västtrafik, among other things, extending the supply of tram services in the morning peak (Västtrafik 2020f) and by a letter appealing to the municipalities in the region that distance education and delayed school starts should continue even after the autumn holidays (Västtrafik 2020g).

Another measure to reduce crowding was targeted walking campaigns. The purpose of the campaign was to reduce the proportion of short journeys in public transport and thus avoid crowding (Västtrafik 2020h). Later in the autumn 2020, a general campaign was launched in the Västtrafik travel planner urging public transport users to walk rather than making short trips with public transport (Västtrafik 2020i). This can be seen as part of the Hållbart Resande Väst [Sustainable Traveling West] (HRV) being included in the assignment for Västtrafik from 1 October 2020. The interim report for the Public Transport Committee states that this created an opportunity to integrate and strengthen Västtrafik's expertise in activities that have the purpose to create behavioral changes in relation to travel habits and facilitate a transition to walking, cycling, public transport and to the avoidance of unnecessary travel (Kollektivtrafiknämnden 2020b).

4.3. Skåne

Region Skåne is public transport authority in the most southern part of Sweden, for an area with 33 municipalities with a total population of approximately 1,3 million. Malmö is the largest city, but the region is polycentric and with close links to Copenhagen in Denmark. Region Skåne is governed by a Regional Council who appoints a Regional Executive Committee and various other committees, including the Public Transport Committee. The committee is supported by Skånetrafiken, which is a public transport administration with approximately 420 civil servants. Skånetrafiken develop, plan, commission and market public transport in the region. Transport services are carried out by private and public companies under the trademark Skånetrafiken.

In mid-March, the Public Transport Committee in Skåne decided to instruct Skånetrafiken to monitor, investigate and take any measures related to Covid-19 and to report this to the committee on an ongoing basis (Kollektivtrafiknämnden Skåne 2020a). Carina Zachau (liberal conservative), chair of the committee, emphasizes that the main reason for the decision was a need to make quick decisions during the pandemic (Interview C. Zachau, October 5, 2020). Two months after the decision in the Public Transport Committee, Skånetrafiken stressed that the operations were strongly underfunded and that they forecasted a net deficit for 2020 of SEK 750 million (Kollektivtrafiknämnden 2020b).

Cost-reductions

At the end of May, the committee decided to instruct the head of the public transport administration to suggest measures to handle the deficit (Kollektivtrafiknämnden Skåne 2020b). Zachau stresses that they commissioned the administration to reduce costs as much as possible and if they were to receive a great share of the financial aid package from the national government, there was an opportunity to switch up. She further mentions that with the reductions made in 2020, there was a hope that further reductions in 2021 would not be needed (Interview C. Zachau, October 5, 2020). In a letter to the Public Transport Committee in early August 2020, the administration reported measures taken including offering face masks to Skånetrafiken's customers, real-time information of occupancy on board buses and trains and moving validators on city buses, since front doors can no longer be used for boarding (Kollektivtrafiknämnden Skåne 2020c). This can be seen as measures to avoid crowding.

But measures were also taken to reduce costs. Adjustments were made to reduce public transport supply by approximately eight percent from 16 August, which according to Skånetrafiken contributed to an expected reduction in costs of SEK 50 million in 2020 (Kollektivtrafiknämnden Skåne 2020d; Skånetrafiken 2020a). In an impact assessment of implemented traffic reductions, it was highlighted that basic supply was maintained in most cases. However, the basic offer had been lowered for certain important regional bus lines and changes in the supply for 2020 had also contributed to the basic offer for four train lines being lowered (Kollektivtrafiknämnden Skåne 2020e). In the train business area, the forecast was that adjustments in traffic supply would result in savings of between SEK 60 and 70 million for 2020 (Kollektivtrafiknämnden Skåne 2020c). Reductions in train services particularly affected traffic to Denmark over the Öresund bridge depended on guidelines and/or restrictions from the Danish government. In addition, there were reductions in traffic in relation to the commuter trains, to save staff and vehicle expenditures (Kollektivtrafiknämnden Skåne 2020d; Skånetrafiken 2020a).

In addition to cost efficiencies in public transport, Skånetrafiken saved 23 million SEK 2020 in areas such as marketing and customer service (Kollektivtrafiknämnden Skåne 2020d). Another area that was intended for savings was the closure of two customer centers. However, the proposal did not receive a majority in the committee and thus all customer centers remained (Kollektivtrafiknämnden Skåne 2020f). The chair of the committee also points out that large investments would be very difficult to carry through if travel demand remain at low levels in coming years. This applies, for example, to the procurement of new trains, as well as investments in electric buses (Interview C. Zachau, October 5, 2020).

Contractual relations

As in Stockholm and Västra Götaland, Skåne have a tradition with incentive contracts with renumeration partly based on the number of passengers. For bus contracts, Skånetrafiken signed new agreements with transport operators to regulate travel incentives for 2020 to meet lower passenger traffic (Kollektivtrafiknämnden Skåne 2020g). The signing of these agreements was part of a mandate given by the committee to Skånetrafiken (Interview A. Schönström, September 25, 2020). The chair of the committee highlights that:

> ” We had a discussion, me and the traffic administration beforehand. That prior to them entering into negotiations; we should go through what an agreement could look like and in what way we could make a good agreement for our traffic operators where they could also feel confident about what revenue they can expect during the pandemic.” (Interview C. Zachau, October 5, 2020)

According to her, they entered negotiations with the various transport operators early on. She stresses that some operators were easy to agree with, while others took longer time. All new agreements were in place during the summer 2020 (Interview C. Zachau, October 5, 2020). According to the annual report, the agreements with the transport operators were expected to reduce costs by SEK 70 million in 2020 (Kollektivtrafiknämnden Skåne 2020d). According to the committee chair, future contracts will probably be designed differently than before as the pandemic has meant a brutal awakening that continuously increase of travel is not always the case (Interview C. Zachau, October 5, 2020).

Fare evasion

As in the other two regions, closing front doors on buses has been a debated issue during the pandemic. The committee chair points out that, in the first stage, there was a proposal from several transport companies to close the front doors at the same time as they wanted to keep the incentive renumeration. However, this was not in Skånetrafiken’s interest. Once the front doors were closed, after a decision from a national court, fare dodging increased from 1.5 to 6-7 percent, according to the chair. Another explanation given for the increase is that on-board staff on regional buses and trains in the first months of the pandemic, instead of inspecting tickets, controlled crowding (Interview C. Zachau, October 5, 2020).

Tickets, additional revenues, and measures

A significant measure in Skåne was the introduction of new tickets. The decision to introduce the temporary ‘7-day ticket’ was proposed in early April in light of the measures and recommendations mediated by the government and responsible state agencies. A customer with a 30-day card could, at short notice, be forced to stay at home and thus not be able to make full use of his/her monthly travel pass. To reduce the financial risk for the customers, it was proposed to introduce a 7-day ticket during the period 6 April to 14 June (Kollektivtrafiknämnden Skåne 2020h). The proposal was approved in mid-April and was extended until 15 December 2020 (Regionfullmäktige Skåne 2020a, b). One main reason for the extension was the sale of 93,000 tickets in the above-mentioned

period (Skånetrafiken 2020b) and according to the annual report for the first half of 2020, the 7-day ticket from April to August generated SEK 23 million in revenue (Kollektivtrafiknämnden Skåne 2020d).

Skånetrafiken highlights that, with the pandemic, new travel needs and patterns have arisen. As part of accommodating this change, a proposal was made in mid-October to phase out the 7-day ticket and replace it with two new ticket types: "10/30" and "10 simple". According to the proposal, "10/30" consists of ten 24-hour tickets purchased at one and the same time and all tickets have a validity period of 30 days from the time of purchase. "10 single" are ten single tickets purchased at one and the same time of purchase where the tickets are valid for three months and gives the traveler a one-time discount of 5 percent (Kollektivtrafiknämnden Skåne 2020i).

However, the proposal was met with criticism. Both the Sweden Democrats and the Left Party considered that the 7-day ticket should become a permanent part of Skånetrafiken's offer due to its success. Furthermore, the Left Party said that the ticket meets the needs of passengers during the pandemic. Both parties also emphasized criticism of the pricing of "10/30" and that there was a risk that it was perceived as complicated and confusing (Regionstyrelsen Skåne 2020a, b). The Green Party shared a similar view (Regionstyrelsen Skåne 2020c). But the three party's opposition was not enough. At the Regional Council meeting in mid-February 2021, the decision was made to introduce the new ticket types and to phase out the 7-day ticket as soon as "10/30" had been introduced (Regionfullmäktige 2020c).

4.4. Regional similarities and differences

In chapter two, two main approaches were presented for how to replan public transport services during or following a crisis with less financial resources: Change the Least Possible (CLP) and Change the Framework (CFR). During the pandemic, all three regions adopted strategies with very few changes. Region Skåne has to a larger extent than Stockholm and Västra Götaland changed routes, timetables etc. in order to reduce costs, however this has been relatively marginal changes and have not affected the fundamental framework.

All regions have renegotiated contracts with its private operators. Interim contracts have been introduced with renumeration based on the production of public transport. It is too early to say when and how incentive-based contracts will be reinstalled.

Previous research points at the possibility that financial crises may lead to substantial reductions in public transport supply. All three regions have started to prepare for possible cost reductions in e.g. administration, traffic supply and investments. Whether or not t these measures will be implemented depends to a large degree on the development of public transport demand after the pandemic, but also on the willingness from regional and national decision-makers to increase the subsidy to public transport.

The regions have, in different ways, implemented new solutions to cope with funding challenges. Some measures have aimed to increase revenues, or more accurately reduce revenue loss, during the pandemic. All regions have e.g. implemented measures against

fare evasion. New ticket offers have been implemented in Skåne to keep customers working from home several days a week. Other measures have been implemented which focus on more long-term impacts on costs and revenues. In Västra Götaland e.g., an increased focus on other sustainable modes of transport (cycling, walking) and more flexible school starts may reduce the cost for public transport in the future.

5. Scenarios for a post-covid era

The chapters above show that Covid-19 has impacted public transport, which has led to considerations on the future of sustainable mobility and public transport more generally. In the third research question of this report we ask, how the changes or stability in public transport caused by Covid-19, in the longer run impact on the possibilities to obtain regional, political aims on sustainable mobility?

To answer this question, scenarios can be an appropriate instrument (Ramirez et al., 2015). Inspired by the literature reviewed in chapter two as well as scenarios developed elsewhere (Beck et al. 2020; Hensher 2020; Smith 2021, Arthur D. Little 2020; C40; Deloitte 2020; Eliasson 2021; Shaheen & Wong 2021; Tirachini & Cats 2020; Trafikanalys 2021b; WSP 2020), we have developed four scenarios for public transport in a post-covid era, all focusing on the Swedish context.

The aim of the scenarios is to facilitate considerations on consequences of Covid-19 as regards sustainable mobility aims. The scenarios further have been instrumental in considerations on appropriate roles, strategies, and funding mechanism in post-covid futures, which we discuss in chapter six The intention is that the scenarios also in other contexts can function as a thinking device for mobility actors looking into and planning for a post-covid future.

In the following, we will first explain the scenarios, afterwards discuss likelihood and sustainability consequences of each scenario, while we finally discuss how Covid-19 might impact on the regional political aims on sustainable mobility.

5.1. Four scenarios for public transport

The scenarios are built from two dimensions, namely:

- The expected level of demand in public transport, and
- The extent to which the framework of public transport will change

While the first dimension is to a large degree inspired by chapter two of this report, the second dimension is mostly inspired by Beck et al. (2020); Hensher (2021); Shaheen & Wong (2021), and Smith (2021). The timeframe of the scenarios is about five years into the future.

Figure 5.1.1 Covid-19 scenarios and public transport

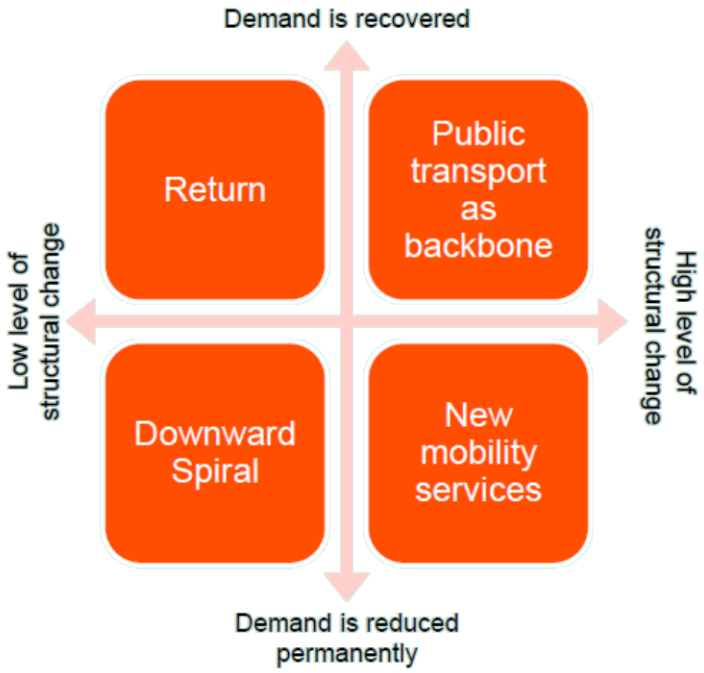

Figure 5.1.1. Covid-19 scenarios and public transport. Two dimensions and four scenarios.

Downward Spiral

This scenario illustrates a future where citizens after Covid-19 still avoid activities with many people such as public transport. The reduction in passenger demand is substantial compared to pre-covid levels, but higher than 2020 levels. We envisage a permanent reduction in passenger demand of 20 percent compared to 2019. Therefore, also the ticket revenue is reduced. Furthermore, the governments at local, regional, and national levels do not have the will or ability to provide extra subsidies to public transport, due to budget deficits generated because of Covid-19.

Initially, the tax paid subsidies to public transport are at almost the same levels as they were before the pandemic. But soon public transport accommodates to a new normality with reduced demand, and costs decreases the subsequent years due to reduced supply. With ticket income decreasing, and the subsidies and costs initially at the same level as before the pandemic, public transport experience a period of substantial deficit, which one way or another must be paid by the public sector trough additional subsidies.

The framework of public transport is business as usual. We experience some degree of micro mobility and shared cars, but these services are at the same level as before the pandemic and are not particularly well integrated with the ordinary public transport system. Within the field of mobility, no particular measures inspired from the Covid-19 experiences are introduced.

Therefore, the modal share of public transport is reduced, while individual modes – car, bicycle, e-scooters, and walking - increase their share.

Return

In this scenario, we envisage a future where social life as of pre-covid returns. No significant impacts from teleworking are experienced, and passengers return to public transport that fast reaches the levels before Covid-19. The tax paid subsidy to public transport returns to pre-covid levels, and local, regional, and national governments are willing to cover short-term losses during Covid-19 in order to keep up services.

All in all, public transport fast returns to business as usual with passenger demand, public transport supply, costs, and modal split vis-à-vis other modes as before Covid-19.

Also, the framework of public transport continues as business as usual. Some degree of micro mobility and shared cars exist, but not particularly well integrated with traditional public transport. The experiences with Covid-19 have not stimulated any new type of measures.

Modal share of public transport returns to 2019 level, and individual modes like car, bicycle, e-scooters and walking also returns to pre-covid levels.

New Mobility System

This and the following scenario differ from the previous in the extent to which the framework of public transport change. In the "New Mobility System" we imagine that many citizens still avoid activities with many people although we are in a post-covid situation. More people work from home two-three days a week, implying less demand for public transport. Some people move further away from their job and public transport hubs because commuting distance is not so important when you commute less. There are fewer but longer trips as some people take long-distance jobs. Reduction in bus -, train -, and tram passengers is substantial compared to 2019 levels, but higher than the 2020 levels. In this scenario, we envisage a permanent reduction in passenger demand in traditional means of public transport with 20 % compared to 2019 levels, and subsequent reductions in ticket income.

In this situation, traditional public transport accommodates to reduced demand, revenue, supply and costs, while other shared modes take passengers, e.g. e-scooters, shared bikes and shared cars. For the traditional means of public transport, the tax paid subsidy is reduced in accordance with the reduction in passenger demand. However, the total subsidy to the wider public transport (incl. other shared modes) returns to 2019 levels. The costs of traditional public transport initially stay at 2019 level but decreases the following years due to reduced supply. With ticket income decreasing, and the subsidies and costs initially at the same level as before the pandemic, traditional public transport experience a period of substantial deficit, which one way or another is to be paid by the public sector through additional subsidies, as was also the case in the scenario of "Downward Spiral". The wider public transport all in all experiences the same demand and subsidies as of 2019.

In this scenario, the framework of the transport system is changed dramatically. MaaS (mobility as a service) solutions are widely introduced, working from home is widespread and new measures to reduce peak- and car traffic, and increase working from home and shared mobility modes are introduced. Changed behavior and policy interventions are inspired by the Covid-19 experiences.

Modal share of the wider public transport including other shared modes all in all returns to the 2019 levels, however with bus, tram and train taking a reduced share, and other shared modes taking an increased share. Car traffic, walking, and bicycling returns to 2019 level.

Public Transport as backbone

In this scenario social life as of pre-covid returns. For that reason, also passengers in bus, tram and train return, and these modes fast reach 2019 levels. However, the pandemic has initiated innovative thinking, political ambitions, and funding, implying that there is at the same time increased supply of other shared modes. Additional passengers are attracted by these modes, and the wider public transport (embracing traditional public transport as well as other shared modes) increases its modal share.

The tax paid subsidy to the wider public transport increases above 2019 levels, however with traditional public transport staying at 2019 level. Also, the costs of traditional public transport stays at 2019 level.

In this scenario, the framework of public transport changes dramatically. Maas solutions are widely introduced, working from home is widespread and new measures to reduce peak and car traffic, and increase working from home and shared mobility means are introduced. Bus, tram, and train form the backbone of the mobility system. Changed behavior and policy interventions are inspired by the Covid-19 experiences. People travel less, but when they travel, they apply to increased extent public transport and other sustainable modes. To own a private car becomes less important and less common. Especially new generations skip becoming "car-owners".

Therefore, the modal share of the wider public transport including other shared means increases above the 2019 level, though bus, tram and train stays at 2019 level. Car traffic and walking decrease.

Table 2

	Downward spiral	**Return**	**New mobility system**	**Public transport as backbone**
Passenger demand	20 % reduction of 2019 level	Returns to 2019 level	20 % reduction for the trad. public transport. The wider public transport returns to 2019 level	Trad. public transport returns to 2019 level. In addition, increase in other shared modes
Subsidy	Reduction below 2019 level	Returns to 2019 level	For trad. public transport reduced. For wider public transport at 2019 level	Trad. public transport at 2019 level. Wider public transport increases above 2019 level
Costs	Reduction below 2019 level	Stays at 2019 level	For trad. public transport reduction below 2019 level	Trad. public transport at 2019 level
Other shared modes	Stays at 2019 level	Stays at 2019 level	Huge increase	Huge increase
Working from home	As before Covid-19	As before Covid-19	Widespread	Widespread
Modal share	Reduced share of public transport compared to 2019	Returns to 2019 level	Wider public transport returns to 2019 level	Trad public transport returns to 2019 level. Wider public transport increases above 2019 level

Notes: Core features of each scenario of public transport post Covid-19. Trad. public transport means traditional public transport like bus, light rail, tram, train. Wider public transport means traditional public transport including new shared modes, like shared bikes, shared e-bikes, shared cars, Maas, etc.

5.2. Futures with different consequences for sustainability

The scenarios above were established to be able to discuss the future and answer the third research question of this report: How does envisaged changes or stability in public transport in the longer run, impact on the possibility to obtain regional political aims of sustainable transport?

To answer the research question, we invited 24 designated individuals from the wider public transport in Sweden to a digital workshop in the spring 2021. The participants represented metropolitan cities (four), metropolitan regions and public transports (seven), operators of traditional public transport and new shared modes (five), public transport associations (three), and state agencies (five). At the workshop, the participants received information about the scenarios. Further, a presentation of overall Swedish regional sustainability aims for the transport system was conveyed to them. It was prepared by the project team and based on available documents from the three Swedish metropolitan regions.

In the presentation, these aims were divided into social, environmental, and economic sustainability. Following this, the transport system should contribute to *social sustainability* by increasing accessibility for citizens with disabilities, as well as to all geographies of the region, and by making sustainable mobility services easy to use, safe and secure. The transport system further should contribute to *environmental sustainability* by making mobility options environmentally friendly and by increasing the share of passengers applying sustainable modes. And finally, the transport system should contribute to *economic sustainability* by obtaining increased growth via improved accessibility and by conducting the transport system in resource efficient manners.

Based on these presentations, the participants individually as well as in groups were asked about 1) the likelihood of each scenario, as well as 2) the possible negative impact for each scenario as regards regional sustainability aims.

Downward Spiral

The workshop participants mostly found that this scenario would have rather negative effects on the possibilities to reach regional sustainability goals. Arguments for this assumption were based in expectations of reduced accessibility for various groups of citizens, increased congestion, and poor conditions for reaching environmental ambitions, e.g. due to increased car dependency.

Regarding the likelihood of the scenario, the results were more scattered. Some found the scenario almost certain, while others found it unlikely, most found it possible. Arguments for high likelihood were e.g. increased car ownership experienced during Covid-19[6] .

The overall assessment for the scenario regarding likelihood and negative impact is shown in the figure below, and the color codes indicate that most of the workshop

[6] However, data from 2020 does not seem to confirm this trend.
https://www.mynewsdesk.com/se/vroom/pressreleases/utkast-bilmarknaden-december-2020-3058071
(July 2, 2021)

participants found this scenario to provide difficulties and even large difficulties for the regional sustainability aims.

Figure 5.2.1. Assessment "Downward Spiral"

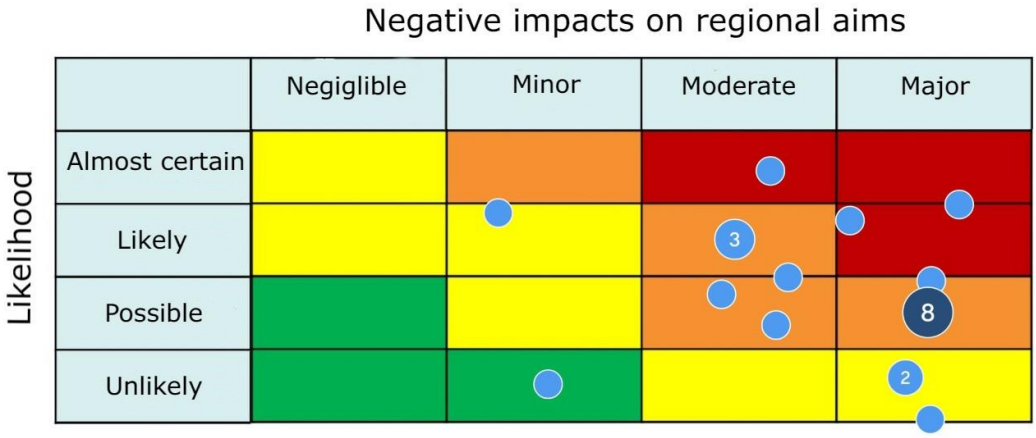

Figure 5.2.1 Assessment of likelihood and negative impact for the scenario "Downward Spiral". In the figure, red indicates large difficulties for political aims. Orange indicates difficulties for political aims. Yellow indicates that there might be some difficulties for political aims, while green indicates small or no apparent difficulties.

Return

The impact of this scenario was considered very differently among the workshop participants. Some found the negative impacts of the scenario major while others found them negligible. The majority found the potential negative effects moderate or minor. The explanations behind the scattered assumptions were e.g. that the scenario would imply that behavioral changes established during Covid-19, such as increased digitalization, walking and cycling would be lost. Therefore, political goals on climate and regional sustainability goals would be difficult to obtain.

Regarding the likelihood of the scenario, the assessment was also scattered. Some found it unlikely, while others almost certain. The majority though, considered the scenario to be possible or likely. The likelihood is e.g. based in the fact that many citizens in Sweden cannot work from home and need to commute.

The overall assessment regarding likelihood and negative impact is shown in the figure below and indicates that most of the workshop participants saw this scenario as providing difficulties and even large difficulties for the regional aims.

Figure 5.2.2. Assessment "Return"

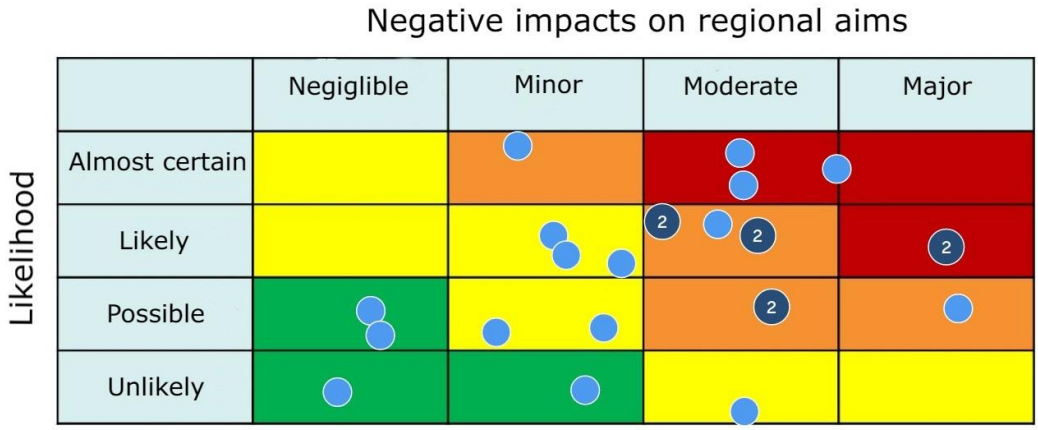

Figure 5.2.2 Assessment of likelihood and negative impact for the scenario "Return". In the figure, red indicates large difficulties for political aims. Orange indicates difficulties for political aims. Yellow indicates that there might be some difficulties for political aims, while green indicates small or no apparent difficulties.

New Mobility System

The participants in the workshop seem to establish some degree of consensus regarding the consequences of this scenario. Hence, the vast majority considered this scenario having only minor or moderate negative impacts on the regional sustainability goals, and only two found the negative impacts being major. It was mostly social sustainability goals that the participants were afraid would not be obtained in this scenario. Thus, more expected social exclusion and division. Further, some expected that only urban areas would benefit from such a development. Some were afraid that new shared forms of mobility would mostly substitute walking and cycling, which are already sustainable means of transport.

When it comes to the likelihood of this scenario, only few found it unlikely or almost certain, while the broad majority possible or likely. Some argued for limited likelihood based in the assumption that traditional public transport would almost always be the most appropriate solution in cities. Some also argued that too many changes in legislation were needed to realize the scenario. However, others argued for this scenario being very likely based in the supposition that society after Covid-19 will experience new travelling patterns with more people working from home and travelling distributed over the day in a manner that suits well new forms of shared mobility.

The overall assessment by the workshop participants is illustrated in the figure below, where the color codes indicate that about half of the workshop participants saw this scenario as providing some difficulties for the regional aims, and a large minority even saw is as providing difficulties or large difficulties.

Figure 5.2.3. Assessment "New Mobility System"

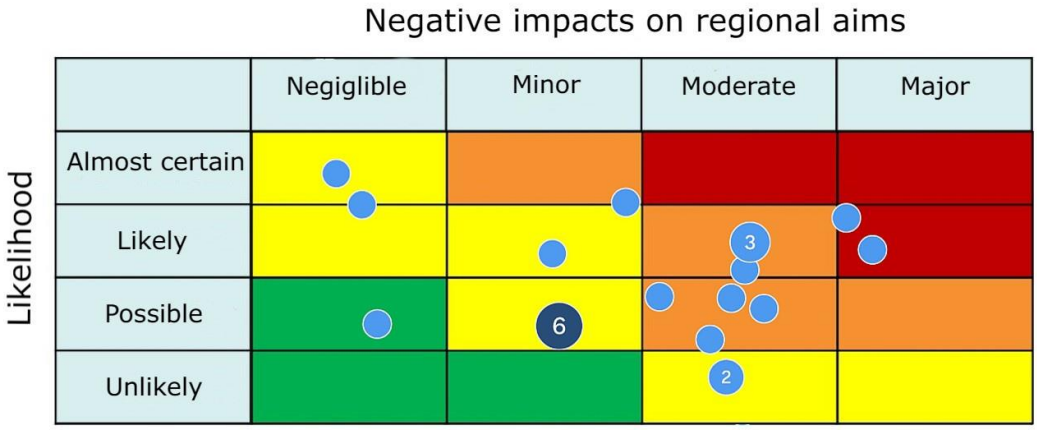

Figure 5.2.3 Assessment of likelihood and negative impact for the scenario "New Mobility System". In the figure, red indicates large difficulties for political aims. Orange indicates difficulties for political aims. Yellow indicates that there might be some difficulties for political aims, while green indicates small or no apparent difficulties.

Public Transport as Backbone

In the considerations of this scenario, the workshop participants mostly agreed on the consequences of the scenario. The large majority considered the negative impacts being negligible or minor. Though some also suggested the impact to be moderate or major. Many saw this scenario as contributing considerably to reach sustainability goals. Others suggested as a possible negative impact that villages would not be integrated in the development envisaged in the scenario. Some expected that this scenario would not provide for economic sustainability, maybe due to increased costs.

As regards the likelihood, this was the only scenario that no workshop participants considered almost certain. Some considered it to be unlikely. The majority considered the scenario to be possible, and many also saw the scenario as likely.

The overall assessment of the scenario is illustrated in the figure below, where the color codes indicate that the vast majority saw this scenario as providing only some or small apparent difficulties for the regional aims.

Figure 5.2.4. Assessment “Public Transport as Backbone”

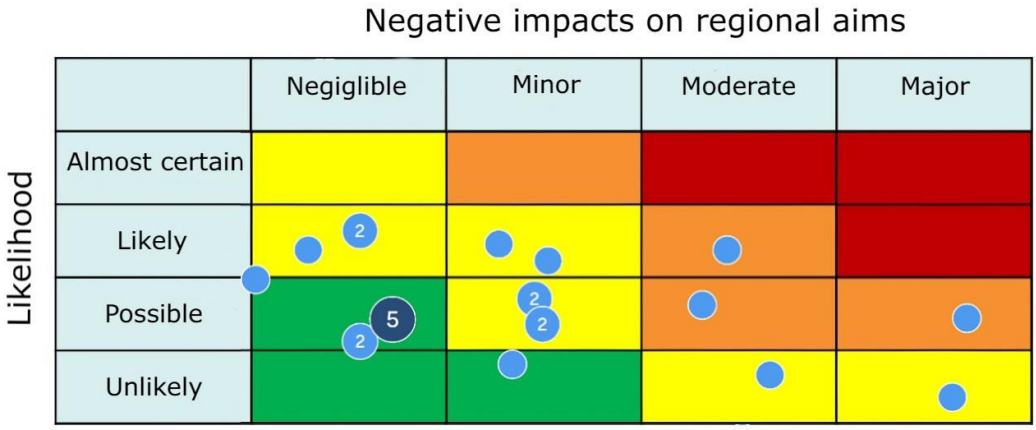

Figure 5.2.4 Assessment of likelihood and negative impact for the scenario “Public Transport as Backbone”, In the figure, red indicates large difficulties for political aims. Orange indicates difficulties for political aims. Yellow indicates that there might be some difficulties for political aims, while green indicates small or no apparent difficulties.

6. Conclusions

This report was written at a time when the Covid-19 pandemic still were not under control and restrictions not fully lifted. Therefore, the results and conclusions presented here should be regarded as preliminary. They reflect what we know at this point. In this final chapter we first turn back to the three research questions presented in the introduction, answering them based on the empirical findings presented in chapter three, four and five. After that we reflect on a more general level upon opportunities, challenges, and possible pathways for public transport funding in a post-covid era.

6.1. Answering the research questions

The first research question was how the Covid-19 pandemic has impacted the costs and revenues for public transport. The compilation of data in chapter three shows very clearly how farebox revenues drastically decreased in all three regions, as many people listened to the recommendations from authorities to avoid public transport. At the same time, costs remained largely unchanged. This obviously resulted in a widened gap between costs for operating the system, and revenues that could finance those costs.

To compensate for the loss of ticket revenues, earmarked state contributions were introduced on several occasions on an ad-hoc basis. Despite this, the regional public transport agencies made considerable financial losses compared to the results the year before. Even with state contributions, challenging political decisions had to be made to increase regional subsidies to public transport. Thus, the so-called cost-recovery ratio, which is a measurement of how much of the costs for operations that is paid for by passengers, declined in unprecedented ways. The share of public subsidies coming from tax-money, both regional and national, increased.

The second research question was: what measures have public transport agencies made in response to the financial challenges? Here we can conclude that the three regions acted in similar ways, but with some variations. Region Skåne was the only region that downsized operations at an early stage to reduce costs, which caused some political turmoil. Stockholm and Västra Götaland decided to maintain operations unchanged, which was also what was urged from the national government.

A decision from the Swedish work environment authority required that front doors in all buses should be closed off, to protect drivers during the pandemic. This resulted in increased problems with fare evasion, which added to the problem of reduced revenues from less people travelling. For the public transport agencies and operators an important measure during 2020 was therefore to find practical solutions to protect drivers, to be allowed to reopen front doors.

To meet changes in demand, with more people working from home, new tickets have been introduced. In Skåne, a new monthly ticket called 30-10 was launched, based on the idea that people who previously bought a monthly pass should continue to do so, but at a lower price and that was only valid for 10 days during the period.

Several other measures have been implemented with the aim to reduce congestion and transmission of disease, such as dispersed school start to avoid crowding in peak traffic, and improved traffic information to nudge people towards less crowded vehicles. Such measures can also impact costs in the longer-term perspective if adopted at larger scale and over longer time perspectives, in ways that reduces peak traffic.

The third research question, finally, was about the impact on the possibility to reach regional political aims of sustainable transport in the longer run. This question is obviously more difficult and speculative, and here we draw on the workshop results presented in chapter five. Based on the workshop participants judgements, the most positive scenario as regards the regional sustainability goals is Public transport as backbone, while the most negative is Downward spiral. The other two scenarios being almost equal and moderately negative. Similarly, the most likely scenario is Return and the least likely is Public transport as backbone. The analysis indicates that he public transport actors should in particular try to avoid and be prepared to handle the scenario of "Downward spiral, but also "Return" and "New mobility systems", since these scenarios are judged by several workshop participants to include difficulties and even large difficulties.

6.2. Funding public transport after the pandemic – institutional change

We want to conclude this report with a few general observations and thoughts on how public transport funding might develop because of the Covid-19 pandemic. We do so by returning to the different perspectives on institutional change presented in chapter two.

A first observation is that the national level has stepped in as an important funder of public transport in Sweden, which was not the case prior to the pandemic. In 2020, state subsidies to public transport increased with 500 percent, although from a low level (Trafikanalys 2021). It is also worth mentioning that the subsidies were not distributed as general contributions to the regions, which is often the preferred way, but as earmarked subsidies to public transport. The subsidies came with requirements not to reduce public transport supply. Thus, during the pandemic we have witnessed a new funding mechanism and an increased national steering of regional public transport. Perhaps this will be a very temporary mechanism. However, if demand for public transport remain on a significantly lower level compared to the pre-pandemic situation, continued national funding might be needed to prevent a development in line with the "Downward spiral" scenario, or to support a "New mobility systems" scenario. If so, national funding may be part of a new institutional equilibrium emerging from the critical juncture created by the Covid-19 crisis, an equilibrium that may influence power relations and actor's behavior in the future.

A second observation is that the pandemic might change ideas about public transport's role in society in ways that transform the existing institutions from within. We see several potential causes why ideas may change. First, the very basic idea of sharing a confined space with unknown people, which is what public transport very often is about, is no longer seen as unproblematic. A larger focus on individual, demand responsive solutions, and measures to reduce crowding will have an impact on funding models. It can increase costs for operating public transport if e.g. more space is needed in vehicles and less crowing is tolerated. It can also lead to a need for funding of alternative modes of transport that can relieve crowding in public transport, especially in peak hour traffic. Second, the huge increase in working from home, and the more flexible work conditions for many people, change the basic idea of a public transport system serving a rather fixed commuting behavior. More flexibility will be needed for public transport to remain relevant. We have already seen examples of institutional adjustments in ticket regimes, which is something that may very well continue at a larger scale. Here we might also experience elements of isomorphism, i.e. solutions copied from public transport agencies elsewhere in Sweden and abroad.

A third observation, finally, is that the widened funding gap that has been described in this report change the cost-benefit equation in public transport. This may have repercussions for the institutional frameworks, but in different ways in the four scenarios presented in chapter five. The "Return" scenario may require increased subsidies for a limited period but will not bring about more fundamental institutional change. In the "Downward spiral" scenario institutions may change mainly from within, with a shift from a focus on societal development and sustainability towards a more budget oriented way of thinking, with cost reductions, revenue maximization, increased ticket prices, and similar measures. To avoid such a development, the national level may need to take a more active role in funding, but also take a much more active role as a "meta-governor" that steer the direction of public transport actors.

The two remaining scenarios, "New mobility systems" and "Public transport as backbone" will require larger institutional makeovers where a new funding model is needed to support other forms of shared transport modes. This may in more fundamental ways broaden the perception of what public transport is, and the division of responsibility between public and private actors. Such a transformation requires a more fundamental shift in preferences among both decision-makers in and around public transport, and among people in general. The future will tell whether the Covid-19 pandemic will contribute to such a shift in preferences.

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K2 is Sweden's national centre for research and education on public transport. This is where academia, the public sector and industry meet to discuss and develop the role of public transport.

We investigate how public transport can contribute to attractive and sustainable metropolitan areas of the future. We educate members of the public transport sector and inform decision-makers to facilitate an educated debate on public transport.

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