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Why do cities invest in bus priority measures? Policy, polity, and politics in Stockholm and Copenhagen [1]

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Abstract

Bus priority measures can be important to improve the attractiveness of buses and thereby contribute to a shift from the private car to public transport. Many cities around the globe do introduce bus priority measures, but studies focusing on Scandinavian capitals are rare. In this paper we ask: Which factors promote or prevent municipal investments in bus priority measures in Scandinavian cities. We depart from an analytic framework distinguishing between policy, polity and politics for analysing two case-studies (Stockholm in Sweden, and Copenhagen in Denmark). Both cities have clear sustainability ambitions, but they differ as regard the financial structure of bus transport. In both cases, bus priority measures include bus lanes, priority of buses in crossings, rebuilding crossings and reduction of parking spaces. In both cities, space is often limited, and there can be resistance, implying that compromises are reached vis-à-vis other means of transport and other concerns. Introduction of bus priority measures is a rather incremental activity. Bus priority is usually not a big issue in policy-making and it is mostly initiated by officials rather than politicians. The division of responsibilities between different arms of the municipal organisation imposes some difficulties. State funding supporting the local initiatives as well as a financial structure implying direct economic incentives are mentioned as important drivers in Copenhagen, but they seem less important in Stockholm.

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1. Introduction

Given the current attention on transport system related challenges concerning climate emissions and air pollution in cities, there are great aspirations to increase the volume and share of passengers using public transport. Among other things, this demands that services should be improved. One type of improvement is to increase the speed of buses and improve regularity. Doing so will make bus services more attractive, which in turn may help to increase public transport. In congested areas, speed and regularity may be improved through the implementation of measures such as bus lanes, signal priority at traffic lights, a reduction in the number of bus stops, and the re-designing of crossroads, etc., measures that are often framed within the term "bus priority measures".

Especially in connection with the introduction of Bus Rapid Transit (BRT), several scientific studies have been carried out regarding factors that promote or prevent investments in measures that prioritize bus service. However, these studies, are often focused on the planning and implementation of measures in the Global South, especially in Latin America and Asia (Lindau et al., 2014; Muñoz & Geschwinder, 2008; Muñoz & Paget-Seekins, 2016; Nikitas & Karlsson, 2015; Rizvi & Sclar, 2014). In contrast, the literature that describes conditions for the implementation of priority measures in Scandinavian countries is more limited (Finn et al., 2011 is an exception). Additionally, while the aforementioned studies focus on the implementation of bus priority measures in the context of large-scale BRT projects[2], there is to the best of our knowledge not any studies on the implementation of priority measures in "conventional" bus services.

In the Scandinavian context the responsibility for implementing priority measures is shared between different actors. In the context of procured public transport the regional public transport authorities (PTA's) and commercial operators are important actors. If bus services operate on roads where the state is infrastructure holder, the national road administrations are also involved (the Swedish Transport Administration, and the Danish Road Directorate). However, the municipal level plays a key role, because they manage the infrastructure for large parts of the urban road network, where the majority of bus travel occurs. Based on this, the purpose of this study is to investigate what causes the Scandinavian capitals, Stockholm in Sweden and Copenhagen in Denmark to prioritize investments in bus priority measures in their road networks. Given the lack of previous research on implementing bus priority measures in the Scandinavian context, we apply a broad, exploratory approach, which means that we are open to explanations both concerning why the cities invest, but also to the challenges associated with implementing bus priority measures. So, the research question is: Which factors promote or prevent municipal investments in bus priority measures?

In the following sections, we first present some concepts that have been used to structure the project's empirical data, we further present an international literature review as well as the project's methods (chapter 2). Thereafter, two case studies of Stockholm and Copenhagen are described and analyzed (chapter 3). In light of the international literature, findings in the cases are discussed (chapter 4), and finally we present the project's conclusions (chapter 5).

2. Methodology and literature

In this article, we seek to discover factors that promote or prevent municipal investment in priority measures. These "factors" may derive from different dimensions of the decision-making and implementation process. Classic dimensions of the decision-making and implementation process are often summarised using the terms "policy, polity, and politics" (Sager, 2007; Stead, 2016; Treib et al., 2007). These concepts are used to structure the article. "Policy" refers to political content. In this context, we use the term to refer to any political objectives to create improved priority for buses, as well as any action plans or policy packages which envision bus priority. It further includes the specific priority measures that are implemented – that is to say, bus lanes, signal priority at crossroads, the re-designing of intersections, a reduction in the number of bus stops, etc. The term "polity" refers to the

[2] We use the term BRT as an umbrella term for capacity-efficient bus concepts. This also covers other names, such as "Buses with High Level of Service" (BHLS) that are sometimes used in a European context.

institutional framework for the formulation and implementation of measures, including the organisational structure for public transport, formal administrative processes and the division of labour that is established between different public authorities and private operators. The funding structure for bus services aslo fall into this category. Finally, "politics" has to do with conflict and consensus – actors' behaviour, negotiations and power struggles – which play out in policy and implementation processes for priority measures. This includes both the actions of political actors and that of officials and citizens, as well as the behaviour of other stakeholders. When it comes to priority measures, many actors have an interest in taking advantage of the city's space. It is important to stress that the three dimensions are interrelated. The content of a given policy may lead actors to oppose it. The actors are assigned varying degrees of power via the institutional structure. Conversely, some political processes and power struggles lead to the evolution of specific policy content.

Which barriers and opportunities for the implementation of public transport priority are addressed in the research literature? It is this question that the literature study presented here aims to address. To begin with, as Renyolds et al., (2017) point out, research on public transport priority in general has mainly been done from a technical perspective, and there is a lack of knowledge on processes of implementation. Therefore, we focus primarily on research on the implementation of Bus Rapid Transit (BRT) projects, because the issue of public transport priority is central to BRT. As more and more cities have built BRT systems, the amount of research literature focusing on planning and implementing BRT systems has increased. Muñoz & Geschwinder (2008) draw lessons from the unsuccessful introduction of Transantiago in Chile. Based on an analysis of the projects implemented in different parts of the world (especially in developing countries), Lindau et al. (2014) identify barriers to the implementation of BRT planning. Rizvi & Sclar (2014) make a comparative analysis of implementation processes in the Indian cities of Ahmedabad and Delhi. Nikitas & Karlsson (2015) make an inventory of experiences from a number of projects in different parts of the world. Muñoz & Paget-Seekins (2016) compile research on BRT from different perspectives, such as organisational issues, urban planning, and technical aspects. Felipe & Macário (2013) develop a framework by which to analyse "policy combinations" for successful implementation. *BRT Planning Guidelines* (Wright & Hook, 2007) and *Buses with High Level of Service* (Finn et al., 2011) are reports based on experiences from a wide range of projects from around the world that include guidelines for the planning and implementation of projects.

Structuring our article on the foundation of the above-mentioned dimensions regarding policy, polity and politics, we will present the factors that affect the implementation of priority measures. We commence with goals and measures, which in this paper is referred to as policy. For many decades, cities were planned for car traffic and the normal response to mobility issues was to increase road capacity. A fundamental problem with this approach to mobility is that mobility is measured and assessed through flows of vehicles instead of flows of people (Lindau et al., 2014). When congestion occurs, it is common for motorists to push planners and politicians to make decisions that will increase road capacity, for example by widening roads and building more lanes. In such a situation, it is challenging to convert existing lanes into bus lanes. Since space is often limited in urban areas, a priority measure such as the construction of bus lanes means that other functions are prevented or hindered. For example, this may mean that parking spaces along the streets must be removed (Finn et al., 2011) or that there is less room for motorists, cyclists and pedestrians than there was in the past (Rizvi & Sclar, 2014; Finn et al., 2011). It is easier to deal with these types of questions if there is a clear, politically rooted vision of which effects will be achieved through the alteration of the transport system's use of space (Wright & Hook, 2007; Finn et al., 2011).

The lack of user perspective is also evident in the excessive focus on the technical aspects of the system and that too little consideration is afforded to the "whole of trip perspective" and integration between different modes of transport (e.g., walking, cycling, other public transport) and the BRT system. Another aspect of the "whole of trip perspective" is the idea that the system's stations and hubs should offer a good level of service (Muñoz & Paget-Seekins, 2016). Because one of the central ideas behind BRT is to allow buses to travel at higher speeds, safety is also an important aspect to consider. In order to be perceived as positive, the system must be highly safe for its own users, other road users, and the public (Nikitas & Kalsson, 2015).

When it comes to the institutional framework, in this paper referred to as polity, one fundamental problem is that

organisations and units within these organisations whose mandates overlap, often tend to work in isolation and remain ignorant of what others are doing. This is why institutional complexity is discussed (Lindau et al., 2014). Experiences from projects in which public transport priority has been a central component indicate that one critical success factor is the simultaneous management of regional and local planning perspectives, both for transport and land use planning (Nikitas & Karlsson, 2015; Finn et al., 2011). This means that the collaboration between many different stakeholders is an important element of BRT initiatives. Institutional complexity can also be expressed in the confusion about which organisations have formal control over various measures (Muñoz & Geschwinder, 2008). This, in turn, can manifest itself as political or institutional inertia, i.e., that it takes an (excessively) long time to adopt the necessary decisions in all instances involved (Wright & Hook, 2007

As with institutional complexity, the barrier of lacking consensus between stakeholders also has to do with the fact that stakeholders with different roles are involved in the decision-making processes. The dimension of conflict or consensus is here referred to as politics. Different stakeholders often have conflicting interests and decisions regarding priority measures are dependent on the existence of consensus between the various stakeholders (Muñoz & Geschwinder, 2008). Nikitas & Karlsson (2015) argue that the core conflict concern the reallocation of road space, a limited and valuable resource, from motorists to bus passengers. To avoid conflicts with motorists, in some projects street space not previously part of the traffic apparatus was claimed for bus lanes, leading to conflicts with the residents and businesses in the area. This means that priority measures for public transport are politically charged issues, and it is almost inevitable that conflicts will arise in the course of planning and implementation (Muñoz & Paget-Seekins, 2016). Clear political leadership is a key factor in overcoming this kind of obstacle (Muñoz & Geschwinder, 2008; Lindau et al., 2014; Muñoz & Paget-Seekins, 2016; Wright & Hook, 2007; Finn et al., 2011). Several studies claim that a key difference between successfully planned and implemented projects (such as those in Curitiba, Bogota and Ahmedabad) and less successful projects lies in how involved the “top tier” of the city’s leadership has been (Muñoz & Geschwinder, 2008; Lindau et al., 2014; Rizvi & Sclar, 2014). Felipe & Macário (2013) employ the same reasoning when they discuss the difficulty of reaching joint decisions when many stakeholders with different mandates are involved. Political leadership is thus a key factor in achieving consensus in order to implement public transport projects. Unless a clear political will exists, the project is unlikely to gain sufficient momentum to overcome the inevitable challenges from opponents. When it comes to major BRT projects in South American cities such as Curitiba and Bogotá, a determining factor has been newly-elected mayors and his/her visions for how the city can be transformed with the help of strategic public transport investments.

At the same time, the importance of the involvement of both politicians and officials is stressed, because radical changes require broad support (Wright & Hook, 2007). To be able to “sell” the project to the public, it is important that politicians and officials present a united front (Finn et al., 2011). Moreover, conflicts with other means of transportation can easily arise (Rizvi & Sclar, 2014; Finn et al., 2011). As mentioned earlier, a clear, politically rooted vision makes it easier to manage these kinds of issues (Finn et al., 2011). As regards consensus between stakeholders, it is important that consensus is achieved, not only between those in the city's political and administrative “top tier,” but also between key decision-makers at local and regional level.

Finally, if there is a lack of public support, it is unlikely that the necessary political leadership will be established (Lindau et al., 2014; Wright & Hook, 2007). Public opinion about the project is therefore a central factor. An important lesson learned from several projects is that the public must be involved in the planning and design phase, as well as during and after implementation (Lindau et al., 2014).

Based on the above concepts and literature, case studies about what causes Stockholm and Copenhagen to invest in priority measures have been carried out. A case study approach was motivated by our interest to achieve a context sensitive understanding of knowledge and experience about working with bus priority measures in the two cities. According to Flyvbjerg, (2007) this approach to case studies is important to develop expertise regarding ongoing processes. The selection of the cases was partly motivated by the fact that they represent different institutional contexts including funding schemes for the municipalities’ investments in bus priority measures (see Table 1). In Stockholm, Region Stockholm funds public transport, while the City of Stockholm is responsible for the city’s road network. In Copenhagen the funding structure implies that the municipality has a direct economic incentive to invest

in priority measures. Measures that increase vehicle speed also lead to reductions in driving time, thereby reducing operating costs. If the measures simultaneously attract more passengers, then the revenues from public transport also increase. Thus, in Copenhagen where the municipality are responsible for paying (a share of the) operating costs they might have what we term direct economic incentives to invest in bus priority measures.

Additionally, both cities have high environmental ambitions and have for instance been European green capitals, (Stockholm in 2010 and Copenhagen in 2014). Generally, the cities are well known for their work with sustainability. And finally, while both cities have a substantial bus network, none of them have implemented "full" BRT systems.

Within the framework of the case studies, we have collected data on each municipality's organisational structure and investments in priority measures. Two qualitative interviews were also conducted in each case study of the regional public transport authorities and the municipality. In two interviews two people participated, and a total of six people were interviewed. While this is a limited number of interviews, all interviewees had a key role in working with bus priority measures in their respective city and organizations. A semi-structured interview guide with questions divided into different themes was used, and all interviews were conducted in person and recorded. The interviews were not transcribed verbatim. Instead each interview was summarized in 4 – 6 pages long texts. In addition to the interviews two workshops with participants from the public transport sector (including some interviewees) and academia were also carried out. In the first workshop the project reference group was consulted on the drafts of the literature study, the selection of cases, and the approach of the project. The reference group consisted of two representatives from a municipality, one representative from a regional Public Transport Authority, one representative from the Swedish Transport Administration, and an academic. None of the persons in the reference group represented organizations involved in the case studied. The second workshop also involved the reference group, and in addition some of the interviewees. Here, preliminary results of the project were presented and discussed. Finally, a draft version of a report in Swedish (Sørensen & Pettersson, 2018) was sent to all interviewees and they were asked to comment on the way the data from the interviews was used, and generally on the results and conclusions of the project. This process ensured that the results presented here have been thoroughly validated.

3. Findings of factors that promote and prevent bus priority measures

3.1 Core features of each city

	The City of Stockholm	**The City of Copenhagen**
Type of priority measures	New bus lanes, the introduction of rights of way for intersecting streets; a reduction in the number of bus stops; enhanced surveillance of public transport lanes to reduce the problem of illegally parked cars; a review of signal priority. Real-time arrival clocks	New bus lanes; the construction of bus platforms and renovation of bus terminals; signal priority (e.g., intelligent control of light signals); a reduction in the number of bus stops; the removal of parking spaces.
Approximate cost, and funding sources for investments	Completed: approx. 1.5 – 2.5 MEUR[3] funded by the City of Stockholm and Region Stockholm between 2012 and 2016. Planned (2017 – 2021): approx. 2 – 3 MEUR. Other measures with an estimated cost of over 10 MEUR have been identified, but lack funding.	The cost of the implemented measures amounts to more than 55 MEUR between 2010 and 2016. All major and expensive projects were partially funded by the Danish state.

[3] The exchange rate was calculated at 10 SEK= 1 € and 7,50 DKK=1 €

Public Transport Authority	Region Stockholm owns the Stockholm PTA, Stockholm Public Tarnsport (SL). SL contracts transport with private operators and plans, orders and monitors the transport, as well as maintaining and renewing the council's infrastructure.	The PTA (Movia) is owned by The Capital Region of Denmark and Region Zealand as well as 45 municipalities in these regions. Movia plans bus routes and timetables, and contracts transport with private bus operators.
Local level organizational structure	The Traffic Administration Office plays a key role in matters related to priority measures. Implementation of priority measures is largely handled by the Transport Planning Department.	The Finance Administration (governed by the city's Lord Mayor) has primary responsibility for priority measures. The Technical and Environmental Administration also plays an important role in the implementation of specific measures.
Funding structure for public transport	Public transport is funded through ticket revenues (approx. 50 %) and the county tax (approx. 50 %).	Movia is funded through ticket revenue and funding from the regions and municipalities (approx. 50 % each)

Table 1. Core features of each case city.

3.2 Case-study Stockholm

Goals and measures

A primary impetus for implementing priority measures in the city of Stockholm is that the municipal road network is congested, and this means that buses get stuck in traffic. The implementation of priority measures is a part of the City of Stockholm's Mobility Strategy. One goal of the Mobility Strategy is that by 2030, public transport shall account for 80 % of motorised trips during rush hours, (compared to 70 % in 2010), (Stockholm Stad, 2012). A concrete target for the trunk line buses is to increase the average speed from 14 km/hr to 20 km/hr. Since 2012, the City of Stockholm and Region Stockholm have developed joint action plans for the implementation of measures in the trunk bus line network. The purpose of the action plans, which were developed in two stages, is to identify measures that can be implemented in the short term.

Region Stockholm and the Swedish Transport Administration have also initiated a partnership between surrounding municipalities and operators. The partnership concerns the identification of measures to improve the priority of routes that traverse the major thoroughfares between the surrounding municipalities and the City of Stockholm. The process resulted in a list of measures, the implementation of which will cost hundreds of millions of Swedish kronor. However, at present the measures lack funding. The interviewee from the City of Stockholm mentions that in working with priority measures, they draw inspiration from what is going on in other cities in the world. They also endeavor to alter their objectives so that speed is not the only focus. According to the interviewee it is problematic to focus only on increased speed because there are other measures that are important to the attractiveness of the buses, e.g. avoiding "bus bunching.

Institutional frameworks

Planning and implementing bus priority measures in Stockholm is characterized by complexity. Various organisations are responsible, not only for different parts of the bus services, but also for the various areas of

responsibility for the implementation of priority measures. Despite the existence of action plans and other strategic documents, the interviewees from Region Stockholm believe that the planning lacks an integrated approach. The priority measures applied within Stockholm can make it possible to save on bus circulation. Under Stockholm's prevailing funding arrangements, this would entail an opportunity for increased profit for the transport operator. Yet, because the cost of implementing the measures and the potential savings to the operating economy accrue to different organisations, this type of direct economic incentive is not a strong driving force behind the implementation of priority measures. One interviewee considers it crucial that the measures create a public benefit by providing the travelers improved service, which ultimately could lead to more travellers and increased ticket revenue. Overall, the interviews suggest that a key driving force behind efforts to implement priority measures in Stockholm is a socio-economic perspective in which the benefits also involve aspects other than operating economy. However, this does not mean that operating economy does not play a role.

A general challenge in Stockholm has to do with the principles for funding of infrastructure measures. In the beginning of the 1980s, the City of Stockholm became infrastructure holder for important parts of the regional road network. The Swedish Transport Administration, which is a state agency, is infrastructure holder for important arterial roads in the surrounding municipalities and are therefore allowed to provide up to 100% of the funding for measures in those parts of the road network. However, when the road passes over the border of the municipality and the role of infrastructure holder passes to the City of Stockholm, 50% co-funding is required from the municipality. This problem thus specifically concerns how to come to an agreement with the Swedish Transport Administration and the surrounding municipalities regarding the funding of the major priority measures identified within the above-mentioned partnership.

State co-funding has not played any direct role in the priority investment made in the road network in Stockholm's inner city traversed by the trunk lines. The measures implemented and planned within in the action plans for trunk lines have been jointly financed by the City of Stockholm and Region Stockholm. However, the interviewee from the City of Stockholm believe that state funding still plays an indirect role. In the short term, they would have implemented the planned measures nonetheless, but in the longer term, state co-funding for other measures in the transport system means that there is more money to invest in bus priority measures.

Conflicts and consensus

According to the interviewee from the City of Stockholm, the collaboration developed through the various action plans for the trunk lines generally functions well. However, all the interviewees paint a picture of a fraught situation: There appear to be many quite difficult challenges involved in working with bus priority measures in Stockholm.

Restrictions with regard to available space in the streetscape mean that difficult decisions must be made about how to use the space. A typical street is 18 metres wide, while a road with room for all modes of transport (walking, cycling, public transport, cars), as well as the green space and trees called for under the principles and guidelines for the city's urban development and transport systems, would require a 45 m wide street. In the practical work of implementing priority measures, it is thus always necessary to prioritise a certain form of transport or other important aspects of the urban environment.

According to the three interviewees, conflicts exist between:
• Buses and bikes: A central issue is about the choice between prioritising bus lanes at the expense of bike lanes, or vice versa.
• Buses and cars: Key issues include signal priority for buses at crossroads, and/or the utilisation of lanes for buses.
• Road safety and a high level of service for buses: For reasons of road safety, some other measures are implemented which do not favour bus traffic, including the lowering of speed limits and physical measures in the street environment of certain roadways to ensure that vehicles hold to the speed limit. The interviewees described a situation in which different and opposing measures are carried out. For example, some ongoing projects simultaneously aim to both increase and slow traffic speeds in the city.
• Parking spaces, loading zones, and buses: A central issue relates to the need to create space for bus lanes by removing parking spaces and loading zones along bus routes.

Interviewees from Region Skåne stressed that the conflicts are not solely rooted in the question of space allotment for various modes of transport; they are also linked to issues of urban development, planning standards and legislation. In some projects, efforts have been made to move the parking and loading zones from main streets to side streets in order to promote priority along the bus thoroughfares, which causes other problems. For Region Stockholm, one of the ideas behind the trunk line buses is that just like track investments, these routes will function as stable and long-term planning elements. However, the interviewees from Region Stockholm found that municipalities and developers do not always share this view of the trunk lines.

When it comes to the problems related to funding, one concrete example is that there is 100 MSEK in proposed spending on priority measures in the regional transport infrastructure plan. The measures are physically located in the City of Stockholm (and in one other municipality), but the measures do not primarily benefit the residents of the City of Stockholm, but rather those living in other municipalities surrounding central Stockholm. The City of Stockholm is the infrastructure holder of the thoroughfare in question. According to general funding principles, the City of Stockholm must provide 100 MSEK of the total investment amount. Because the measures do not directly benefit the citizens of the municipality itself, interviewees from the City of Stockholm explained that the municipality finds it difficult to prioritise this investment. One of the interviewees from Region Stockholm confirms this description and argues that the problem of primarily looking at one's own municipality and being unwilling to implement measures that benefit the inhabitants of other municipalities is one that affects the work of implementing priority measures in many locations in greater Stockholm.

All three interviewees believe that there is a political consensus on the importance of priority measures, but at the same time, political support is contingent on the priority measures being implemented on a relatively small scale. According to Region Skåne interviewees, this limitation in the political commitment to priority measures is also reflected in some conflicts at the official level, and senior officials do not always fully dare to de-prioritise cars. Officials with responsibility for various issues also tend to focus on their own projects, because shortcomings in co-ordination and management make it difficult to see the whole picture and to think about all the connections between different means of transport.

Interviewees from the City of Stockholm also confirmed the existence of political support for bus priority measures: "Buses are not in the forefront of the political limelight – it's more fun to sign contracts for billion-krona investments in new tracks and underground expansions. But on the other hand, everyone likes buses, so it is easy to gain political support..." (Interviewee, City of Stockholm). However, attempts to eliminate stops on the trunk lines are one example of the limited nature of this political support. In this instance, the interviewees recount that this led to protests from the public, and the result has been that the proposals to reduce the number of bus stops have been scrapped.

3.3 Case-study Copenhagen

Goals and measures

There is no overall action plan for priority measures in Copenhagen; rather, the initiatives are ad hoc. However, the municipality has had a fixed budget for bus priority measures in place since 2007. Examples of major activities carried out or planned in recent years include: a BRT-inspired four kilometre thoroughfare in the centre of Copenhagen; measures around a station and on more thoroughfares; measures aimed at increasing priority for so-called "+ Way" buses; and planning of measures in connection with the opening of a new metro line in 2019, which will entail a radical adjustment of bus services (Københavns Kommune, 2017; Trafik- og Byggestyrelsen, 2016; ViaTrafik, 2016). City of Copenhagen's ambitious goal of achieving carbon neutrality by 2025 plays an important role in its implementation of priority measures. Moreover, the municipality's goal of achieving at least 1/3 bicycle,

1/3 public transport and a maximum of 1/3 automobile traffic also plays a role, since the modal shift of car traffic to, e.g., public transport is also a municipal objective. In this sense, Copenhagen is unique in relation to other municipalities in Movia's area of operation. Punctuality is also an important argument, but it has proved difficult to document the impact of priority measures on bus punctuality, because the general development of traffic and other projects can alter the effects.

The fact that many other cities around the world are implementing solutions and bus priority measures similar to BRT, inspires similar visions and actions in Copenhagen. However, it is clear from the interviews that a city like Copenhagen has many different commitments that it wishes to implement. Better priority for buses is therefore just one of many political objectives. Others include creating faster bicycle traffic, conserving parking places, creating more urban environments, precipitation conservation, and the preservation of trees along roadways. These objectives often conflict with each other when space is limited. Examples of concrete measures that promote priority for buses include bus lanes and a reduction in the number of bus stops. However, both of these measures can elicit great resistance. Less problematic measures include the re-designing of crossroads and signal priority.

Institutional frameworks

All respondents stress that direct economic incentives are the main incentive and the key driving force behind investments in priority measures. The way in which bus services in Denmark are financed are regarded as the "most important" issue. An interviewee from City of Copenhagen notes: "If we didn't have the incentive [...], it would be incredibly difficult to get anything through. Things that benefits many passengers are difficult to get through if they negatively affect a small number of them. But if there's a good business case – the fact that we can save some money it's important. We can invest here at the same time as we save on operating costs. That's absolutely crucial. Otherwise, we would say that we will take away parking spaces, bicycle paths and trees because we expect it will benefit a few passengers. That would still be positive, but much more difficult to implement." The funding structure for bus services means that several municipalities often finance the same bus line. The benefits of the priority measures implemented in a municipality can thus also result in benefits in other municipalities, but this may mean that the municipality making the investment does not enjoy the full benefit of having done so. If the development of the whole line is not coordinated between all municipalities, this can constitute an obstacle to the implementation of measures. State support, which may finance up to half of the investment for a bus priority measure, is crucial. Often the opportunity to apply for government funds inspires the initiation of planning for a specific priority project. This is also confirmed by the fact that all of the above-mentioned priority projects have received government co-funding.

In Metropolitan Copenhagen, the so-called "station proximity principal" applies. This means that functions that generate a great deal of passenger traffic (e.g., offices) must be placed near a station (Erhvervsstyrelsen, 2017). In this context, "stations" include only stations with rail traffic and not stops or junction points that are exclusively for bus traffic. There are ongoing discussions about changing this principle so that stations with BRT-like solutions will be included in the station proximity principle (Erhvervsministeriet, 2019; Nielsen et al., 2016).

In Copenhagen, the Finance Administration (under the leadership of the Lord Mayor) is in charge of the bus service and other public transport, while the Technical and Environmental Administration (under the leadership of the Technical and Environmental Mayor) is responsible for bicycle traffic. This makes it challenging to maintain a holistic perspective in the work.

Conflicts and consensus

The initiative to implement priority measures usually comes from Movia. Because many municipally financed bus lines operate in several municipalities, Movia seeks to engage all relevant municipalities in the individual project in question. The interviewees from City of Copenhagen stress that decision-making processes regarding priority measures can be very different. Sometimes projects are small and the process is relatively simple, but in other cases the processes are very complex, because many different aspects are included within the project on priority measures, e.g., bicycle projects and flood prevention. In the practical political reality, the situation is often such that priority measures are carried out in some places while the priority for buses is reduced elsewhere. The decisions are often

volatile, and previous decisions on priority measures may be changed or reconsidered. Among other things, this is because the implementation processes extend over a long time, which means that the same citizens and politicians who participated in making the decision do not necessarily participate in its subsequent implementation. From Movia's perspective, there are few bus routes where optimal measures have been taken. The process involves many compromises. As one of the interviewees from the city puts it: the closer a project comes to reality, the more the ambitions about priority are reduced, compared to Movia's original goals when it first proposed the project.

To improve priority, it is sometimes appropriate to eliminate bus stops. Yet, this can prove politically difficult, because citizens react negatively. In this context, dialogue with citizens is often difficult. While the city and Movia consider it important that the travel time of a bus is reduced by, e.g., 20 seconds per bus by removing a stop, it often seems to be incomprehensible to the individual citizen that such a limited improvement of bus travel time is prioritised over the fact that some people will have to walk longer distances to reach a bus stop. Eliminated stops elicit many queries from citizens to the politicians, which in turn means that politicians in the City Council pose questions to the administration and call for the decisions to be reviewed.

In City of Copenhagen, dialogue with citizens in connection with large projects is institutionalised. There are 12 local committees in the municipality, each of which has the right to consult and organise civic meetings regarding priority projects, especially in the case of larger projects. These committees are not an insignificant factor; a planned big BRT-inspired project was halted by protests from a local committee. One of the interviewees from City of Copenhagen, stressed that dialogue with citizens is important because it gives decisions democratic legitimacy. The manner in which one communicates can arouse opposition. For example, one of the city's consultants described a priority project as a "bus highway". The expression was intended to be positive, but contributed to the formation of local resistance.

Which political parties have a majority in the City Council or which mayor leads the individual administrations is not believed to play a major role in the implementation of priority measures. On the other hand, interviewees from Movia believe a certain conflict exists between the Technical and Environmental Administration, which is responsible for cycling, and the Finance Administration, which is responsible for public transport. Interviewees from City of Copenhagen emphasise that the Lord Mayor and the Finance Administration must take a holistic approach and not merely look after public transport interests.

When it comes to priority for buses, no strong political leadership exists. Politically, there is more focus on rail transport, such as metro lines and a new tramway set to be established within Greater Copenhagen. In general, priority measures for buses are not "big politics" in the municipalities. However, the City of Copenhagen interviewees point out that buses can be big politics. For example, this is true for the introduction of electric buses, which has become part of the environmental agenda. The priority measures that do not work, can also evolve into big politics.

4. Discussion

Compared to the literature on BRT including particularly Latin American and Asian experiences, significant differences can be found in the Scandinavian cases on implementation of bus priority measures. Most notably, the conflicts differ. The cases confirm the impression that the implementation of bus priority measures relating to the redistribution of space between various road users and requiring that space is claimed for bus infrastructure is difficult and often fraught with conflict. When it comes to conflicts related to the redistribution of space between various road users, the findings are somewhat in line with the experiences recounted in the literature, e.g., Nikitas & Karlsson (2015) and Muñoz & Paget-Seekins (2016), which argues that the crux of the problem lies in the reallocation of road space from motorists to bus passengers. However, the case interviews illustrated that other conflicts also affect the possibilities of implementing priority measures for buses in the studied cities. In part, these conflicts involve other road users than motorists, such as cyclists and pedestrians. Both case cities aim to increase cycling and walking. In concrete planning situations, this results in conflicts between priority measures for buses and measures to increase walking and cycling. The interviews indicated that conflicts may also arise between

officials who work with public transport and those who work primarily with other means of transport, such as cycling, car travel, walking, or more general urban development. Officials who work with different issues have different views of the problem,and hence divergent views about which types of solutions are justified.

The interviews further illustrated that a fundamental conflict has to do with the pursuit of generally reducing the speed of vehicle traffic in the city, while at the same time improving the speed of buses, which also received limited attention in the literature (Muñoz & Paget-Seekins, 2016; Nikitas & Karlsson, 2015). In both cases, conflicts between bus priority and urban qualities are discussed. It is difficult to work on speeding up bus service while protecting urban qualities. In both cases, examples were provided in which proposals to introduce "BRT-like" solutions met considerable resistance, both from the public and from politicians and some officials. In both cases, the interviewees stated that an important reason for this was that the measures had been presented in a way that highlighted large-scale infrastructure measures in order to ensure high and consistent speeds for buses. Those living in areas served by buses seldom consider faster buses as something positive, but rather as a threat to their quality of life. Concerns about increased noise and inadequate road safety along thoroughfares, as well as the elimination of stops, are issues that have engaged the public and impeded the implementation of priority measures. One aspect highlighted in Stockholm was that the high value of exploitable land in the cities impedes the implementation of bus priority measures that require a great deal of space. For example, representatives of Region Skåne argued that developers often see this type of measure (such as designated bus lanes) as negative, because it reduces the amount of exploitable surface area in the city. Summing up it seems, that while conflicts over reallocation of road space are mentioned in the literature and arise in our cases as well, the character of the conflicts in the two Scandinavian capitals seem to be broader and involving a more diverse set of stakeholders.

In the literature it is often found that political leadership and political champions are critical for resolving conflicts and facilitate implementation. However, when we look into the Scandinavian city cases this does not seem to be the case. In both cases efforts to implement priority measures are driven by civil servants and not primarily by politicians. This does not mean that politicians play no role, nor that the matter is apolitical. However, the responses from the interviews suggest that officials in public administrations have played important roles as initiators, which can be interpreted as a difference vis-à-vis the reviewed literature on BRT (e.g., Muñoz & Geschwinder, 2008; Lindau et al., 2014; Muñoz & Paget-Seekins, 2016; Wright & Hook, 2007). The results from our study suggest that the cities researched lack clear political champions, and no specific politicians are associated with the implementation. The difference might be explained by the difference in policy content: while in the literature reviewed, full-scale BRT systems are implemented, the bus priority measures implemented in Stockholm and Copenhagen are characterized by smaller changes to the existing system (though in some cases BRT inspired), but not genuine BRT schemes. Bus priority measures carried out in the case cities tend to take the form of incremental improvements. Drastic measures to implement full-scale BRT solutions might require clear political leadership if they were to be implemented in the case cities[4]. All in all, it seems that political leadership and political champions are not of importance in the case cities regarding implementation of bus priority measures, which might be explained by differences in the policy content: a full-scale BRT is something very different from small incremental changes in bus priority.

While political champions do not seem to be important in the Scandinavian case cities, our case studies add a another dimension that hitherto has not be dealt with in the literature, namely the role of funding and economic incentives for local authorities, which differ between the case cities in question. While the City of Copenhagen has direct economic incentives to implement priority measures, this is not the case in Stockholm. In Copenhagen the direct economic incentive constitutes an important driving force, thus the opportunity to recoup investments in priority measures in terms of improved operating economy and more passengers is by far the single most important factor for implementing bus priority measures. Also state co-funding is highlighted as playing a crucial role for investing in priority measures in Copenhagen, where the possibilities for state funding are emphasised as being of utmost importance. The City of Stockholm differed, since priority measures were funded either by the city itself, or

[4] When a trial of congestion charging in Stockholm was implemented in 2006, it has been discussed whether the then lord major, Annika Bilström, played a role as a political champion, see e.g. Sørensen et al., 2014.

together with Region Stockholm. It is clear that the costs of investments of priority measures in Copenhagen are significantly higher than those undertaken in Stockholm. One possible interpretation could be that the implementation of large and expensive priority measures is more likely when there is both a direct economic incentive and an opportunity to receive significant state funding for the implementation of priority measures. In Stockholm, the problem posed by funding structures of infrastructure projects was discussed as a difficulty in the implementation of measures that favour in-bound commuter busses from surrounding municipalities. The example of funding structures is highlighted as an explanation for why important measures for in-bound bus lines from adjacent municipalities are not implemented. The representative of the City of Stockholm explained that it was difficult to justify the co-funding of large investments that do not benefit the city's own local residents, but rather primarily favour residents of the surrounding municipalities. The city cases explained in this paper illustrate that funding structures are very important when discussion and analyzing bus priority measures. Though, under-researched in the literature, funding structures and -mechanisms constitutes a share of the institutional complexity which receives much attention in the literature (e.g. Lindau et al. 2014) since the complexity often hampers the implementation of priority measures.

As regards other kinds of the institutional complexity, the lessons from the cases in this paper are in line with the BRT literature reviewed. In both cities, responsibility for the planning and execution of various types of measures is divided amongst various organisations or between different departments within the same organisation. For example, in Copenhagen responsibility for the operation of public transport and infrastructure investments rests with different political boards that are controlled by politicians from various parties. In Stockholm, various partisan constellations exercise control at the regional and municipal level. Nevertheless, there are no major partisan divisions that greatly influence decisions on priority measures. However, administrative structures involving different organisations with separate budgets contribute to an institutional complexity that can complicate the work of implementing priority measures. These results are in line with, e.g., Lindau et al. (2014), who highlight institutional complexity as a hindering factor.

5. Conclusions

The purpose of this paper has been to investigate what causes the Swedish and Danish capitals to invest in bus priority measures in their road networks, thus the research question is: Which factors promote or prevent municipal investments in bus priority measures?

We conclude that in both cities, space is often limited, and there can be much resistance, implying that compromises need to be reached vis-à-vis other means of transport and other concerns. The introduction of bus priority measures is a rather incremental activity. Implementing of bus priority measures are usually not a big issue in policymaking and it is mostly initiated by officials rather than politicians. The division of responsibilities between different arms of the municipal organisation, and other institutional complexities following from the involvement of different organisations with varying mandates and responsibilities impose some difficulties. State funding favouring bus priority measures is mentioned as an important driver in Copenhagen, but it seems less important in Stockholm. When it comes to direct economic incentives, it appears that where direct economic incentives exist (as in Copenhagen) it has a crucial role. Large investments in bus priority measures are carried out, where direct economic incentives exist along with state funding, though, all other types of barriers and challenges when deciding and implementing bus priority measures remain and seem quite equal across the cases.

Implementation of bus priority measures in the studied Scandinavian capitals seem to deviate in significant ways compared to the implementation of BRT schemes. First, the implementation of bus priority measures in the case capitals is also fraught with conflicts, however – to some extent - with another content and with other types of stakeholders. In the cases, the conflict over reallocation of road space is not only with the motorists, it also includes pedestrians and cyclists. Second, it seems further clear that in the Scandinavian case cities the clash between urban qualities and faster public transport, is more significant than it seems to be in the reviewed BRT literature. Third, the cases further suggest that the role of clear political leadership and political champions seem not to be present and not to be of importance in the case cities, why this is stressed as vital in the literature. Fourth and finally, the role of

funding schemes and economic incentives seem to play an important role in the Scandinavian cases, though this is not an issue which receives much attention in the literature. Funding structures and mechanisms can contribute to the reflections in the literature on institutional complexity.

This paper comprises two cases of Scandinavian cities, which imply that generalisation of the results obviously can be questioned. The general difficulty of transferring policy from one city to another (Ison et al., 2011) further indicates that more case studies from Scandinavia (and Europe) are important to learn further lessons about implementation of bus priority measures. A problem in this respect is that implementation of bus priority measures seem to gather limited attention from transport researchers. This might be explained by the incremental, day-to-day character of the endeavours initiated and carried out mostly by public administration officers that characterise the efforts. Like the politicians, the transport researchers seem to consider implementation of bus priority measures as a rather boring activity, which cannot compete with research of big infrastructure projects.

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List of References

Erhvervsministeriet, 2019. *Forslag til Fingerplan 2019. Landsplandirektiv for hovedstadsområdets planlægning.* Copenhagen: Erhvervsministeriet, https://em.dk/media/12893/forslag-til-fingerplan.pdf, April 16, 2019.

Erhvervsstyrelsen, 2017. *Fingerplan 2017. Landsplandirektiv for hovedstadsområdet planlægning.* Downloadable from https://planinfo.erhvervsstyrelsen.dk/sites/default/files/media/fingerplan_2017_26072017.pdf, December 6, 2017.

Felipe, L.N. & Macário, R., 2013. Policy packaging into the BRT projects: A methodology for case study analysis, in *Research in Transportation Economics, Volume 48, 152–158.*

Finn, B., Heddebaut, O., Kerkhof, A., Rambaud, F., Sbert Lozano, O., Soulas, C., 2011. *Buses with high level of service – Fundamental characteristics and recommendations for decision-making and research. Results from 35 European cities.* Final report – COST action TU0603 (October 2007 – October 2011).

Flyvbjerg, B., 2007. Five misunderstandings about case-study research. In: Seale, C., Gobo, G., Gubrium, J.F., Silverman, D. (Eds.), *Qualitative Research Practice*. Sage, London and Thousand Oaks, CA.

Københanvs Kommune, 2017. *Effektiv kollektiv trafik.* Available at https://www.kk.dk/artikel/effektiv-kollektiv-trafik, December 5, 2017.

Ison, S., Marsden, G., May, A.D., 2011. Transferability of urban transport policy. Transport policy 18 (3), 489–491.

Lindau, L.A.; Hidalgo, D.; de Almeida Lobo, A., 2014. Barriers to planning and implementing Bus Rapid Transit systems, in *Research in Transportation Economics 48 (2014) 9–15.*

Muñoz, J.C. & Geschwinder, A., 2008. Transantiago: a tale of two cities. In *Research in Transportation Economics*

22 (2008) 45–53.

Munoz, J.C. & Paget-Seekins, L. (Eds.), 2016. *Restructuring public transport through Bus Rapid Transit – an international and interdisciplinary perspective*, Policy press, Bristol.

Nielsen, O.A.; Anderson, M.K., Ingvardson, J.B.; Andersen, J.L.E.; Christiansen, H.; Halldórsdóttir, K.; Wibrand, J., 2016. *Internationale og nationale erfaringer for effekten af forskellige typer højklasset kollektiv transport og tæthed til stationer og standsningssteder.* Downloadable from https://www.moviatrafik.dk/media/4590/moviarapport_final_05022016.pdf, December 6, 2017.

Nikitas, A. & Karlsson, M., 2015. "Worldwide State-of-the-Art Analysis for Bus Rapid Transit: Looking for the Success Formula", *Journal of Public Transportation*, Vol. 18, No. 1, 2015.

Reynolds, J., Currie, G., Rose, G., Cumming, A. ,2017. Moving beyond techno-rationalism: new models of transit priority implementation, *Australasian Transport Research Forum 2017 Proceedings 27 – 29 November 2017, Auckland, New Zealand*

Rizvi, A. & Sclar, E., 2014. Implementing bus rapid transit: A tale of two Indian cities, in *Research in Transportation Economics* 48 (2014) 194–204.

Sager, F., 2007. Making transportation policy work: polity, policy, politics and systematic review. *Policy & Politics*, vol. 35(2), pp. 269-288.

Stockholm Stad, 2012. *Mobility Strategy*. Ref no: T2008-310-02378.

Stead, D., 2016. Key research themes on governance and sustainable urban mobility. *International Journal of Sustainable Transportation*, 10(1), 40-48.

Sørensen, C.H., Pettersson, F, 2018. *Vad avgör om kommuner investerar i bussframkomlighetsåtgärder? Fallstudier av Stockholm, Karlstad och Köpenhamn*. K2 Working Papers 2018:2, http://www.k2centrum.se/sites/default/files/fields/field_uppladdad_rapport/vad_avgor_om_kommuner_investerar_i_bussframkomlighet.pdf, April 16, 2019

Sørensen, C.H., Isaksson, K., Macmillen, J., Åkerman, J., Kressler, F., 2014. Strategies to manage barriers in policy formation and implementation of road pricing packages. *Transportation Research Part A.*, 60, 40-52.

Trafik- og Byggestyrelsen, 2016. *Kommer der flere passagerer, når bussen kommer hurtigere frem? Evaluering af effekter fra projekter i Fremkommeligheds- og Passagerpuljen 2009-2013*. Copenhagen: Trafik og Byggestyrelsen. Downloadable from https://www.trafikstyrelsen.dk/~/media/Dokumenter/06%20Kollektiv%20trafik/06%20Buspuljer/Publikationer/Evaluering%20af%20effekter%20fra%20projekter%20i%20Fremkommeligheds-%20og%20Passagerpuljen%202009-2013.pdf, July 3, 2018.

Treib, O.; Bähr, H.; Falkner, G., 2007. "Modes of governance: Towards a conceptual clarification". *Journal of European Public Policy*, 14 (1), 1-20.

ViaTrafik., 2016. *The Danish Road Directorate. Vejregelgruppen kollektiv trafik på veje. Effektundersøgelse af busfremkommelighedsprojekter.* May be downloaded from https://www.moviatrafik.dk/media/4801/effektundersoegelse-af-busfremkommelighed.pdf.

Wright, L., Hook, W., 2007. Bus Rapid Transit Planning Guide. Downloadable from https://www.itdp.org/wp-content/uploads/2014/07/Bus-Rapid-Transit-Guide-Complete-Guide.pdf, July 3, 2018.