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Collaborative challenges and barriers when planning and implementing Bus Rapid Transit (BRT). Lessons from Swedish BRT projects

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ABSTRACT
The aim of this paper is to improve the knowledge of collaborative challenges when planning and implementing Bus Rapid Transit (BRT). Collaborative challenges are here understood as the barriers that may arise in BRT planning and implementation as a consequence of several formally independent actors, occasionally with different interests, participating in the planning. The results are based on an analysis of actor interactions in Swedish BRT projects. These projects are analysed in relation to the state of the art in the research field of collaborative approaches. The results show two main and interrelated collaborative challenges. The first category of challenges concerns difficulties for actors in creating a common understanding of what a BRT system is, the second category concerns details of bus priority measures, e.g. busways, priority at intersections, and how to handle and deal with conflicting interests when removing speed bumps or pedestrian and cycle crossings. In terms of policy is in the early stages of the planning processes. This can be generated by working practices and tools that facilitate agreements on how to handle different interests and trade-offs. BRT guidelines adapted to national transport policy, legal and organisational conditions could function as tools in assisting actor dialogue.

1. Introduction

High-quality bus systems, such as Bus Rapid Transit (BRT), or what in the European context is sometimes referred to as Buses With High Level of Service (BHLS),¹ are important for making better use of the road transport system’s existing capacity, enabling a modal shift from car trips to public transport, and thereby contributing to a more sustainable transport system (Levison et al., 2003, Finn et al., 2011). Since the 1990’s the concept of BRT has proliferated, with many examples of BRT systems in different parts of the world, with early successful implementations in South America (Nikitas and Karlsson, 2015). In Sweden, only a handful projects have been completed, while there

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are others currently in a planning phase. As such, planning and implementing BRT is a relatively new experience and evolves in a geographic, political and administrative setting, which is very different from the mega cities of South America and Asia that BRT research has often analysed. With this, planners and other decision makers working with BRT are presented with several new issues to deal with compared to the planning of conventional bus services.

A key challenge to deal with when planning and implementing BRT, regardless of different national legal and organisational conditions, is that it has no clear agreed-upon definition but is often described as a high-quality bus system with high capacity, separated lanes, signal prioritisation, and station-like stops (Deng & Nelson, 2011, Finn et al., 2011, Hidalgo & Gutiérrez, 2013, ITDP 2017, Nikitas and Karlsson, 2015). Exactly what this means in a specific national and local context is a matter of interpretation and as such typically a matter of negotiation between several involved actors when planning and implementing such systems. In order to make the concept of BRT more concrete, guidelines (ITDP, Institute for Transportation and Development Policy, 2017, Finn et al., 2011) and planning tools such as the BRT Standard (ITDP, Institute for Transportation and Development Policy, 2016) have been developed. These international guidelines and planning tools are, however, not directly transferable to a Swedish context characterised by, e.g. much smaller cities, a different governance context with well-established public transport systems governed by regional public transport authorities, and an organizational setting where private public transport operators compete to win contracts to operate services in either parts of, or an entire, urban area (see section 3 for a deeper description of Swedish governance conditions). In addition, in order to make improvements regarding right of way, signal priority and other measures to enhance the level of service for buses, as well as rebuild bus stops, Swedish municipals play a key role as the infrastructure owners, and being responsible for the formal land use planning processes necessary to alter urban space in order to implement BRT systems. Thus, planning and implementing BRT in a Swedish context requires collaboration between different, formally independent organisations that need to agree on what BRT is and how it should be implemented in the specific urban transport and land use context in question. Inspired by international BRT guidelines, such as ITDP, Institute for Transportation and Development Policy (2017) and Finn et al. (2011), an adapted version of guidelines for Swedish BRT has been developed (X2AB., Trafikverket., Energimyndigheten, 2015), which established two levels (yellow and green) defining basic characteristics of Swedish BRT systems regarding aspects such as urban design, infrastructure, vehicles and support systems, and service level. Additionally, Odbacke (2018) developed a BRT evaluation tool for Swedish BRT projects. These guidelines are, however, not very specific, and their role in actual decision-making is unknown.

In previous research, several barriers to the implementation of BRT have been identified, for example, technological barriers, including problems with infrastructure and maintenance (Angelia et al., 2017); institutional and legislative barriers (Yamili Chayacani Mallqui and Pojani, 2017); or weak and discontinued political leadership and too complex institutional set-up (Wu and Pojani, 2016). There are, additionally, a number of planning trade-offs between potentially conflicting interests that need to be handled when planning and implementing BRT systems, which can make planning difficult, e.g. the distance between stops, service level,
frequency, and use of road space for bus lanes (Finn, 2013, Lindau et al., 2014). How to handle the potentially controversial goals of redistribution of road space from motorists to bus passengers is another well-known challenge in BRT planning and implementation (Nikitas and Karlsson, 2015, Muñoz and Paget-Seekins, 2016). In cities with high sustainability ambitions, conflicts between measures to increase the priority of buses and measures to increase walking and cycling may arise (see Pettersson and Sørensen, 2020 for examples from Sweden and Denmark). Ambitions to implement BRT in order to improve the performance of buses (e.g. increasing capacity, frequency and operational speeds) can clash with efforts to reduce the speed of vehicular traffic in cities as a way to contribute to improving urban qualities (Pettersson and Sørensen, 2020).

Several of the potential barriers described in previous research arise as a consequence of several formally independent actors, or departments within an organisation, with different interests and roles, participating in the planning and implementation of BRT. Due to different roles and mandates, these actors may have different views on how trade-offs should be made, or how a BRT system should be designed. In this paper, we therefore refer to them as collaborative challenges. Previous research on BRT planning and implementation has highlighted the importance of coordinated decisions when planning and implementing BRT policy packages (Felipe & Macário, 2013), and the need for consensus, dialogue, communication, public participation, political leadership, and institutional design (Muñoz & Geschwinder, 2008). Similarly, Lindau et al. (2014), and Rizvi and Sclar (2014) identified the alignment of incentives, the institutional arrangements, and the coordination of multiple agencies as key factors influencing BRT planning and implementation. However, apart from Pettersson (2018), there are few studies focusing explicitly on collaborative challenges in BRT planning and implementation. In this article, Swedish BRT projects are used to analyze such challenges more deeply.

The aim of this paper is to improve the knowledge of collaborative challenges when planning and implementing BRT. The results are based on a comparative study of four Swedish BRT projects implemented 2014–2019 which we use to identify and analyse collaborative challenges. The expected contribution is knowledge of the collaboration challenges that may arise in BRT planning, here illustrated in a Swedish context.

Theoretically, the analysis is based on insights from previous public transport planning research, which has aimed to improve the understanding of actor interactions as this is a key issue in public transport planning and decision-making (see section 2). The framework used in this paper approaches collaboration as a step-wise process to overcome problems of collective action. According to this view, collaboration is about changing a situation where actors act independently into one where they adopt coordinated strategies to achieve shared objectives. The analytical framework thus has two dimensions: (a) the identification of the main collaborative challenges in planning and implementation processes, and (b) an interpretive analysis of actor interactions and relations in relation to the state of the art in the research field of collaborative approaches.
2. BRT implementation and conceptualisation of collaboration

2.1. Previous research on BRT planning and implementation

As already described, previous research shows the importance of coordinated decisions and dialogue between actors in BRT planning and implementation. Felipe and Macário (2013) studied why some BRT implementations are considered successful and others not. The authors argue that in order for BRT implementation to be successful, there is a need to consider several policy measures, often labeled ‘policy packages’ in addition to the development of the BRT project. These policy packages require coordinated decisions in several different areas, some of them being funding and financing, integration of the BRT within existing urban environment and public acceptance. In Muñoz and Geschwinder’s (2008) report on the implementation of the BRT system in Santiago, Chile, several of policy measures mentioned by Felipe and Macário (2013) were unsuccessfully implemented, most notably the fare collection system and the bus way infrastructure (Muñoz and Geschwinder, 2008). Several of the unsuccessful implementations of policy measures were attributed to a lack of political leadership and institutional design, highlighting the need for dialogue and collaboration between involved actors.

As previously mentioned, both Lindau et al. (2014) and Rizvi and Sclar (2014) highlight the coordination of multiple agencies as key factors to BRT implementation. Rizvi and Sclar (2014) argue for the need of timing as well as collaboration in the BRT implementation process. Without these there is a risk of missed opportunities to build momentum and support for a project. Lindau et al. (2014) argues similarly that a lack of alignment between stakeholders can cause prolonged planning and implementation processes, where a lot of the time and energy of stakeholders are spent negotiating rather than conceiving and designing projects. Similarly, Pettersson (2018) and (Pettersson, et al., 2018) found that using a small and closed group working with developing a regional BRT concept faced backlash and criticism when opened to larger groups of actors, indicating a need for collaboration and to have a transparent and open planning process.

An overview of previous research shows in summary that factors such as collaboration, coordinated decision-making, dialogue, consensus, etc. are important for BRT planning and implementation. How can one then understand such factors theoretically? To understand such factors, we turn to previous research on how to develop a functioning collaboration, mainly focusing on the field of public transport.

2.2. Conceptualising collaboration in BRT planning and implementation

Collaboration is a phenomenon that has been researched in several scientific disciplines using different theoretical approaches. In the field of public transport, collaboration has become a research theme that is used to understand the conditions for more coordinated actions in complex governance settings involving numerous public and private actors (see Hrelja et al., 2020 for an overview of public transport research). Collaboration has in previous public transport research, as already mentioned, been defined as an attempt to overcome problems with collective action, thereby transforming a situation in which the various organisations operate independently into one where they act in concert to achieve shared objectives. Fully
functioning collaboration has been described as a form of ‘co-action’ that results in a shared creation of values in the form of products and services (Hrelja et al., 2016). Transferred to the area of interest in this article, this would mean that a high-quality BRT system is successfully planned and implemented.

For it to be possible to achieve coordinated actions, previous research on public transport planning shows that the actors who collaborate need to create a common image, or vision, of what the collaboration is about, one that channels organisations’ actions in a joint direction, thereby making it possible for them to come to an agreement regarding how to act in relation to conflicts of interests (Paulsson et al., 2018, Pettersson and Hrelja, 2020). For the planning of a BRT system, with those characteristics associated with a high-quality bus system, such co-action ought to mean that actors succeed in creating a common understanding of what such a system looks like, which facilitates agreement on how to handle the potentially difficult trade-offs identified in previous BRT research, for example, prioritisation for buses, the distance between stops, service level, frequency, use of road space for bus lanes, etc.

Previous research, which is not only about public transport, also describes some important prerequisites that need to be in place for it to be possible to create both a common vision and agreements regarding how to act in relation to conflicts of interests. A situation where actors act in a coordinated manner is facilitated by joint rules and structures that govern the relationship and behaviour of the involved organisations (Conteh, 2013, Thomson and Perry, 2006). This highlights the importance of formally decided agreements, such as project directives and declarations of intent. However, there is also an important informal aspect concerning actor interactions, which includes a shared interpretation of formally decided agreements that develop successively in a dialogue between individuals (Pettersson and Hrelja 2020). For this to happen, previous research describes how the interaction between actors needs to have specific ‘qualities’ to identify common denominators on which collaboration can be based (Hrelja et al., 2016, Pettersson and Hrelja, 2020). Important qualities include a dialogue that is open and inclusive, used by actors to explore mutual benefits or handle conflicts of interest. Such conditions can result in a shared understanding of what should jointly be achieved through collaboration, and the necessary actions to reach this goal. This does not mean that the actors always agree. Instead, participating actors handle different interests in a constructive way that leads to coordinated actions in those situations where there is a functioning collaboration.

The interaction between actors in a functioning collaboration should, therefore, be seen as an evolutionary process developing over time through recurrent interaction between involved actors supporting BRT planning and implementation. Such processes thus develop gradually when the involved actors create a common vision and then agree on which measures to implement to achieve their objectives. A shared understanding presupposes a common problem formulation and a learning process that creates an understanding of the motivations and roles of other organisations and ways of handling conflicts of interests, for example, when there is a need to handle the planning trade-offs described in previous BRT research. However, handling these trade-offs is not easy, and different actors involved have different perspectives on BRT implementation.
We will use collaboration, thus defined, as an analytical framework in the analysis of the four Swedish BRT projects. Analytically, we will describe what the main collaborative challenges were in the cases and use the concept of collaboration to reflect on the conditions for BRT planning and implementation. We will also relate collaborative challenges identified in the Swedish context to collaborative challenges for BRT planning and implementation found in international studies as barriers to BRT implementation. Before that, however, we will first describe the method and sources.

3. Method and material

The results are based, as mentioned, on case studies of four Swedish BRT projects. Collaborative challenges and barriers that arise in BRT planning and implementation are influenced by the political, legislative and organizational context in which they arise. Their contextual nature makes it appropriate to use case study method to investigate them. In case study research the ambition is to understand a case in the sense of a functioning complex whole, which is studied in its context (Yin 2009). We have already described that Swedish BRT projects are planned in an organizational context that partly differs from BRT projects in other countries that previous research has analyzed. One can therefore expect that collaborative challenges may differ between countries. To which extent that is the case, we discuss this in the discussion and conclusion section.

3.1. The cases

The analysed BRT projects are located in the municipalities of Malmö (Malmöexpressen), Karlstad (Karlstadsstråket), Helsingborg (Helsingborgsexpressen), and Järfälla (Barkaby-stadens BRT). These projects were chosen since they have been planned and implemented in different geographical and urban settings (see Figure 1), ranging from BRT projects in mid-sized Swedish cities, such as Helsingborg, Järfälla and Karlstad, to larger cities like Malmö (according to Swedish standards). Järfälla is however a municipality within the Stockholm region, and as such part or the largest urban area in Sweden. Apart from the difference in population, the urban context also differs in that three of the projects, Karlstad, Helsingborg and Malmö, were implemented in the existing built environment while the BRT project in Järfälla (Barkarbystadens BRT) was implemented in a new urban development area, meaning that the project did not have to consider existing urban structures.

In general, there are three types of actors involved in BRT planning and implementation in the studied projects: municipalities, regional public transport authorities (RPTAs) and operators. As mentioned in the introduction, the municipalities are responsible for local land use and transport planning. In the context of BRT implementation, the municipalities are typically infrastructure owners, and have a key role in planning and implementing key measures in BRT systems, such as bus lanes, signal priority at intersections, or other forms of priority measures, including the placement of bus stops. The municipal level also has a responsibility for the planning of the local transport system, including infrastructure for biking, walking and cars, as well for urban planning and development on both detailed and strategic levels. The RPTA is typically responsible for planning and procuring public transport services and has considerable influence on
Figure 1. Map of cases: 1 Karlstadstråket. 2 Malmöexpressen. 3 Helsingborgsexpressen. 4 Barkarbystadens BRT.

Table 1. Presentation of cases.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Inhabitants 2022 (Statistics Sweden, 2022)</th>
<th>BRT Project</th>
<th>Involved actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karlstad</td>
<td>96466</td>
<td>Karlstadstråket</td>
<td>Karlstad municipality, Karlstad buss</td>
</tr>
<tr>
<td>Malmö</td>
<td>357377</td>
<td>Malmöexpressen</td>
<td>Malmö municipality, Skånetrafiken,(RPTA) Nobina</td>
</tr>
<tr>
<td>Helsingborg</td>
<td>150975</td>
<td>Helsingborgsexpressen</td>
<td>Helsingborg municipality, Skånetrafiken (RPTA)</td>
</tr>
<tr>
<td>Järfälla</td>
<td>85460</td>
<td>Barkarbystadens BRT</td>
<td>Järfälla municipality, Region Stockholm (RPTA), Nobina</td>
</tr>
</tbody>
</table>
Case: Karlstadstråket

Karlstad municipality
Responsibility:
Infrastructure
Urban plans

Karlstadbuss (RPTA)
Responsibility:
Public transport planning
Procuring operator

Way of communication

Figure 2. Roles and communication ways in Karlstadstråket.

Case: Helsingborgexpressen

Helsingborg municipality
Responsibility:
Infrastructure
Urban plans

Skånetrafiken (RPTA)
Responsibility:
Public transport planning
Procuring operator

Way of communication

Figure 3. Roles and communication ways in Helsingborgexpressen.

Case: Malmöexpressen

Malmö municipality
Responsibility:
Infrastructure
Urban plans

Skånetrafiken (RPTA)
Responsibility:
Public transport planning
Procuring operator

Joining in the implementation phase
Nobina (Operator)
Responsibility:
Operations

Way of communication

Figure 4. Roles and communication ways in Malmöexpressen.
suggesting routes, the capacity of vehicles, the design and type of vehicles, the frequency of departures, the operating hours, the system for fare collection, and fare structures. The operators bid for contracts in tendering processes, where the RPTAs in different parts of the country have different approaches regarding the degree of freedom the operator has to choose the design aspects of the service.

While the description above is generally valid for the governance context in Sweden, there are exceptions. Among the studied cases (presented in Table 1), Karlstadstråket is one exception, since at the time of the planning process studied, all planning and implementation was done ‘in-house’, by Karlstad municipality, where different departments within the municipality were responsible for planning the infrastructure and the tendering process when procuring an operator. See Figures 2–5 for the actors and communication process for the different cases.

Table 2. List of informants.

<table>
<thead>
<tr>
<th>Informant</th>
<th>Organisation</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM</td>
<td>Karlstad Municipality</td>
<td>Karlstadstråket</td>
</tr>
<tr>
<td>KB</td>
<td>Karlstad Buss (Public Transport Division within Karlstad Municipality)</td>
<td>Karlstadstråket</td>
</tr>
<tr>
<td>MM</td>
<td>Malmö municipality</td>
<td>Malmöexpressen</td>
</tr>
<tr>
<td>SKT1</td>
<td>Skånetrafiken (RPTA)</td>
<td>Malmöexpressen</td>
</tr>
<tr>
<td>SKT2</td>
<td>Skånetrafiken (RPTA)</td>
<td>Malmöexpressen</td>
</tr>
<tr>
<td>SKT3</td>
<td>Skånetrafiken (RPTA)</td>
<td>Helsingborgsexpressen</td>
</tr>
<tr>
<td>SKT4</td>
<td>Skånetrafiken (RPTA)</td>
<td>Helsingborgsexpressen</td>
</tr>
<tr>
<td>HM</td>
<td>Helsingborg municipality</td>
<td>Helsingborgsexpressen</td>
</tr>
<tr>
<td>JM</td>
<td>Järfalla municipality</td>
<td>Barkarbystadens BRT</td>
</tr>
<tr>
<td>SL1</td>
<td>Region Stockholm (RPTA)</td>
<td>Barkarbystadens BRT</td>
</tr>
<tr>
<td>SL2</td>
<td>Region Stockholm (RPTA)</td>
<td>Barkarbystadens BRT</td>
</tr>
<tr>
<td>N</td>
<td>Nobina</td>
<td>Barkarbystadens BRT</td>
</tr>
</tbody>
</table>
3.2. Interviews and documents

The main choice of method has been interviews with twelve officers representing the involved municipalities, regional transport authorities, or operators (see Table 2). The informants all had central roles in the studied projects. They worked as project managers, traffic planners or product developers. The interviews followed a semi-structured model with open ended questions that allowed room for follow-up questions regarding topics and issues that arose during the interviews (Merriam & Tisdell, 2015). The interview guide comprised questions divided into three different themes: the background of the project, the organisational structure of the project and questions concerning actor interactions. The interviews lasted around one hour each and were transcribed and analysed with Nvivo. All citations in the results section of this paper have been translated by the authors from Swedish to English. Any ambiguities about how to interpret information from the interviews have been double checked with the respective informant via e-mail in order to make sure that the interpretation of the interviews is in line with their experiences and descriptions of the planning and implementation processes. Additionally, we have analysed planning documents, such the declarations of intent and agreements for each project.

When analysing data, our ambition has been to identify the circumstances that have resulted in collaborative challenges in the projects by mapping different themes, here understood as recurrent regularities in the material (Ryan and Russel Bernard, 2003). Through the interviews, we have identified different actors’ perspectives and experiences of the planning processes. The declarations of intent and agreements are used in the results section, in combination with the interviews, to illustrate how different design aspects of a BRT system became the subject of discussions between actors illustrating different standpoints and perspectives about the ‘proper’ design of the BRT systems. The resulting conclusions are context dependent and are, as such, as in all qualitative research, not statistically generalisable. The analyses of the projects should be seen as illustrative examples of BRT planning and implementation, which in combination with theoretical reasoning in relation to previous research contribute to the theoretical discussion about collaborative challenges and the role of collaborative approaches in BRT planning and implementation by so-called analytical generalisations (Yin, 2009).

4. Results

There are two clear and recurring themes among the informant’s descriptions of collaborative challenges that arose during the projects’ planning and implementation phases. These will be described in the following sections. The first theme relates to what has been described in previous research on collaboration as the important task of achieving a common understanding of what the collaboration is about, in this case what a BRT system is. The second theme presented in this section relates to different bus priority measures, illustrating discussions about how to handle potentially difficult trade-offs.
4.1. Different understandings of what a BRT system is

In all the cases there was a lack of agreement on what BRT is. In ‘theory’, BRT is a concept with clear characteristics compared to traditional bus services, but the concrete content and design of BRT was negotiated between actors. The involved actors succeeded, to varying degrees, in reaching a common understanding about what a BRT system is and how it should be designed, but different interpretations of what BRT actually is made it difficult and delayed the planning of all projects.

In the case of Helsingborgsexpressen, the differences in understanding what a BRT system is were already shown in connection with the drafting of the declaration of intent (Helsingborg municipality and Region of Skåne, 2015). The declaration of intent aimed to specify the responsibilities of each actor and detail the service design and technical solutions of the upgraded bus service. However, formulating the declaration of intent was challenging, as it proved difficult for the involved actors to agree on the ambition of the project. An informant from the RPTA said that they wanted to include many infrastructure measures, such as separated busways, a reduction of speed bumps and uninterrupted priority at intersections, in the declaration of intent to ensure that they created a system that met the requirements that should be placed on a BRT system (informant, SKT3). According to the informant from the RPTA, their emphasis on including infrastructure measures in the agreement was rooted in a lack of trust regarding the municipality’s commitment to the public transport infrastructure measures necessary for achieving a system with a sufficiently high standard (informant, SKT3). The informant from the RPTA perceived that the municipality was reluctant to promise too much in relation to infrastructure measures, as these would prove difficult to implement, whereas the RPTA was afraid that the level of ambition proposed by the municipality would compromise the right of way for buses and thereby result in a poor-quality service. Because of the fear of producing a watered-down BRT design, the RPTA wanted to add more and more measures, causing a rapid growth of the declaration of intent. Nearly every measure that was added to the document was first questioned by the municipality, according to the informant from the RPTA (informant, SKT3).

According to the municipality, their reluctance was rooted in a fear of promising to implement measures that would later be impossible to fulfil, as they cannot just consider public transport perspectives, but also need to consider others’ interest (such as other transport modes or the prospect of political approval) or legal requirements (informant HM). One example of how this influenced the actions of the municipality was, according to informant HM, that the municipality was reluctant to add detailed specification to the declaration of intent regarding the reduction of roadside parking on some parts of the route. This was because there are many technical and legal considerations the municipality would have to consider concerning, e.g. accessibility to public buildings, which influenced the possibility of reducing roadside parking in some places. Such clashes between legally mandated design criteria, and the ambitions to improve the quality of the bus services to a BRT standard, were difficult to solve and made the writing of the declaration of intent very challenging.

In order to come to an agreement on what to include in the declaration of intent, the RPTA and the municipality agreed to refer to the Swedish BRT guidelines (X2AB et al.,
which specifies the different levels of ambition characterising a BRT system, instead of specifying all the technical details in the declaration of intent (informant SKT3). In the finished declaration of intent (Helsingborg municipality and Region of Skåne, 2015), the actors agreed to aim for a green level of BRT development, which is the highest level of ambition. It in turn defines a number of the system’s characteristics regarding urban design, infrastructure, vehicles and support systems, including the service level. In the agreement, it is also stated that the parties could accept a yellow level system, which is a lower level of ambition according to the guidelines. While this meant that the challenges of agreeing on specific technical details was pushed forward, although they needed to be dealt with later in the planning and implementation process, the signing of the declaration of intent was an important step in the process as it made it possible to continue to plan the system (informant SKT3).

Similar problems about agreeing on what a BRT system is arose in the planning and implementation of the BRT project in Barkarbystaden. In this project, an extensive discussion arose about what colour the buses should be. While this issue may at first seem trite, the colour is an important part of a BRT system’s ‘identity’ and signals a critical difference in actor perspectives concerning whether the BRT buses should be considered a separate service from the existing trunk bus network within the regional public transport system in Stockholm. The trunk bus lines are branded as Blue Bus Line, which is the RPTAs (SLs) name for its trunk bus network. The lines are served by buses in blue, hence the name, distinguishing this part of the network (which is characterised by a higher level of service) from the ordinary bus network, operated with red buses. Järfälla municipality and the operator, Nobina, wanted the introduction of the new BRT route to be separated from the existing trunk bus network and for the design features, such as the colour of the buses on the BRT route, to indicate this separation (informants JM and N). However, according to the operator Nobina, the RPTA was clear that they did not want an additional bus concept in the region other than the blue and red colours they already had (informant N).

An informant from the RPTA stated that they did not consider the BRT buses to be separate from the trunk line network, and therefore they saw no need for additional marketing or a separate colour for the BRT service. One informant from the RPTA described how: ‘[we at the RPTA] . . . has said that this is no BRT, it is express bus route 175, under the working title BRT’. (informant SL2). Also, in the case of Karlstadstråket, the interviews illustrate how actors had difficulties agreeing on what a BRT system is compared to conventional bus services. This is in the Karlstadstråket project illustrated by the placement of a bus stop within a housing area called Rud surrounded by a ring road. When planning for the new BRT route, the municipal department responsible for public transport, Karlstadbuss, wanted to place the route centrally within the area, constructing a new road for buses to reduce resident’ walking distance to public transport, making it the clear public transport option in the area. However, the idea was rejected in the end, resulting in a bus stop for the BRT route on the eastern side of the residential area and a conventional bus service at the western side of the area, forcing the residents to walk longer distance to the BRT bus stop. An informant from the municipality stated that the plans for constructing a route and a bus stop centrally in the area Rud was abandoned as it was seen as too controversial for municipal officers representing other policy areas (informant KB). The benefits from having a centrally placed bus route and bus stop were not considered as outweighing the sensitive subject of reducing green
spaces, despite the goal of the BRT project being to make public transport a structuring factor for the built environment (informant KM). An informant from Karlstadsbuss made the following reflection regarding this decision:

\[...\) both in terms of the attractiveness for public transport and financially we would benefit from having a centrally placed bus stop. Now we have to operate on both sides of the residential area since the implementation of the BRT route does not take away the need to service the other side (of the area). (informant KB)

### 4.2. Different views on priority measures

An important aspect that separates BRT systems from other traditional bus systems is a high degree of right of way, achieved by implementing bus priority measures such as traffic signal prioritisation, separated bus lanes, the removal of speed bumps and pedestrian crossings, etc. The second recurring collaborative challenge concerns such bus priority measures. The actors in all projects ended up in negotiations that risked watering down the special features of BRT systems compared to traditional bus systems due to different interests and interpretations of already made agreements, or a lack of clarity in already made agreements.

In the Malmöxpressen project, the municipality was according to the declaration of intent responsible for conducting bus priority measures (Malmö municipality and Region of Skåne, 2011). Exactly which measures, other than bus priority at traffic signals, were not explicitly stated, since other priority measures mentioned in the declaration of intent were only to be viewed as suggestions to be investigated according to the municipality (informant MM). This resulted in a discussion of how to make trade-offs between the goals of the BRT project and other municipal transport policy goals. More specifically, this discussion came to focus on how to deal with speed bumps and pedestrian crossings in the route of the planned BRT service. Speed bumps in the proposed route were viewed as problematic from the perspective of the RPTA since it limited the possibility to speed up buses while also negatively influencing the on-board comfort of passengers. The involved actors made different interpretations of what was written in the declaration of intent. In the declaration of intent, there is a section concerning speed bumps, stating:

Skånetrafiken [RPTA] investigates the possibilities to use ISA [Intelligent Speed Adaption] to limit the speed to 30 km/h, for the ‘Superbuss’, in areas with speed bumps. If this [solution] fulfills the criteria of ‘The Road Department’[at Malmö municipality], existing speedbumps in the prioritized bus lane will be removed and replaced with ISA. (Malmö municipality and Region of Skåne, 2011, p. 2)

A second solution would be that Malmö municipality reconstruct the existing speed bumps from a 7% slope to 4%, if ‘the Road Department’ criteria cannot be fulfilled” (Malmö municipality and Region of Skåne, 2011, p. 2). Informant (MM) from Malmö municipality explained during an interview that he believed that the RPTA (Skånetrafiken) interpreted the passage in the declaration of intent as meaning that all speed bumps should be removed along the whole route. However, from the perspective of Malmö municipality, the interpretation was that no new speed bumps should be added
anywhere along the route, and those already existing should be adapted to allow for a smoother ride for buses (informant MM). A key point of contention in the discussions was whether the ISA solution used on the buses met the municipality’s criteria as defined in the declaration of intent (and referred to in the quotation above).

Once the process of procuring an operator for the service was completed, a new actor, the operator Nobina, became involved in the planning. It again became obvious that the actors made different interpretations of what was agreed upon, this time regarding pedestrian crossings. The operator interpreted the declaration of intent to mean that all pedestrian crossings, along the route, should be removed (informant SK2). However, Malmö municipality interpreted it as meaning that no new pedestrian crossings should be added (informant MM). This led to new negotiations about priority measures between the municipality, the RPTA and the operator that delayed the completion of the project.

In the planning of Karlstadstråket, the actors disagreed on how to handle pedestrian crossings and speedbumps. The informant from Karlstad municipality described that the idea to have a fairly high average speed for the bus along the route clashed with traffic safety considerations, where a lower speed was desired, for example, at pedestrian crossings (informant, KM). The municipality and the RPTA worked to reduce the number of pedestrian crossings along the BRT route; however, in the end, the municipality replaced the removed crossings with new ones, since the municipality saw a need to facilitate safer crossings for pedestrians (informant KM). The informant from Karlstad municipality said that handling these different perspectives is difficult, as they want to prioritise public transport and follow principles of BRT; nevertheless, at the same time, they have to relate this to the politically decided traffic strategy (Karlstad municipality, 2014) that prioritises walking and cycling over public transport (informant KM).

Also, in the case of Helsingborgsexpressen, the informants described how they had problems agreeing on priority measures. This included controversies about the placement of busways and the choice of whether to place them centrally in the street. Right of way in the central parts of the city was a key point of contention. Initial proposals for median aligned busways through the city centre were re-designed into curb aligned busways. The reason for this decision was, according to an informant from the municipality, that the politicians viewed the negative effects for car drivers as unacceptable (informant HM). This decision reduced the level of service for buses, arguably on the sections of the route where right of way and priority is most needed.

In Järfälla, in the case of Barkarbystadens BRT, the informants also highlighted challenges related to priority measures, despite the project being implemented in an urban development area that did not have much other infrastructure built before the start of the planning of the project. For example, the informant from the RPTA described that there were discussions on how to prioritise between the BRT service, and other bus services at intersections (informant SL1). Giving the BRT a high level of priority would lower the level of service for other bus routes in the area. This illustrates how BRT planning needs to handle not only priority between modes of transport, but also priority within the same mode, i.e. between different bus routes.
## Collaborative challenges

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<td><strong>Route alignment</strong></td>
<td><strong>Placement and length of busways</strong></td>
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<td>Actors experience collaborative challenges when deciding the direction of the route, as well as the distance between bus stops.</td>
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<td><strong>Writing and interpreting declarations of intent</strong></td>
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<td>The actors experience collaborative challenges when writing or interpreting the declaration of intent, different actors have different goals and objectives for the project.</td>
<td>The actors experience collaborative challenges when dealing with speed bumps and pedestrian crossings since these objects prioritize pedestrians over the BRT buses.</td>
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<td><strong>Identity and colour on buses</strong></td>
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<td>The actors do not agree on the need to highlight the difference between BRT buses and conventional urban buses by colour.</td>
<td>The actors experience issues providing BRT buses priority over other modes of transport at crossings.</td>
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*Figure 6. Collaborative challenges found in the studied cases.*

## 5. Discussion and conclusions

The aim of this paper was to improve the knowledge of collaborative challenges when planning and implementing BRT. The results from the case studies highlighted the importance of two interrelated categories of collaborative challenges (*Figure 6*). The first category of challenges concerned difficulties for actors in agreeing on *what a BRT system is*, that is, creating a common understanding of what such a system looks like, as it differs compared to conventional bus services, which may facilitate agreements on how to handle differences in interests and potentially difficult trade-offs. The lack of shared agreement on what BRT is led to difficulties when writing and interpreting declarations of intent, deciding on the colour of buses and the identity of the BRT system, and has led to issues concerning route alignment. These examples illustrate how negotiations between actors with different interests and different perceptions of what the distinctive features of BRT are compared to conventional bus services slowed planning and implementation down.

In a collaboration that works well, the actors manage to handle conflicts of interest and decide about necessary actions through an interplay between the formal and informal dimensions of collaborative processes. The difficulties that arose at the very beginning of the planning when deciding on declarations of intent, and the problems this resulted in later planning stages, illustrate the importance of formal dimensions of collaborative processes. Without formally decided planning guidance that ensured that difficult issues were raised and handled early in the planning process, it became harder to reach agreements on how the BRT systems should be designed in later planning stages. This brings us to the next category of challenges.
The second category of challenges concerned more specific details when planning for the design and implementation of bus priority measures. These include the placements of busways, priority at intersections, and how to handle conflicting interests when removing speed bumps or pedestrian and cycle crossings in the BRT routes to increase commercial speed and comfort for bus passengers, while maintaining a high level of accessibility for other transport system users including pedestrians, cyclists and car drivers. This second category of challenges was found in all the cases. The results also show that while some challenges on a detailed, specific level were unique to a certain case, a similarity was that problems in managing priority measures arose because key actors had different interests and different understandings of what BRT is, as well as how such systems should be designed. The difficulties in agreeing on priority measures also highlight the importance of informal aspects concerning actor interactions, here understood as a shared understanding of BRT as a system and how a shared interpretation of the projects developed successively as a result of dialogue and discussions between individuals representing different organizations. For example, when new actors joined the planning, new problems about priority measures arose, which highlight the need for all important actors to be involved at the beginning of planning processes.

The identified collaborative challenges for BRT planning and implementation in the Swedish case studies adds to the international literature on barriers to BRT planning and implementation (see section 1 and 2). It is not certain that challenges found in the Swedish case studies will be found in other countries, and vice versa. Comparing the results of this study with previous research illustrate that barriers are contextual, and how the transport policy, organisational and legislative context of which BRT projects are a part, results in different barriers. For example, financial and technological barriers (e.g. the requirement of GPS-driven control systems) reported in previous research about Indonesian BRT projects (see; Angelia et al., 2017) were not prevalent in the Swedish projects. Neither has this research found reports barriers caused by too weak political leadership or too complex institutional set-up as found in the case of the BRT in Bangkok, Thailand (Wu and Pojani, 2016). Another contrast between the Swedish case studies of BRT planning compared to the international literature concern the specific identify of a BRT system and design features such as a separate colour scheme for the BRT buses, which is highlighted as important in international BRT planning guidelines and tools (ITDP, 2017, 2016), and research literature (see; Bitterman & Hess, 2008, Levison et al., 2003). The results from our cases highlight that in the Swedish context of rather powerful RPTA’s, that already have well-established public transport system brands for different services, the issue of unique designs and identity may have to be treated differently. The Swedish BRT cases show clearly that BRT is not considered a separate public transport system, but rather part of an existing system. Instead, the result from our study identifies collaborative challenges in generating a common understanding of the BRT concept and shared project goals. A result of these collaborative challenges is difficulties in handling potential trade-offs, most notable between bus priority measures and other modes of transport. The found collaboration challenges highlight the need to consider the local context when planning and implementing BRT projects, particularly to be able to handle conflicts between modes.

The question about how BRT systems should be designed, and how to handle diverging views of how to implement key aspects of the concept, should be seen
as a potential key barrier of general importance to implementing BRT regardless of the different national legal and organisational conditions (Finn, 2013; Lindau et al., 2014). In terms of policy recommendations, then, the results suggest a need for actors in BRT projects to focus on developing a common understanding of what a BRT system looks like in the early stages of planning processes. A common understanding can be built by working practices and tools that facilitate agreements on how to handle different interests and trade-offs. BRT planning tools (e.g. benchmarking approaches, score cards, or similar approaches) adapted to national transport policy, and legal and organisational conditions, could function as such tools that assist actor dialogue and negotiations. In a Swedish context, this points to the need to adapt the existing international BRT planning tools to Swedish conditions to facilitate dialogue between actors on issues such as separated busways, and the design of bus stops and buses, in order to signal that the standard of the route has increased. Context adapted BRT planning tools do not guarantee success, but they can help actors handle likely conflicts of interests when dealing with ‘larger issues’, such as agreeing on how to design BRT on a system level, to ‘smaller issues’ about priority measures including the placing of pedestrian- or cycle crossings and speed bumps.

Notes

1. We will use the abbreviation BRT throughout the rest of the paper as a term denoting both BRT and BHLS.
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