

# **A Study Of Partnerships In The Sustainable Last Mile**

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## **ABSTRACT**

Cities are growing everywhere. With this growth comes the challenge of supplying the cities and its citizens. This supply of cities brings several negative effects to its citizens, such as air pollution and negative health effects. To divert negative effects and further nuisance, solutions need to be found. One such solution is setting up a Sustainable City Logistics Hub. Through these hubs goods traveling into the city are bundled and consolidated. This research aims to find out what roles need to be fulfilled through partnerships to make such a hub successful. Several potential partners were interviewed to find their views on partnerships in Sustainable City Logistics Hubs. The results show that four categories of partnerships are needed, namely: equipment, consolidation, government, and set up partners. Besides these categories of needed partnerships, the results also showed different challenges the interviewees faced while partnering in Sustainable City Logistics Hubs.

## INTRODUCTION

Cities all over the world are growing. Amsterdam, the capital of the Netherlands, is no exception. People predict the population of the city will rise above 1 million by 2050 (Municipality of Amsterdam, 2021). With the growing population comes the challenge of supplying the city. Currently, more than 99% of city logistics uses traditional non-electric, polluting, vehicles (ACEA, 2017). With the rising population, the number of polluting vehicles in the city will increase as well. This is due, for instance, to the fact that shops need to provide the citizens of Amsterdam with food and other products, so they need to be supplied. In other words, demand for products will grow with the city's population. The increasing amount of trucks in the city will also increase negative effects for its citizens.

Delivering goods in the city with trucks causes air pollution and other negative effects. A major source of air pollution is motorized vehicles (Brunekreef, Janssen, de Hartog, Harssema, Knape, & van Vliet, 1997). Thus, distribution by trucks plays a part in this large source of air pollution. Also, logistics in urban areas is the most polluting, costly, and inefficient part of the whole supply chain (Gevaers, Van de Voorde, & Vanelslander, 2010). This is due for instance to congestion (Russo, & Comi, 2010), causing unnecessary starting and stopping leading to wasted time and fuel, and inefficient loading (Bosona, 2020), leading to more traffic in the city than needed.

As stated before, trucks in cities cause negative effects, one of them is the negative effect on citizens' health. For instance, air pollution can cause "acute and chronic effects on human health" (Kampa, & Castanas, 2008: 362). Depending on the "concentration and length of exposure" (Kampa, & Castanas, 2008: 365) air pollution can cause health effects ranging "from nausea and difficulty in breathing or skin irritation, to cancer" (2008: 364). Aside from health effects, air pollution has negative effects on the environment (Stern, 1977). Grimm et

al. find that “cities are point sources of  $CO_2$  and other greenhouse gasses, which affect Earth’s climate” (2008: 757). Relating this to the boundaries of the earth system (Steffen et al., 2015), it shows that it is of high importance to decrease the air pollution to not cross our planetary boundaries and keep the cities, and with that our planet, in its liveable state.  $CO_2$  (carbon dioxide) and  $NO_x$  (nitrogen oxide) are just two of the gasses trucks emit (Dreher, & Harley, 1998). According to Steffen et al. (2015), climate change, measured by  $CO_2$  emissions and the level of  $NO_x$  are both at levels that can potentially destabilize our liveable environment.

Traditional city logistics uses fuel-based vehicles and considers each movement into the city individually. Castillo, Bell, Rose, and Rodrigues (2018) mention that in traditional city logistics companies have their own fleet of vehicles dedicated to their own product. This may lead to more unnecessary traffic and thus congestion and stationary vehicles.

Action is needed to ensure the health of citizens and the environment and to keep city logistics possible at an efficient level. The municipality of Amsterdam is limiting the amount of polluting trucks to eventually allow only zero-emission vehicles into the city. Their goal is to only allow zero-emission trucks in certain parts of the city by 2025 (Municipality of Amsterdam, 2020). These regulations will create the necessity to find sustainable alternatives. This necessity not only applies to sustainability-minded people but also to everyone else since everyone has to adhere to this new regulation.

In 2010 the municipality created a plan of action towards “smart and clean city distribution” (Sinnema, & van ’t Hull, 2010). This plan of action, states that through bundling goods a better flow of traffic, less noise, and a safer and cleaner city is achieved (Sinnema, & van ’t Hull, 2010). Bundling goods means consolidating the goods that move into the city. Through this trucks are filled as efficiently as possible so that no redundant trucks drive into the city. This will, when executed correctly, lead to fewer vehicles in the city, and hence fewer emissions. Fitting to this, Crainic, Ricciardi, and Storchi find that considering each

movement into the city as “components of an integrated logistics system” (2009: 433), instead of individually is fundamental to concepts of consolidation.

To achieve the municipality’s goal of bundling, the use of a Sustainable City Logistics Hub (from here SCLH) (Jamshidi, Jamshidi, Ait-Kadi, & Ramudhin, 2019), where products are gathered and consolidated, is needed. From this hub, products and goods will be transported into the city using zero-emission vehicles, making this ‘last mile’ of logistics less polluting and more efficient. The idea of consolidating (Crainic et al., 2009) and bundling of goods (Sinnema, & van ‘t Hull, 2010) fits perfectly with the idea of creating an SCLH. The goal of the municipality of Amsterdam to achieve a city with cleaner air can thus be achieved by deploying these SCLHs.

To succeed at all the different facets of setting up such an SCLH, different tasks have to be fulfilled. We need to for instance think about who will take care of the building process and who will coordinate the hub once it is finished and is fully being used. This is where we find a gap in the literature. The ‘what’ of an SCLH is known to us (Jamshidi et al., 2019); however, on the ‘how’ and ‘who’ aspects of such a hub, virtually no research has been done.

This research aims to fill this gap in the literature and offer a starting point to actors wanting to set up such a hub. Specifically researching the sustainability aspect of City Logistics Hubs is something that virtually has not been done so far. Solving problems is best done through partnerships with agencies that are specialized in the problem area (Onojaefe, & Leaning, 2007), which is sustainability here. Consolidating products with other businesses’ products is at the core of City Logistics Hubs. Since sustainability challenges often cross many jurisdictional boundaries partnerships are useful. By building on the capabilities of multiple partners these challenges can be overcome (Albani, & Henderson, 2014). In general for logistics, Duffy and Fearn (2004) found that, when equally powerful, partnerships could help the involved firms improve their performance. Next, with this understanding of

partnerships, unnecessary confusion can be avoided and the field progresses in its completeness. Besides, this knowledge is useful for other cities or organizations wanting to create SCLHs. The added knowledge may increase the confidence to engage in the process and start-up of this concept. Lastly, as the concept gains more attention, the knowledge may even stimulate others to start up SCLHs.

This research will take on the following research question: *What partnerships need to be fulfilled when setting up a Sustainable City Logistics Hub?* To achieve an answer to this question a qualitative case study will be conducted during the start-up phase of an SCLH just outside of Amsterdam. Even though this question is quite descriptive, during the research I will be open to analyzing complexities that occur during the interviews.

The remainder of this paper will be structured as follows. First, a theoretical background will be presented that elaborates on key aspects of this research. Next, the methods section will elaborate on how this case study was conducted. Third, the results from this research will be presented. Thereafter, I will discuss these findings in the form of conclusions, recommendations, and limitations. Finally, suggestions for future research are made.

## **THEORY**

The current knowledge on SCLHs will be discussed in this section. Five independent subjects, all contributing to the main subject, are researched. These subjects are city logistics, partnerships, sustainability in logistics, the last mile, and city logistics hubs. These five subjects will now be discussed.

### **City Logistics**

Firstly, it is important to know what exactly city logistics are. Benjelloun and Crainic state that logistics is aimed at analyzing, planning, and managing different flows "within a

potentially multi-partner value network” (2009: 46), these flows can consist for instance of products and information. City logistics is defined similarly, yet, specified to cities. Gammelgaard states that when we talk about city logistics we mostly refer to transport “optimization and measurements” (2015: 335). Logistical processes should be measured to understand when optimizations are necessary and possible.

While city logistics aims to be efficient and environmentally have little impact, this is not always possible. Competing logistics providers all want to go into the city to deliver their goods. However, the more this happens in combination with other traffic, the fuller streets will get and the more roadblocks will appear, resulting in longer delivery times (Ehmke, & Mattfeld, 2012).

### **Partnerships**

When dealing with sustainability, partnerships are necessary for several reasons. Hartman, Hofman, and Stafford (1999) find three reasons. Firstly, they state that partnerships are vehicles for innovation. They also find that partnerships encourage a more open systems view. Making the system more understandable, which is fundamental for a system change. To transition to sustainability in city logistics, this system change is necessary. Lastly, they find that partnerships are needed to initiate new social values, which are needed to make sustainability more accepted in the wider community.

Lambert, Emmelhainz, and Gardner (1999) find that partnerships emerge through three components: drivers and facilitators create the potential for partnerships, and components determine how the partnership is achieved. Drivers are for example strong benefits in making a profit and marketing. Facilitators can support the partnership through for instance management philosophy and mutuality. Finally, examples of components are joint planning, risk/reward sharing, trust/commitment, and investment. All of these components contribute to how the partnership performs (Lambert et al., 1999).

Setting up and forming partnerships should be taken seriously, as “poor organizational pairing” (Seitanidi, Koufopoulos, & Palmer, 2010: 141) can cause negative effects, especially when aiming for a system change. Also in the process of formation, partners should adapt to each other, as partners are then able to offer solutions for substantial positive change (Seitandi, 2008).

Lindholm, & Browne (2013) find that there is no model on urban freight partnerships yet. They do, however, find that good management, organization, and having a variety of stakeholders in your partnerships are important.

Olsson et al. describe the last part of the supply chain, as “the process of planning, implementing, and controlling efficient and effective transportation and storage of goods, from the order penetration point to the final customer” (2019: 10). From this, I can identify several different tasks that need to be fulfilled in the SCLH. These are planning, coordination, control, transportation, and storage.

For a partnership to be successful multiple things are needed. Lindholm and Browne (2013) suggest it is important to have good management and organization in place, and having a variety of stakeholders in your partnerships, as they bring different views, which combined lead to optimal decision-making. Lastly, for a partnership to be successful, realistic expectations from both parties are necessary (Lambert et al., 1999).

Even though reasons for partnerships in city logistics are known in the literature, much of this literature is not specified to sustainability. Most literature is specified to traditional city logistics, not considering sustainability. This is problematic since traditionally it is the government’s task to deal with sustainability (Huijstee, Francken, & Leroy, 2007). So traditionally other than government parties no others give attention to sustainability. However, to achieve sustainability over the whole triple bottom line all parties should give it attention. It is for this reason that we cannot simply apply the current knowledge on city

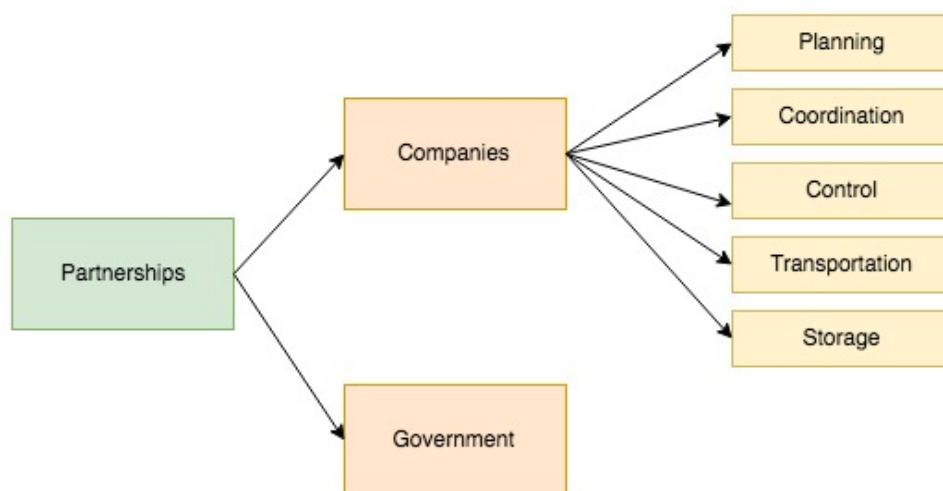
logistics hubs to sustainability-related issues, as the knowledge must be adapted to the specific issue at hand.

To achieve substantial sustainable change in the field, Anderson et al. (2004) propose two groups that need to be distinguished, namely governing bodies and companies. Governments have flexibility in their way of influencing the field, for instance through financial incentives, regulation, liberalization, infrastructure and land-use planning, and advice and exhortation (McKinnon, 2010). Through laws and policies, governments can force companies and other involved parties to behave more sustainably. People will have to adhere to these laws and policies to avoid punishment. Law might be necessary for areas where it does not clearly pay to be green. Companies, on the other hand, are important because they may voluntarily do more in the field of sustainability than is legally asked of them. Other than law and policy, reasons for companies to engage in sustainability are for instance top management support, value-driven motives, a desire to manage risk, and long-term orientation (Sajjad, Eweje, & Tappin, 2015).

What Anderson et al. do not discuss, is the potential interaction between the two groups. Since the field of sustainability in logistics is quite new, designing the right measures to achieve the government's goals can be challenging (McKinnon, 2010). This is why in developing infrastructure projects, partnerships between the public and private sectors are considered effective (Shen, Tam, Gan, Ye, & Zhao, 2016). Shen et al. also find that this is key in strengthening the "sustainability performance" (2016: 289).

Lastly, the literature also does not go into further detail about what companies are needed in these city logistics hubs, it only makes a distinction between government and companies. Some tasks, however, were derived from the definition of last mile logistics. To get a better overview of the identified partnerships in the theory, please see figure 1.





**Figure 1 Partnerships derived from the literature**

### **Sustainability in Logistics**

To make city logistics more sustainable we have to understand what sustainability is, and what research has been done on it in combination with logistics.

In most literature, the definition of sustainability is stated as the Brundtland report does. It states that sustainable development is the “development that meets the needs of the present without compromising the needs of future generations to meet their own needs” (World Commission on Environment and Development, 1987: 45).

Anderson, Allen, and Browne show that, when operating in urban environments, road freight vehicles emit more pollutants than other vehicles in that same urban environment (2004). Generally, when we hear the word ‘pollutant’ we think of the environmental impact. However, traffic in urban areas creates a much larger impact than just on the environment. Urban traffic creates impacts over the whole triple bottom line of sustainability, consisting of environmental, social, and economic aspects (Anderson et al., 2004). For instance, air pollution does not only have a negative environmental effect, but it also negatively affects citizens’ health, thus a social problem follows. Another negative social effect can for instance be noise and loss of green spaces in the city. Lastly, urban traffic has economic effects; for instance, when traffic is inefficient due to congestion in the city and because of that wastes

time, fuel, and other resources (Anderson et al., 2004). Notably, the triple bottom line is currently not fully integrated and considered in logistics processes, which is why true sustainability in city logistics is not yet achieved.

Jamshidi et al. (2019) analyzed several papers and listed the different alternatives for implementing sustainability in logistics they found. Some of these alternatives are location planning, vehicle sizing restrictions, urban distribution centers, and a city freight delivery plan. Quak and Tavasszy (2011) find that these alternatives have not been executed on a large scale because shifting towards more sustainable logistics is very time-consuming. They state that all actors should be dedicated to the project to eventually become a self-supporting project.

### **The Last Mile**

Considering city logistics as the final stage of a whole system of logistics, it is also referred to as 'the last mile'. Most often the last mile is defined as "the last stretch of the supply chain from the last distribution center to the recipient's preferred destination point" (Olsson, Hellström, & Pålsson, 2019: 1). There is more to the last mile than just being the final stage in logistics. It is also seen as the most polluting, costly, and inefficient part of the whole supply chain (Gevaers, Van de Voorde, & Vanelslander, 2010). These negative associations with the last mile ask for more attention to steer away from these negative effects.

Most of the literature on city logistics finds that solutions to these problems can only be achieved "through a streamlining of distribution activities resulting in fewer freight vehicles traveling within the city" (Benjelloun, & Crainic, 2009: 46).

The last mile consists of three sub-components, which are last mile fulfillment, last mile transport, and last mile delivery (Olsson et al., 2019). These different parts all play a role in successfully implementing the last mile. Last mile fulfillment executes an order and makes it ready for delivery, last mile transport focuses on the movement of goods in the last mile,

and last mile delivery facilitates all activities needed to deliver the goods to their final destination (Olsson et al., 2019). As stated previously, consolidating and coordinating make streamlining of distribution achievable (Crainic et al., 2009). Consolidating and coordinating are most noticeable in last mile fulfillment, as this is where shipments are prepared before they are transported.

### **City Logistics Hub**

As stated before, consolidation and coordination are two important aspects in sustaining the triple bottom line (Crainic et al., 2009, and Benjelloun, & Crainic, 2009). This consolidation and coordination of goods can be achieved through city distribution centers (Benjelloun, & Crainic, 2009), or sometimes called City Logistics Hubs. At these hubs, trucks dock and unload their goods. From here, goods are sorted and consolidated to efficiently move to their final destination (Benjelloun, & Crainic, 2009). The three sub-components of the last mile, introduced previously, can all be executed at the same hub making streamlining and acting sustainably more accessible.

City Logistics Hubs have been proven useful before; take for instance the case in the Dutch city Nijmegen. The city logistics hub here, Binnenstadservice, has proven that it can have positive effects on all parts of the triple bottom line. Besides, coordinating logistics through a city logistics hub has proven profitable for both carriers and receivers (Quak, & Tavasszy, 2011). Lastly, Quak and Tavasszy (2011) state that since each actor has different stakes, ‘customized solutions, tailored to the specific problem at hand’ are needed every time such a hub is set up.

## **METHODS**

### **Research Design**

My aim with this study is to find what roles need to be fulfilled through partnerships in an SCLH and be open to finding any complexities in these partnerships. A qualitative research design is most fitting here because in qualitative research you deal with the opinions of people working in the field you are researching. The opinions of these people are key in this research because based on their opinions; people will judge the partnerships they are in. I aim to understand the situation through the interpretation of the situation by its participants (Bell, Bryman, & Harley, 2019). Since the field is not static but ever-changing, qualitative research is needed to understand the field holistically instead of quantitatively which often doesn't consider the environmental changes around the field of observation. By observing the field of SCLHs holistically, I take into account all factors surrounding partnerships (Colley, & Diment, 2001), such as responsibilities and expectations.

This research has a case study design. I focus on the SCLH in Amsterdam, which is “an entity with a purpose and functioning parts” (Bell et al., 2019: 63), so quantifiable for a case study.

### **Data Collection**

I conducted semi-structured interviews to qualitatively get an answer to this research's main question. Interview participants were approached through email and obtained through Van Vliet Containers, who is one of the initiators of the SCLH. They have the right contacts and some potential partners with whom they will be collaborating. These people will be able to provide me with information and insights into partnerships in this particular case. Interviewees for this research were people who specialized in planning, coordination, control,

logistics, and storage. These interview partners were selected based on the functions that were identified in the theory section.

Before the interviews, the interviewees were informed of the topic of the research and received the informed consent form (Appendix A). This consent form was needed for interviewees to make an informed decision on whether or not to participate in the research (Bell et al., 2019). At the beginning of each interview, this informed consent was signed by both the interviewer and interviewee.

I interviewed 7 people all with the roles of project leader and other key roles in the SCLH project. The specific roles of the interviewees can be found in table 1. All interviews lasted 30 to 45 minutes and were conducted in Dutch, the interviewees' native language.

<b>Role</b>	
<b>Interviewee 1</b>	Professor City Logistics and initiator of the project
<b>Interviewee 2</b>	Managing Director of a load carrier manufacturer
<b>Interviewee 3</b>	Supply Chain Developer at supermarket chain Jumbo
<b>Interviewee 4</b>	Project Manager at a project logistics company
<b>Interviewee 5</b>	Deputy Director at an electric vehicle manufacturer
<b>Interviewee 6</b>	Hardware consultant
<b>Interviewee 7</b>	Project Manager at online supermarket Picnic

**Table 1 Interviewee Roles**

## **Interview Guide**

The interviews were semi-structured, which allowed for comparable answers across all of the conducted interviews. Also, this form of interviewing allowed for questions that came up during the interview to be asked. For the full interview guide, please see appendix B.

In the introduction to the interview, I explained the topic once again and went through the informed consent form. Following, in the introduction to the interviewee, we talked about the interviewee's function, their view on sustainability, and their role in the SCLH project. I asked for example: 'What is your company's role in the project?' By asking the 'easy' questions first, rapport was built (Leech, 2002).

Third, we talked about the initiation of the project. With questions such as ‘How did you become involved in this project?’ the interviewees were triggered to think about their role and that of others in the project.

Next, we spoke about partnerships and what partnerships the interviewees can identify, and which ones are still necessary. I for instance asked ‘What partnerships are necessary for you to fulfill your tasks successfully?’ and ‘What would you expect from your partners?’ Then, we also spoke about sustainability and how partnerships potentially influence this.

Lastly, asking if the interviewee still wanted to add something concluded the interview.

## **Survey**

A short survey (Appendix C) was conducted to get some background information on what the interviewees’ colleagues thought of certain topics. The interviewees shared the survey with their colleagues that are working on the project as well. The gathered information was treated as qualitative rather than quantitative data as there was not enough response to treat it as quantitative data. Three colleagues shared their thoughts through the survey. Questions in the survey were for instance: What partnerships do you need, to execute your task the best? And, Is there a difference between must-have and nice to have partners?

## **Data analysis**

After conducting the interviews, I transcribed and coded them using Atlas.ti. The codes used were established before conducting the interviews. These codes are themes I am looking for in the interview such as sustainability, partnerships, positive experiences, negative experiences, and expectations. During the coding process, inductive codes were added when

important information did not fit any of the first codes. These were codes such as long term, short term, government, consolidation, and equipment.

The transcript was sent to the interviewees to verify that they were comfortable with what was written. This also gave them the chance to change or add anything if they felt that was necessary.

Finally, a mind-map was made to see how the interviewees could be linked to each other and in what ways they were dependent on one another in the process of setting up an SCLH.

## RESULTS

The interviews in this research led to several results that are needed to answer the research question. These can be divided into two main storylines. First that of partnerships, and second that of the challenges faced. From the codes, two mind maps have been made to guide the story, see appendices D and E.

### Partnerships

All interviewees considered partnerships to be incredibly important to the SCLH project. ‘You can’t do it alone, you need many partners to do it’ (interviewee 2). From the interviews, 4 types of partnerships can be distinguished, which I will go into now. Please see table 2 for an overview of the partnerships.

Partnership	Description
<b>Equipment</b>	Partnerships that supply equipment are needed at the SCLH to make the process flow easily, and to be manageable for all parties using the hub.
<b>Consolidation</b>	Partnerships between the parties using the SCLH. These are the parties sharing their transport into the city.
<b>Government</b>	The government can play a large part in the success of an SCLH. For instance through law and subsidies.
<b>Set up</b>	Partnerships that are needed before the hub is in use. Those parties that initiate the SCLH and the parties working with this initiator.

**Table 2 Partnerships overview**

### *Equipment*

Each interviewee agreed that equipment partnerships are those partnerships that concern the products that are needed at a hub to ensure it functions properly. Equipment often needs to be made to the requirements of the user. In SCLHs different parties come together, all with different requirements. By using equipment partners a middle ground can be found to please all parties involved, as these parties are specialized in making the equipment.

Firstly, the interviewees emphasized the need for proper hardware and IT. IT is needed for instance to manage the goods and consolidate them. IT is also needed ‘to tie everything together’ (interviewee 2) through the IT, partners and their products will be connected, making consolidation easier. Then the hardware is needed to use this IT and generate new data. This can be data about for instance where products are, and also to give more insight into the process to allow for further optimization.

Next, specifically to the sustainability aspect, the need for electrical vehicles was mentioned. The project needs electrical vehicles to achieve zero-emission deliveries. Together with a load carrier manufacturer, these vehicles should be made to exact requirements, to carry the goods into the city as efficiently as possible. Remarkably here is that only one of the interviewees explicitly mentioned the need for vehicles. All other interviewees talked about using them but when asked about partnerships they did not mention these vehicles.

Some more general equipment partnerships that were mentioned were for instance: cold storage (depending on the products shipped through the hub), a ticketing system, lift tables, and secondary equipment. Secondary equipment is the equipment needed by the direct partners to be able to deliver and manufacture their products.

Finally, a partnership applicable to all other partnerships in this category is that with a maintenance company. This can be either the company that supplied the equipment or a specialized maintenance company.



### ***Consolidation***

Consolidation partnerships occur between companies who will share their transport into the city. Thus, these are the companies using the hub when it is in use. Both interviewees 1 and 3 and two survey participants, mention the explicit difference between two types of consolidation partners.

Starting, all four of them mention the need for large volume carrying companies. Without this large volume of goods, consolidation is not possible. ‘You always need someone who brings the carrying volume [...] you need large parties’ (interviewee 1). Some specific examples given of companies that can bring this carrying volume are IKEA, Amazon, or even supermarket chains.

The second type of consolidation partnership is with companies that carry smaller volumes of goods. As interviewee 3 explained: ‘when it is not a full truck anymore, that is where the sweet spot for collaboration is’. Basically what this means is that these smaller volumes can fill the load to its maximum capacity. Partners to be considered in this smaller volume segment are for instance electric utility companies, starting caterers, chain companies, parcel services, and construction companies. Chain companies are those companies that may have their own shops and products but do not have their own distribution network.

### ***Government***

The government is an important partner; this can be either a local government or national government. As interviewee 5 described it: ‘they can make or break it’. ‘An initiator of a city logistics hub has to consider the government very much’ (interviewee 1).

The government is important in different ways. The most important role of the government is its stimulating role. All but one interviewee agreed that the government should invest in subsidies to stimulate sustainable logistics alternatives. Interviewee 1 namely stated that you should be careful with this stimulating role because ‘if the model can’t stand alone, it

has no future'. Surprisingly though, other interviewees did not express concern related to subsidies. The other interviewees did not state that they were completely reliant on the government; however, they did implicitly mention the need for subsidies.

One interviewee made the relationship to the government very clear: 'I am firmly convinced that the government must also leave it to the business community and entrepreneurs to make it a success. But they must give their maximum to make it possible. And I think that is to, in a positive way, use the network that a government has for such a project. And possibly open doors with subsidies or something along those lines' (interviewee 2).

Other than stimulating, the government also makes destination plans for the city. These destination plans will decide whether or not a hub can be built. They also have to do with environmental zones in the city, which prescribe certain vehicles to be allowed in that part of the city or not.

Strategically the government is important as well. The government can create policies to make driving electrically more attractive, for instance by opening up taxi lanes for electrical vehicles. As one interviewee described it 'it makes no sense' (interviewee 5) to use a more expensive vehicle, to then also have to participate in the same traffic congestions.

All interviewees indicated that the government should always be involved in an SCLH. From the moment of initiation until it closes down. Their role may change over time; however, the government should always stay involved. It should be kept in mind though that the speed by which a government itself may join the project is often quite slow. Also, most interviewees believe that it is the government's task to get involved in the project, not that of the SCLH. 'They need the business community; I don't think that should be the other way around. They have an exemplary function, they write policy [...] then as a municipality you should also make that happen' (interviewee 5).

### ***Set Up***

Lastly, partnerships to set up the hub are important, as the interviewees described it; a hub makes consolidation much easier.

Firstly, an initiator is needed. The initiator should involve a project developer to gather for instance financial support, but ‘they also realize the facility, the plot of land, the infrastructure [...] because no one else can do that’ (interviewee 2). This project developer should act as a connecting link to get all necessary partners together to set up the hub.

The main concern and also main partner that is needed in this category are those revolving around energy. More specifically, partnerships with grid management companies, energy providers, electricians, and energy brokers. Partnering with grid management is a first step, and also a more temporary partnership. When setting up the hub the grid has to be ready for the amount of energy it will use. This often means that the grid and transformer’s capacity has to increase. Once this is done, a partnership with the grid management company is not needed anymore. To be connected to the grid, a partnership with an energy provider is needed. To get the best price for the electricity the hub uses, an energy broker was mentioned as a partner. Lastly, an electrician is needed to ensure no or as little as possible interruptions in the core business occur.

Next, a logistics service provider should be involved. This party manages the hub, and plans the logistical process, to make sure all products are delivered in time. The planning this logistics service provider makes, ‘connects all elements’ (interviewee 4) in the project.

Lastly, some more general partnerships in the setup of the hub that were mentioned were: an academic, a consultant, an employment agency, a safety partner, and a legal partner.

### **Challenges**

Next to the needed partnerships, complexities in the form of challenges arose. In the process of working together towards partnerships in SCLHs some challenges appear. The

interviewees experienced several challenges themselves, from which 5 main challenges can be distinguished. For an overview of the challenges please see table 3.

<b>Challenges</b>	<b>Description</b>
<b>Sustainability</b>	Differing views on sustainability may cause friction in the partnership leading to sub-optimal or even not working partnerships.
<b>Information Sharing</b>	Information sharing is key to good partnerships; however, parties are hesitant to share information due to for instance competition.
<b>Work Method</b>	The work method, may it be culture or work planning related, should overlap to promote smooth collaboration.
<b>Repacking</b>	Repacking leads to additional costs, making potential consolidating partners hesitant to participate. The added value of transporting goods through such a hub should be clear.
<b>Network Capacity</b>	The electricity grid is not ready for large absorption, as SCLHs will need. The companies managing the grid are certainly not ready, causing long waiting times and irritated partners.

**Table 3** Challenges overview

### ***Sustainability***

The sustainability aspect of this project poses a challenge to partnerships. This is due to the differing views on the importance of sustainability in the project, which may lead to friction within the partnership. Most interviewees expressed average concern for sustainability. The interviewees noted that sustainability is important to them, however; also concerning their intonation, sustainability is not their sole concern.

Often these partners partly consider sustainability because they want to keep their market position and because it is asked of them by governing bodies or customers. ‘Many clients come with the problem that it needs to be greener [...] logistics is changing anyway, we are stuck with the climate agreement that has been signed. [...] you have to get along with it and stay ahead, otherwise, you get bogged down.. and you won’t be one of the big players anymore..’ (interviewee 4).

Even though 5 out of 7 interviewees considered sustainability to be of average concern, one interviewee explicitly said that ‘the sustainability aspect may even be the most important aspect’ (interviewee 2). Opposing to this, interviewee 1 expressed that his ‘main

concern is not with the sustainability aspect, but keeping [the hub] running.’ He also expressed that ‘the reason to use a city hub [...] is that it is getting more and more expensive to drive into the city’.

### ***Information Sharing***

A second challenge is that of information sharing. While on the one hand information sharing is key to good partnerships. On the other hand, there is the threat of getting in each other’s way. As interviewee 5 put it ‘we don’t just give our drawings to others, because of competition’. So ‘you have to be able to trust each other’ (interviewee 6). On the other hand, as one survey participant noted: ‘parties must be willing to share information’. Another challenge that comes with information sharing and dealing with competitors that are at the same time also partners, is that you want to create a friendly partnership while also doing business. ‘We often talk about money, so there are tough negotiations, but you also want to create a relationship with that party’ (interviewee 7).

All of this uncertainty leads to a lot of paperwork, i.e. ‘relationship clauses, non-competition clauses, and non-disclosure agreements’ (interviewee 2).

### ***Work Method***

Partners working together should, to a certain degree, have overlapping work methods for smooth collaboration. ‘Every industry has a different supply chain, so also different challenges for city logistics’ (interviewee 3). Next to this, each company has a different corporate culture. The collaborating partners should fit together to make the partnership work. As one interviewee explained this, ‘those guys wear suits and ties, if they walk in, they are immediately laughed at’ (interviewee 6). Also, schedules of consolidating partners should align to be able to share transport, as ‘one of their biggest challenges is to link all systems of those partners’ (interviewee 7). More specific challenges are those of dealing with different

product sizes, and different goals each company might have that should align. When work methods do not match, smooth collaboration may be hindered.

### ***Repacking***

Another challenge is that of repacking. With the use of SCLHs, you do not physically add value to the products. You do, however, add ‘an incredible amount of administrative costs’ (interviewee 1) and the ‘activities are never measurable in monetary terms’ (interviewee 4). Multiple interviewees mentioned that by adding track and trace they try to make the process more transparent and show their added value. ‘Customers have to be prepared to pay a little more to transport their product in a sustainable way to their end consumer’ (interviewee 5). The challenge here is thus to show potential partners the added value of transporting goods through such a hub. To show each partner the added value and make sure ‘everyone benefits, can be quite challenging’ (interviewee 7). This challenge can be resolved by ‘creating a smooth, simple, and accessible process’ (interviewee 4). By doing so partners will see the added value.

### ***Network Capacity***

Lastly, the challenge of network capacity is of great importance to make SCLHs work. Charging infrastructure is needed to charge the vehicles needed to transport the goods into the city. Multiple interviewees expressed their concern for the electricity network that is not ready for these hubs as large absorption points. Interviewee 5 painfully laughed that ‘if you are going to be charging 20 vehicles then Eneco has to come by to adjust your fuse box, most people forget that’. Not only your fuse box needs adjustment, but most interviewees also mentioned the need for larger cables and transformers. The big challenge that comes with this is that ‘the grid is not ready, and the parties that have to expand the network are certainly not ready for it’ (interviewee 7). The situation now often leads to long waiting times of ‘on

average half a year before it can be realized' (interviewee 7). This poses a challenge for the partnership as long waiting times can lead to irritation with partners.

## DISCUSSION

In this final chapter, I will discuss the conclusions of the results compared to the current literature. Then I will make recommendations regarding partnerships in similar projects. After which I will also go through the limitations this research has faced. And finally, a view on future research regarding partnerships in the SCLHs will be discussed.

### Conclusions

This research aimed to answer the following research question: *What partnerships need to be fulfilled when setting up a Sustainable City Logistics Hub?* This question can be answered as follows: partnerships that need to be fulfilled when setting up an SCLH fall under four categories. These categories are: equipment partnerships, consolidation partnerships, governmental partnerships, and set up partnerships. Depending on the companies using the SCLH and what industries they operate in, different equipment and consolidation partnerships are needed in these categories. All interviewees agreed that through partnerships, you can learn and achieve more than by doing it alone. This also connects to the definition of logistics by Benjelloun and Crainic (2009); who find that logistics is all about managing flows with multiple partners.

Comparing the theory to the partnerships that were found, a few remarks should be discussed. Firstly, the theory mentioned several partnerships that were needed. Lambert et al. mentioned the need for joint planning, risk/reward sharing, trust/commitment, and investment (1999). Adding to this, Olsson et al. mentioned the need for roles that take care of implementing, controlling, and the storage of the goods (2019). These partnerships were all mentioned in the interviews. Adding to the theory, the interviewees made a distinction

between investment by the government and investment by companies themselves in time and resources. Interestingly, a partnership that was not mentioned by the theory is one with energy providers and grid management companies. With regards to the sustainability in city logistics hubs, this energy partnership is more specific to SCLHs. All vehicles traveling into the city from the SCLH will be zero-emission and electrical, so partnerships with these companies are essential.

Both the theory and interviewees mentioned the government as a partnership category. McKinnon mentioned several ways in which the government is important, namely through financial incentives, regulation, liberalization, infrastructure and land-use planning, and advice and exhortation (2010). However, the interviewees only mentioned the stimulating role, the role of making destination plans, and the strategic role. These three roles match the roles from the theory.

While Anderson et al. (2004) make a distinction between the role of companies and government that are needed to achieve change for sustainability no further distinction is made. For instance, in the interviews, a distinction between equipment, consolidating, and set up partners was found. This distinction seemed of importance to the interviewees to create a clear oversight of their tasks and obligations. Lastly, one interviewee explicitly mentioned the need for caution of the stimulating role of the government. As the projects should also be able to continue when subsidies are no longer available. Quak and Tavasszy (2011) also mentioned the need to eventually be able to be independent. It can thus be concluded that participating parties should be more aware of what the government can mean to, and has to offer businesses engaging in SCLHs.

Next to the needed partnerships the research also resulted in some challenges faced when partnering in SCLHs. These challenges can also be divided into different categories;



sustainability, information sharing, work method, repacking, and network capacity. Comparing these challenges to the theory, some differences and similarities should be noted.

Firstly, one of the challenges is sustainability and each participant's view of its importance in the project. All partners should be on the same page when it comes to the sustainability goals to avoid friction. According to Hartman et al. (1999) partnerships can initiate new social values. Therefore through further partnering, sustainability should become more accepted, helping all partners to get on the same line.

Even though the interviewees may not be on one line when it comes to sustainability, they do all find it important. The reason these companies behave sustainably is in line with theory by Sajjad et al. (2015) who found that reasons for behaving sustainably are for top management support, value-driven motives, a desire to manage risk, and a long-term orientation. The reason to engage in sustainability for the interviewees is mostly a long-term perspective on their market position, which is comparable to the theory by Sajjad et al. Even though sustainability is important to the interviewees, I can conclude that their reason to be sustainable is not very specified yet, and mostly focused on keeping customers happy. Companies should think about their motivation to be sustainable for their sustainability strategy to be as effective as possible.

Then, Benjelloun and Crainic (2009) mention the need to unload, sort, and then repack again at SCLHs. During the interviews, this inefficient process came up as a potential negative effect of partnering to collectively transport goods into the city. Even though this challenge of partnering is not mentioned in the literature, the interviewees see it as a challenge for partnering. Quak and Tavasszy (2011) find that the use of city logistics hubs is profitable for both carriers and receivers. How to show this added value from an SCLH, however, is still missing. So it is of high importance for parties in SCLHs to clearly state the benefits of

partnering to transport their goods. When this is not clear, potential partners might divert from partnering to transport goods, which may cause the project to fail.

Finally, network capacity was a very important topic when it came to challenges, and seemed like something the interviewees really worried about. Surprisingly though, this concern for the capacity of the electricity grid was not mentioned at all in the theory. From this, it can be concluded that giving much attention to this electricity part of the hub is needed to make sure that when the hub is ready for use, also the electricity grid is ready for use.

### **Recommendations**

Based on this research, a few recommendations can be made. First, it should be advised to take the energy supply seriously from the initiation of an SCLH. Electricity is essential to make the SCLH a success in terms of zero-emission deliveries. It is of importance now and will be in the future when the need for energy may change. It is thus advisable to keep the future in mind when designing and setting up all energy-related parts of the hub. By setting up a proper grid now, the chance of delays in the future is kept to a minimum.

Next, the role of the government should be considered when setting up an SCLH. Partners should discuss in what ways, other than subsidies and making an exception here and there, governments could be an advantage and how they can be included in the process. Also, the partners should think of ways in which the SCHL can continue to work once government support comes to an end.

Furthermore, to many, an SCLH may seem to only bring added costs. So, the benefits that outweigh the added costs of the use of an SCLH should be clear for all parties when setting it up. Without these benefits clearly stated, potential partners may opt out. Lastly, when parties do decide to work together, it is advisable to discuss sustainability and get on one line before officially partnering. This way no confusion can appear later on in the partnership.

## **Limitations**

When using the results from this research, certain limitations should be kept in mind. First of all, this research only used a small number of stakeholders. This means that it cannot be said with complete certainty that the results from this research are generalizable.

Another limitation is that of limited time. It would be interesting to research SCLHs over a longer time to see whether or not the same partnerships are felt to be important by the interviewees. Also studying the SCLH for a longer time would allow speaking to more people and also talking to more definitive partners that would be using the hub. I have interviewed potential larger parties and talked about their perspective, but talking to smaller potential partners would allow for more complete information to be gathered.

Lastly, the studied SCLH is still very much in the beginning phase. Even though many sections of the SCLH have already been well thought through, this could have led to data that is in a way wishful thinking. Would the project have been a bit further along, then some statements could have been made with more confidence, leading to data that is more reliable and generalizable.

## **Future Research**

As stated before, the development and use of an SCLH is new and research has virtually not been done. Further research is needed to prove whether the findings of this research also apply to other SCLH projects. Multiple people from the same party should then be interviewed to find a general opinion of that party. By comparing more SCLH projects, wider applicability can be confirmed or denied, and statements can be made with more certainty.

Also, research should be done on the role specifically of governments, from a government perspective. Since all interviewees agreed the government should have a role in these sustainable alternatives, it would be very interesting to see their perspective. The two views of these parties can then be compared and matched.

Finally, research on partnerships with grid management companies, and electricity providers should be done. Seeing their importance, this research could help in defining the exact role these companies play and what the best ways of involving them would be.

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## APPENDIX A

Informed consent

### Your consent to participate in an interview for a Master's Thesis

Dear ...,

Thank you for participating in an interview as part of the data collection for my Master's Thesis. I am writing this during the Master's program Sustainable Entrepreneurship at Campus Fryslân, at the University of Groningen.

The purpose of this interview is to collect valuable information to support answering the research question: What partnerships need to be fulfilled when setting up a Sustainable City Logistics hub?

By participating in this interview, you agree to the following:

1. The purpose of this interview is to collect qualitative data for research into partnerships in Sustainable City Logistics Hubs.
2. To conduct the research, the interview will be recorded, transcribed, and analyzed. The recording will not be published, but will only be used for analysis.
3. The transcribed interview will be emailed to you to be edited and reviewed when necessary and then approved. You can therefore request changes to the transcript. Citations can be taken from this transcript that will be used in the thesis.
4. The data will be used anonymously. This means that only your position will be mentioned in the thesis unless you specifically ask me not to.
5. You can withdraw from the study at any time, up to May 27<sup>th</sup>. The thesis will be handed in on May 27<sup>th</sup>.
6. The final version of the thesis will be reviewed by the study supervisor.
7. The final version will be electronically archived in the University of Groningen Library Catalog and will therefore be accessible to staff and students of the University of Groningen.
8. The final thesis will be emailed to you and all interviewees.

**Name of the supervisor:** Dr. Emma Folmer – Assistant professor at University of Groningen  
e.c.folmer@rug.nl

**Name interviewee:**

Name of organization:

E-mail address:

Date & signature:

**Name student:**

Merel de Vries

E-mail address:

m.de.vries.57@student.rug.nl

Date & signature:

## APPENDIX B

### Interview guide

#### **Introduction to the interview:**

- Would it be okay if I record this interview?
- Explain research -> explain the goal of this study. To understand what partnerships are necessary for successfully executing a sustainable city logistics hub.
- Go over the informed consent form

#### **Introduction to the interviewee:**

- What does your role entail?
  - And what does it entail with regards to the project?
- Can you tell me a bit about the Sustainable City Logistics Hub project?
- What is your company's role in this Sustainable City Logistics Hub?
  - What is your company's main goal with this?
- What does sustainability mean to you?
- What makes your company a sustainable one? (or why is it not a sustainable one?)
  - How do you integrate it in your business?
  - Are you working to improve your sustainability?

#### **Main questions:**

##### Initiation:

- How did you or your company become involved in this project?
- What is your current experience with city logistics and distribution?
  - Is sustainability a part of that already?

##### Partnerships:

- What are your tasks in the project?
- What are challenges you are/will be facing in this project?
- What is your role in relation to your partners?
- What partnerships are necessary for you to fulfill your tasks successfully? (ask about private/public partnerships)
  - Are these temporary or permanent?
  - Why specifically these partnerships?
- What does it take to become partners (time/means?)
- How do you think partnerships relate to the degree of sustainability in this project?
- Do you think partnerships can help you overcome your challenges here?
- What would you expect from your partners?
- Can you make a distinction between partnerships that are a must-have and nice to have?
- Do you think there are currently partnerships missing that would be important or nice to have?

##### Sustainability:

- How do you think partnerships relate to the degree of sustainability in this project?
- How do you combine the different aspects of sustainability? (social, economic, environmental)

#### **Ending:**

- Would you like to add anything to this interview?
- Is there anyone you think I should talk to? In terms of partnerships that are important for your part in this Sustainable City Logistics Hub?



- Thank you for your participation, I will share the transcript of this interview once I have finished it.
- I would like to also do a short survey to triangulate information from this interview. Could I send a link of this survey to your colleagues that are working with you on this project?

## APPENDIX C

### Survey SEP

Dear participant,

For my master's study 'Sustainable Entrepreneurship' I am researching Sustainable City Logistics Hubs and the needed partnerships within such a project. For the validity of the research, I would like to ask you several questions through this survey. This survey will take approximately 10 minutes of your time.

By participating in this survey, you agree to the following:

Your answers in this survey will be processed anonymously in the research and the accompanying master thesis by Merel de Vries. This thesis is about the different partnerships required in Sustainable City Logistics Hubs.

The corresponding research question is as follows: Which partnerships must be filled in when setting up a Sustainable City Logistics Hub?

The answers given will be compared with other answers and used to analyze the current situation.

Because the survey is anonymous, it is not possible to withdraw from the survey after taking part and submitting the responses

If you have any further questions please email me at [m.de.vries.75@student.rug.nl](mailto:m.de.vries.75@student.rug.nl)

Thank you very much for your participation.

If you are interested in the final report, please leave your email address in the last question.

As soon as the thesis is finished, I will send it to you.

This research is specifically aimed at sustainable city logic hubs. Can you indicate in a few words what sustainability means for you in your daily work?

Which company do you work for?

What role in the project do you fill in / are you going to fill in?

In this research, I focus on various partnerships within the Sustainable City Logistics Hub project. Which partnerships do you need to perform your task within this project as well as possible?

Is there a difference for you in these partnerships that are essential and are "nice to have"?  
Yes/No

If yes, which partners are essential, and which ones are "nice to have" for you?

When you think of short-term partnerships, how long do they last on average?

- 1-3 months
- 3-6 months
- 6-8 months
- 8-12 months

Thinking back on short-term partnerships, what kind of parties are these partnerships with?

When you think of long-term partnerships, how long do they last on average?

- 1-2 years
- 2-3 years
- 3-4 years
- For the entire duration of the project

Thinking back on long-term partnerships, what kind of parties are these partnerships with?

In the case of Sustainable City Logistics Hubs, do you think the (local) government should play a role in this?

- 1 not important at all - 10 very important

When you think of your most important partner, who is it? And what role does this partner play in the project?

Thinking about this partner, what is your contribution to this partnership?

Are you interested in receiving the final report? Please leave your email address here.

Thank you for your participation!

## APPENDIX D

Results mindmap: partnerships



## APPENDIX E

Results mindmap: challenges

