

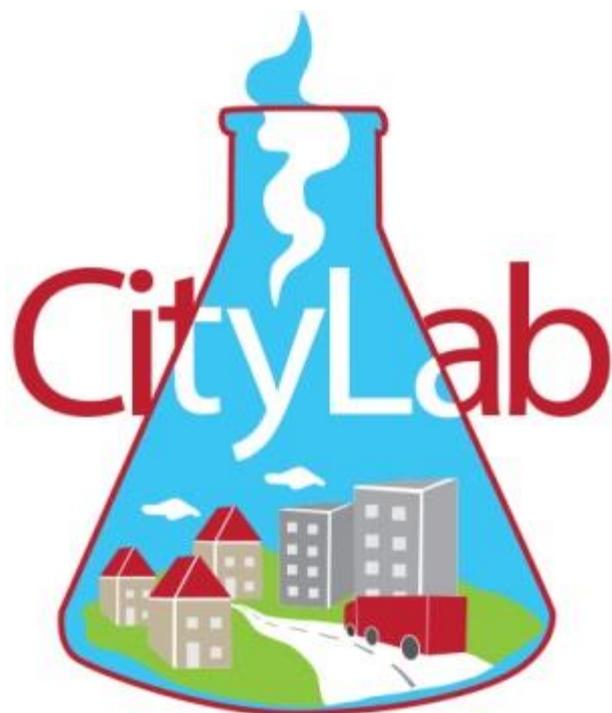
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Minutes of local stakeholder meetings

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London	Transport for London	TNT Gnewt Cargo	University of Westminster University of Gothenburg
Oslo	Oslo kommune	Steen & Strøm	TOI
Paris	Mairie de Paris		IFSTTAR DLR
Randstat	Gemeente Rotterdam	PostNL	TNO
Rome	Roma Capitale	Poste Italiane MeWare SRL	Università degli studi Roma Tre
Southampton	Southampton City Council	Meachers Global Logistics	University of Southampton
Networking and outreach partner			
POLIS			

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Executive summary

The objective of the CITYLAB project is to develop knowledge and solutions that result in roll-out, up-scaling and further implementation of cost effective strategies, measures and tools for emission free city logistics. In a set of living laboratories, promising logistics concepts were tested and evaluated. This deliverable fits CITYLAB's objective to develop the fundament for further roll-out of the solutions. In the seven CITYLAB cities, we organised a local stakeholder meeting during which local stakeholders assessed whether the tested CITYLAB solutions would be a good option for their city or not. We used Multi-Actor Multi-Criteria Analysis (MAMCA), which is an interactive tool that allows integrating different stakeholder opinions in one analysis. We used the same methodology during all workshops. The approach was slightly adjusted after the workshop in London because it took too much time to have the participants pairwise compare each alternative (7 in total) on each criterion (4 or 5).

During the workshops, participants were asked to weigh a list of criteria (per stakeholder group) and to evaluate each CITYLAB alternative on these criteria. Afterwards, we combined their input to get a view on overall stakeholder support for the CITYLAB alternatives and on why a certain alternative was liked or disliked.

When asked for their feedback on the predefined list of criteria, two gaps were identified:

- Receivers: time loss or time gain by a more efficient way of being delivered is not included in the current list of criteria
- Transport operators: currently, none of the criteria covers security for the driver and goods. You could assume that it is part of employee satisfaction, but it is not clear and does play a role.

A few trends can be discovered in the weights attached to the criteria

- Receivers:
 - Receivers tend to make a trade-off between high-quality deliveries and cost
 - Attractive shopping environment usually comes third
 - They don't attach great value to the criterion 'positive impact on society'
- Society
 - Traffic safety is the most important criterion for stakeholder society (except in Paris and Rome where it came second, after air quality)
 - Air quality is usually the second important criterion for stakeholder society
- Transport operators:
 - Nearly all of them put profitable operations first, closely followed by viable investments
 - Positive effect on society does not receive high weights

These are the trends that can be discovered when looking at the preferences of the different stakeholder groups towards the alternatives:

- Receivers: Overall the 'e-freight bikes and microhubs' alternative and 'last-mile carrier with electric vans' alternative score best. Except in Amsterdam and Brussels, where the latter alternative does not score well.
- Shippers: The 'common logistics in shopping centres' alternative received the highest score from shippers during all workshops (except for London). The 'integrated reverse logistics' alternative was assessed as second best everywhere (except for London).
- Society: Representatives of the 'society' stakeholder group prefer the 'last-mile carrier with electric vans' alternative and the 'e-freight bikes and microhubs' alternatives in all cities. In that sense, their estimation is similar to the one of the receivers. Only in Rome, 'society' did not like the 'e-freight bikes and microhubs' alternative.

- Transport operators: In most cities, transport operators see great value in the 'integrated reverse logistics' alternative and in the 'common logistics in shopping centres' alternative, except for transport operators in London who do not envision a future for the 'integrated reverse logistics' alternative and for transport operators in Rome and Brussels who do not appreciate the 'common logistics in shopping centres' alternative.

1 Introduction

1.1 Background and overview of CITYLAB

The objective of the CITYLAB project is to develop knowledge and solutions that result in roll-out, up-scaling and further uptake of cost effective strategies, measures and tools for emission free city logistics. In a set of Living Laboratories (“Living Labs”), promising logistics concepts are being implemented, tested and evaluated, and the potential for further roll-out and upscaling of the solutions is being investigated and explained.

In CITYLAB, an implementation is defined as **the process of preparing and putting into practice a new service or a new way of operating or organising logistics activities**. The objective of this concept note is to describe the role of the implementations in the CITYLAB project. It outlines for each of them the motivation for intervention, the innovative idea, the scope and progress made so far, and the outcomes and lessons learned.

The project focuses on **four axes** that call for improvement and intervention. Within these axes, CITYLAB supports **seven implementations** that are being tested, evaluated and rolled out. The cities involved are London, Amsterdam, Brussels, Southampton, Oslo, Rome and Paris. If the four axes for intervention are not explicitly tackled in the EU, the rising populations and densities of cities will produce such an increase in freight transportation that the economic and environmental sustainability will no longer be guaranteed. This, in turn, will endanger the future growth potential of European cities. The four axes and the related CITYLAB implementations are shown in Table 1.

Table 1. CITYLAB axes for intervention and implementations.

Axes for intervention	Implementation	City	Partner
Highly fragmented last-mile deliveries in city centres	Growth of consolidation and electric vehicle use	London	TNT and Gnewt Cargo
	Floating depot and city centre micro-hubs	Amsterdam	PostNL
	Increasing load factors by utilising free van capacity	Brussels	Procter & Gamble
Inefficient deliveries to large freight attractors and public administrations	Joint procurement and consolidation	Southampton	Meachers Global Logistics
	Common logistics functions for shopping centres	Oslo	Steen & Strøm
Urban waste, return trips and recycling	Integration of direct and reverse logistics	Rome	Poste Italiane, Meware
Logistics sprawl	Logistic hotels	Paris	SOGARIS

Work already carried out in CITYLAB has evaluated the expected economic, social and environmental outcomes of the initiatives in the seven CITYLAB implementations. The results of this analysis are provided in Table 2 and reflect expected improvements in operational efficiency, traffic safety, air quality, and carbon dioxide (CO₂) emissions across the seven implementations. Table 2 reflects the wide coverage of the expected positive efficiency, traffic and environmental impacts of the CITYLAB implementations, beyond that of CO₂ emissions reduction (CITYLAB, 2017b).

Table 2. Analysis of Living Lab implementations and their expected positive economic, social and environmental impacts.

Logistics impacts	London	Amsterdam	Brussels	Southampton	Oslo	Rome	Paris
Reduction in vehicle kilometres	✓✓	✓✓	✓✓*	✓✓	✓	✓✓	✓✓
Reduction in CO ₂ emissions	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓✓
Improvement in air quality	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓✓
Reduction in logistics-associated noise and disturbance	✓	✓	✓	✓	✓	✓	✓
Reduction in total time spent by vehicles on roads (driving/ loading / unloading)	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Retiming of logistics operations (i.e. out of peak period)	✓	✓		✓	✓		✓
Alleviation of logistics sprawl**	✓✓	✓✓		✓✓			✓✓
Promotion of alternatively-fuelled / clean delivery vehicles	✓✓	✓✓				✓	✓✓
Reduction in time spent by receivers on goods reception and internal logistics	✓✓	✓✓	✓✓	✓✓	✓✓		✓✓

✓✓ - expected outcome ✓ - possible outcome * - also expected to reduce car trips by shop owners
 ** - In the sense of reducing the need for road-based stem mileage.

Compared to many projects that involve short-term demonstration of urban logistics solutions, the CITYLAB implementations are one component of a broader and more ambitious project aiming to **build long-term partnerships at the city level**. The roles of the implementations in CITYLAB are to:

- 1) **Implement innovative ideas** that propose a way of intervening to make sure that the expected increase in freight transportation can be dealt with in an **economic and environmentally sustainable** way.
- 2) Initiate or support city logistics Living Labs on the local city levels, contributing to **building partnerships** between research, industry and authorities.
- 3) Extract detailed **insight and understanding** as to how the implementations can be prepared, organised and supported in order to achieve their intended objectives, and determining their **transferability potential** to larger areas and other cities.

Relating to the first role, the CITYLAB implementations are **initiated from engaged private industry partners** who believe their implementation is financially and environmentally sustainable. The CITYLAB implementations receive no funding for equipment purchase (i.e. capital expenditure) or subsidy of operating costs. CITYLAB funds the implementations by 1) supporting labour efforts from the research team studying the ongoing processes in their hometown implementation, collecting quantitative and qualitative data concerning the solutions, impacts and disseminating lessons learned, and 2) partially supporting the industrial partner in setting up these implementations. Industrial partners in six cities, except Paris, receive a few months of labour support as a contribution towards their efforts. In total, the

implementations work package (WP4) accounts for 20% of the total person-months in the entire CITYLAB project.

Secondly, the implementations act as gate-keepers in building partnerships needed for developing city logistics living labs. Several ex post EU and global level evaluations have shown that multi-stakeholder deployment is the key challenge in the city logistics innovation process. **In CITYLAB, we use Living Labs, which is new in city logistics, as an implementation approach to foster innovation deployment.** The concept of Living Labs, compared to conventional demonstrations, creates an experimentation environment in which stakeholders such as citizens, governments, industry and research, together aim at **achieving a shared long-term goal**. Using an **iterative cyclical approach of planning, implementing, evaluating and acting** (CityLab, 2015), the ambition is to reduce conflicting stakes from different backgrounds and to speed up real-life developments and deployment of innovations. In this environment stakeholders can co-design, explore, experience and refine new policies, regulations and logistics actions. This implies a process in which implementations are tried out, supported by dynamic prediction and evaluation tools, where the environment is adapted to make it work, and where barriers are directly dealt with to have a maximum impact. City logistics living labs require **continuous cooperation** between research, industry and authorities. Since the seven CITYLAB cities have different experience levels of cooperation between these three types of actors, CITYLAB aims at using good examples from advanced cities to transfer knowledge to the others e.g. from the charter in Paris to clean air cooperation in Southampton. Additionally, the CITYLAB implementations provide a groundwork for continued cooperation after the project life-time.

Finally, the seven CITYLAB implementations provide detailed insight and understanding to how the selected initiatives achieve their objectives and how they should be prepared, organised and **supported to achieve these objectives**. That is why CITYLAB does not stop when the initiatives have been implemented. The outcome of the local implementations will be used for a **transferability analysis**, transferability workshops in the seven CITYLAB cities and a transferability trajectory with 7 non-CITYLAB cities. CITYLAB also has 18 **follower cities** who expressed interest in following one or more CITYLAB implementation. In combination with the dissemination activities, CITYLAB aims to facilitate roll-out and/or upscaling of the successful CITYLAB initiatives.

1.2 Scope of the deliverable

This deliverable is the output of one of the tasks of CITYLAB's work package on Living Lab interaction and transfer (WP6). To stimulate transfer of the CITYLAB implementations from their city of origin to one or more of the other CITYLAB cities, we organised one local stakeholder meeting per city where the different CITYLAB solutions were discussed and evaluated by representatives of the private and public sector. This CITYLAB deliverable 6.2 reports on these local stakeholder meetings.

1.3 Deliverable structure

The local stakeholder meetings were set up as MAMCA workshops. MAMCA is short for Multi-Actor Multi-Criteria Analysis. Chapter 2 of this deliverable describes the MAMCA methodology and explains how the meetings were organised. Chapter 3 provides a detailed report of the local stakeholder meetings in each city. In chapter 4, we summarize the most important outputs of the meetings.

2 MAMCA workshop

The goal of the local stakeholder meetings in the seven CITYLAB cities was to have local actors assessing whether the other tested CITYLAB solutions would be a good option for their city or not. We used Multi-Actor Multi-Criteria Analysis, which is an interactive tool that allows integrating different stakeholder opinions in one analysis. In Section 2.1, we describe the methodology in detail. In Section 2.2, we explain how the different steps of MAMCA were applied during CITYLAB's local stakeholder meetings. The idea of a MAMCA workshop is that representatives of each urban freight transport stakeholder group (shipper, transport operator, receiver and society) are present. During the workshop, each participant is guided in expressing how important certain (decision) criteria are to him/her when choosing or evaluating a certain last-mile option. In a second part of the workshop, the participants assessed how well they believe the CITYLAB implementations would score on these criteria if they were applied in their city. A third part of each workshop consisted of challenging the perceptions of local stakeholders by discussing the results and comparing them to the actual performance of the CITYLAB implementation (in the city where they were implemented). This assessment of actual performance was based on the evaluation work that was done in WP5. In Appendix A, we included the presentation material that was used during the workshops to present the actual performance of the CITYLAB solutions.

2.1 Multi-Actor Multi-Criteria Analysis (MAMCA)

The fact that many stakeholders are affected by urban freight transport decisions is commonly mentioned in papers and research project reports on the topic as well as the idea that successful urban freight transport solutions should reconcile the interests of all stakeholders (Verlinde, 2015). It is impossible and not necessary, though, to develop urban freight transport solutions that do not have any disadvantage to any stakeholder (Bjerkan, Sund, & Nordtømme, 2014). It suffices that each stakeholder perceives the advantages of a measure to be greater than its disadvantages to “reach common ground” which requires reflective collaboration between the different stakeholders (Bjerkan et al., 2014). That is why we use multi-actor multi-criteria analysis (MAMCA) to evaluate and visualise stakeholder support for CITYLAB's urban freight transport solutions.

MAMCA was developed by Macharis (2000, 2005 & 2007) as an extension of the traditional multi-criteria decision analysis (MCDA) which explicitly accounts for the objectives of the stakeholders involved in a certain decision-making process. Explicitly involving stakeholders boosts the acceptance rate of a certain solution (Walker, 2000). Traditional multi-criteria analysis (MCA) evaluates multiple conflicting criteria in decision-making but does not contain that multi-stakeholder perspective. There is only one list of criteria. According to Banville et al. (1998) it is possible to integrate this extra dimension in traditional MCA by including socio-political criteria into the decision-making process. MAMCA takes it one step further and combines and confronts several multi-criteria analyses, each from the perspective of one stakeholder. It allows stakeholders to define their own criteria and to allocate weights to these criteria. The output is an MCA for each stakeholder separately which provides insight in why they like or dislike a solution. The second output is a multi-actor view which reveals whether there would be overall stakeholder support for a certain solution or not. The methodology has been used for many applications, mainly in transport related decision-making problems (for an overview, see (Macharis, de Witte, & Ampe, 2009)).

MAMCA consists of two main phases (Macharis, 2005; Macharis *et al.*, 2009). The first phase is mainly analytical and gathers all necessary information to perform the analysis. The second phase consists of the actual analysis. These two phases are divided into respectively four and three steps (Macharis *et al.*, 2009) (See Figure 1). The first step is to clearly formulate a

problem and to identify which possible solutions to that problem will be evaluated. In the second step, all relevant stakeholders are determined as well as their objectives. In step three, these stakeholder objectives are translated into criteria and weighed by the stakeholders to know how important each criterion is to them. The fourth step assigns one or more measurable indicators to each criterion. These indicators allow evaluating each alternative or solution with regards to a given criterion. These indicators can be either quantitative or qualitative. In step five, the information of the previous steps is aggregated into an evaluation matrix. Step 6 generates the results of the analysis by applying MCA techniques. The seventh and last step is the actual implementation of the alternative that receives overall stakeholder support.

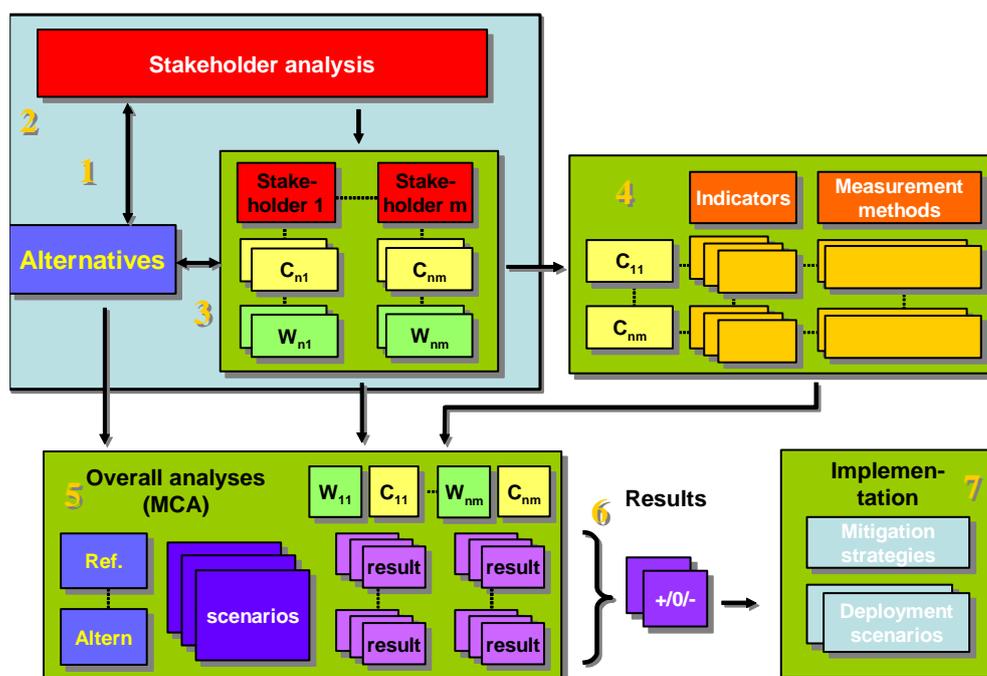


Figure 1. The MAMCA methodology (Source: Macharis *et al.*, 2004).

2.2 MAMCA for local stakeholder meetings

During each local stakeholder meeting, we followed the same MAMCA steps. The common parts for all local meetings are explained below. All meetings were held in the local language with support of VUB and by means of the MAMCA software developed by VUB (www.mamca.be).

Step 1: Alternatives

Determining the relevant alternatives is the starting point of the whole analysis. These alternatives are determined with respect to a given problem. These alternatives can be policy measures, scenarios, strategies or other actions which could solve the problem at hand. The alternatives are then translated into concrete scenarios.

During the local stakeholder meetings, we asked participants to compare the 6 implemented CITYLAB solutions to business as usual (BAU). Table 3 lists the alternatives and shows how they were presented to the participants.

Table 3. List of evaluated alternatives.

LIST AND DESCRIPTION OF ALTERNATIVES		
BAU	Baseline	<ul style="list-style-type: none"> - Largest parcel company in the country does B2B parcel pick-ups and deliveries in the city-centre by means of diesel vans. Vans travel between city-centre and distribution centre located outside city-centre. Parcel company only transport parcels from their own clients. - Small independent stores go to a wholesaler/retailer and supply themselves with their merchandise. - Shopping centres do not have common logistics functions. Drivers park their vehicle in the delivery area of the shopping centre and deliver shipments to the store inside the shopping centre. Retailers do not pay directly for deliveries.
A1	E-freight bikes and micro-hubs	<ul style="list-style-type: none"> - Largest parcel company does B2B parcel pick-ups and deliveries in the city-centre by means of e-freight bikes through centrally located micro-hubs. Parcels are carried between micro-hubs and distribution centre outside city-centre by means of diesel trucks. Parcel company only transport parcels from their own clients.
A2	Online shop and use of spare capacity	<ul style="list-style-type: none"> - Owners of independent stores buy some of their merchandise online and directly from one large manufacturer. Deliveries are done by a transport service provider with spare transport capacity and a very dense inner-city network. Store owners still go to a wholesaler/retailer to supply themselves with products from other manufacturers.
A3	Last-mile carrier and electric vans	<ul style="list-style-type: none"> - Largest parcel company outsources B2B parcel pick-ups and deliveries in the city-centre to a smaller 'last-mile' carrier. Roundtrips are done by means of electric vans from the centrally located warehouse of the last-mile carrier. Last-mile carrier consolidates with shipments of other clients in the same van. Shipments are carried between warehouse last-mile carrier and distribution centre parcel company by means of diesel trucks.
A4	Common logistics in shopping centre	<ul style="list-style-type: none"> - One centrally located shopping centre introduces a common logistics function. The in-house transport leg is decoupled from the delivery trips to the shopping centre. Drivers deliver the shipments to one or more shops in the shopping centre in a staffed goods receipt area, use of the common logistics by shopping centre retailers is compulsory and a paying service, service provider delivers from the goods receipt area to the store and handles waste.
A5	Urban warehouse and electric vans (25%)	<ul style="list-style-type: none"> - Largest parcel company operates an additional warehouse located in the city-centre. From there, roundtrips are done by means of electric and diesel vans (25% electric). Transport between centrally located warehouse and distribution centre outside city-centre is done by means of diesel trucks. Parcel company only transport parcels from their own clients.
A6	Integrated reverse logistics	<ul style="list-style-type: none"> - Largest parcel company integrates pick-up of plastic caps for recycling from different locations of one existing client in their regular roundtrips.

For the workshop in Amsterdam, we used a slightly different set of alternatives because the meeting was set up together with project partners of a Dutch research project on the use of electric light commercial vehicles for urban freight transport at the Amsterdam University of Applied Sciences. More information about the project can be found [here](#). Table 4 lists the which alternatives were evaluated during the local stakeholder meeting in Amsterdam and shows how they were presented to the participants. This is a translation of the original list which was in Dutch.

Table 4. List of evaluated alternatives (Amsterdam).

LIST AND DESCRIPTION OF ALTERNATIVES (AMSTERDAM)		
BAU	Baseline	PostNL does B2B parcel pick-ups and deliveries in Amsterdam by means of diesel vans. Vans travel between city-centre and distribution centre located outside city-centre. PostNL only transports parcels from their own clients (collections and deliveries).
A1	E-freight bikes and multiple micro-hubs	PostNL does B2B parcel pick-ups and deliveries in Amsterdam by means of e-freight bikes through centrally located micro-hubs. Parcels are carried between micro-hubs and distribution centre outside city-centre by means of diesel trucks. PostNL only transports parcels from their own clients (collections and deliveries).
A2	One centrally located urban warehouse and electric vans (25%)	PostNL operates an additional warehouse located in the city-centre. They rent the warehouse from the local authorities under favourable conditions. From the warehouse, roundtrips are done by means of electric and diesel vans (25% electric). Transport between centrally located warehouse and distribution centre outside city-centre is done by means of diesel trucks. PostNL only transports parcels from their own clients (collections and deliveries).
A3	One centrally located urban warehouse, electric vans and electric freight bikes	PostNL operates an additional warehouse located in the city-centre. They rent the warehouse from the local authorities under favourable conditions. From the warehouse, roundtrips are done by means of electric vans and electric freight bikes (choice based on distance). Transport between centrally located warehouse and distribution centre outside city-centre is done by means of diesel trucks. PostNL only transports parcels from their own clients (collections and deliveries).
A3	Last-mile carrier and electric vans	PostNL outsources B2B parcel pick-ups and deliveries in the city-centre to a smaller 'last-mile' carrier. Roundtrips are done by means of electric vans from the centrally located warehouse of the last-mile carrier. Last-mile carrier rents the warehouse at normal market price. Last-mile carrier consolidates with shipments of other clients in the same van (collections and deliveries). Shipments are carried between warehouse last-mile carrier and distribution centre PostNL by means of diesel trucks.
A5	Last-mile carrier and electric freight bikes	PostNL outsources B2B parcel pick-ups and deliveries in the city-centre to a smaller 'last-mile' carrier. Roundtrips are done by means of electric freight bikes from the centrally located warehouse of the last-mile carrier. Last-mile carrier rents the warehouse at normal market price. Last-mile carrier consolidates with shipments of other clients in the same van (collections and deliveries). Shipments are carried between warehouse last-mile carrier and distribution centre PostNL by means of diesel trucks.

A6	Integrated reverse logistics	PostNL does B2B parcel pick-ups and deliveries in Amsterdam by means of diesel vans. Vans travel between city-centre and distribution centre located outside city-centre. PostNL only transports parcels from their own clients (collections and deliveries). They combine their roundtrips with collection of clean waste from existing customers.
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Step 2: Stakeholders

Once the alternatives are determined, all relevant stakeholders need to be identified through a stakeholder analysis. According to Freeman (1984), a stakeholder is a person who has a certain interest (financial, legal, etc.) in the consequences of a certain decision or measure. It is crucial to determine what the objectives of each stakeholder are to perform the analysis. Their vision on the problem definition is crucial and it is possible that they could come up with a new alternative.

Explicitly including the stakeholders in the analysis is necessary due to two main reasons. First, the quality of the final decision cannot be guaranteed by the sole fact that a researcher performs an analysis. He/she has limited access to important sources of information concerning the decision problem. Second, including stakeholders might be useful when the decision problem is highly controversial (Macharis, 2005; Macharis, 2007; Macharis *et al.*, 2009).

CITYLAB solutions address urban freight transport problems. Literature identifies different stakeholders for urban freight transport. Ogden (1992), who was one of the first to write a comprehensive analysis of urban freight transport, identified three main stakeholders with an active role in urban freight transport: receivers, carriers and forwarders. Most of the other authors addressing the topic of urban freight stakeholders also distinguish among these three, although some of them do not consider forwarders (also called shippers) and receivers to be separate stakeholders (Taylor, 2005; Witlox, 2006; Quak, 2008; Behrends; 2011) or do not include receivers (Taniguchi & Tamagawa, 2005). The importance of policy-makers, decision-makers and local authorities as urban freight transport stakeholders is also commonly recognised (Ballantyne, Lindholm, & Whiteing, 2013; Behrends, 2011; Bjerkan *et al.*, 2014; M. Lindholm & Browne, 2013; M. E. Lindholm, 2012; MDS Transmodal, 2012; Muñuzuri, Larrañeta, Onieva, & Cortés, 2005; Quak, 2008; Russo & Comi, 2011; Stathopoulos, Valeri, & Marcucci, 2012; Taniguchi & Tamagawa, 2005; Taylor, 2005; Witlox, 2006). Policy makers take the role of defending the stakes of all urban stakeholders that are affected by urban freight transport. Some authors suggest considering ‘society’ or ‘citizens’ as a fifth stakeholder (Taniguchi & Tamagawa, 2005; Taylor, 2005; Witlox, 2006; Quak, 2008). Ballantyne *et al.* (2013) argue that citizens and visitors have an interest in the system of urban freight transport but do not have a direct influence on the system. From that perspective, the authors differentiated between actors and stakeholders and considered public transport operators, trade associations, commercial organisations and land owners/property owners as passive stakeholders. Some authors also include infrastructure providers and operators (Taniguchi & Tamagawa, 2005; MDS Transmodal Limited, 2012).

For the MAMCA analyses of the CITYLAB solutions, we identified five types of stakeholders: shippers, receivers, transport operators, society and shopping centre owners. This is based on the description of the solutions in D5.3 (CITYLAB, 2017a). We chose to merge local authorities and citizens in one stakeholder group (society) because the CITYLAB solutions are not policy measures for urban freight transport that can effectively be implemented by authorities. Stakeholder group shopping centre owners is only relevant for the Oslo implementation.

For each local meeting, local research partners invited local shippers, receivers, transport operators and authorities. It appeared to be hard to also have shopping centre owners present.

They were only there during the workshop in Oslo. In Chapter 0, we list the participating stakeholders for each local stakeholder meeting individually.

Step 3: Criteria and weights

The criteria of each stakeholder are determined based on the two previous steps (Macharis, 2007). In a traditional MCA, these criteria represent the effects of a certain alternative but this is not the case in MAMCA. In MAMCA, they represent the objectives of the stakeholders. Once these criteria are determined, they can be summarized by using a hierarchical tree (Macharis, 2005). Determining the criteria is not enough. It is obvious that not every criterion is equally important for a given stakeholder. Therefore, this step also consists of allocating weights to the criteria (Macharis, 2005; Macharis, 2007; Macharis *et al.*, 2009). There are different methods available for determining the weights (for an overview, see (Nijkamp *et al.*, 1990).

For the MAMCA workshops during the local stakeholder meetings, we used the criteria we used for the MAMCA analyses that were performed for each implementation individually as part of WP5 (CITYLAB D5.4). Table 5 lists the criteria that were used during the local stakeholder meetings per stakeholder group.

To assign weights to each criterion, we used the AHP (Analytic Hierarchy Process) pairwise comparison method developed by (Saaty, 1990) as it provides a systematic way to allocate the weights (Saaty and Vargas, 2000). Participants were asked to pairwise compare their criteria (maximum 5) on a nine-point scale ranging from 1 (meaning that both criteria are equally important) to 9 (meaning that criterion A is much more important than criterion B). Figure 2 shows how the weight elicitation was presented to workshop participants in the MAMCA software.

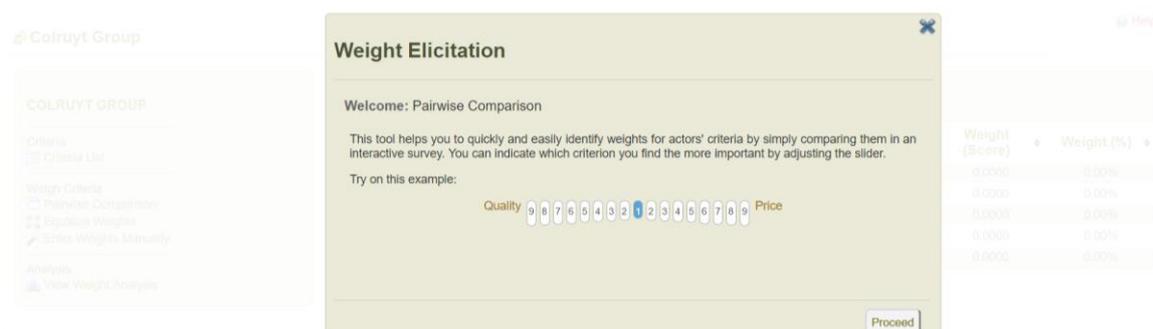


Figure 2. Weight Elicitation in the MAMCA software by pairwise comparison.

Table 5. List of stakeholders and criteria used during the MAMCA workshops with local stakeholders.

STAKEHOLDERS	CRITERIA	DESCRIPTION
Shippers	High quality pick-ups	High quality pick-ups (convenient, on time and without damaging the goods)
	Low cost for transport	Low cost for transport
	High quality deliveries	Satisfied receivers
	Positive effect on society	Social and environmental ambitions, beyond the interests of the firm and beyond complying with the law
Transport operators	Profitable operations	Maximum positive difference between revenues and variable costs for providing transport services
	Viable investments	Positive return on investment
	High quality service	Shipper and receiver satisfaction
	Satisfied employees	Employees are satisfied with their work and working conditions
Receivers	Positive effect on society	Social and environmental ambitions, beyond the interests of the firm and beyond complying with the law
	High quality deliveries	High quality deliveries (convenient, on time and undamaged)
	Shopping environment	Attractive shopping environment for consumers (goods availability and pleasant physical shopping environment)
	Low cost for receiving goods	Low cost for receiving goods (also when included in cost for goods)
Society	Air quality	Low concentration of particulate matter, NOx and SO2
	Noise	Low exposure to noise nuisance from transport
	Fluent traffic	Fluent traffic flows on the urban road transport network
	Road safety	Low risk of a person using the urban road transport network being killed or injured
	Shopping environment	Attractive shopping environment for consumers (goods availability and pleasant physical shopping environment)
Shopping centre	Financial viability	Making profit by providing storage service
	Shopping environment	Attractive shopping environment for consumers (goods availability and pleasant physical shopping environment)
	High quality service	High quality deliveries (convenient, on time and undamaged)

Step 4: Indicators

The fourth step consists of “operationalizing” the criteria by identifying measurable indicators which allows an evaluation of how well a certain alternative performs on a given criterion. In other words, a scale is created by using indicators that can measure the contribution of an alternative (Macharis, 2007, Macharis *et al.*, 2009). These indicators can be quantitative or qualitative (Macharis *et al.*, 2009). It is also possible that several indicators are used to measure the performance of an alternative on one single criterion and vice versa, that one indicator can be allocated to multiple criteria (Macharis, 2007).

In CITYLAB D5.4, we performed a MAMCA for each implementation. For those analyses, the criteria were linked to one or more indicators of the Excel template developed for data collection and dashboards in CITYLAB and the analyses were based on quantitative data collected during the implementation.

For the MAMCA workshops during the local stakeholder meetings, we did not ask participants to assess the indicators because they did not experience most of the alternatives yet since it is an ex-ante assessment for them. We asked them how they assess a certain alternative would score on each of their criteria. It means that the criterion ‘positive effect on society’, for example, was not split up in road safety, air quality, fluent traffic, noise and greenhouse gas emissions but evaluated by the participants as one criterion.

Step 5: Analysis and ranking

To evaluate the different alternatives there are many different MCA methods available. Especially the MCA methods of the so-called Group Decision Support Methods (GDSM) are very useful to apply in the MAMCA methodology. These methods involve the PROMETHEE methods (Brans, 1982; Macharis *et al.*, 1998), ELECTRE (Roy & Bouyssou, 1988) and AHP (Saaty, 1988). The main advantage of these GDSM is that they offer a certain freedom to the stakeholders in terms of defining their own criteria, weights and preference structure and only at the end of the analysis the different points of view are being confronted (Macharis *et al.*, 2009).

For the MAMCAs in WP5 (D5.4), we chose the Analytic Hierarchy Process (AHP) which uses pairwise comparisons. Performances of alternatives on criteria are converted into scores through pairwise comparison on a 9-point scale. These pairwise comparisons were based on the quantitative data collected during the implementation or on qualitative assessments based on the comments during the data collection for evaluation and for the dashboards or in D5.3. Through pairwise comparison, relative priorities are assigned. In the aggregations phase: scores of alternatives on criteria are multiplied by weights and added up into a compound utility score. We chose for AHP because it is user friendly and reliable (Wang & Yang, 1998).

We planned to also use this AHP method during the local stakeholder meetings to be able to compare the assessments of the local stakeholders to the project assessments based on actual data collection. During the first stakeholder meeting in London, where the AHP method was used, it appeared that it took participants too much time to pairwise compare the seven alternatives (BAU + six implementations) on each of their criteria (maximum five). That is why we decided to change the approach for the remaining local stakeholder meetings and use the PROMETHEE method. Workshop participants were asked to score how they assess the six alternatives would score on a seven-point scale (very negative, negative, slightly negative, neutral, slightly positive, positive or very positive) compared to BAU. Figure 2 shows how participants are asked to pairwise compare two criteria or alternatives in the MAMCA software. In case of evaluation of alternatives, a score ‘1’ means that both alternatives score equally on the criterion under evaluation and a score of ‘9’ means that alternative 1 scores distinctively better than scenario B on this criterion.

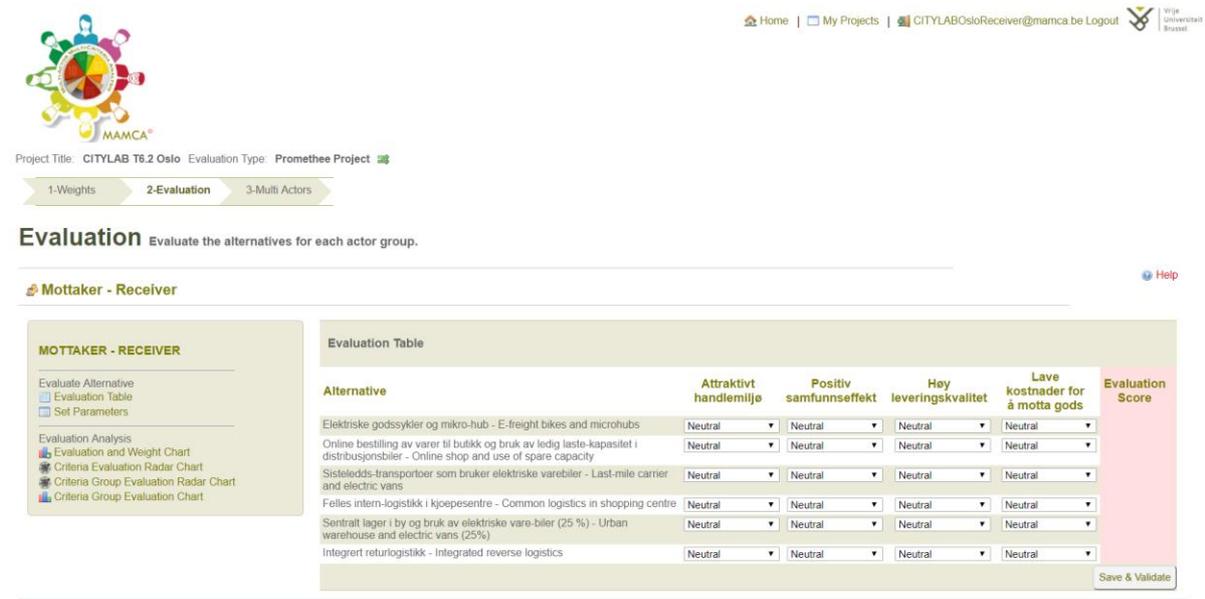


Figure 3. Evaluation of alternatives in the MAMCA software (Promethee).

There is one important issue when introducing the extra dimension of involving stakeholder to the decision-making problem: should the stakeholders also be weighed? The initial assumption is that every stakeholder is equally important because it reflects the concept of involving all stakeholders the best. Depending on the decision-making problem, this assumption might not be optimal. The researcher always has the possibility to perform a sensitivity analysis to see if the assumption of equal importance is valid (Macharis *et al.*, 2009). For the MAMCA workshops during the CITYLAB local stakeholder meetings, we assumed that the opinion of each stakeholder is equally important.

Analysis and ranking of the alternatives were done automatically during the workshop by the MAMCA software.

Step 6: Results

The eventual outcome of the MAMCA is a classification of the proposed alternatives which reveals their strengths and weaknesses. The overall classification is however not the only result the MAMCA provides. A second output is a ranking per stakeholder allowing to identify the most important stakeholders in the decision-making process along with their criteria. For each stakeholder, you can evaluate which elements have a positive or negative effect on his acceptance of the proposed alternatives. In Chapter 0, we present the output of the MAMCAs for each local stakeholder meeting individually.

Step 7: Implementation

Traditionally, the final step of MAMCA is implementing a solution that receives overall stakeholder support. MAMCA supports a decision on which solution to implement but also on the implementation path because you know what is important to all stakeholders. It might also be that this step leads to the definition of new alternatives based on the output of the analysis which, in turn, can lead to a restart of the whole analysis with different alternatives (Macharis *et al.*, 2009).

The MAMCA workshops during the local stakeholder meetings in CITYLAB aimed to explore whether there is support among local stakeholders for the implemented CITYLAB solutions. In

this case, step 7 was not implementing the solution but comparing the assessment of the local stakeholders to how an alternative performed while it was implemented in its city of origin. This comparison resulted in a discussion. The most important learnings from those discussions are listed per local stakeholder meeting in Chapter 0. In Appendix A, we included the presentation material that was used during the workshops to present the actual performance of the CITYLAB solutions.

3 Output of local stakeholder meetings

CITYLAB's local stakeholder meetings are listed in Table 6.

Table 6. List of local stakeholder meetings in CITYLAB cities.

CITYLAB city	Date local stakeholder meeting
London	25 October 2017
Oslo	15 November 2017
Amsterdam	27 November 2017
Southampton	5 December 2018
Brussels	8 December 2018
Paris	8 December 2018
Rome	31 January 2018

3.1 Local stakeholder meeting London

3.1.1 General information

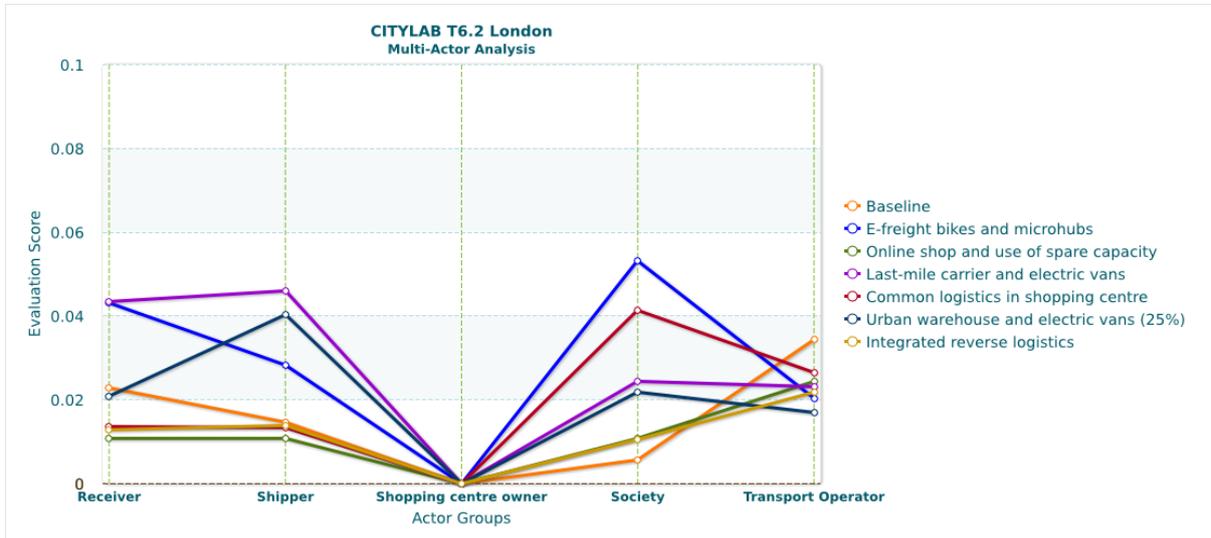
The local stakeholder meeting in London took place on 25 October 2017 at University of Westminster (35 Marleybone Road, London) from 11am until 2pm. Moderator was Bram Kin (VUB). The different stakeholder groups were represented by:

- Receivers:
 - Maria Curro, Better Bankside BID
 - Julian Allen, University of Westminster
- Shippers:
 - Andy Wilson, TNT UK
 - Russell Hodson, Anglo Stationery
- Society:
 - Jacqueline Short, TfL
 - Tom Parker, London Borough of City of London
 - Jacques Leonardi, University of Westminster
- Transport operators:
 - Sam Clarke, Gnewt Cargo
 - Bruce Carnaby, Clipper logistics

3.1.2 MAMCA Multi-Actor view

For the stakeholders in London, there is not one solution that would receive overall stakeholder support. There is consensus on the fact that the 'online shop and use of spare capacity' solution

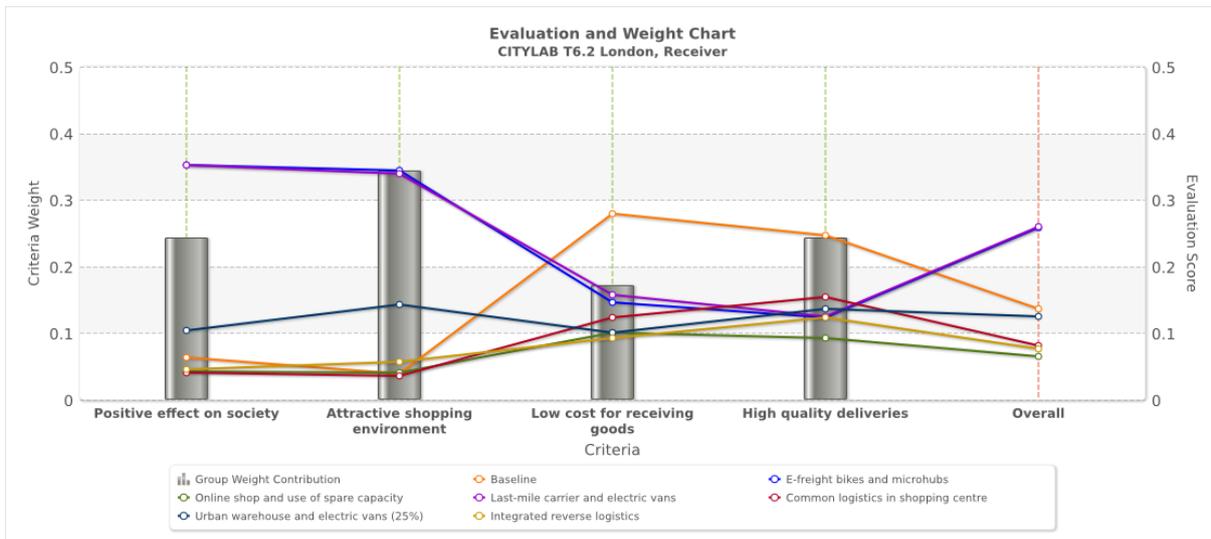
and the 'integrated reverse logistics solution are not favourable. All participating stakeholders have a different preferred solution. Transport operators assess that business-as-usual would be better for them than all proposed CITYLAB solutions. Receivers and shippers like the solution with a last-mile carrier and electric vans but society and transport operators are not too keen on the solution. Shopping centre owners were not represented during the workshop which is why their point of view is not depicted.



3.1.3 MAMCA Mono-Actor views

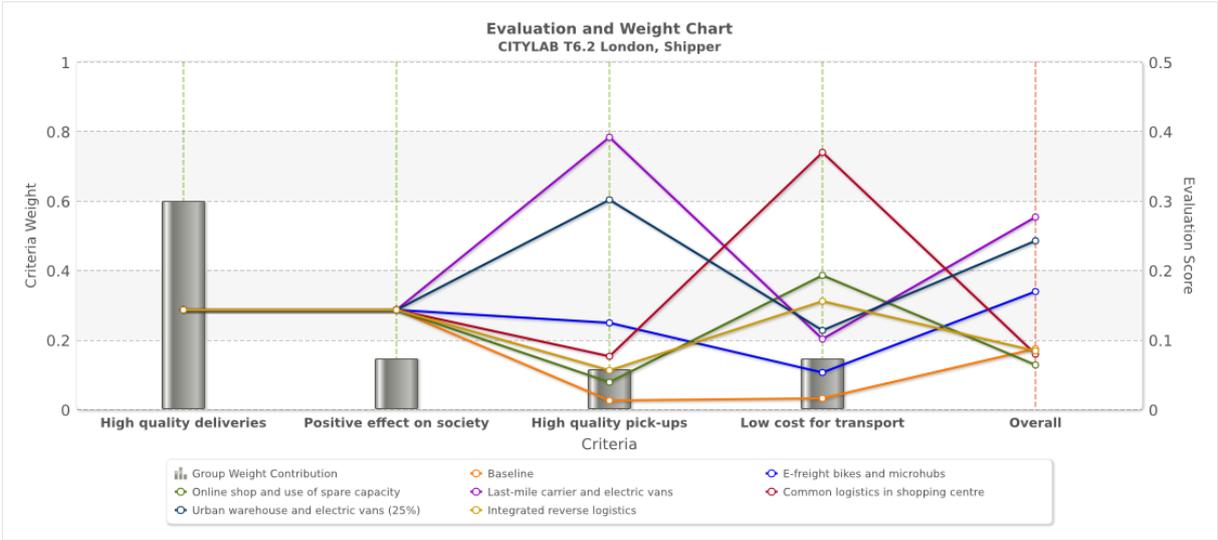
3.1.3.1 Receiver

Receivers indicated that they attach most importance to an attractive shopping environment and least importance to a low cost for receiving goods. Overall, they expect that the 'E-freight bikes and microhubs' solution and the 'Last mile carrier with electric vans' would suit them best. They assess that both solutions would score much higher than the other solutions on their most important criterion (attractive shopping environment). Overall, their third best scenario is business-as-usual because they assess that BAU would score well on their low-cost criterion and on their high-quality deliveries criterion.



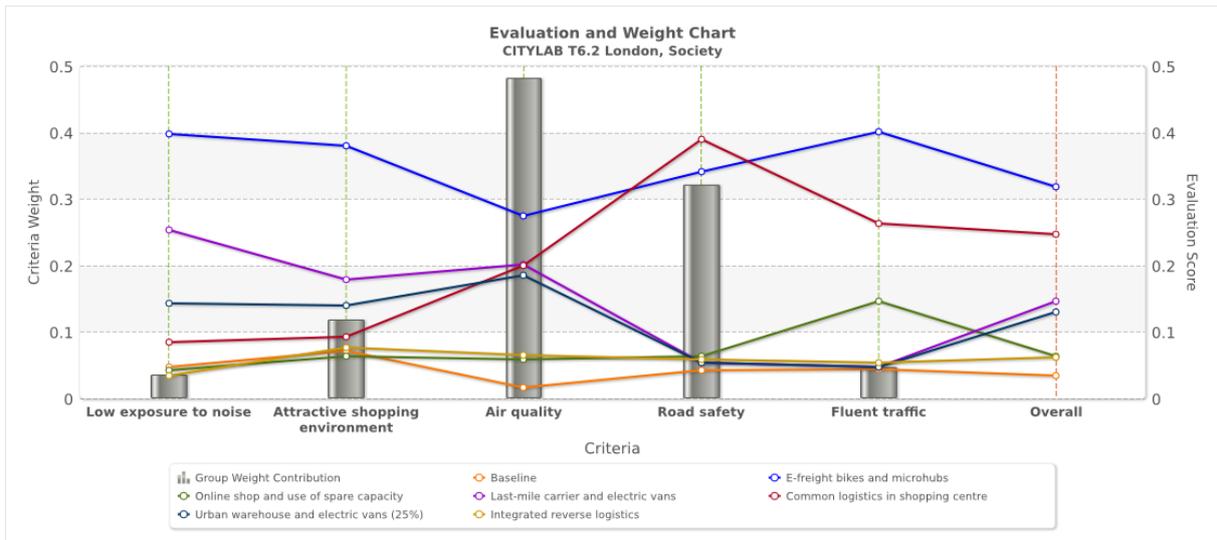
3.1.3.2 Shipper

For the shippers represented in the workshop, there is one main criterion: high-quality deliveries. To them, it is nearly four times as important as the other criteria which are equally important. Unfortunately, shippers did not evaluate how they assume the different alternatives would score on two of their criteria: ‘high-quality deliveries’ and ‘positive effect on society’ because it took too much time to pairwise compare all alternatives on all criteria. That is why we adjusted the workshop method after this workshop. Based on the two criteria they did evaluate their two best solutions are the ‘last mile carrier and electric vans’ and the ‘urban warehouse and electric vans’. ‘E-freight bikes and microhubs’ also scores better than BAU. They expect that all other solutions would be just as good for them or a bit worse than BAU.



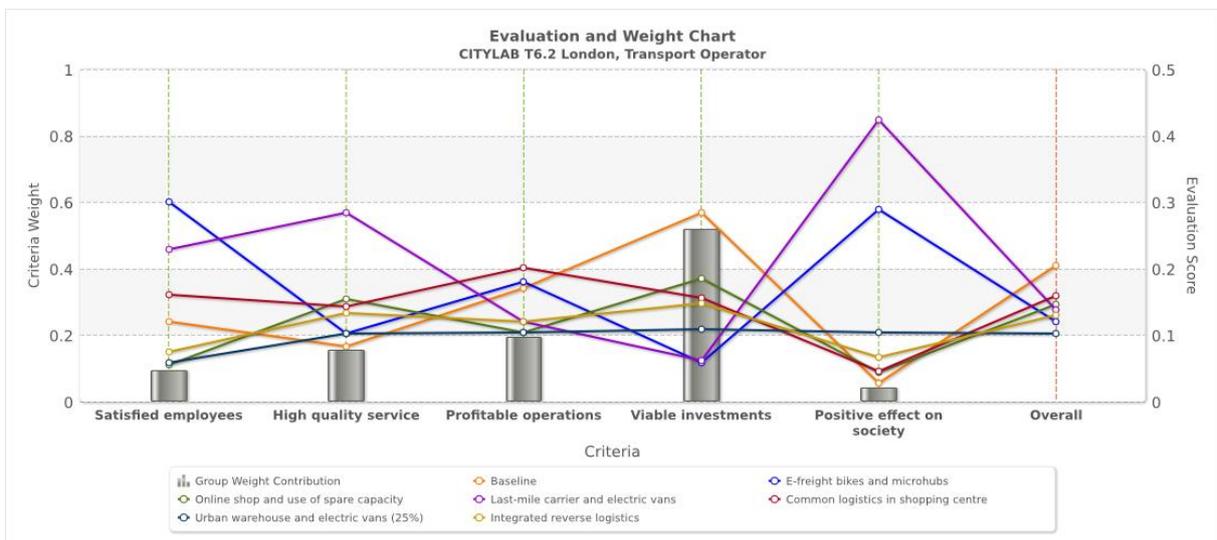
3.1.3.3 Society

For society, there are two dominant criteria: air quality and road safety. One solution is particularly appealing to this stakeholder, it scores high on all criteria of this stakeholder: e-freight bikes and microhubs. They also assess that a ‘common logistics in shopping centres’ would also meet their needs and that all alternatives would be better for them than BAU.



3.1.3.4 Transport Operator

Transport operators do not believe in the CITYLAB solutions. They assess that BAU would always score better on their most important criterion, which is viability of investment. When implementing one of the solutions, making sure that this criterion is met should receive a lot of attention. The criterion ‘positive effect on society’ is not important to this stakeholder. Transport operators assess that all CITYLAB solutions would score better than BAU on the criteria ‘high-quality service’ and ‘positive effect on society’ but because of the dominance of their most important criterion, this is not reflected in the overall ranking. From a profitability perspective, they see some value in ‘common logistics functions in shopping centres’ and in ‘e-freight bikes and microhubs’. Compared to the other stakeholder groups in London, overall there are only small differences in the scores for the different alternatives.



3.1.4 Discussion

During the MAMCA workshop in London, there were some issues with the MAMCA software. Because of it, we were not able to display the above figures to discuss them.

Concerning the objectives and their weights, one of the transport operators believes that in general, too much value is attached to the criterion 'viable investment', assuming that this criterion is always positive.

There was a constructive conversation about future steps and potential growth of the London solutions. There was no time to formalise actions out of it, as this will be the main task of the next London Living Lab meeting early 2018. It was concluded, though, that three actions remain on top of the priority list when dealing with growth of electric vehicle use for urban freight transport and consolidation:

- Search for suitable central location for electric vehicle depots
- Test further business models and expand the business with new clients and new partnerships
- Include multiple stakeholders into the search for feasible solutions in London and in other cities in UK

3.2 Local stakeholder meeting Oslo

3.2.1 General information

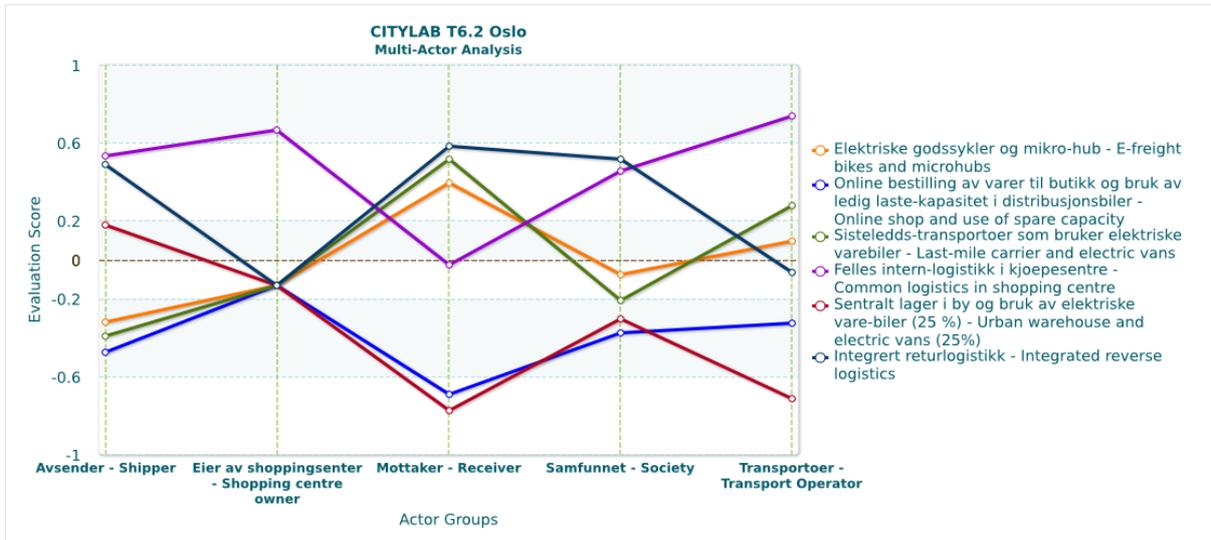
The local stakeholder meeting in Oslo took place on 15 November 2017 at the Institute of Transport Economics (21 Gaustadalléen, Oslo) from 11.30am until 3.30pm. Moderator was Sara Verlinde (VUB). The different stakeholder groups were represented by:

- Receivers:
 - Sven Bugge, Leverandørenes Utviklings- og kompetansesenter (LUKS)
 - Jon Anders Henriksen, Oslo Handelsstands Forening (OHF)
 - Elise Caspersen, Transportøkonomisk institutt (TOI)
- Transport operators:
 - Niels Oscar Grande, Bring
 - Cathrine Brusveen Tyszko, ColliCare (In-house logistic service provider)
 - Jurg Berger, Leverandørenes Utviklings- og kompetansesenter (LUKS)
- Shopping centre owners:
 - Pål Samuelsen, Steen & Strøm
 - Olav Eidhammer, Transportøkonomisk institutt (TOI)
- Shippers:
 - Gjermkund Strømnes, ASKO
 - Rune Tyskeberg Stranna, ASKO
 - Gaute Taarneby, CIVITAS
- Society:
 - Ole Helmick Øen, Statens vegvesen Region Øst
 - Karin Fossheim, Transportøkonomisk institutt (TOI)

3.2.2 MAMCA Multi-Actor view

For stakeholders in Oslo, two alternatives stand out. First, the reverse logistics scenario appears to be appealing to shippers, receivers and society. Only transport operators do not favour the alternative, they even assess that it would be worse for them than business-as-usual (BAU). Shopping centre owners are not really impacted by this reverse logistics alternative. For them, all alternatives score much lower than the one alternative that impacts them (the common logistics in shopping centres). Second, the 'common logistics in shopping centres' alternative scores well for all stakeholders, except for receivers. There should be a focus on meeting their criteria when implementing this solution. Two solutions would be worse

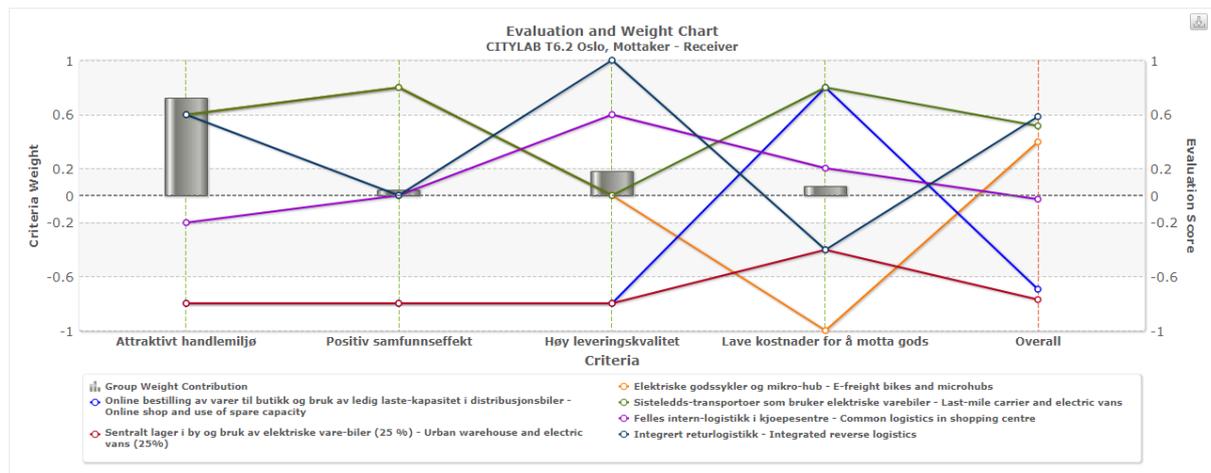
than BAU for all stakeholders (according to their own assessments): ‘online shop and use of spare capacity’ and ‘urban warehouse and electric vans’.



3.2.3 MAMCA Mono-Actor views

3.2.3.1 Receiver

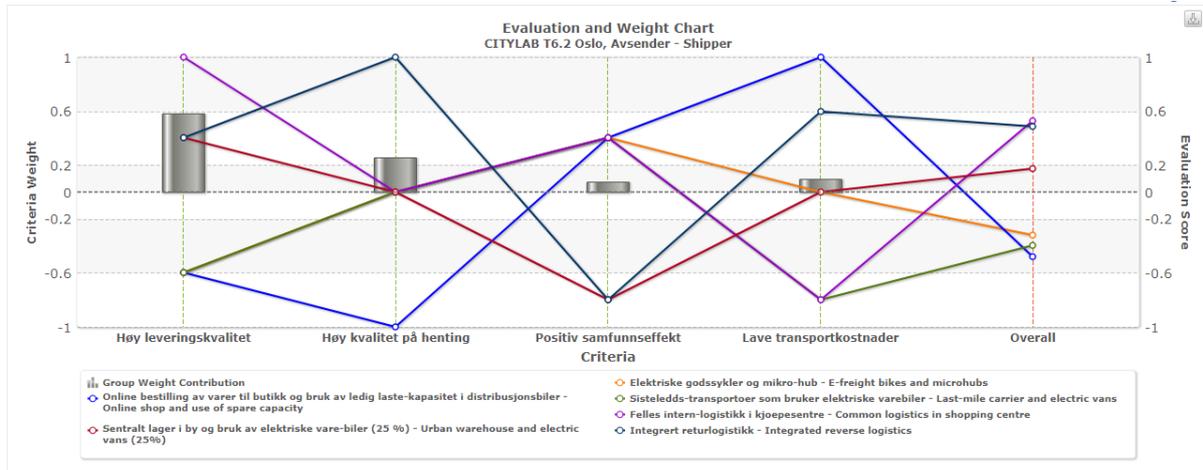
Receivers in Oslo attach a lot of importance to the criterion ‘attractive shopping environment’. The other criteria are only of minor importance, especially ‘low cost’ and ‘positive effect on society’. Because this criterion is so dominant and because they assess that the alternatives ‘integrated reverse logistics’, ‘last-mile carrier and electric vans’ and ‘e-freight bikes and microhubs’ would score well on this criterion, these three alternatives are their favourites.



3.2.3.2 Shipper

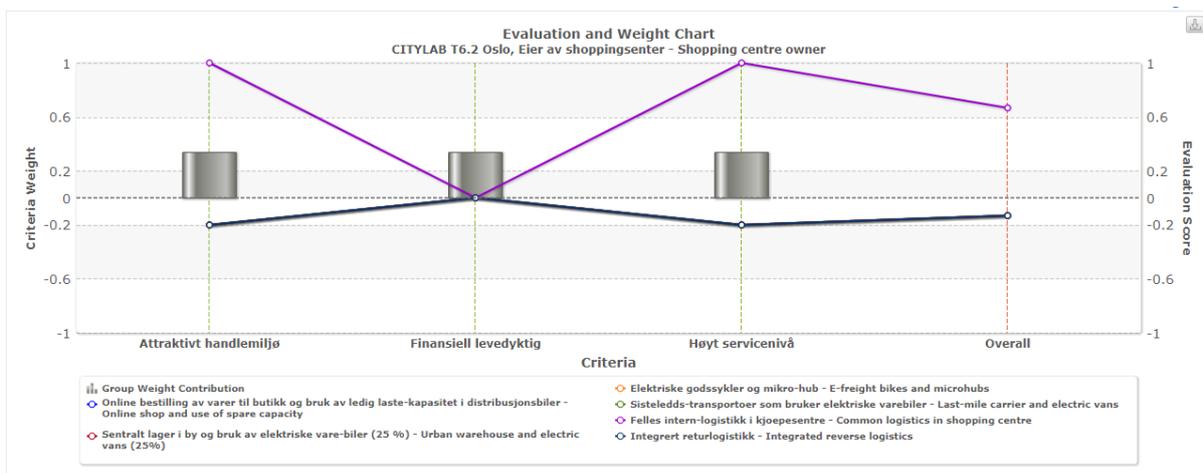
Shippers find the criterion ‘high-quality deliveries’ is the most important criterion. They also attach importance to ‘high-quality pick-ups’. Overall, they like the ‘common logistics function in shopping centres’ alternative because they feel that it will heavily improve the quality of deliveries and they like the ‘integrated reverse logistics’ alternative because it might improve the quality of pick-ups. Receivers also assess that the ‘common logistics function’ will improve quality of deliveries, but they do not attach high value to that criterion which is why this

alternative does not score that well. Most lines displayed in the graph have lows and highs which means that shippers feel that no alternative would meet all their criteria. For them, there is no perfect solution which covers all their criteria, but they do prefer ‘common logistics in shopping centres’ and ‘integrated reverse logistics’ because they score relatively high on their important criteria and relatively low on the less important criteria.



3.2.3.3 Shopping centre owner

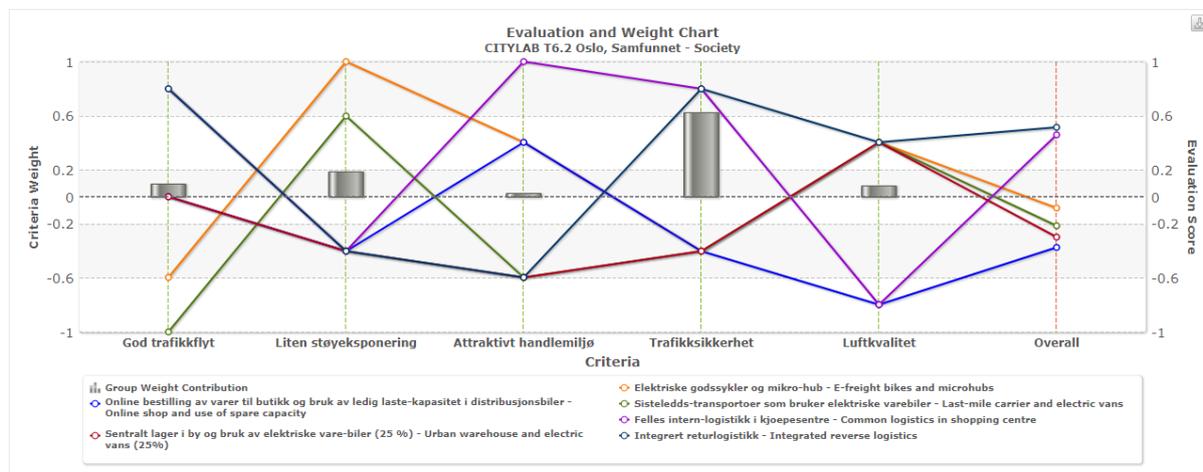
This was the only local workshop where a shopping centre owner was present. All criteria were considered equally important and all alternatives score equally on the three criteria, except for the ‘logistics function in shopping centres alternative’ of which this stakeholder finds that it would score better than BAU on ‘attractive shopping environment’ and ‘high-level service’ and that it would not have an impact on financial viability.



3.2.3.4 Society

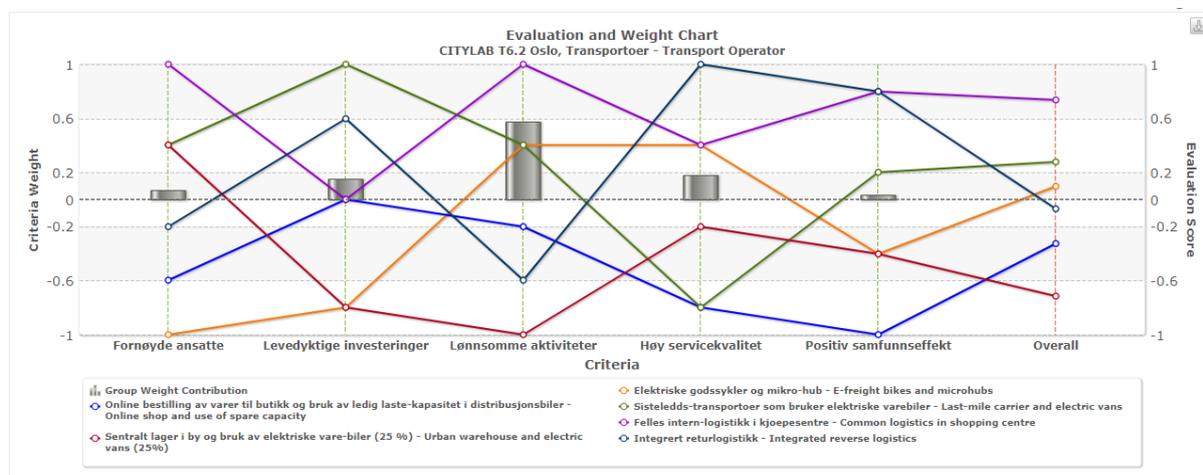
For society, ‘traffic safety’ is the dominant criterion (over 60%). The second important criterion is fluid traffic (nearly 20%). Again, there is not one alternative that scores well on all criteria which means that for the participants to the workshop, all alternatives have advantages and disadvantages. The reason that ‘integrated reverse logistics’ and ‘common logistics in shopping centres’ score well is because participants assess that these scenarios would

contribute to better traffic safety compared to BAU. They assess that 'e-freight bikes and microhubs' and 'last-mile carrier and electric vans' would have a positive impact on their second important criterion (fluid traffic).



3.2.3.5 Transport Operator

Transport operators feel that 'profitable operations' is their most important criterion. 'Positive effect on society' and 'satisfied employees' is least important to them. There is no alternative that receives an overall positive evaluation but the 'common logistics in shopping centres' alternative comes close. There are doubts on whether this solution would meet their 'viable investments' criterion, but for the rest, they like this alternative. Transport operators are not at all enthusiastic about the 'online shop and use of spare capacity alternative'.



3.2.4 Discussion

One important comment during the discussion afterwards was that the alternatives are difficult to compare, especially the alternatives 'Online shop and use of spare capacity' and 'Common logistics in shopping centre' are completely different from the other alternatives.

Concerning the criteria:

- Cost as such is not that important for receivers. What is important is the added value a certain solution offers. If this added value is proportional to the price that should be paid for it, cost is not an issue.
- Transport operators emphasize that operational cost is by far their most important criterion. The other criteria are less important because transport companies cannot exist if the operational cost is not under control.

Concerning the alternatives:

- Participating transport operators all transport large volumes and large shipments. They do not see the potential of solutions that involve freight bikes because their shipments are too large. They also state that the volumes of small parcels are too small for freight bikes to make a substantial difference in impact for society.
- The transport operators assess that the solution with a centrally located urban warehouse cannot work in Oslo because real estate prices are too high and local authorities would never support such a solution by offering a warehouse below market prices. They also believe that concrete changes and minor improvements is easier to implement than substantial changes.
- One of the receivers claims that a solution only works if it lowers costs or if it adds value. Most of the people present do not object against interference of local authorities: by raising taxes, they can make sure that solutions that are beneficial to society are cost-efficient as well. Most important aspect is that the playing field is the same for all companies and authorities do not favour certain private companies.
- The Alnabru logistic centre should be used more efficient as a consolidation centre and terminal connecting long distance transport using rail and road with city distribution.
- In the new Økern shopping centre it is important that charging facilities for electric vehicles is a part of the services. A challenge for the centre is the high share of area dedicated to restaurants, 18 % of the area in the new centre, compared to normally 4 %. This give specific challenges connected to deliveries and in-house logistics in the centre.

3.3 Local stakeholder meeting Amsterdam

3.3.1 General information

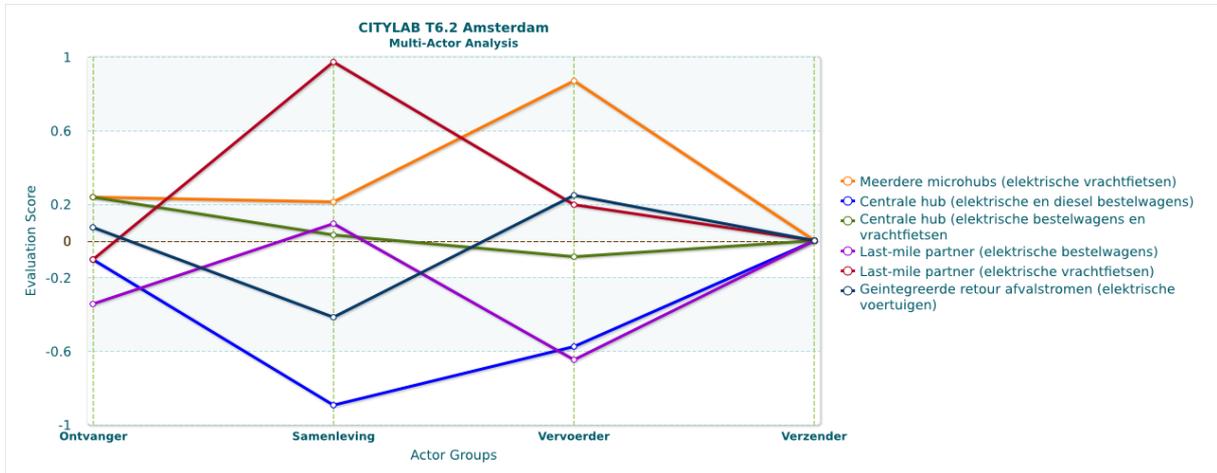
The local stakeholder meeting in Amsterdam took place on 27 November 2017 at Amsterdam University of Applied Sciences (190 HvA Weesperzije, Amsterdam) from 1pm until 3pm. Moderator was Sara Verlinde (VUB). The different stakeholder groups were represented by:

- Susanne Balm, Amsterdam University of Applied Sciences
- Martin Boerema, Amsterdam University of Applied Sciences
- Stan Hoogteijling, Amsterdam University of Applied Sciences
- Tariq van Rooijen, TNO
- Stefan Talen, TNO
- Nannette Wielenga, PostNL

3.3.2 MAMCA Multi-Actor view

For the workshop in Amsterdam, some of the confirmed participants cancelled at the last minute. To stimulate discussion and because no representatives of stakeholder group 'shipper' were present, we decided to do a workshop with 'receivers', 'society' and 'transport operators'. That is the reason why all scenarios score equally for stakeholder 'shipper'. Also keep in mind that the list of alternatives was slightly adjusted for this workshop (See Table 4 on p. 12 for the list of alternatives). Stakeholders in Amsterdam like both solutions with e-freight bikes ('multiple

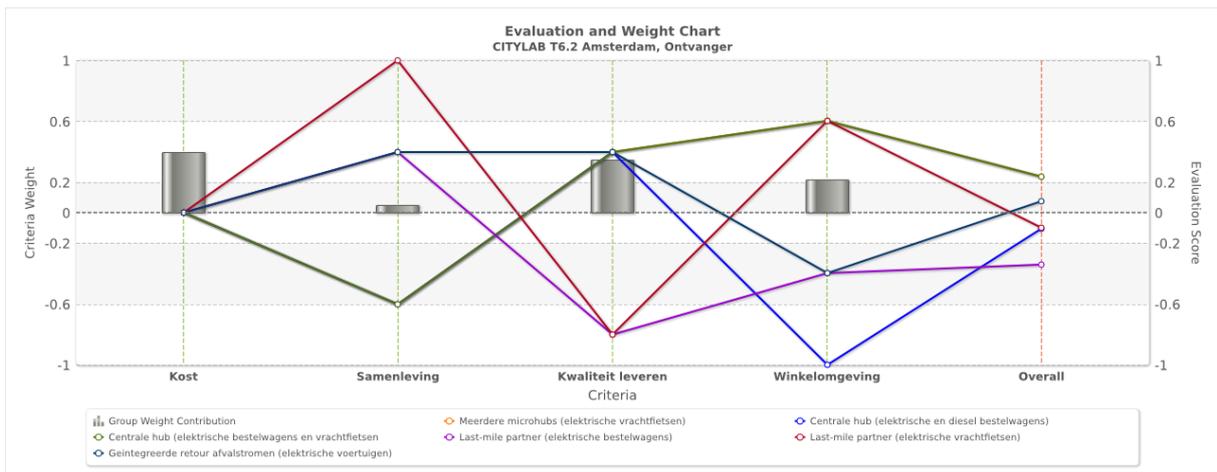
microhubs' (orange line) and a 'hub operated by a specialized last-mile partner' (red line)). They do not like the alternative with a 'central hub and a combination of diesel and electric vans' (blue line) and they are relatively neutral towards a 'central hub operated with electric vans and e-freight bikes' (green line). The purple line represents the 'hub operated by a specialized last-mile partner with electric vans' alternative and the cyan line represents the 'Integrated reverse logistics' alternative.



3.3.3 MAMCA Mono-Actor views

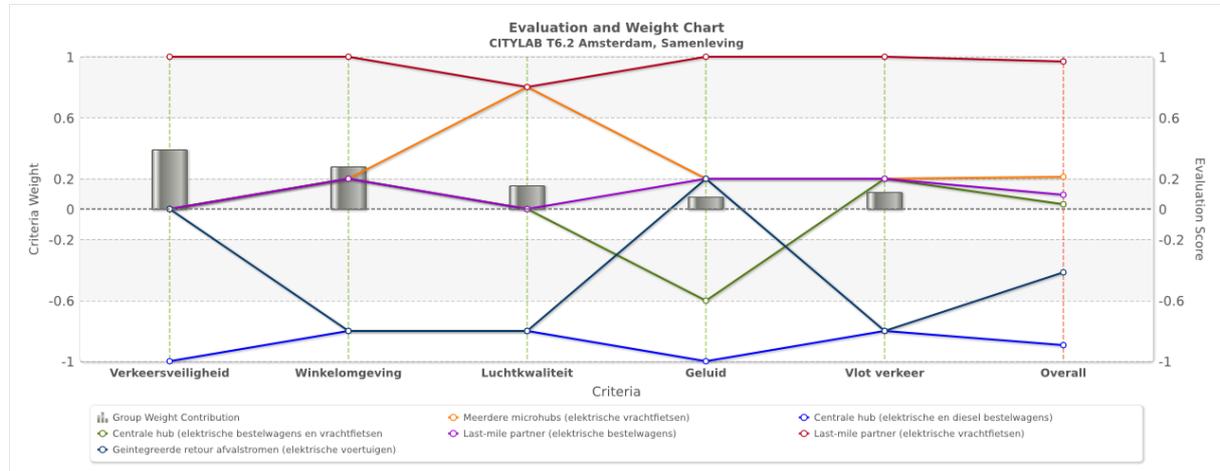
3.3.3.1 Receiver

For receivers, there are three important criteria: cost, high-quality deliveries and a pleasant shopping environment. During the discussion afterwards, participants from this stakeholder group indicated that there are several types of receivers and that they pretended to be a local retailer. They also said that their assessments depend a lot on the value and vulnerability of the goods they are trading. Overall, receivers like a 'central hub' when it is operated by means of environmentally friendly vehicles. They also have a preference for the 'integrated reverse logistics' alternative.



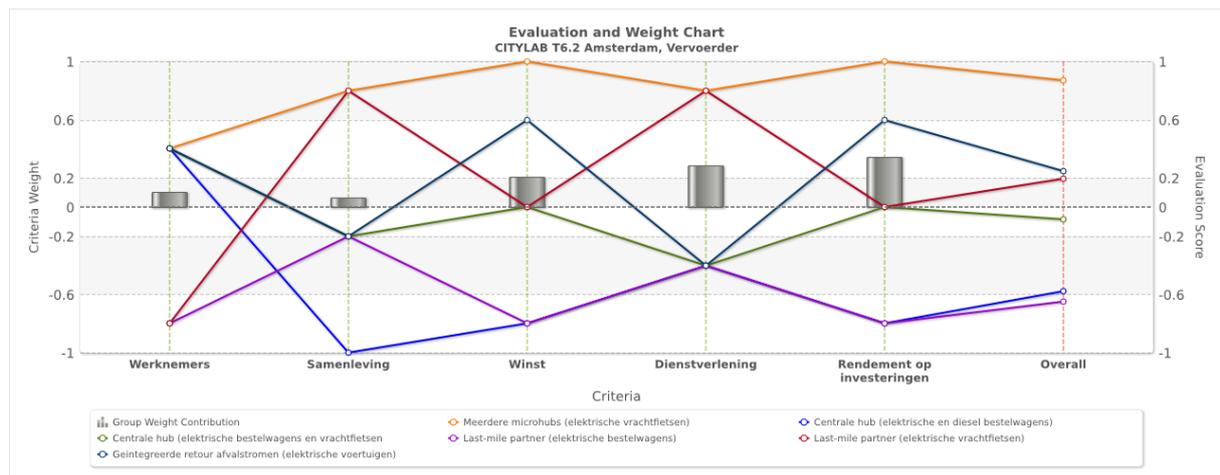
3.3.3.2 Society

In Amsterdam, participants belonging to stakeholder group society find ‘traffic safety’ and ‘a pleasant shopping environment’ important. For society, there is a clear winning alternative of which participants believe that it would score extremely well on all their criteria: a specialized last-mile partner for PostNL that distributes by means of e-freight bikes. They do not like the idea that PostNL would operate one hub in the city-centre of Amsterdam and distribute from there by means of electric and diesel vans.



3.3.3.3 Transport Operator

The representatives of stakeholder group ‘transport operator’ focus on ‘profitable operations’ and ‘viable investments’ while maintaining a certain service level. ‘Employee satisfaction’ and ‘impact on society’ are less important. The most favourable solution to them is the one with multiple microhubs from where distribution is done by means of e-freight bikes. Two other alternatives also get a positive result: ‘integrated reverse logistics’ and ‘last-mile partner with e-freight bikes’. According to transport operators, the first one scores well on ‘quality of service’ whilst the second scores well on ‘profitable operations’ and ‘viable investments’.



3.3.4 Discussion

Proposed adjustments to the list of criteria:

- Transport operator:

- No need to make the distinction between ‘profitable operations’ and ‘viability of investments’. Can be merged into one criterion: profit. Profit is determined by efficiency of the solution and how bad traffic congestion is in the city under consideration since the revenues are stable and independent of the implemented solution and costs are linked to time needed to do the deliveries and pick-ups.
- The consideration transport operators in urban areas make is one between ‘profit’ and ‘impact on society’ while keeping service levels as high as possible.
- A criterion that could be added to the list is ‘innovation’ or getting publicity because you are the first company to implement a certain innovative solution.
- Society:
 - What they missed as criterion is the cost a certain solution implies to local authorities.
- Receivers:
 - Considered themselves as a local retailer
 - They feel that their assessment of how important the criteria are, is heavily influenced by the value of the products they sell and whether the goods are vulnerable or not
 - No suggestions for the list of criteria

3.4 Local stakeholder meeting Southampton

3.4.1 General information

The local stakeholder meeting in Southampton took place on 5 December 2017 at University of Southampton from noon until 2pm. Moderator was Bram Kin (VUB). The different stakeholder groups were represented by:

- Receivers:
 - Suzanne Carlisle (University of Southampton procurement)
 - Claudia Whiting (University of Southampton, Glen Eyre Hall of Residence)
- Society
 - Rob Gloyns (Southampton City Council)
 - Graham Ellis (CITYLAB Living Lab Advisory Group)
- Transport operators:
 - Gary Whittle (Meachers)
 - Malcolm Gibson (Steve Porter Group)

3.4.2 MAMCA Multi-Actor view

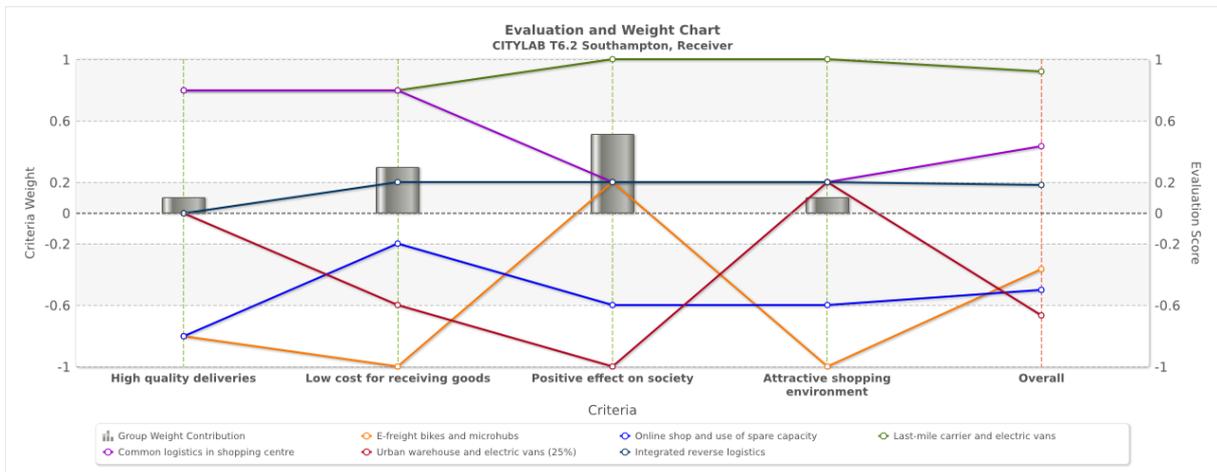
Also for this workshop, it appeared to be challenging to find shippers willing to participate. They cancelled closely prior to the workshop which is why we left them out of the exercise. We knew that there was not going to be a shopping centre owner present, so we used the MAMCA analysis from CITYLAB D 5.4 for this stakeholder. Receivers and transport operators in Southampton prefer the same three alternatives: ‘integrated reverse logistics’, ‘common logistics function in shopping centres’ and ‘a last-mile carrier that works with electric vans’. Receivers preferred the last-mile carrier; transport operators preferred the other two solutions. Society has a different opinion: they prefer ‘microhubs and e-freight bikes’ and a centrally located urban warehouse operated by the transport operator from where parcels are distributed by means of electric and diesel vans. Receivers and transport operators consider these two to be the worst two alternatives which makes it difficult to find consensus. None of them liked the idea of having an online shop and using spare van capacity.



3.4.3 MAMCA Mono-Actor views

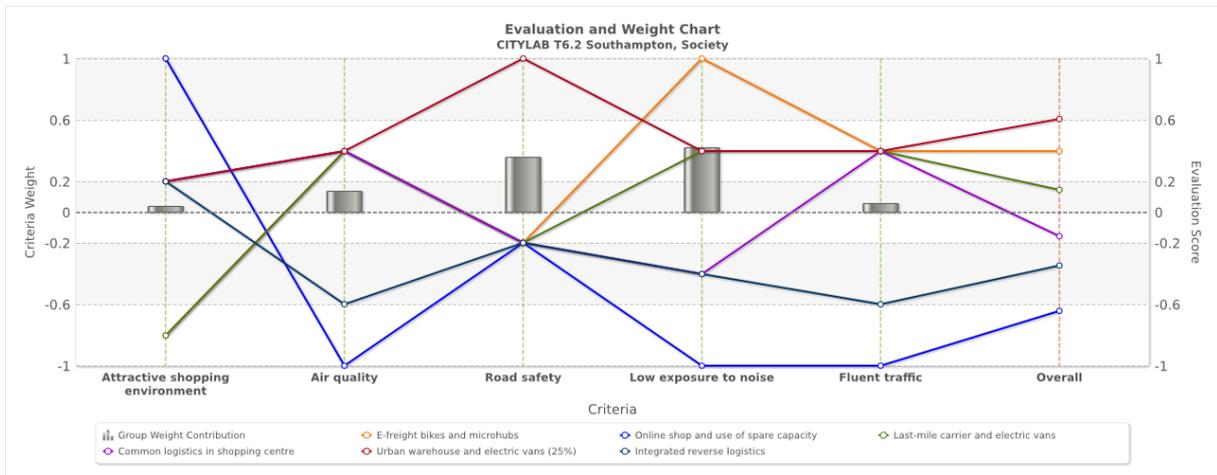
3.4.3.1 Receiver

Participating receivers in Southampton attach great value to ‘positive effect on society’ and ‘transport cost’. They also believe that the solution of outsourcing volumes to a last-mile carrier that distributes by means of electric vans would score high on these criteria, which is why this is their preferred scenario.



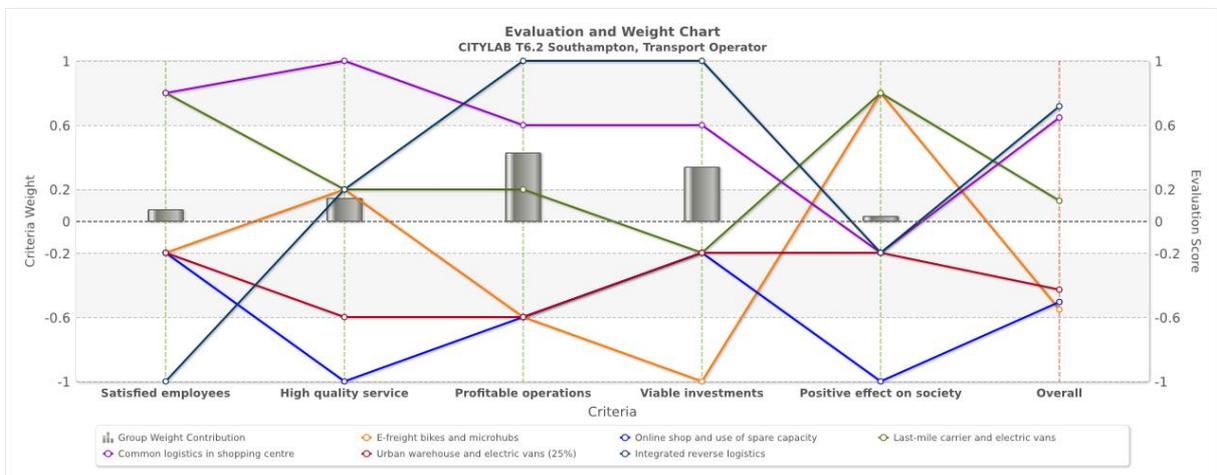
3.4.3.2 Society

Stakeholder group ‘society’ finds ‘road safety’ and ‘low exposure to noise’ the two most important criteria. ‘E-freight bikes and microhubs’, which they assessed would score well on ‘low exposure to noise’ and ‘urban warehouse and electric vans’, which they assessed would score well on ‘road safety’ were their preferred alternatives.



3.4.3.3 Transport Operator

Transport operators are mainly concerned with economic impact on their company: ‘profitable operations’ and ‘viable investments’ being considered most important. ‘Positive effect on society’ hardly plays a role when taking decisions. Because they felt that ‘integrated reverse logistics’ and ‘common logistics in shopping centres’ would meet those criteria well, they preferred those two alternatives. When implementing ‘integrated reverse logistics’ attention should be paid to employee satisfaction; they feared that this criterion would not be met by this alternative. They also believed that outsourcing deliveries to a last-mile carrier that distributes by means of electric vans would also be profitable. The fear that this would not be a viable investment is compensated by the expected positive effect on society and on employee satisfaction.



3.4.4 Discussion

The discussion afterwards covered the following topics:

- The need to manage expectations of receivers.
 - Many of the challenges of goods distribution are the result of ever-faster deliveries direct to door (home deliveries) or desk (office deliveries) even if not actually required by the customer.

- Similarly, ‘free delivery’ is often offered and may be another unreasonable expectation (as the delivery is not actually free). It was asked whether any study of the effect of delivery charge on purchasing behaviour has taken place. Some online retailers offer free return of goods (effectively allowing ‘try before you buy’) which can generate extra transport where customers order several similar items in different sizes (e.g. clothes, TVs) and only keep the one that fits best.
- At large municipal organisations, purchasing is often spread widely across their many departments and can be difficult to control.
- One measure to restrict buying is to rationalise the supplier base. The UK government encourages working with small local suppliers; while laudable, this can lead to a wider supplier base.
- It is increasingly challenging to deliver to large student residences. The reception of these buildings receive e-commerce deliveries, fresh groceries ordered online (that must be stored if the student is not present), meals, large products such as furniture, while there is a high amount of different waste products. University halls need to control what students can have delivered at their residences as they currently sometimes have to deal with uncollected food products (e.g. meat, ice cream) going off.
- The number of transport operators should perhaps be limited through regulation.
- Comment by a transport operator on the challenges in the London implementation: no fleet reduction and no reduction in number of staff, that basically means no reduction in costs, hence the problem of a UCC. Cross-dock costs do not seem to be included in the evaluation.

3.5 Local stakeholder meeting Brussels

3.5.1 General information

The local stakeholder meeting in Brussels took place on 8 December 2017 at the offices of Polis (98 Troonstraat, 1050 Brussels). Moderators were Giacomo Lozzi (Polis) and Sara Verlinde (VUB). The local workshop in Brussels was open to representatives of the CITYLAB transfer cities as well. Partners from local authorities were offered the possibility to participate together with the professional stakeholder they are considering to replicate one of the CITYLAB solutions with. The different stakeholder groups were represented by:

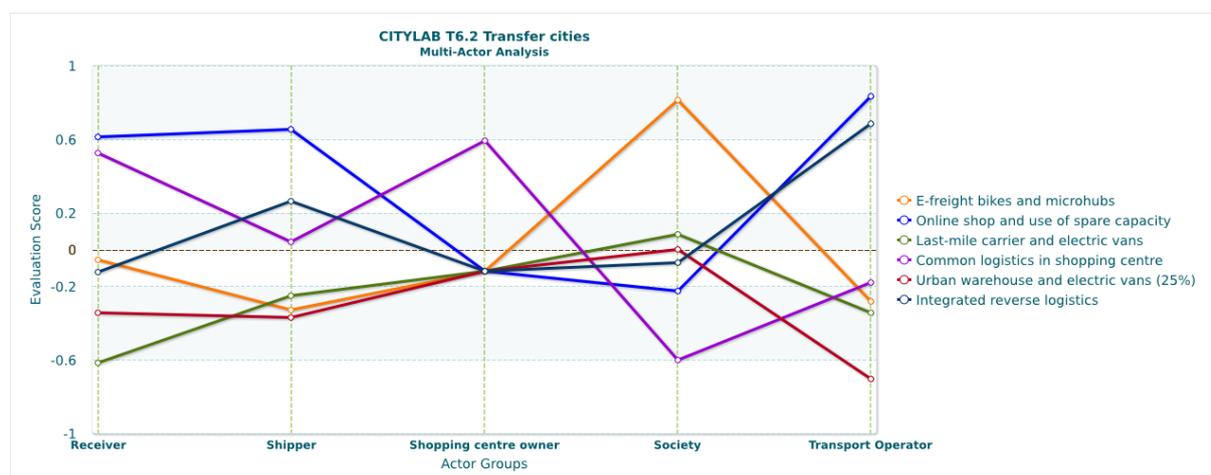
- Receivers:
 - Sergio Fernández Balaguer (Madrid City, Spain)
 - Tijn Dendal (Flanders Region, Belgium)
 - Sigurd Ur (Rogaland County, Norway)
- Shipper:
 - Graham Dixon (Esprit Warehousing & Docks Trafford Park, UK)
 - Jan Merckx (Flemish Institute for Logistics, Belgium)
- Society
 - Richard Banks (TfGM, Manchester, UK)
 - Marilena Branchina (Navicellei SpA, Pisa, Italy)
 - Enrique García Cuerdo (EMT, Madrid, Spain)
 - Charlotte De Broux (Brussels-Capital Region, Belgium)
 - Matthieu Graindorge (La Rochelle (agglomeration), France)
 - Nimrod Levy (Jerusalem, Israel)
 - Laura Tavernier (Antwerp, Belgium)
 - Lukáš Tittl (Institute of Planning and Development, Prague, Czech Republic)
 - Patrik Toth (BKK, Budapest, Hungary)

- Martine Vazquez (City of Paris, France)
- Jan-Kees Verrest (Delft, the Netherlands)
- Transport operators:
 - Levente Erős (Kantaa, Hungary)
 - Malcolm Gibson (Steve Porter Group)
 - May Lopez (SEUR, Spain)
 - Katerina Ovesná (Messenger, Czech Republic)

Because of the high number of representatives of ‘society’ stakeholders, we divided them into two groups. Their points of view were merged in the graphs and discussion below.

3.5.2 MAMCA Multi-Actor view

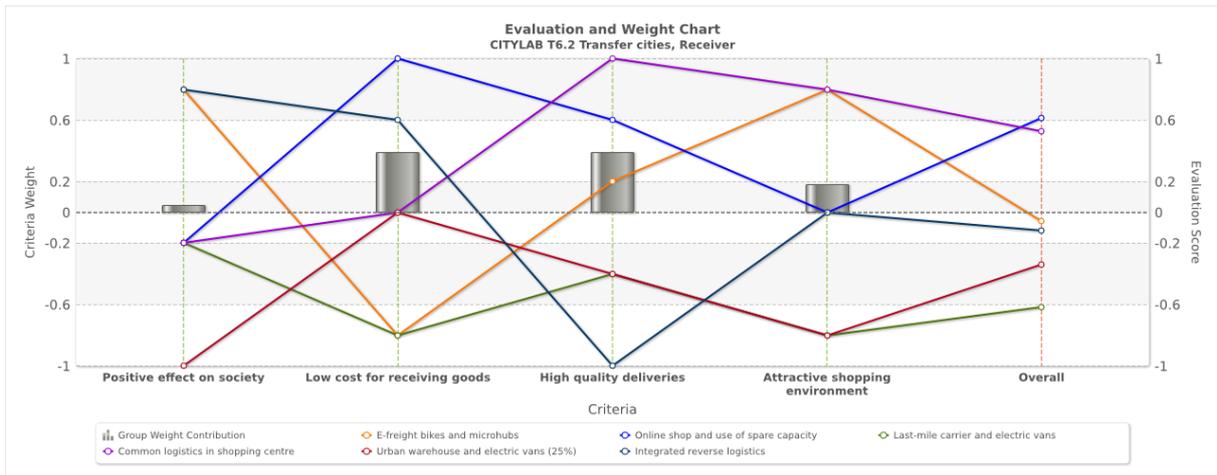
During the workshop in Brussels, no representative of stakeholder group ‘shopping centre owner’ was present, which is why we used the MAMCA analysis from CITYLAB D5.4 for this stakeholder. Receivers, shippers and transport operators prefer the same alternative: ‘online shop and use of spare capacity’. Next to that, receivers also like ‘common logistics in shopping centres’, while shippers and transport operators prefer ‘integrated reverse logistics’. They all do not like the alternatives for parcel deliveries. Society has a different point of view: they like the alternatives for parcel deliveries and do not like the three other alternatives.



3.5.3 MAMCA Mono-Actor views

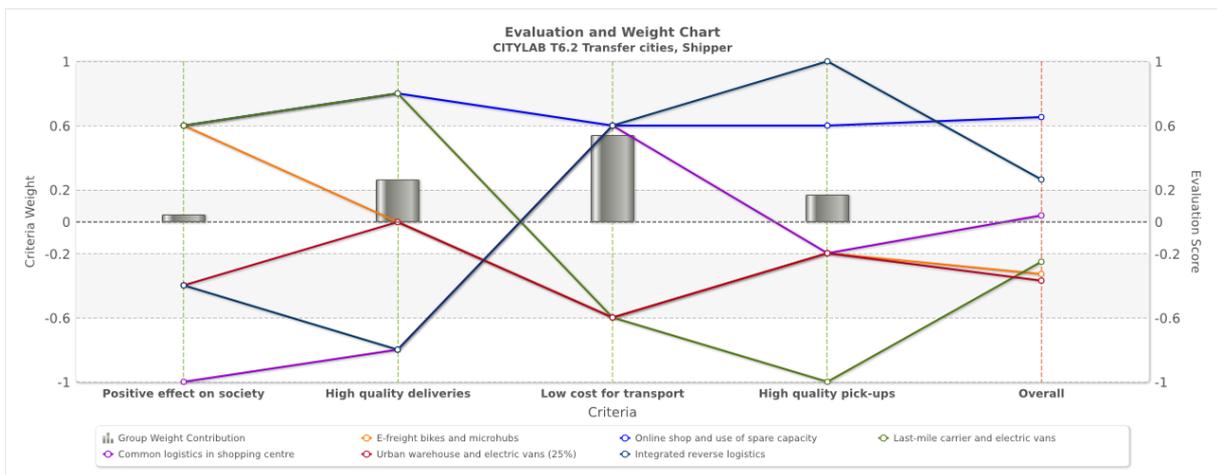
3.5.3.1 Receiver

Receivers prioritize on ‘low costs’ and ‘high quality deliveries’. They assess that the ‘online shop and use of spare capacity’ alternative would score well on costs and the ‘common logistics in shopping centres’ alternative would score well on quality which is why they prefer these two. They do not value these alternatives well for the criterion ‘positive impact on society’.



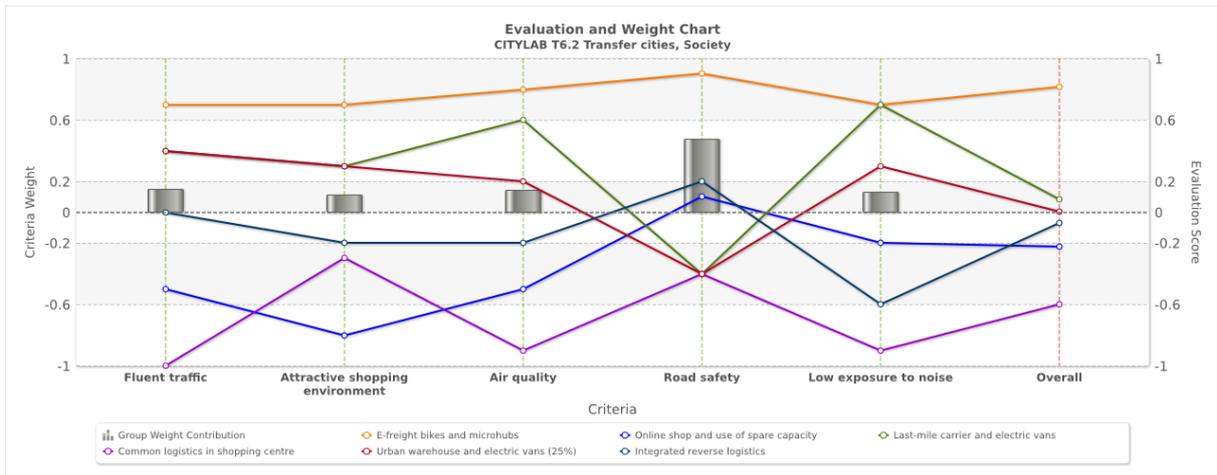
3.5.3.2 Shipper

Shippers have the clear priority to keep costs to a minimum (in combination with high-quality deliveries). The reason why they like the ‘online shop and use of spare capacity’ alternative and the ‘integrated reverse logistics’ is because they assess that they would score well on this criterion (and on the criterion ‘high-quality’ pick-ups as well. When implementing ‘integrated reverse logistics’, they fear a negative impact on society and lower-quality deliveries.



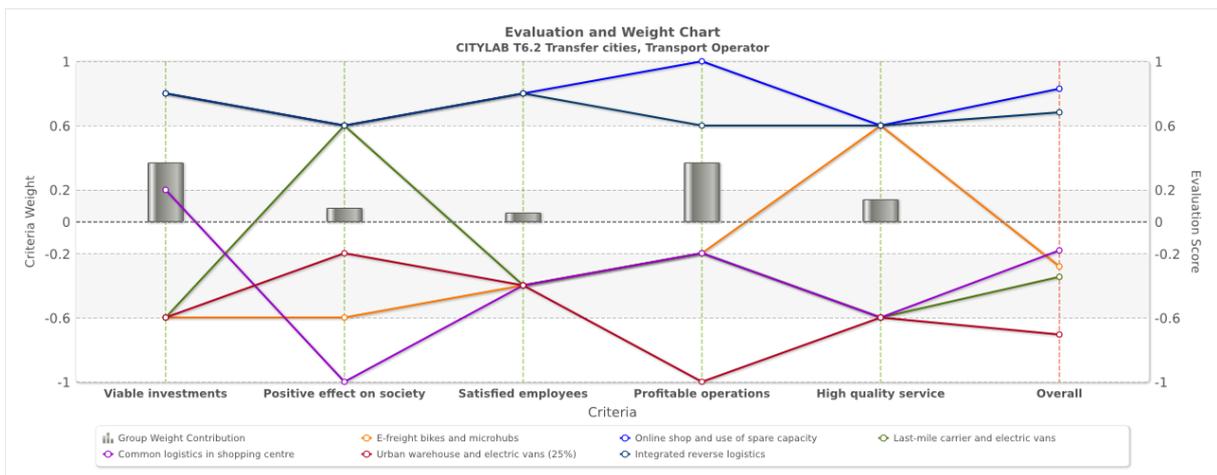
3.5.3.3 Society

For society, the main priority is road safety. The other four criteria are equally important. They assess there is one alternative that would score well on all their criteria: ‘e-freight bikes and microhubs’. The other two that are received well are: ‘urban warehouse and electric vans’ and ‘last-mile carrier and electric vans’. Challenge for those two alternatives is the perceived worse impact on traffic safety compared to the other alternatives. Society representatives do not see much value in ‘common logistics in shopping centres’ and ‘online shop and use of spare capacity’.



3.5.3.4 Transport Operator

During the workshop in Brussels, transport operators indicated that profitable operations and viable investments are their main priorities. They also attach value to ‘high-quality service’, but ‘positive effect on society’ and ‘satisfied employees’ are considerably less important. They assess that there are two scenarios that would score well on all their criteria: ‘online shop and use of spare capacity’ and ‘integrated reverse logistics’.



3.5.4 Discussion

During the MAMCA workshop, some people indicated that they would adjust the list of criteria for their stakeholder group:

- Society stakeholders said that they would add a criterion on urban space, the use of space or public space occupancy. When evaluating a solution like a mobile depot, for example, the fact that this type of solution requires public space to park the depot cannot be considered with the current list of criteria.
- Society stakeholders also said that the ‘attractive shopping environment’ criterion is too narrow and should be broadened to ‘attractive living environment’ in general.
- Both groups of ‘society’ stakeholders struggled with the fact whether they represented local authorities or citizens.

- Transport operators said that they miss a criterion linked to meeting legal requirements in the list of criteria.

After the output of the MAMCA workshop was discussed, all partners indicated how they want to proceed. Interesting topics from the discussion:

- City of La Rochelle:
 - Would like to use MAMCA for the development of their new freight plan
- City of Madrid:
 - Would like to proceed with the CITYLAB solution of Paris Beaugrenelle
 - At first, they indicated to be primarily interested in the 'logistics hotel' solution, but based on this workshop, they are also open to the other CITYLAB solutions
 - City of Madrid and SEUR would like to use MAMCA in the future
- Rogaland county:
 - Would like to use MAMCA
 - A solution with e-freight bikes and microhubs is currently being planned in the region
- City of Paris:
 - Will be testing the concept of a 'truck within a truck'. This truck is using public space which is an important criterion to them.
 - Another aspect of urban freight transport that should be studied more carefully is the impact of freight vehicles on traffic safety in cities.
- Brussels-Capital Region:
 - There is a need for detailed information on the regulations in all cities in Europe and their impact.
- City of Delft
 - Started a Living Lab one year ago
 - They already have a freight hub which is operational. They want to change access regulations now to stimulate the use of the freight hub.
- City of Prague
 - Will shortly start a study on how sustainable different urban freight transport solutions will be in Prague. The CITYLAB solutions will be an inspiration to identify the solutions to be studied.
- City of Budapest
 - Important added value of CITYLAB: contacts with logistics companies

3.6 Local stakeholder meeting Paris

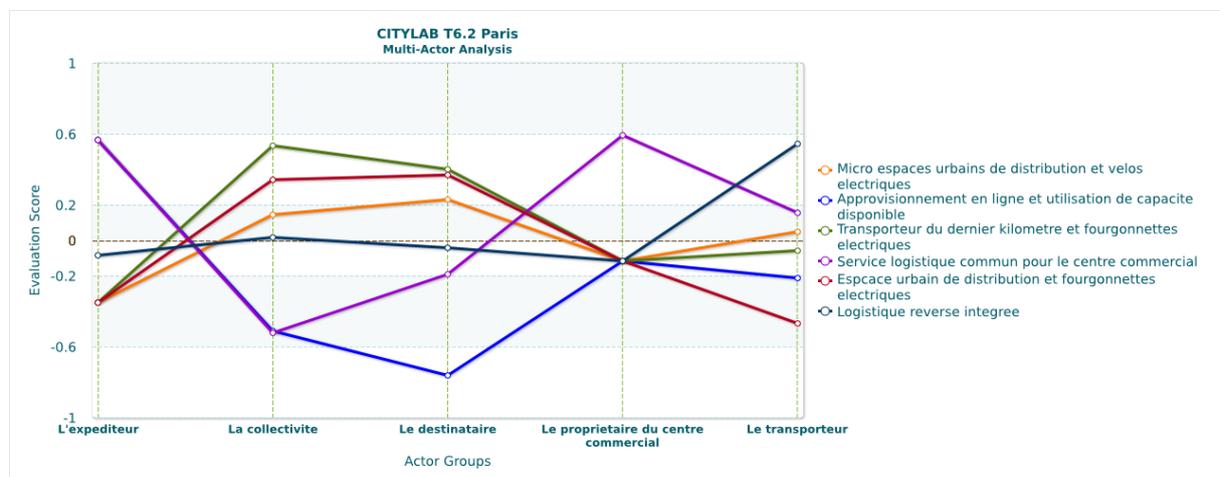
3.6.1 General information

The local stakeholder meeting in Paris took place on 8 December 2017 at the Mobility Agency of the City of Paris (121 Avenue de France, 2-15 Rue de France, Paris) from 4.30pm until 6.30pm. Moderators were Laetitia Dablanc (IFFSTAR) and Gino Baudry (VUB). The different stakeholder groups were represented by:

- Sophie Launay, Paris Chamber of Commerce, Research and Study Department
- Philippe Barbier, Group Pomona (wholesale in food), and CGI (trade organization of wholesalers)
- Jean-Philippe Labaronne, TLF (transport et logistique de France), Paris branch. One of the two main freight organizations in France
- Elisabeth Charrier, FNTR (fédération nationale du transport routier), Paris branch. The other main freight organization in France
- Laurence Morin, Mobility Agency of the City of Paris

3.6.2 MAMCA Multi-Actor view

In Paris, representatives of stakeholder group ‘society’ and ‘receiver’ shared the same point of view. They both assess that a ‘central warehouse with electric vehicles’ (red line), outsourcing to a specialized last-mile carrier which distributes by means of electric vehicles (green line) and ‘e-freight bikes and microhubs’ (orange line) would serve them best. Shippers dislike these three solutions and prefer ‘common logistics in shopping centres’ (purple line). Transport operators also like this solution, but prefer ‘integrated reverse logistics even more’ (green line). During the workshop in Paris, there were no representatives of stakeholder group ‘owner of shopping centre’ which is why we used the MAMCA analysis of CITYLAB D5.4 to visualise the point of view of this stakeholder group during the workshop. There were also no representatives of stakeholder group ‘receiver’. All participants discussed together how they believe receivers would perceive the solution and how they would value their criteria. The ‘online shop and use of spare capacity’ alternative is represented by the cyan line.



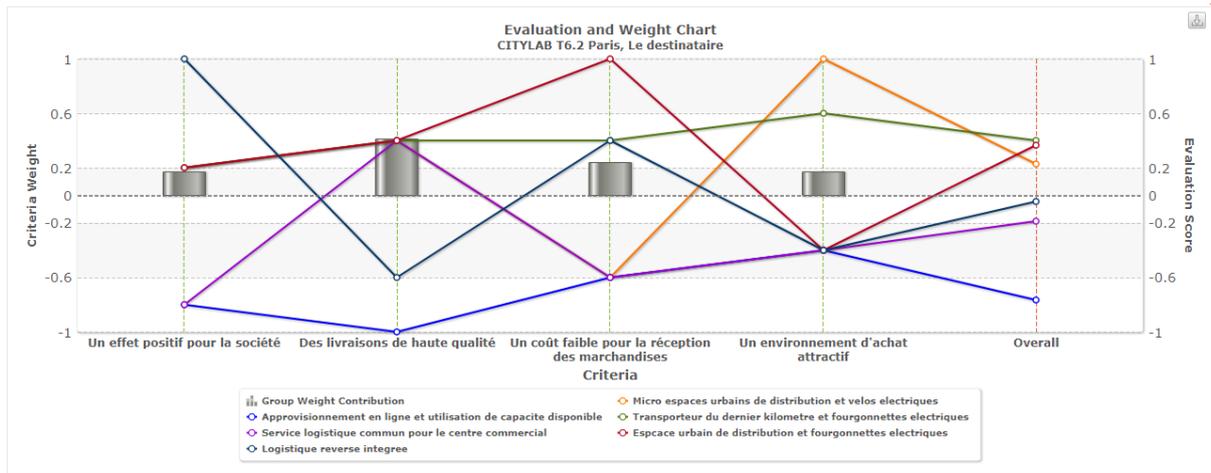
3.6.3 MAMCA Mono-Actor views

3.6.3.1 Receiver

Participants of the Paris workshop assess that for receivers, ‘high-quality deliveries’ is their main criterion, followed by ‘low-cost deliveries’. There are a few alternatives that score well on some criteria and do not score well on other:

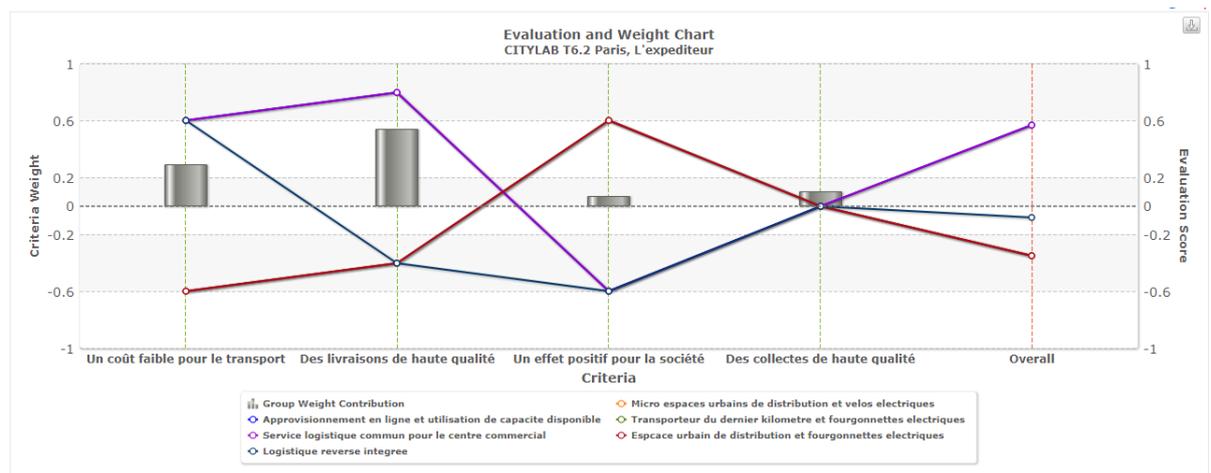
- ‘Urban warehouse and electric vans’ scores well on costs but scores much worse on ‘attractive shopping environment’
- ‘E-freight bikes and microhubs’ is expected to score well on ‘attractive shopping environment’ but scores worse on costs.
- ‘Integrated reverse logistics’ scores well on ‘positive effect on society’ and costs but does not score well on ‘high-quality deliveries’ and ‘attractive shopping environment’.

‘Last-mile carrier and electric vans’ scores reasonably well on all criteria and ‘online shop and use of spare capacity’ is not expected to meet any of the criteria of the receiver.



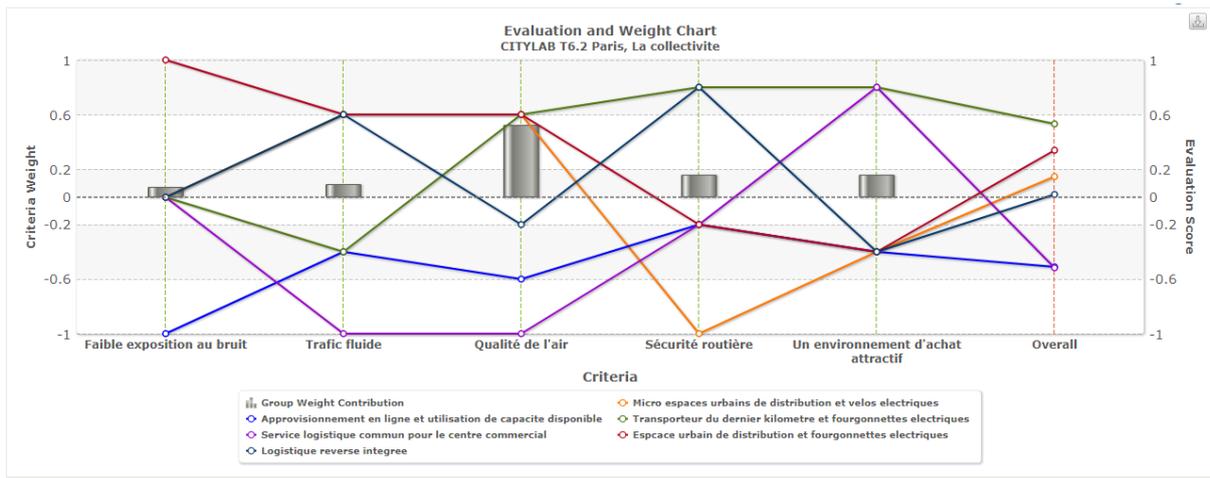
3.6.3.2 Shipper

For shippers, providing a good service is their main priority. Apart from that, they also pay considerable attention to costs. Having a ‘positive effect on society’ and ‘high-quality pick-ups’ are not that important to them. They see great value in ‘common logistics in shopping centres’ but do not see how that will have a positive effect on society.



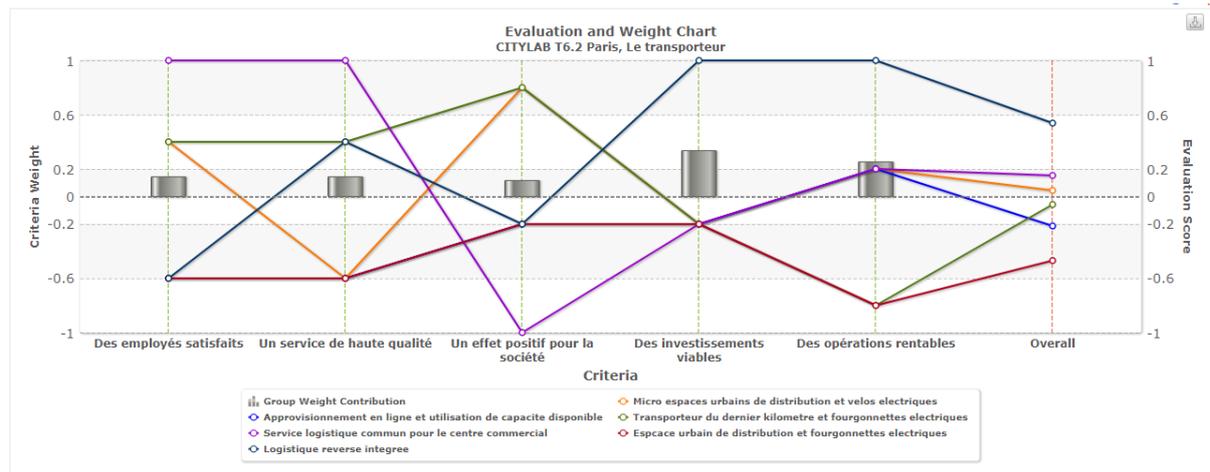
3.6.3.3 Society

In Paris, representatives of stakeholder group society attach great value to ‘air quality’. ‘Traffic safety and an ‘attractive shopping environment’ are equally important (each just under 20%) and ‘fluent traffic’ and ‘low exposure to noise’ are not that important (each around 10%). For the participants of the workshop, none of the proposed alternatives scores well on all criteria of this stakeholder group. When implementing their most favourable alternative, which is ‘urban warehouse and electric vans’, it is expected that there would not be a favourable impact on traffic congestion.



3.6.3.4 Transport Operator

Transport operators in Paris have two priorities: ‘profitable operations’, followed by ‘viable investments’. Their assessment of how the alternatives will score on those two criteria heavily influences the overall ranking. They clearly prefer ‘integrated reverse logistics’, despite that they assess this alternative will score worse on the criterion ‘employee satisfaction’.



3.6.4 Discussion

During the MAMCA workshops, some people indicated that they would adjust the list of criteria for their stakeholder group:

- During the discussion, transport operators highlighted that it is getting harder to find employees because there is a lack of drivers in France. During the evaluation, they assumed this aspect is part of the criterion ‘employee satisfaction’. They also assumed that ‘driver security’ is also part of the criterion employee satisfaction. Apparently, delivery zones and loading and unloading zones can be quite dangerous and represent 9 out of 10 work accidents among drivers. For them, ‘security’ could also be a criterion on itself, but now they assumed it was part of ‘employee satisfaction’.
- Receivers indicated that they would add a criterion which covers the time they spend to receive goods. It is not enough that it is part of ‘high quality deliveries’.

- Society stakeholders would make the distinction between impact on climate change and air quality.

3.7 Local stakeholder meeting Rome

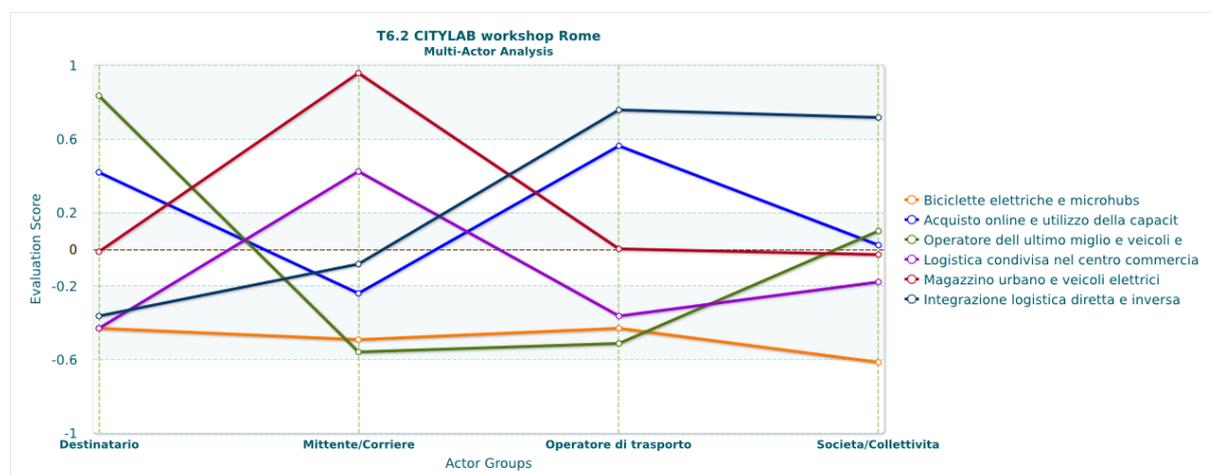
3.7.1 General information

The local stakeholder meeting in Rome took place on 31 January 2018 at the University of Roma Tre. Moderators were Edoardo Marcucci and Valerio Gatta (UR3). The different stakeholder groups were represented by:

- Retailers:
 - Xueyan Lu (Consultant for Chinese shops in Rome)
 - Roberto Mastrofini (Unindustria, Industrial Union)
- Shippers:
 - Coorado Rabbia (Freelogy Consulting)
 - Cesare Carlo Manetti (Consultant import-export)
- Society
 - Marco Surace (RMS, Public Agency for Mobility)
 - Carlo Gentile (RMS, Public Agency for Mobility)
 - Roberta Girmenia (Citizens' representative)
- Transport operators:
 - Sergio Assumma (SGT, Express courier)
 - Riccardo Verini (FM Logistics)

3.7.2 MAMCA Multi-Actor view

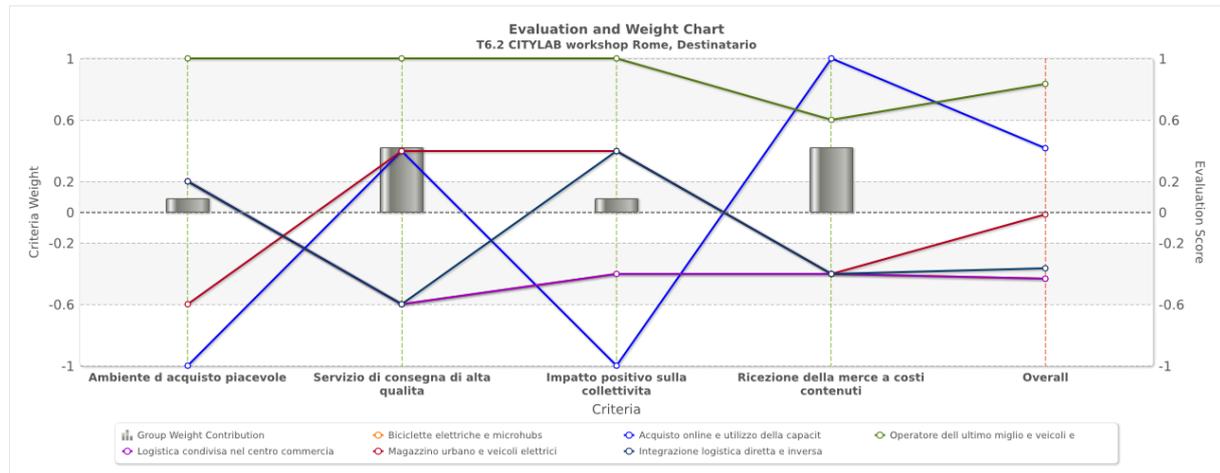
During the workshop in Rome, there was no alternative that would receive overall stakeholder support. 'Integrated reverse logistics' (cyan line) was preferred by stakeholder groups 'society' and 'transport operator' but not by 'receivers' and 'shippers'. Shippers clearly preferred 'urban warehouse and electric vehicles' (orange line), but this was only the third or even fourth preferred option of the other groups. Receivers preferred a 'last-mile carrier and electric vans' (green line) but this was the least preferred option of shippers and transport operators. The blue line represents 'online shop and use of spare capacity', the purple line represents 'common logistics in shopping centres' and the red line represents the 'last-mile carrier with electric vans' alternative.



3.7.3 MAMCA Mono-Actor views

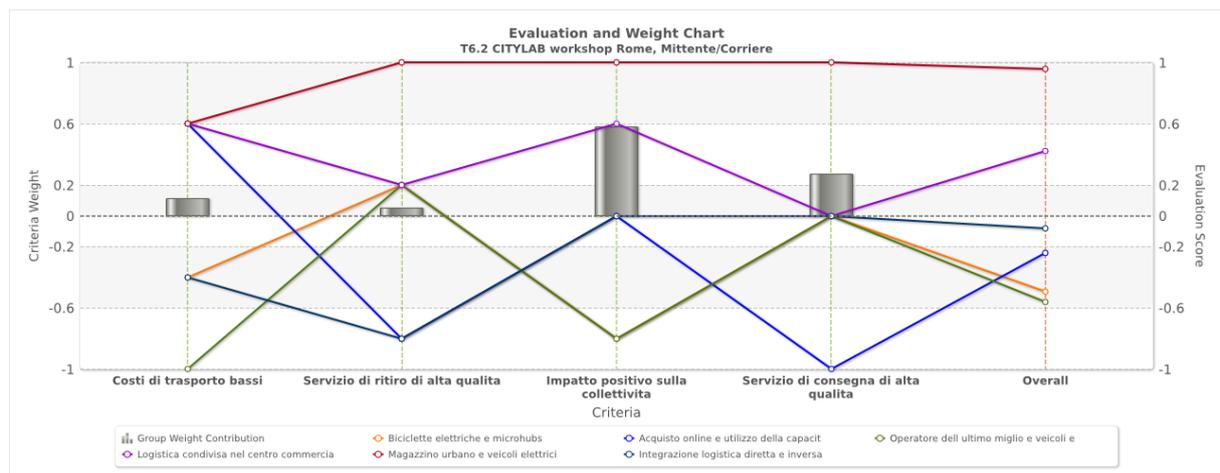
3.7.3.1 Receiver

Participating receivers have two priorities: receiving ‘high-quality deliveries’ and ‘low delivery costs’ (over 40% each). The other criteria are less important. They believe that the ‘last-mile carrier and electric vans’ alternative would score well on all their criteria. Their second preferred alternative, ‘online shop and use of spare capacity’ is believed to score well on quality of deliveries and costs but worse than all other alternatives on ‘positive impact on society’ and ‘a pleasant shopping environment’. When implementing that alternative, attention should be paid to the impact on those two criteria.



3.7.3.2 Shipper

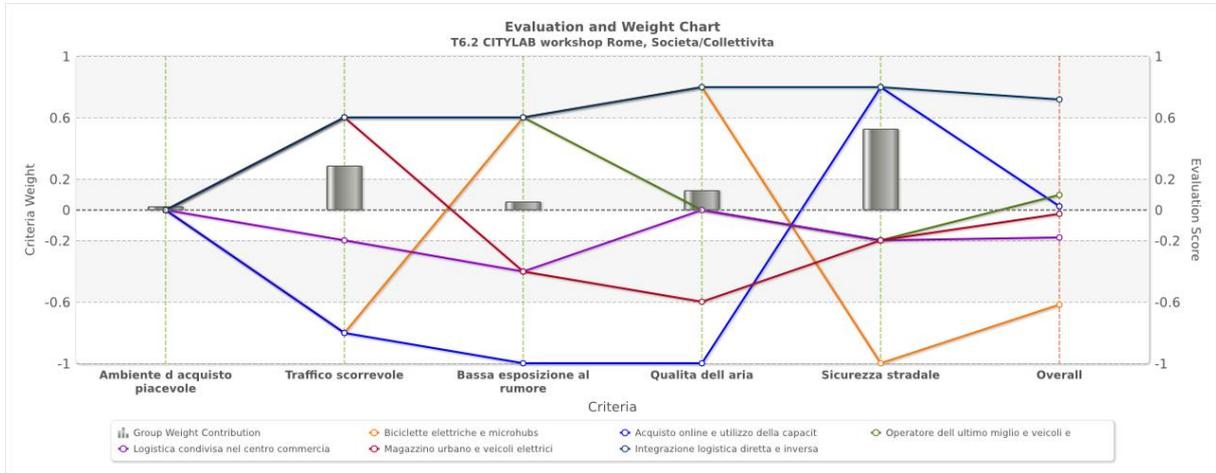
Participating shippers in Rome indicated to attach great value to the criterion ‘positive impact on society’ (nearly 60%). They also believe that the alternative in which the largest parcel company operates an additional warehouse in the city-centre (with electric vans) would serve their criteria best. Second best is the ‘common logistics in shopping centres’ alternative.



3.7.3.3 Society

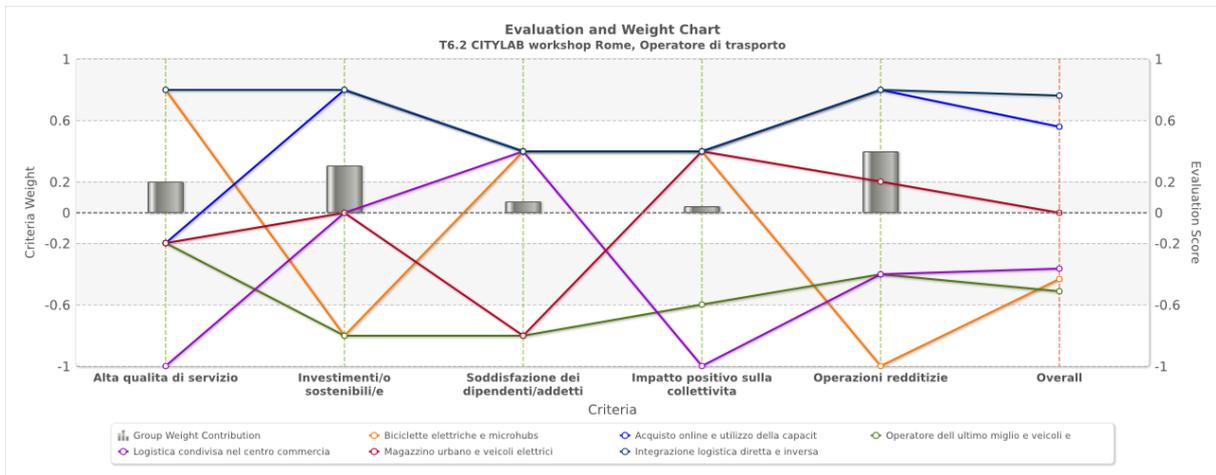
Air quality is the main priority of stakeholder group ‘society’ (over 50%), followed by road safety (nearly 30%). The ‘integrated reverse logistics’ alternative is assessed positively and is expected to score well on all criteria. The ‘e-freight bikes and microhub’ alternative is not

considered as a valuable option for Rome. During the discussion, it appeared that participants feel that this solution is hard to implement because of road safety issues, cultural issues and habits. However, because of the workshop, the solution raised the interest of the stakeholders and will be discussed further. The other four alternatives received more or less the same score.



3.7.3.4 Transport Operator

Transport operators' most important criteria are: 'profitable operations' and 'viable investments', closely followed by 'high-quality deliveries'. Participating transport operators assessed that the 'online shops and use of spare capacity' alternative and 'integrated reverse logistics' alternative would score well on these criteria which is why these are the preferred alternatives. It is worth underlining, though, that the provided results came from a variety of respondents: a certain heterogeneity emerged between transport operators and couriers.



3.7.4 Discussion

Concerning the MAMCA results:

- Participants indicated that the proposed criteria are exhaustive. No suggestion for additional criteria.
- During the discussion of the output of the MAMCA, all participants said that the MAMCA graphs are congruent with the reality and visualise their points of view.
- Participants appreciated the CITYLAB solutions.

Broader topics under discussion:

- There is need for more regulations and more surveillance on existing time windows and vehicle access restrictions
- There is need for re-organization of loading/unloading bays
- There is need for incentives for receivers accepting off-hour deliveries.

4 Conclusions

We had local stakeholder meetings in all seven CITYLAB cities and used the same methodology during all of them (MAMCA workshops). The approach was slightly adjusted after the workshop in London because it took too much time to have the participants pairwise compare each alternative (7 in total) on each criterion (4 or 5).

During the workshops, participants were asked to weigh a list of criteria (per stakeholder group) and to evaluate each CITYLAB alternative on these criteria. Afterwards, we combined their input to get a view on overall stakeholder support for the CITYLAB alternatives and on why a certain alternative was liked or disliked.

Five relevant stakeholder groups were identified for the CITYLAB solutions: receivers, shippers, shopping centre owners, society, transport operators. In Amsterdam and Brussels, the comment was raised that there should be distinction between citizens and local authorities in stakeholder group society.

The list of criteria was fixed per stakeholder group and can be found on p.15. This was the main feedback on the list of criteria:

- Receivers:
 - Time loss or time gain by a more efficient way of being delivered is not included in the current list of criteria
- Society
 - There needs to be distinction between the criteria 'air quality' and 'climate change'
 - The criterion 'attractive shopping environment' should be broadened towards 'attractive living environment' or 'attractive place to spend time'
 - Currently, none of the criteria covers 'efficient use of urban space'
 - Currently, none of the criteria covers the cost of a certain measure for local authorities
- Transport operators:
 - It is difficult and too complex for an exercise like this one to make the distinction between 'viable investment' and 'profitable operations'. It would be sufficient to only keep the latter criterion. Most transport operators indicated that this is their main priority.
 - Currently, none of the criteria covers security for the driver and goods. You could assume that it is part of employee satisfaction, but it is not clear and does play a role.

A few trends can be discovered in the weights attached to the criteria

- Receivers:
 - Receivers tend to make a trade-off between high-quality deliveries and cost
 - Attractive shopping environment usually comes third
 - They don't attach great value to the criterion 'positive impact on society'
- Society
 - Traffic safety is the most important criterion for stakeholder society (except in Paris and Rome where it came second, after air quality)

- Air quality is usually the second important criterion for stakeholder society
- Transport operators:
 - Nearly all of them put profitable operations first, closely followed by viable investments
 - Positive effect on society does not receive high weights

In general, we saw that most professional stakeholders do not attach great value to the criterion 'positive effect on society'. They are focussed on providing the required service-level to their clients at a reasonable cost. From the discussions, it appeared that they expect authorities to make choices and to create a level playing field for all players on the market by means of regulations that reflect the preferences of society. They do not accept preferential treatments for certain professional stakeholders. Concerning the stakeholder groups, it is important to point out that there was a certain heterogeneity within stakeholder groups (both between cities and within cities). Transport operators, for example, were sometimes representing companies that are transporting large volumes in and out of cities while others represented a parcel company or a transport company only transporting parcels by means of e-freight bikes and/or electric vans.

These are the trends that can be discovered when looking at the preferences of the different stakeholder groups towards the alternatives:

- Receivers:
 - Overall the 'e-freight bikes and microhubs' alternative and 'last-mile carrier with electric vans' alternative score best. Except in Amsterdam and Brussels, where the latter alternative does not score well.
 - The use of an online shop combined with spare capacity has the lowest score in all cities, except in Brussels.
 - The 'common logistics in shopping centres' alternative (except Brussels and Southampton with a high score) and 'integrated reverse logistics' alternatives (except Oslo with a high score) received a moderate score in all cities.
 - The preferences for the 'urban warehouse and electric vans' alternatives show a lot of variety with high scores in Paris and Amsterdam and low scores in Oslo, Southampton and Brussels.
- Shippers:
 - The 'common logistics in shopping centres' alternative received the highest score from shippers during all workshops (except for London). The 'integrated reverse logistics' alternative was assessed as second best everywhere (except for London).
 - Shippers in the different cities assessed the 'urban warehouse and electric vans' alternative completely different (best in Rome, worst in Brussels and Paris).
 - For shippers, the worst alternatives are the 'e-freight bikes and microhubs' alternative and the 'last-mile carrier with electric vans' alternatives.
- Society:
 - Representatives of the 'society' stakeholder group prefer the 'last-mile carrier with electric vans' alternative and the 'e-freight bikes and microhubs' alternatives in all cities. In that sense, their estimation is similar to the one of the receivers. Only in Rome, 'society' did not like the 'e-freight bikes and microhubs' alternative.
 - The 'online shop and use of spare transport capacity' has the lowest score in all cities, except in Rome.
 - The assessment of the other alternatives - 'integrated reverse logistics', 'common logistics in shopping centres' and 'urban warehouse and electric vans' – varies heavily between cities.
- Transport operators:

- In most cities, transport operators see great value in the ‘integrated reverse logistics’ alternative and in the ‘common logistics in shopping centres’ alternative, except for transport operators in London who do not envision a future for the ‘integrated reverse logistics’ alternative and for transport operators in Rome and Brussels who do not appreciate the ‘common logistics in shopping centres’ alternative.
- The ‘urban warehouse with electric vans’ alternative received the lowest score.
- The other alternatives received a moderate score, but with a lot of variety between cities.

In summary, there is not one alternative that stands out for one stakeholder group across cities. Despite the many differences, across cities and stakeholders, there is most support for the ‘integrated reverse logistics’ alternative, followed by the ‘common logistics in shopping centres’ alternative, the ‘last-mile carrier with electric vans’ alternative and the ‘e-freight bikes and microhubs’ alternative. The ‘urban warehouse with electric vans’ alternative scores slightly less and the ‘online platform with use of spare transport capacity’ alternative scores worst overall. It is most remarkable, though, that rather similar alternatives like ‘last-mile carrier and electric vans’ and ‘urban warehouse and electric vans’ were not evaluated in the same way in most cities and by most stakeholders. Based on the comments and feedback that was given during the workshop, we assume this has got to do with the fact that it was clearly mentioned that the parcel company did not have to pay the market price for renting the urban warehouse in the ‘urban warehouse and electric vans’ alternative. The second important difference between the two alternatives is that in one case, the parcel company operates the centrally located warehouse while they subcontract to a specialized urban last-mile carrier in the other case. We also observed that there is a tendency to prefer the local implementation in some cities (Amsterdam, Brussels, London and Oslo), which can be expected since some of the participants are project partners or were involved in the local implementation. Finally, both in London and Southampton, it was mentioned that the alternatives under consideration can be combined in one city.

The workshops provided insights into preferences of local stakeholders and into local support for the CITYLAB solutions. During the workshop in Brussels, we asked participants to give feedback on the workshop. In general, participants were satisfied about the workshop, not only for what they learned, but also for networking purposes. MAMCA is considered useful for deciding on the most optimal solution for urban freight transport challenges together with local stakeholders because it stimulates discussion and networking between different stakeholders and it helps prioritizing different options. During all workshops, we observed that participants did have the feeling that the mono-actor view represented their point of view. When alerted to remarkable preferences compared to what could be expected based on experiences in the other CITYLAB cities or literature, they were usually eager to explain their point of view in front of the other participants. We also received the feedback that it is important to have mutually comparable solutions. Some CITYLAB solutions appeared difficult to compare to the other solutions, mainly the ‘common logistics in shopping centres’ and ‘online shop and use of spare capacity’ alternatives. Based on the workshops, we can conclude that this type of local stakeholder meetings is valuable in a transferability process when the solutions that are evaluated are detailed enough and comparable enough, respond to a local problem and when the right stakeholders are present during the meeting.

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Appendix A – Slides used to present the impact of the CITYLAB implementations in their city of origin



E-freight bikes and micro-hubs



- Reduction of emissions
- Overall operating cost decreases by **6.8%** (including van network outside the city)
- Challenge:
 - Finding bike drivers
 - Finding affordable hubs at the right location
 - Finding dedicated bicycle planning software



Online shop and use of spare capacity



- Operationally, the system worked
 - It is possible to use spare transport capacity of a service-driven company and integrate additional freight flows in their operations
 - **No additional kilometres** were done by the service-driven companies to deliver the goods because of their high stop-density tours
- Challenge: Engaging shop owners
 - They do not consider self-supply as a cost
 - They are convinced that supermarket promotions are always cheaper
 - They do not want to order and pay online (traceability and paying upfront)
- Challenge: offering wide range of products





Last-mile carrier and electric vans



- Distance reduction in km/parcel: **67%**
- Energy reduction in goe/parcel: **87%**
- Empty distance reduction in monthly empty distance: **93%**
- No fleet reduction
- No reduction in number of staff
- Challenges:
 - Lack of affordable space in city centre
 - Lack of bigger 3.5t electric van with at least 15m³ volume and 1.4t load weight capacity
 - Shared use of depots, vehicles and customer data
 - Growth in operational scale implies a shift in business contracts from one subcontractor to another



Common logistics in shopping centre



- Reduced dwell times for delivery vehicles in the freight receipt area: **minus 10 to 15 minutes per pallet** delivered
- Fewer individual transports inside the shopping centre, option to store goods is not used frequently
- Satisfied store employees: **69% extremely satisfied**
- Better waste handling and increased degree of waste sorting
- Also tested when not compulsory:
 - **54%** of shop owners want to continue but fear extra cost
 - Solution not viable for shopping centre





Urban warehouse and electric vans (25%)



- Reduction of emissions:
 - 50.4% CO2 reduction
 - 52.4% PM reduction
- **Vehicle kilometre savings of 52%**
- Profitability:
 - More or less the same as in baseline, cost of deploying electric fleet is too high
- Challenges:
 - Drivers do not like the electric vans because they cannot take them home and need other type of transport to commute to work
 - Deploying electric fleet is technically complex => shift to CNG



Integrated reverse logistics



- Reduction of total vehicle kilometres and emissions
- Financial viability?
 - Increase financial revenues for shipper – revenues of recycling do not exceed costs
 - Parcel company already enters the building (limited time loss, no extra kilometres) and are paid a small fee
- Challenges:
 - Regulatory and contractual constraints on transporting waste
 - Locating recycling facilities

