

# User Needs Assessment – City Report

## City: Montevideo

Project SOLUTIONS+

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This document complements the User Needs Assessment Guideline.

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## 1 Approach

The user needs assessment (UNA) for the city of Montevideo, Uruguay, aims to identify user needs and preferences that will contribute to the development of this city demonstration actions targeting the test operations, charging and integration of e-taxis, business models for e-buses and electric utility vehicles for urban logistics during the development of SOLUTIONSplus project. Therefore, information was gathered on the city's background, current mobility situation, and to ascertain the desired solutions as well as available options to support decision making. For this purpose, two qualitative methods were applied: online survey and interviews.

### 1.1. City report objectives

The main objective of this city report is to present the user needs methodology approach implemented for Montevideo by identifying the steps undertaken and the team involved. In addition, this report presents an overview of the user needs findings and self-reported responses covering the topics pre-defined by the project SOLUTIONSplus consortium team of Work Package 1, (DLR and VTT, 2020).

This report is organized as follows. The first section presents the key stakeholders whose perspectives, experiences, and strategies were the basis to conduct the UNA. Section 2 presents the responses collected through the online survey. Section 3 presents the results of stakeholders' interviews.

### 1.2. User needs assessment steps and team involvement

The UNA research approach consisted of an online survey and semi-structured interviews involving key stakeholders for the Montevideo Municipality and was conducted accordingly to the instructions on the SOLUTIONSplus project user needs assessment (DLR and VTT, 2020).

Montevideo's city team involved with the UNA activities consisted of the following partners: city representatives, WP1 representatives (VTT), and WP4 representatives (WI and UEMI).

The activities undertaken for the UNA implementation involved three major steps with the contribution of city teams as summarized below.

- First, key stakeholders were identified by the city representatives with the support of the WP4 representatives.
- Second, an online survey and interviews were conducted by the city representatives with the support of the WP4 representatives.

- Third and last, results of the UNA were documented and reported by WP1 (VTT) and WP4 (WI and UEMI) partners.

Table 1 identifies targeted stakeholders and the corresponding group that were selected to carry out the UNA with the application of an online survey and semi-structured qualitative interviews.

Table 1 Selected stakeholders and applied research methods for Montevideo's UNA.

Stakeholder		Method and Sample Size	
Stakeholder group	Organisation Name	Online Survey (N)	Interviews (N)
National / regional / local authorities	Municipality of Montevideo (IM)	1	1
	Public Utility Company (UTE)	1	1
	Mobility Uruguay - NOVELLI Group.	1	
	Ministry of Energy, Industry and Mining (MIEM)	1	1
	MOVES Project	1	1
Public transport Operators (PTOs)	Uruguayan Company of Collective Transport (CUTCSA)	1	1
	Cooperative Union of Transport Workers (UCOT)	1	1
Small and medium-sized enterprises (SMEs) and original equipment manufacturers (OEMs)	SADAR	1	1
	Green Star SRL	1	1
	Weflow / Ecomoving	1	1
Service providers (delivery services)	PedidosYA	1	1
Academy / Research	Institute of Electrical Engineering, Faculty of Engineer of the Public University (UDELAR)	1	1

In total, 12 key stakeholders were selected for the UNA of the city of Montevideo. Those stakeholders represent different groups, such as National and local authorities, Public Transport Operators, OEMs (i.e. vehicle companies, maintenance), Service Providers (delivery services) and Research and Academia. However, one of the participants in the online survey did not report the organisation name. Thus this table identifies 12 stakeholders but there is an additional stakeholder participating in the online survey. The online survey and interviews were conducted during November and December 2020.

## 2 Results – Survey

The survey data was collected by using a self-completion online questionnaire consisting of twenty-four items measured using five-point Likert scale from -2 “not at all important” to 2 “very important”, multiple-choice questions and open questions. The survey included five major sections: city identification (Question 1), city aims (Questions 4 to 11), implementation (Questions 12 to 18), obstacles, limitations and barriers (Questions 19 to 21), and finally, background questions (Questions 22 to 26).

Montevideo’s online survey comprises 13 responses gathered across different stakeholders’ group, previously identified in Table 1. The participant's ages ranged from 30 to 57 years (M=44,00 yr, SD ±11,75). A copy of Montevideo’s online survey responses can be accessed here [Online Survey Montevideo](#) .

## 2.1 Montevideo aims

For city aims questions (items 4 to 11), using five-point Likert scale, the importance rating assigned by stakeholders was computed based on the counts of each point Likert scale (e.g. stakeholder response “-2” ) and its corresponding weighting factor (e.g. “-2” for point scale “-2”) as presented in the equation below. An overview of the online survey responses and importance assigned by stakeholders with respect to city aims are presented in Figure 1 to Figure 4.

$$\text{Importance Rating} = \frac{[\text{Count}("-2") * (-2) + \text{Count}("-1") * (-1) + \text{Count}("0") * (0) + \text{Count}("1") * (1) + \text{Count}("2") * (2)]}{\text{Number of responses}}$$

The most important aim for the city is *“To analyse costs related to the implementation of e-vehicles”* with importance assigned by stakeholders of 1,77, as shown in Figure 1. *“To increase the share of trips made with e-vehicles”* and *“To identify preferred user groups and usage patterns”* were also very important, (1,62 and 1,54, respectively).

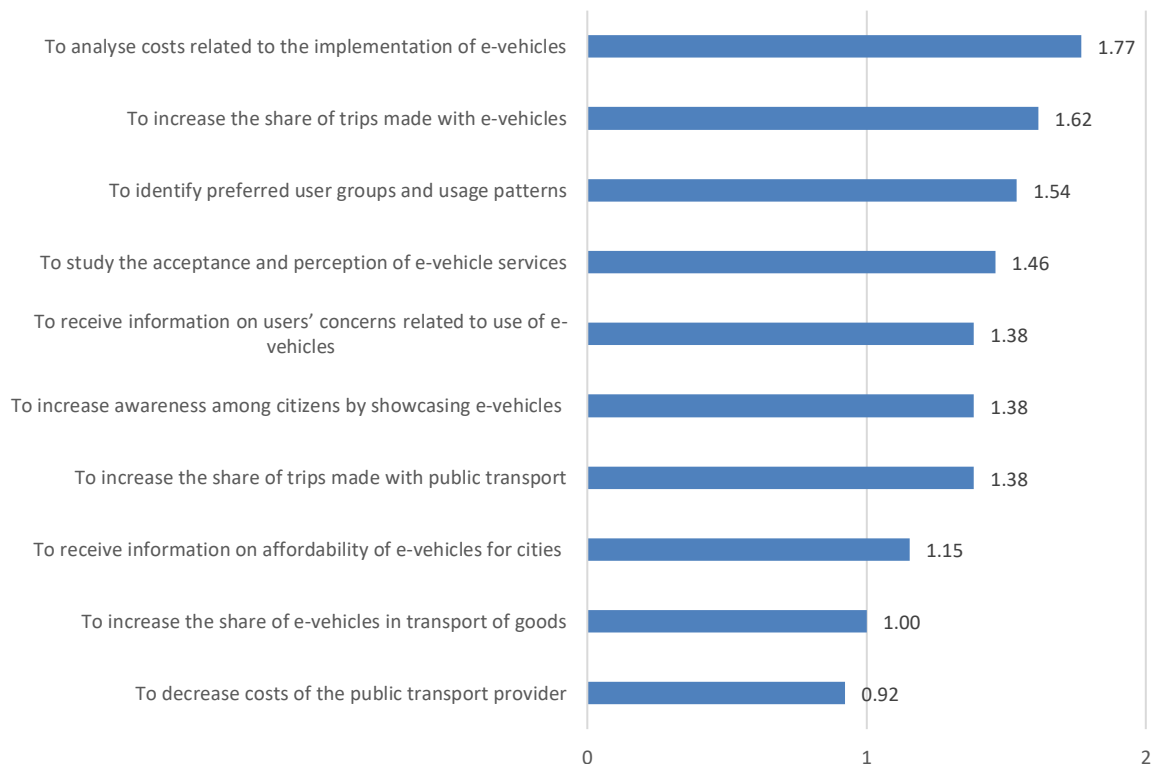


Figure 1: City aims related to usage and user acceptance of e-vehicles and importance assigned by stakeholders (Likert scale -2 “not at all important” to 2 “very important”).

Other important aims regarding usage and user acceptance identified by Montevideo’s stakeholders are (accordingly to the open question 5) are:

- To study different modes and not contradict different electric mobility alternatives.

- To adequately inform users about the benefits of the electric vehicle.
- To generate awareness in the population about public health problems due to transport / multimodal transport and last mile are the key.
- To make information available on charging networks and focus on the user.

For the city mobility patterns, the most important aim is *“To improve quality of travelling”* (1,46), in Figure 2. This aim is followed by *“To study impacts of e-vehicle services on the amount of travelling”* (1,31) and *“To offer a more stable transport service”* and *“To study impacts of e-vehicle services on choice of travel mode”* both with 1,23) based on the importance assigned by the stakeholders.

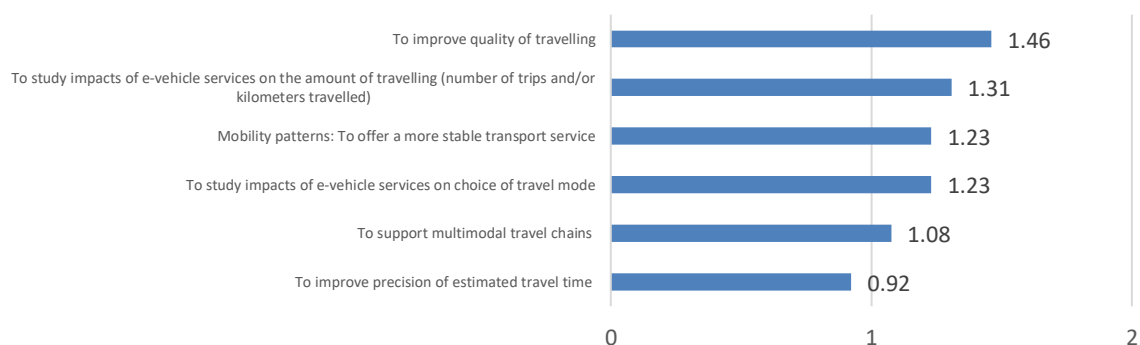


Figure 2: Mobility patterns aims and importance assigned by stakeholders (Likert scale -2 “not at all important” to 2 “very important”).

Other related mobility aims identified by the stakeholders are (accordingly to the open question 7):

- To understand why users choose individual / personal transport.
- To ensure vehicle safety (in competition with two-wheelers) / low operating costs / which should be maintained and profit-enhancing for EV acquisition.
- To improve equity in terms of access to public transport and infrastructure in different areas of the city.
- To gather real-time information on the location and type of public transport vehicle.
- To identify specific patterns related to the characteristics of electric buses (autonomy/load management/incidence of driving).
- To improve comfort.

For the city environment, the two most important aims are *“To reduce CO2 emissions”* (1,56) and *“To reduce pollution (NOX, CO, PM, VOC)”* (1,54), as shown in Figure 3.

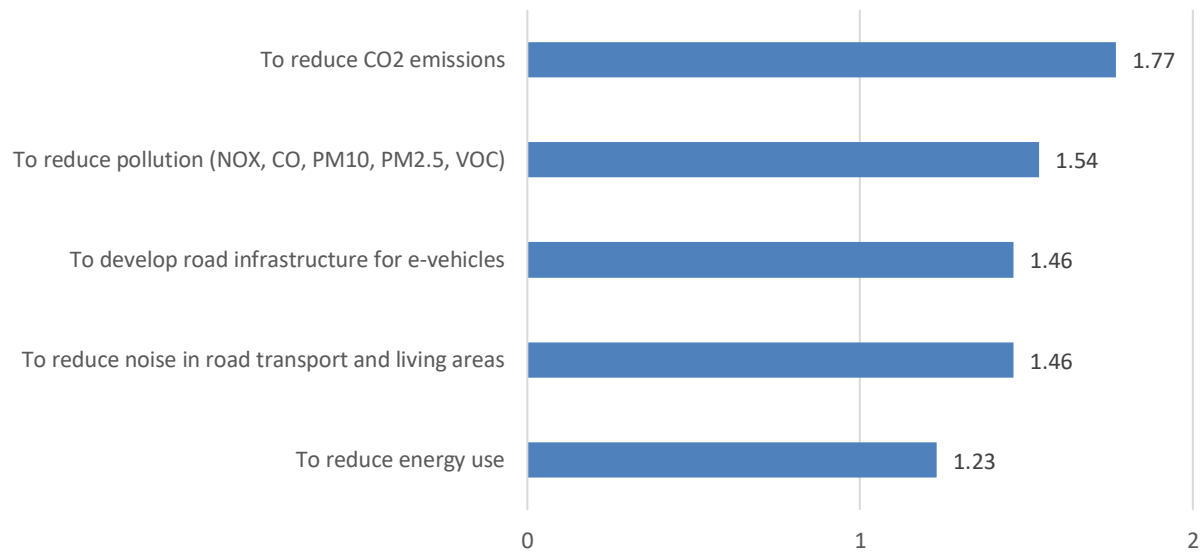


Figure 3: City environment aims and importance assigned by stakeholders (Likert scale -2 “not at all important” to 2 “very important”).

Other city environment aims include:

- To develop compatible charging technologies.
- To promote multimodal nodes and integrate them with public spaces in the city.
- To ensure policies for recycling or reusing EV batteries that when the time comes there will be a large volume.
- To create more spaces for pedestrians and active mobility, which are required to achieve higher levels of equity.
- To segregate space for public and active transport to the detriment of motorized mobility for private/personal mobility.

For the quality of life in the city, the most important aim is *“To improve public health in general, esp. by reducing exposure of citizens to air pollution”* (1,62), in Figure 4. In addition, *“To enhance job creation”* ( 1,56). *“To improve livability of the city in general”* and *“To improve access to public transport”* are also considered very important (both 1,23).

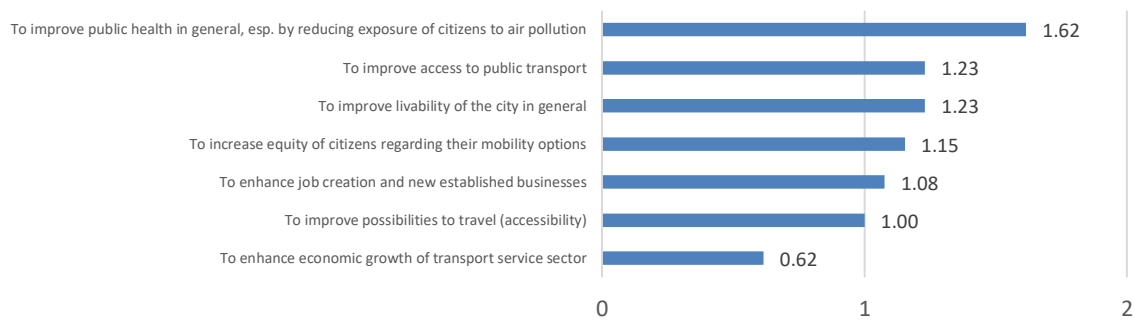


Figure 4: Quality of life in the city aims and importance assigned by stakeholders (Likert scale -2 “not at all important” to 2 “very important”).

Other city environment aims identified by the stakeholders are:

- To achieve minimal impact on urban life (agreement with specific institutions to train drivers).
- To generate qualified labor for maintenance, operation and cargo management that can be replicated in other countries.
- To increase/improve road safety with new technologies.
- To take actions that aim to decongest the city in the number of vehicles (private or public vehicles).
- To complement the multimodality for active mobility that displaces the use of cars and contributes to a dense city being more dynamic.
- To reduce travel times (improvement of commercial speed/use of dedicated bus lanes/improvement of the travel experience).

## 2.2 Implementation

For implementation questions (items 12 to 18), the results are presented based on the counts for each multiple-choice question options. An overview of stakeholder’s responses to the city e-vehicles implementation is presented next.

For the targeted use cases for e-vehicles in Montevideo city, last/first mile delivery was identified by all stakeholders (13/13), followed by the transport of people (11/13) (Figure A, in Appendix 1). Other targeted use cases include private or industrial use, tourism and recreation.

The e-vehicles will be most used for the *transport of people / delivery of goods in city centre* and in suburban areas (12/13) and (6/13), respectively, (Figure B, in the Appendix 1).

In the transport of people, all citizens were the targeted user group of the e-vehicles with more relevance identified by stakeholders (11/13), followed by people with disabilities and senior citizens, students and commuters though with less relevance (all 3/13), in Figure 5. Other user groups were: pregnant women; families, logistics and tourism.

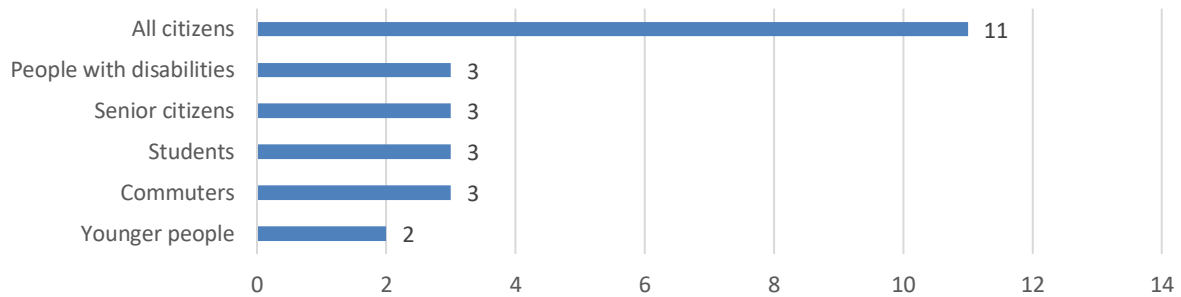


Figure 5: Targeted user groups of the e-vehicles for the transport of people (N=13).

E-vehicles may be used most for commuting (13/13), followed by school trips (12/13) and other job-related trips (8/13), as shown in Figure 6.

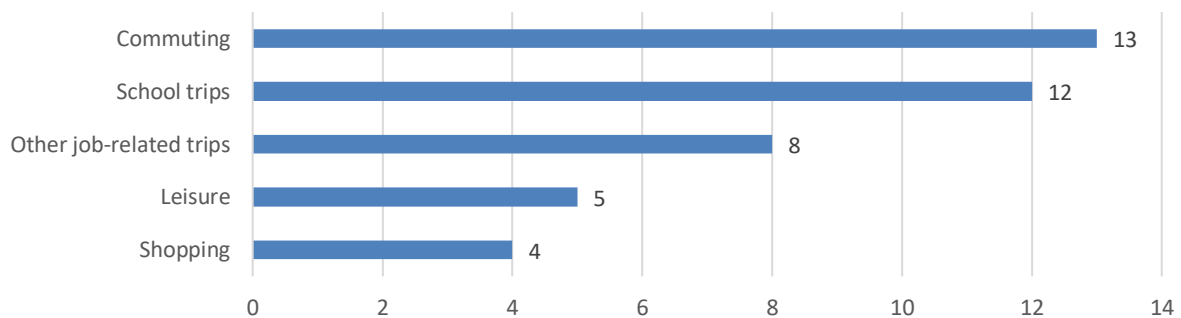


Figure 6: Potential trips that people will make in Montevideo using the e-vehicles (N=13).

In the transport of goods, stakeholders expected that e-vehicles may be mostly used by medium or small private companies (10/13), followed by private large companies and other public actor (both 6/13), in Figure 7.

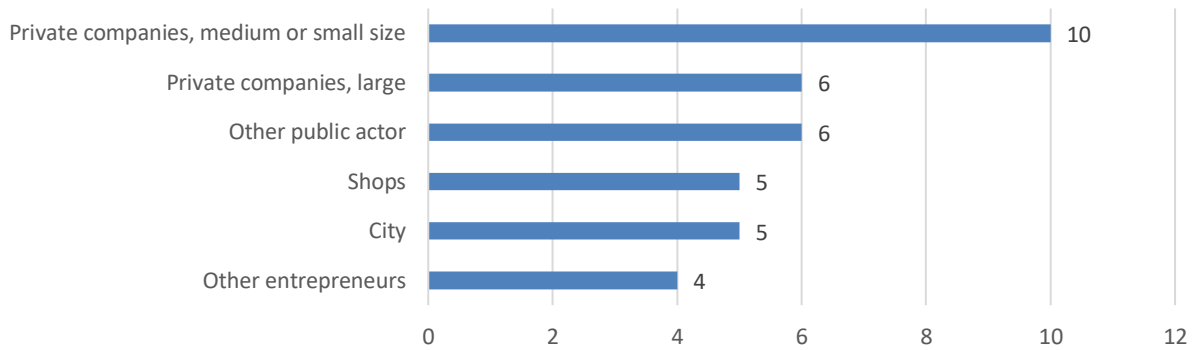


Figure 7: E-vehicles use for the transport of goods (N=13).

Based on the stakeholders' opinion, the main service operator for the e-vehicles should be a private service operator (9/13), ( Figure C in Appendix 1). Besides, Montevideo's stakeholders identified the following e-vehicle operators:

- Private companies endorsed by the Municipality of Montevideo.
- Logistics operators/distributors of mass consumption.
- Public / private partnership.

## 2.3 Obstacles, limitations and barriers

For the assessment of online survey questions related to the obstacles, limitations and barriers linked to the e-vehicles implementation, the results are presented based on the counts for each multiple-choice question option (item 19, Subsection 2.3.1) and stakeholders feedback reported in the open questions (items 20 and 21, Subsections 2.3.2 and 2.3.3, respectively).

### 2.3.1 Most challenging

The top three challenges for the successful implementation of e-vehicles are lack of money / financial resources (7/13), organizational issues (5/13), and investments needed (4/13), as shown in Figure 8.



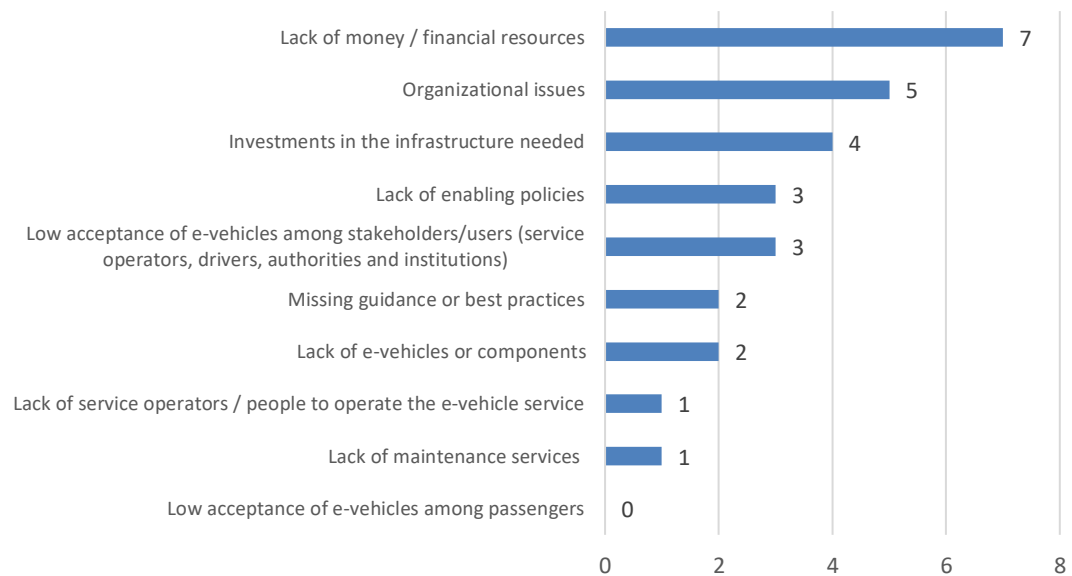


Figure 8: Most challenging for the successful implementation of e-vehicles (N=13).

Another barrier (identified by one stakeholder) is related to the limited battery life and degradation of batteries depending on the speed of recharging.

### 2.3.2 Regulatory barriers

For the regulatory barriers that currently hinder the implementation, the stakeholders identified several factors and as listed below.

- Incentives period and the useful life of the investment (10 years).
- Regulations referring to batteries should be issued (currently in process, in legal proceedings of the Ministry of the Environment).
- Regulatory framework that helps to reverse the sector and standards or regulations for safe circulation in public spaces.
- Limitations of the battery life and degradation of batteries depending on the speed of recharging.

Supplement information on regulatory barriers identified by the Montevideo stakeholders is presented in Section 3, the viewpoints from the interviews.

### 2.3.3 Other barriers

Other barriers that may exist (e.g. institutionally) that can also hinder the implementation, were identified by the stakeholders as listed below.

- Deviation between different state entities, thus there is the need to strengthen the regulation of collective public transport for all cities in the country / there must be a collective transport system at the country level.

- Delay in publishing regulations, as sometimes technological advancement appears first.
- Complex homologation processes and difficulties for patenting. Besides differences, according to Municipality (Department), / Institutions may impair safe conditions for transit.
- Need to create economic incentives for the transition to electric mobility (the current stimulus is limited in the number of units).
- Need to strengthen the regulation of collective public transport for all cities in Uruguay; there must be a collective transport system at the country level.
- Uncertainty regarding the change in the political "color" of the central government and the fluid relationship at different levels of government.

Supplement information on other barriers identified by the Montevideo stakeholders is presented next, in Section 3.

## 3 Results –Interviews

In the case of Montevideo, 11 interviews were conducted aiming to grasp the perspective of all stakeholders. At the Government and Public sector level, 4 interviewees were chosen: the Municipality of Montevideo (IM), the Ministry of Energy (MIEM), the MOVÉS project and the Public Utility Company (UTE). From an operating perspective, 2 public transport operators (PTO) were interviewed: they were CUTCSA and UCOT. Then, one actor from the academy was also interviewed, who was the president of UTE for a period of 10 years. Several stakeholders from the industry and services were also asked: Sadar (importer and manufacturer of conventional cars), GreenStar (3-wheelers manufacturer), WeFlow (e-cargo bikes manufacturer) and PedidosYa (Delivery services). All these institutions representing the stakeholders that were interviewed are identified in Table 1, except for ABB Uruguay, in which the interview is pending as expected to be conducted in a few weeks.

### 3.1 Aims of the city and Expectations of Stakeholders

All interviewees were asked regarding the reasons to get involved in an e-mobility project such as SOLUTIONSplus and most of them pointed out the environmental aspects as a key reason, although specific details varied from climate goals, to the need to address pollution and to improve the quality of life and preservation of heritage.

The Public Utility Company (UTE) highlighted the economic benefit for the Company with the growth of e-mobility. Other important issues and/or challenges for them is how to optimize the use of the grid with the introduction of e-mobility and how to manage the new energy demand without increasing the power of the grid nor the power generation (important solar and eolic surplus already exist in Uruguay).

The conditions for electricity generation are an important topic for the MIEM considering that important solar and eolic surpluses already exist in Uruguay which positions the country in a good place to promote electric mobility. In addition, the alignment of Uruguay with international commitments to reduce emissions were also mentioned as well as the fact that Uruguay can be a good

pilot country due to its size.

From the side of the Municipality, the reasons to get involved in an e-mobility project such as SOLUTIONSplus are the reduction of emissions in the city center, the energy efficiency, the autochthonous and renewable electric energy consumption and the associated improvement of comfort in the travel. Another important point is the promotion of a new technology from the side of the public sector as well as the dissemination of some knowledge about this new technology.

For the Academy, regarding the Ciudadela terminal, the SOL + project is seen as an interesting project to solve the problem of recharging electric buses. In addition, the Ciudadela initiative is seen as an interesting charging hub where to test technologies and/or test modes of use both in relation to charging and in relation to the use of electric buses. Regarding the project to promote local manufacturers with MOVES, it is very good to do a pilot that shows that this technology works and it is a good opportunity to promote work and add value to the processes.

For the delivery services company, PedidosYa, the motivations are the reduction of emissions and contamination and the alignment with objectives of Delivery Hero. Finally, for the SMEs the motivations are the passion for development of this type of vehicle as well as the thinking that mobility and efficiency in transport are a great opportunity to improve the quality of life. Economic reasons are also among the most important motivations.

## 3.2 Implementation

Regarding implementation of the SOLUTIONSplus demos and how vehicles should be used, the comments of the interviewees depend on the component of the project. For the last mile logistic component (local manufacturing of light electric vehicles) some stakeholders commented on the need to have a design customized for the characteristics of the city, taking into account, for example, the slopes and the availability of bikeways, and ensuring the quality and good performance given the topography (the power of the motor was discussed in some cases). Another relevant point that emerged during the interviews, in particular with MOVÉS, was the requirements for the homologation of the 3-wheelers - for the moment there are no particular requirements for this type of vehicle but the homologation depends on the National Direction of Industry that belongs to the MIEM. At the time, the local manufacturers must comply with the requirements.

All the stakeholders related to the local manufacturing agreed that the technical specifications must meet users' needs for each use case and the vehicles must also comply with the security and regulation of local standards. Additionally, support from EU experts will be desired and required in order to get those objectives.

Regarding the powertrain for 3-wheelers, it does exist some worries about the dimensions of that part of the vehicle since Valeo has not given that information related to that part of the vehicles. Among the required information that determines the design of the vehicles is the width of the powertrain. That worry was mentioned by GreenStar during the interview and also by Novas. The programming and control of the powertrain is another important topic for local manufacturers.

Batteries for the vehicles was another important topic that emerged during the interviews for both one another components of the project (local manufacturing and charging infrastructure). First of all, it was asked if the project will supply the batteries for the vehicles and then it was commented on the issue regarding the final disposal or second life of the batteries. That topic was remarked by CUTCSA, UCOT, GreenStar and some of the public authorities.

As regards the charging infrastructure component, there are several concerns regarding the operation of the public charging point for the Ciudadela terminal. One of the PTOs, CUTCSA, said that it would be not possible to organize the plug-in and energy dispatch if the charging point is public and shared among the PTOs. On the other hand, UCOT said that they don't see major troubles with that, pointing that if it is free one charging point inside the terminal it should be used by the first applicant and the power dispatch should be organized in a reasonable way. Following that reasoning the management of the charging point should be in the hands of the IM or UTE, they said.

The second component is also seen as a pilot for further scaling of charging hubs for e-buses. Some of the interviewees commented that other public charging hubs would be required in a short time in different locations of the city, mainly because of the autonomy of the buses and the battery degradation.

### 3.3 Regulation

Regarding the local manufacturing of e-cargo bikes and 3-wheelers, there is no for the moment of local regulation. However, the DNI is currently working on an homologation regulation for motorbikes and 3-wheelers that will take as reference the UN regulations for that type of vehicle. It is expected that this regulation will be issued at the end of 2021 / beginning of 2022. Regarding e-cargo bikes, there are no local regulations but the MOVÉS project points to the compliment of the UN regulations of that kind of vehicle, which means that the power of the motor must be no bigger than 250 W.

Regarding charging infrastructure and fast charging for e-buses, there have been recently issued the standard UNIT-1234/2020 which set down the requirements for connectors for fast charging infrastructure, taking as reference the IEC61851 and the IEC62196 standards (CCS2). No additional regulations were mentioned by the different stakeholders.

### 3.4 Obstacles, limitations, barriers

Regarding the first component of the project, one of the most important obstacles was the one related to the charging infrastructure standard. This obstacle was solved through the writing and publication of the UNIT-1234-2020 standard, which set down the conditions for fast charging connectors. Another important obstacle or limitation that emerged from the interviews was the one related to the energy dispatch and the limits of responsibility for charging infrastructure. For instance, it was discussed who will be the responsible during the manipulation of every charging point as well as who will be responsible for the control and energy dispatch. For example, from the point of view of CUTCSA, each PTO should be designated with one dedicated charging point. On the other hand, from the point of view of UCOT, as well as the Municipality, the charging points should be shared by all the PTOs.

Regarding the second component of the project, there were some concerns regarding technical issues such as the power and the control of the motor for the different types of vehicles that will be manufactured. Another topic that arose in the interviews was the size and the type of the batteries as well as the final disposal once the lifetime is ended. Another important topic that was mentioned during the interviews was the homologation for 3-wheelers since there are no current specific requirements for that type of vehicle but there is a draft in the Ministry of Industry, Energy and Mining (MIEM) that will be issued in 2021/2022.

### 3.5 Sustainability of the e-Mobility solutions to be implemented

Regarding the sustainability of the project, all actors said that the planned E-mobility solutions are useful to improve the urban mobility in the city on both components: charging infrastructure and local manufacturing.

Regarding the first component, it is understood that the planned implementations can help to increase the participation of people in public transport and improve intermodality since users' perception of electric buses is very good and, additionally the e-buses are more modern and better valued. On the other hand, in electric taxis the user experience is not as good compared to electric buses.

On the other hand, in relation to the second component of the project, which consists of the manufacture of light electric vehicles, the authorities observe that despite being electric, the problem of the number of vehicles remains. Either way, it is understood that electric vehicles will make a great contribution to improving air quality in Montevideo and the fact that manufacturing is local is also seen as very positive.

Regarding social positive or negative impacts derived from the demonstration project it was observed that, for example, the ticket price would not be affected. Additionally, it is assumed that the TCO of electric buses would be the same in comparison with a conventional bus. Regarding other social aspects such as gender issues and accessibility, it is observed that there is an absolute improvement with electric buses since they incorporate certain amenities that were not previously required of PTOs (the accessibility of women with children, adults older, etc.)

At the employment level, it is necessary to train the PTOs employees in EV topics in order to avoid job losses. In this sense, there is a definition already assumed which determines that there will be no layoffs and the people will be re-trained. In order to mitigate the negative impacts and potentiate the positive ones, the training on charging issues and electric mobility is quite important and they are being carried out by entities such as UTE, UTU and UTEC in coordination with MOVES.

### 3.6 Impact on existing business models

Regarding the main impacts of the adoption of e-vehicles (e.g. SOL + vehicles) on the existing business models, there are some critical points such as the TCO and the battery life for the first component of the project. On the one hand, the conventional bus is evaluated from a financial point of view in 16 years. On the other hand, the electric bus has a battery life of 8 years which makes the economic and financial evaluation more complex and would force companies to perform a battery replacement within the financial evaluation period. On the other hand, there is a very high level of risk given that these are new technologies and there is a lot of ignorance about various elements of the electric bus, among which are particular issues related to the behavior of batteries and issues related to recharging systems.

Regarding the second component of the project, electric delivery vehicles could imply certain economic benefits for the owner of the vehicle, due to a greater extent to the savings in fuel. However, there are certain difficulties in making this known to dealers who use conventional vehicles that are purchased at a very low price and whose fuel consumption is affordable.

### 3.7 Implications for Planning and Urban Development

Regarding the urban development and planning, there is a very important expectation at the level of the Municipality of Montevideo and other actors of the Montevidean society in relation to the specific improvements that will be seen in the Ciudadela bus terminal. Within the Municipality of Montevideo, it is understood that in order to massify electric mobility it is essential to coordinate actions with the "Department of Urban Development and Planning" (for example in the green space that is adjacent to the citadel terminal) with "Department of Mobility" which is SolutionsPlus' counterpart in the city.

Another comment that emerged during the interviews was the necessity of additional public charging stations for e-buses along with the city. In that regard, the charging station at the Ciudadela terminal could represent a good model for further replications in the city. Several points were mentioned as an example where new charging stations could be implemented.

Regarding the urban development and planning for the second component, some of the interviewees such as WeFlow and Moves commented that it is necessary to improve and expand the bikeways in particular for bikes and e-cargo bikes. Additionally, in some areas such as the Old City the 3-wheelers would be a good option for last mile logistics since there is not much space for big and medium vehicles.

### 3.8 Contribution of SOLUTIONSplus to Long Term Goals

The contribution of SOL + in the long term is seen with very good eyes in both components of the project since in both cases they are prototypes that, if they are successful, can be replicated in other areas of the city or the Country.

Regarding the first component, the charging center at the Ciudadela terminal is seen as a shared center for experimental use, which can be used as a model for future replications, in addition to being seen as an experience for learning and training capabilities.

Regarding the second component, the local manufacture of electric vehicles is seen as an experience that can also be replicated in other cities of the country as the number of bikeways grows and the trust of users and distributors in electric vehicle technology grows. The project is also seen as an excellent opportunity to acquire skills and local knowledge in the manufacture of small electric vehicles.

## References

DLR and VTT. (2020). *SOLUTIONSplus User Needs Assessment: Guideline*.  
[https://drive.google.com/file/d/12F3\\_C5g0doKrdDYdzgLQKFHj1c8VLbqV/view](https://drive.google.com/file/d/12F3_C5g0doKrdDYdzgLQKFHj1c8VLbqV/view)

# Appendix

## Appendix 1 – Additional Figures

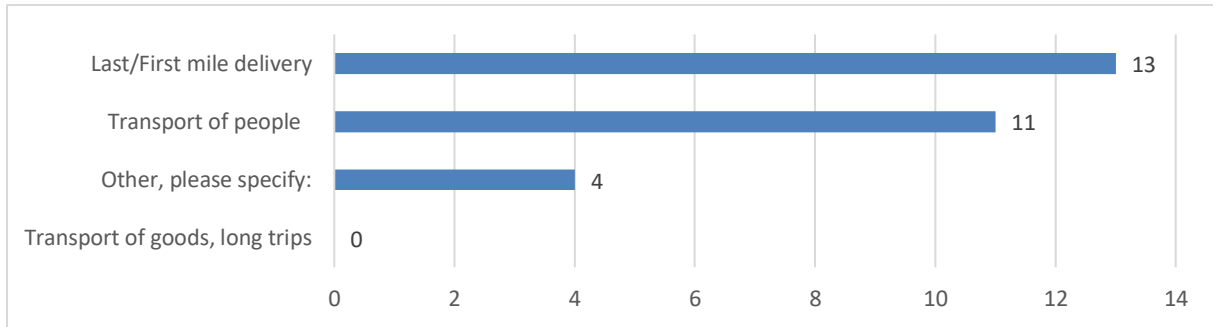


Figure A: Targeted use cases for e-vehicles (N=13).

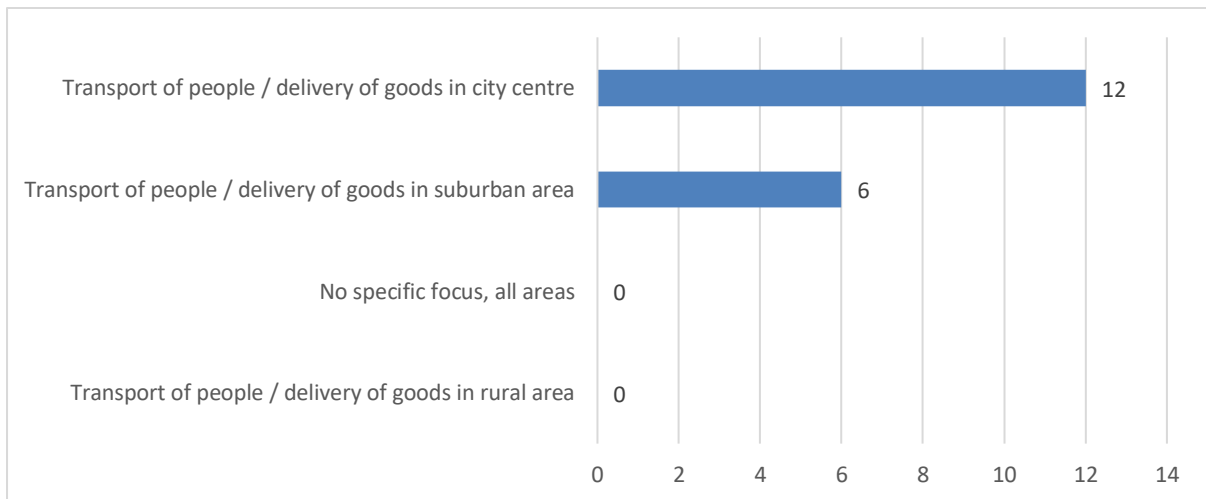


Figure B: Areas of the city/region where the e-vehicles are going to be used (N=13).



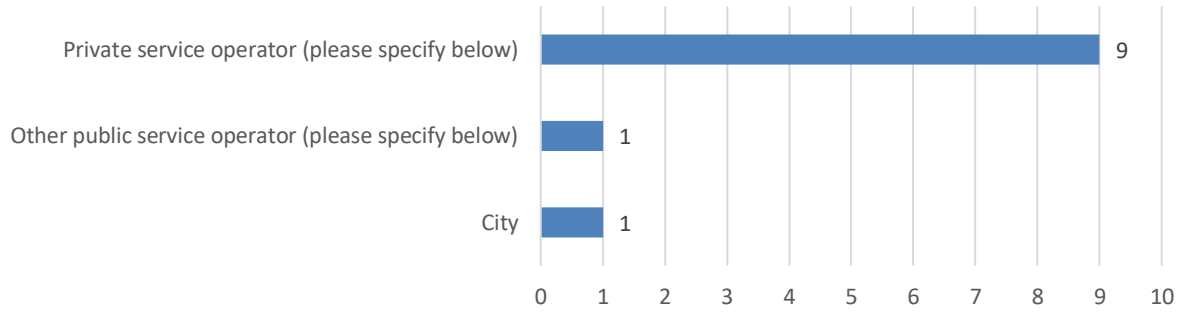


Figure C: Main service operator of the e-vehicles (N=13).

## Appendix 2 – Systematization of Questions and Answer, by stakeholder group and organization

### Aims and expectations

<b>What are the main reasons why your organization is embarking on projects involving E-mobility?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Generation of new demand for electric energy can improve electric infrastructure</li> <li>- Increased demand for electric energy without increasing the power of the grid</li> <li>- Use existing surplus energy generated by renewable sources</li> <li>- Decarbonize the transport system</li> <li>- Economic benefits</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- To be in line with objectives of Delivery Hero</li> <li>- Reduce emissions and contamination</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- The total cost of ownerships (TCO) of EVs will be better in short-term</li> <li>- MCI vehicles will be replaced by EVs for first and last mile logistics and for private transport</li> </ul>
Local Authority	MIEM (Ministry of Industry, Energy and Mining)	<ul style="list-style-type: none"> <li>- The conditions for electricity generation are in place to promote electric mobility</li> <li>- Alignment with international commitments to reduce emissions</li> <li>- Uruguay is a pilot country due to its size</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Reduce emissions in central areas of Montevideo</li> <li>- Energy efficiency, production of autochthonous and renewable electric energy</li> <li>- Setting a good example</li> <li>- Distribution of knowledge about this new technology</li> <li>- Economic aspects: lower energy consumption</li> <li>- Improve travelling comfort</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Advantages for the company's business idea of exporting vehicles: E-vehicles require a smaller amount of different components, they are simpler, and more reliable than conventional vehicles</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Contribute to a solutions for charging e-vehicles in Ciudadela</li> <li>- A recharging hub where to test technologies and modes of use</li> </ul>

		<ul style="list-style-type: none"> <li>- In regards to MOVES: It is good to show that such a project can work; it is a good opportunity to encourage work and add value to the process</li> </ul>
E-Vehicle EOM	WeFlow	<ul style="list-style-type: none"> <li>- passion for development</li> <li>- mobility and efficiency in transport is a great opportunity to improve the quality of life</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- environmental pollution is a point of concern for them.</li> <li>- They recognize that PTOs are polluting and therefore seek to reduce the degree of pollution. For example: they have a driving school, they prioritize vehicles that consume less and emit less (in total they have 1150 buses), they add diesel with a product that reduces approximately 3% of consumption</li> <li>- they are evaluating buses of different technologies</li> <li>- in 2016 they incorporated the first electric bus to make a learning curve</li> <li>- They are committed to national and departmental government initiatives</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- The boost given by the government is the first reason</li> <li>- Reducing emissions is a priority but it would be impossible without state support</li> </ul>
<b>What have been your experiences in the current project so far (until now)?</b>		
E-vehicle OEMs	UTE	<p>Positive aspects</p> <ul style="list-style-type: none"> <li>- A lot of public interest/ support for new technologies</li> <li>- Massification of energetic concepts</li> <li>- Companies are ready to implement electric vehicles (EVs)</li> <li>- Investments in this sector</li> <li>- Understanding of challenges and opportunities (especially among public transport suppliers)</li> </ul> <p>Hurdles</p> <ul style="list-style-type: none"> <li>- Lack of supply of EVs</li> <li>- Few local initiatives</li> <li>- Resistance in the taxi union (owners)</li> <li>- Few capacities and lack of technical staff for reparation and failure diagnosis</li> <li>- Importers train their own staff</li> <li>- Low quality of after-sales service</li> <li>- Delays in obtaining spare parts</li> <li>- Insufficient infrastructure in private areas</li> </ul>
Private transport companies	PedidosYa	<ul style="list-style-type: none"> <li>- Broken streets cause problems for tricycles of MOVÉS</li> <li>- Would prefer e-cargo bikes to tricycles</li> <li>- Average load &lt;5 kg</li> </ul>

(delivery)		<ul style="list-style-type: none"> <li>- Tricycles amount of 2% of entire fleet → their main purpose is publicity</li> <li>- Tricyclists are dependent workers</li> <li>- Are now monitoring the battery life (what they did not do before)</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- High user acceptance of EVs due to the ease of use of EVs</li> <li>- The demand exceeds the predictions because of governmental initiatives (until 31.03.2021, uncertainty amount development after march)</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Learning curve: currently measuring system variables</li> <li>- Lack of supply of EVs</li> <li>- tax exemption mechanisms do not fully reach the end user</li> <li>- Some externalities have not been taken into account: maintenance, lack of training, user difficulties, services, etc.</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- A lot of learning, for example about hurdles and opportunities</li> <li>- Good experience for taxis and buses</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Production geared to user needs → users can use e-vehicles for various purposes</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Incorporation of 90 e-trucks with a fleet management system</li> <li>- Supporting MOVÉS with e-mobility</li> <li>- Successful implementation of taxis</li> </ul>
E-Vehicle EOM	WeFlow	<ul style="list-style-type: none"> <li>- They have a previous experience of 300 bikes sold and more than 2000 bicycle users, that is to say, economically and profitably the project has been a great success.</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- the experience with electric buses so far is very positive and promising for the future</li> <li>- there are opportunities for improvement that will be resolved by the industry (for example, the autonomy of buses)</li> <li>- the technology of electric buses with its limitations in terms of autonomy would imply not reaching the required distances in 80% of its current trips</li> <li>- They understand that the State's policy is to recharge at night to take advantage of night-time wind surpluses, which may not be enough to recharge quickly during the day.</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- the experience has been positive due to public acceptance, low noise emission, good performance and very satisfied drivers</li> </ul>

		<ul style="list-style-type: none"> <li>- satisfactory rate in terms of electricity rate</li> <li>- concern about autonomy and battery life</li> <li>- it would be interesting to have opportunity cargo in intermediate terminals such as the citadel example</li> </ul>
<b>What are the main challenges in the selected area / city / your operations, which you think e-mobility can help address?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Centralized challenges in PT possible due to well regulated field</li> <li>- More efficient public transport &amp; higher customer satisfaction</li> <li>- Cooperation between PTOs in adaption to EVs is a challenge</li> <li>- Interoperability between different PTOs</li> <li>- Taxis: few regulations, atomized, irrational decisions, non-professional behaviour of taxi-union, perception of new technologies as threat</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- Reduce physical exhaustion &amp; improve the comfort of cyclists → happy deliverers could increase customer's satisfaction</li> <li>- Increase the speed of bicycles</li> <li>- Improve productivity</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Fears about short ranges and loss of autonomy</li> <li>- Public quick charging is key</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Noise</li> <li>- Emissions</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Better quality of service would improve modal split</li> <li>- User perception improved over the last years</li> <li>- Generate actions so that issues related to the environment and number of vehicles does not worsen</li> <li>- Hurdles: lack of supply, price, financing</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- All components are bought from the same supplier</li> <li>- The construction of the vehicle in its electric version is quite easy</li> <li>- Integration of Valeo's engine is feasible, no major adjustments necessary</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- E-mobility as possibility to align actors</li> <li>- Implement improvements that go beyond electric vehicles</li> <li>- Intermodal transportation required</li> <li>- E-mobility can attract investors</li> </ul>
E-Vehicle EOM	WeFlow	<ul style="list-style-type: none"> <li>- the biggest challenge is culture and communication</li> <li>- it is necessary to generate knowledge (awareness), understanding of the situation and empowerment</li> <li>- Electric mobility can help in part but it is not all, but</li> </ul>

		there are a lot of other factors that must be intervened
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- In the event that electric buses are added more and more, night recharging becomes a problem and the future need to carry out opportunity charging for rapid recharging in the middle of the bus work shift appears.</li> <li>- SOL + pilot see it as a necessity considering rates should be equalized at night</li> <li>- reducing emissions is the priority</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- the electric bus is very well accepted by the user and therefore can attract a greater number of users, which could help to solve congestion issues in the city and emissions issues</li> </ul>
<b>What's your vision for a scale-up of the project? Where could it be implemented next?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Shared recharge infrastructure, for example in public terminals or next to them</li> <li>- Implementation in different areas of the city</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- Evaluate (un-) loading spaces &amp; autonomous e-cargo bikes in the context of scaling up: cadets of 60-70 km in 8-10 hours</li> <li>- Financial support to include e-vehicles into cadet</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Incentives for final users to equalize the TCO</li> <li>- Install public fast-charging infrastructure</li> <li>- Car-sharing</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Replication of experiment in Ciudadela in Eastern parts of the city where the public transport operators (PTOs) have their charging infrastructure</li> <li>- Replication also possible in other nearby cities like La Paz, Las Piedras, Maldonado, Salto, Colonia, Rivera</li> <li>- The urban logistics project could also be implemented in other cities</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Support stations for recharging</li> <li>- Opportunity charging</li> <li>- Scale up in Montevideo as the fleet grows</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Scale up production of GS above 100 units per month, producing also in other countries (Argentina, Europe)</li> <li>- Scaling up in Uruguay is very difficult due to political and technical barriers</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Possibility for scaling-up at 8 different places in the metropolitan region</li> <li>- Nodal center, electric energy and security are required</li> </ul>

E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- The cargo bike will be sold in a scaled way with an exponential upward curve since the cargo bike will be sold in a “customized” way (made to measure)</li> <li>- the e-cargo bike has 5 different variables to achieve higher sales levels</li> <li>- Weflow currently has no mass production capacity but could expand their activities in 6 months</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- the scalability of the electric bus project for Montevideo (MIEM subsidy) is limited / progress has to be made as the industry solves technological problems / number of people transported by each bus is lost by 10% -12%</li> <li>- European industry is very focused on serving the European market and they are also behind China the management is as important as the technological problem so it must be clear who will manage the community charging point</li> <li>- They manage their own charging center in a very good way and are very jealous about the charging point</li> <li>- 3 or 4 charging points should be dedicated one for each PTO (the example of taxis already denotes some problems in terms of sharing the charging point)</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- Portones terminal could be a point with good centrality and with an influx of many lines</li> <li>- It could also be the Punta Carretas bus terminal</li> </ul>

## Implementation

<b>What are your expectations with regards to how the SOLUTIONSPUS vehicles / charging equipment are to be used in the demonstration project? What characteristics should the vehicles have?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Meet the requests of the buses</li> <li>- Provide energy for each vehicle</li> <li>- Vehicles should be safe, reliable, robust</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- access to financing plans</li> <li>- Charging infrastructure</li> <li>- Durable vehicles</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Prevent major changes in the use cases of vehicles to avoid adaptations of internal processes</li> </ul>

Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Serve to later replicate</li> <li>- Enable scale-up</li> <li>- Strengthen regulations</li> <li>- Generating an sustainable ecosystem beyond SOLUTIONSPLUS</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Equipment for opportunity charging and charging at night</li> <li>- Functional load to the vehicles</li> <li>- Make the terminal more friendly for operators, chofers and users</li> <li>- More harmonious environment</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- The diffusion of the product via el plan “Flota Verde” would be very important</li> <li>- Good braking system</li> <li>- Relatively quick recharging of batteries</li> <li>-</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Contribution to understanding how the system functions</li> <li>- Evaluating of security and charging issues</li> <li>- Providing solutions and that lessons can be learned from experience</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- The versatility (techniques and efficiency) of the vehicle is very important to be in demand. Weflow has 5 different types of cargo bike</li> <li>- For bike-loads the motor should be from 350W to 1000W of power, not 250W, and the maximum speed 33 km / h =&gt; it has to have displacement force to carry the load</li> <li>- The design of the bicycle will have to be accessible to all, that is, older adults can climb</li> <li>- Bicycles have to be affordable, repairable and durable in the Latin American context.</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- compatible with the CUTCSA fleet standard</li> <li>- have a management system that communicates with the CUTCSA system and be able to reserve a charging point</li> <li>- there are no commitments with any brand of electric buses</li> <li>- The standardization of the fleet has given them a lot of results since having many brands was problematic in terms of maintenance and operating costs, so a brand unification process has begun (MBenz / Marcopolo)</li> <li>- have their own authorized workshop with preferential shopping line</li> <li>- The key is to choose the correct bus brand, but the next selection of brands will depend on market conditions.</li> </ul>



PTO	UCOT	<ul style="list-style-type: none"> <li>- it is necessary to generate many charging points in the city available to encourage the use of the electric bus since autonomy is a problem</li> <li>- today there should be between 5 and 6 electric bus charging stations</li> <li>- Regarding the loading standard, UCOT understands that it has to be unified. The connector and associated software must be unique. Yutong provided them with electric buses with the GB / T standard, which was a mistake and promised to solve (with CCS2) in the next call.</li> </ul>
<p><b>Do you have any concerns/worries regarding the vehicles? Are there any risks regarding the vehicles that need to be taken into account?</b></p>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Integration of the EVSE to the UTE charging infrastructure</li> <li>- Incompatibility of chargers and buses</li> <li>- Consider technical aspects in the next call for applications</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- Where to charge the e-cargo bikes, especially at night</li> <li>- Battery swapping could work, depending on the user acceptability</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Security issues in traffic</li> <li>- Bicycles should use bike lanes</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Different objectives of PTOs</li> <li>- E-bikes: risk of financial and technical viability, vandalism</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Consensus with PTOs necessary about changes in the terminal</li> <li>- No technical problems</li> <li>- The facilities must be exploited</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Security aspects, especially because of three-wheelers</li> <li>- Changing of batteries could be technically complex</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Vandalism</li> <li>- Uruguay as a small country has few possibilities to influence the supply of components, vehicles, etc.</li> <li>- Maintaining of the vehicles has to be contemplated from the business model</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- there is a lot of concern about the power limitation of electric motors (250W)</li> <li>- For the user to be satisfied and convinced, the motor must be greater than 350W and the batteries allow autonomy of at least 60km</li> </ul>

		<ul style="list-style-type: none"> <li>- Users of the previous renting plan of the MOVES plan equipped with 250W motors were not satisfied</li> <li>- logistics companies (fedex, dhl, mercadolibre) would be a target audience for e-cargo bikes through mercadoenvío (they could have a fleet of 1,500 cargo bikes).</li> <li>- The 300 bikes sold by Weflow / Ecomoving are assisted bikes for passengers, not for freight.</li> <li>- Weflow / Ecomoving will insist on MOVES so that the motor power is greater than or equal to 350W</li> <li>- locally manufactured product has to be repairable locally</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- the power supply must be permanent and there can be no dips (7x24x365) which exceeds the load point (for example, in fuels they have their own backup of 4-5 working days autonomously)</li> <li>- To minimize recharging risks, they have a recharging center at the Añón plant for 100 electric buses with power guaranteed by UTE with a ring-shaped connection to minimize supply risks.</li> <li>- the user's point of view is key and there should be no drop in trips due to recharge problems</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- an operator for the charging point would have a high cost (the driver should recharge)</li> <li>- Ideally, each company has its own recharging point and that each PTO uses its own charger and the driver himself performs the opportunity recharging</li> <li>- They welcome the use of a pantograph, consequently reducing the size of the battery</li> <li>- Personnel costs. The charging time is much longer than that of conventional vehicles.</li> <li>- there is concern about power failure</li> <li>- They see the Ciudadela charging terminal as a backup and do not see too badly sharing charging points with other companies</li> </ul>
<b>How would you rate the current perception of EVs in the target population?</b>		
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- A narrative about expensive e-bikes is a big hurdle for their implementation</li> <li>- Cadets know how to fix their bikes with MCI but not about LEVs</li> </ul>
Local Authority	MIEM	<p>Business owners &amp; delivery companies::</p> <ul style="list-style-type: none"> <li>- Do not know about their savings due to a lack of quantification of energy costs</li> <li>- Doubts about autonomy and problems with battery</li> </ul>

Local Authority	Intendencia de Montevideo	- PTOs: Some companies are interested in EVs, they are training people and they achieve good results
E-Vehicle EOM	Green Star SRL	- Users, business owners & delivery companies: Good adaptation of the product
Research	Engineering Faculty	- Drivers: highly appreciated the EVs, challenged public charging stations - Business owners: Investors are having doubts concerning batteries, reselling value and spare parts
E-Vehicle OEM	WeFlow	- there is a good perception on the part of potential users although the strength has to be adequate for the user experience.
PTO	CUTCSA	- very positive. they value that they are non-polluting and silent. Accessible. 30% of the fleet with low floor (all electric with low floor)
PTO	UCOT	- very satisfied. Doubts regarding autonomy. Routes that cannot be done
<b>What would be your expectations with regards to the SOLUTIONSPPLUS start-up incubator?</b>		
E-Vehicle OEM	Green Star SRL	- The European market could generate more demand - Partnering with European companies would be important added value - Gave positive feedback regarding the training the European companies will acquire in the process of the SOLUTIONSPPLUS project
E-Vehicle OEM	WeFlow	- There is a high level of expectations, specifically regarding sharing knowledge, measurements for the search for solutions, brand knowledge for product development - more solidity is sought in the product they are developing - frames made in Uruguay will be validated by Legend in Europe once they are finished

## Regulation

<b>Based on your experience with e-mobility projects, specifically with the one being implemented under SOLUTIONSPPLUS, are there existing regulations that you think need re-thinking, or are missing, in order to accelerate the adoption of e-mobility?</b>		
E-vehicle OEMs	UTE	- Regulatory challenges regarding charging standards: control imports to make sure certain norms are met - A wider spread of charging infrastructure

		<ul style="list-style-type: none"> <li>- Regulation of recharging services</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- No clear regulations regarding delivery services on the part of the <i>Intendencia de Montevideo</i> (IM)</li> <li>- IM should improve quality and concept of bike lanes</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Lack of fiscal incentives and long waiting periods to access them</li> <li>- Lack of standards for fast-charging</li> <li>- Obligation of having a EV for 10 years: time period is too short, the total costs of ownerships is not paid off in this time</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- There should be more direct restrictions on petrol vehicles</li> <li>- The new regulation of the Municipality of Montevideo is sufficient for public transport (Euro 5, hybride, electric)</li> <li>- Need for clear regulations on technicals standards and safety for e-bikes</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- It was necessary to modify the subsidy for the purchase of electric buses and incentives for taxis (regulatory change)</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Incentives for e-vehicles exist</li> <li>- Uruguayan policies for producing and exporting are good</li> <li>- Support from the National Agency of Investigation and Innovation for the design of the vehicle</li> <li>- Homologation (Uruguay and United States) should be feasible</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Regulations and norms already exist, except for the final disposition of the batteries</li> <li>- Over the past years, different institutional actors started a coordination process</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- minimum and safety qualities in promoted vehicles</li> <li>- lack of inspection bodies for this type of vehicle (brake, tires, road safety)</li> <li>- Lack of coherence in policies (public health, transport, etc.). Lack of inter-institutional coordination.</li> <li>- 1,200,000 conventional motorcycles sold in 8 years without homologation requirements or controls</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- in Montevideo the service is highly regulated and the Municipality has the capacity to carry out the necessary regulations in a timely manner.</li> <li>- in relation to the recharging center in Ciudadela, the Municipality will have the capacity to manage the charging point</li> </ul>

		<ul style="list-style-type: none"> <li>- the promulgation of the UNIT standard is a key point but it is not mandatory and there should be additional regulation that mandates the use of this standard</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- Tariff issues are critical for opportunity charging. The reduced rate is only the night</li> <li>- Battery replacement issue at the half-life of the BUS is a concern</li> <li>- the auxiliary fleet incentives (IRPF exemptions) do not see it because the Cooperatives do not pay personal income tax, so they cannot access that benefit</li> </ul>

### Obstacles, limitations, barriers

<b>In which phase of the project do you see the biggest hurdles/obstacles? What's your strategy to overcome these?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- The first months after the implementation are key</li> <li>- Adequate communication</li> <li>- Importance of close monitoring</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- Financing: need of credits</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- Buses: Technical support of the importer or representative has to improve</li> <li>- Urban logistics: Need of management of productive projects</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Main hurdles: Connectors → already half-way solved</li> <li>- Bureaucracy and a lack of time</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- In the beginning, user acceptance could be problematic</li> <li>- Mass production in Uruguay is a big challenge</li> <li>- Financial difficulties in the beginning</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- There are no unbridgeable hurdles</li> <li>- Incorporation of private actors could be challenging</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- There is currently a lot of misinformation</li> <li>- bad sales on VEs. Very poor quality vehicles have been imported</li> <li>- Users have not been well informed about the</li> </ul>

		proper use of vehicles. For example, the batteries in some of these vehicles stop working in 1 year.
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- availability of the charging point and agree on access to recharging in an orderly manner</li> <li>- the use of the intermediate charge will be finely evaluated to determine if it would generate degradation in the battery</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- in the initial phase would be the biggest obstacles, that is, to think well the initial design of the project</li> </ul>
<b>What are the capacity building needs related to demo and in general e-mobility in the city?</b>		
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- Basic knowledge of how an e-bicycle works</li> <li>- Knowledge about repairs</li> <li>- Accessible repair points for drivers</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Recharging issues must be enhanced and expanded</li> <li>- Necessity of a person in the terminal responsible for carrying out the manual charging process</li> <li>- Develop capacities in the PTOs to carry out the management of the recharge</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Manufacturing the bodywork as a great difficulty due to lack of knowledge among electrical technicians</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- Technical University of Uruguay (UTU) =&gt; Education model focused on practice =&gt; could be a very interesting partner for the development of capacities =&gt; strong focus on the automotive issue, although mainly on internal combustion vehicles (especially tuning) .</li> <li>- UDELAR and UTU Eco Challenge project in which each group manufactured an electric vehicle.</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- Not answered</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- For now the electric buses are under warranty. At the moment it is a very new technology but not even the factory itself knows the main problems of this technology.</li> <li>- Maintenance and software</li> </ul>

		<ul style="list-style-type: none"> <li>- They also see that all the components are expensive and there is also a very high electrical risk so training is required for this</li> <li>- With the current electrical and physical infrastructure, there would be a limit on the number of buses that could be incorporated and there is concern that the necessary investments in electrical infrastructure (substation) should be made by UCOT (terminal located in Castrisi and Cabrera, in the Union). With the current infrastructure they have capacity for 4 vehicles.</li> </ul>
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### Sustainability of the e-Mobility solutions to be implemented

<b>Are the planned E-mobility solutions useful to improve urban mobility?</b>		
E-vehicle OEMs	UTE	- Yes
Private transport companies (delivery)	PedidosYa	without an opinion
E-Vehicle OEMs	SADAR	- without an opinion
Local Authority	MIEM	- without an opinion
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Increase the number of persons using public transport</li> <li>- Improve intermodality</li> <li>- E-buses are more modern and are better evaluated by users</li> <li>- Still too many light vehicles</li> <li>- Electric mobility improves the quality and travel times in the city</li> </ul>
E-Vehicle EOM	Green Star SRL	- without an opinion
E-Vehicle OEM	WeFlow	- without an answer
PTO	CUTCSA	- without an answer
PTO	UCOT	- without an answer

<b>Do you foresee any social positive or negative impacts derived from the demonstration project?</b>		
E-vehicle OEMs	UTE	- No negative impacts for society are foreseen
Private transport companies (delivery)	PedidosYa	- By seeing many EVs, more people can become motivated to use LEVs - Economy of scale - Improve quality of life
E-Vehicle OEMs	SADAR	- The impact will be positive
Local Authority	MIEM	- The comfort and accessibility for the people has to be improved - People who work in the vehicle maintenance have been retrained - Similar trainings would be necessary for e-bikes - Logistic vehicles should be comfortable
Local Authority	Intendencia de Montevideo	- The TCO of the buses is not clear at the moment, so it is assumed that the costs would be the same (lack of evidence at the moment) - Prices would not be affected - Improvement in social, gender and accessibility issues - Improve the aspect of the terminal (less emissions) - Employees must be retrained in PTOs to avoid job losses
E-Vehicle EOM	Green Star SRL	- Generation of jobs - Technological transition without job losses - Positive impact on security, accessibility etc.
Research	Engineering Faculty	- Job losses due to maintenance activities
E-Vehicle OEM	WeFlow	- without an answer
PTO	CUTCSA	- there may be additional job opportunities as new skilled jobs are created
PTO	UCOT	- the impact on employment would be positive - the issue of personal safety of the employees who carry out the load
<b>What do you think needs to be done to mitigate the negative impacts and potentiate the positive ones?</b>		
E-vehicle OEMs	UTE	- Improve public transport



Private transport companies (delivery)	PedidosYa	without an opinion
E-Vehicle OEMs	SADAR	- without an opinion
Local Authority	MIEM	- without an opinion
Local Authority	Intendencia de Montevideo	- Training on recharge issues is being carried out by other entities such as UTE (also MOVES)
E-Vehicle EOM	Green Star SRL	- without an opinion
Research	Engineering Faculty	- Locally assembled employment units
E-Vehicle OEM	WeFlow	- without an opinion
PTO	CUTCSA	- without an opinion
PTO	UCOT	- without an opinion

### Impact on existing business models

<b>What do you think would be the main impacts of the adoption of e-vehicles (e.g. SOLUTIONSPPLUS vehicles) on the existing business models/jobs/services?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- UTE: improve energy management (in vehicle fleets) and efficiency</li> <li>- New schedule for energy generation &amp; consumption</li> <li>- Business idea: respond to a price signal given by a joint venture incorporating technology</li> </ul>
Private transport companies (delivery)	PedidosYa	- without an opinion
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- Transition to renting and leasing (pay what you use); the initial investment will be assumed by larger companies</li> <li>- In the long term: negative impact for current employees because higher qualified persons will be required</li> </ul>
Local	MIEM	- Leasing services

Authority		<ul style="list-style-type: none"> <li>- Freight management</li> <li>- Small importeurs of conventional vehicles could disappear</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Reconvert the subsidy from diesel to electric as the initial investment is much higher</li> <li>- There is a challenge in the life of the batteries that will have to be replaced at an unknown price (in 7,8,9 or 10 years)</li> <li>- EVs increase the cost of tires by weight but the cost of maintenance is lower</li> <li>- Challenge when using air condition</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Production without batteries would facilitate the production process a lot and make it more economical</li> <li>- In the previous export scheme, each distributor had its own guarantee system</li> <li>- here in Uruguay it would be Green Star who would face the after-sales service</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Uncertainty</li> <li>- Varying prices</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- not answered</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- the conventional bus is rated at 16 years and the electric one has a battery life of 8 years</li> <li>- from an environmental point of view the impacts are positive</li> <li>- the negative impacts mentioned above will be evaluated over time</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- not answered</li> </ul>
<b>What can be done to dampen/reduce possible impacts on existing business models? How can currently active workers be included?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Sharing services to make EVs more profitable</li> <li>- Optimize logistic services: decouple logistics and core business</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Currently there are no major technical issues</li> <li>- There are 100% electric lines (they are short lines in general)</li> </ul>

		- There is a longer line that would need opportunity load
E-Vehicle OEM	Green Star SRL	- without an opinion
E-Vehicle OEM	WeFlow	- not answered
PTO	CUTCSA	- not answered
PTO	UCOT	- not answered

## Implications for Planning and Urban Development

<b>How can e-mobility affect the planning of the transport system in the city?</b>		
E-Vehicle OEMs	SADAR	- No circumstantial changes that are exclusively caused by e-mobility
Local Authority	MIEM	- Reduction of emissions and noise
Local Authority	Intendencia de Montevideo	- without an opinion
E-Vehicle OEM	Green Star SRL	- without an opinion
E-Vehicle OEM	WeFlow	- not answered
PTO	CUTCSA	- not answered
PTO	UCOT	- Some autonomy of the buses is lost, so there could be a problem in that sense, but the convenience and comfort is much greater, which would favor the use of electric buses.
<b>How can e-mobility affect urban development/planning?</b>		
E-Vehicle OEMs	SADAR	- Positive impact on health, emissions, etc. - Future investments in infrastructure have to consider e-mobility - New technologies bring about changes in individual mobility
Local Authority	MIEM	- Electric mobility will not have effects on the territorial order in short-term

Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- Generation of charging points in public streets</li> <li>- it would be defined in coordination with the "Planification and Urban Development Department of the Municipality and also the Mobility Department</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- No big impact on urban logistics by GS</li> <li>- Electrification of public transport would be good, as well as making it more efficient and faster</li> </ul>
E-Vehicle OEM	WeFlow	<ul style="list-style-type: none"> <li>- not answered</li> </ul>
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- cutcsa understands that the industry does not have a sufficient degree of maturity and Montevideo does not have major air pollution problems</li> <li>- the 8-year useful life of the buses is a key point and obsolescence can be a serious problem about which you have to be very careful</li> </ul>
PTO	UCOT	<ul style="list-style-type: none"> <li>- not answered</li> </ul>
<b>How can e-mobility affect the energy network?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- Power is enough for several years</li> <li>- Integrate surpluses from wind energy into the system</li> <li>- Some buildings / large surfaces could require some adaptation (transformers, cables) because of increased power demand, but demand management could avoid this</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
E-Vehicle OEMs	SADAR	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Local Authority	MIEM	<ul style="list-style-type: none"> <li>- If private/personal transport is promoted there could be problems with power peaks</li> </ul>
Local Authority	Intendencia de Montevideo	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>
Research	Engineering Faculty	<ul style="list-style-type: none"> <li>- Generation of opportunities for expansion</li> <li>- Modernization of the network</li> </ul>
E-Vehicle	WeFlow	<ul style="list-style-type: none"> <li>- without an opinion</li> </ul>

OEM		
PTO	CUTCSA	- without an opinion
PTO	UCOT	- UTE must carry out infrastructure works to enable the growth of the electric bus fleet
<b>Is there currently a long-term goal/vision for e-mobility in the city/ within the company? If yes, how might projects such as SOLUTIONSPUS demonstration be able to contribute towards the achievement of this long-term goal?</b>		
E-vehicle OEMs	UTE	<ul style="list-style-type: none"> <li>- No concrete goal about number of EVs or amount of electric energy used for e-mobility</li> <li>- There will be specific requirements for buses</li> <li>- Faster decisions based on demand</li> </ul>
Private transport companies (delivery)	PedidosYa	<ul style="list-style-type: none"> <li>- they do not have specific goals in this regard other than the adoption of EVs in order to give a good image</li> <li>- In this type of delivery people, the economic is what prevails</li> <li>- If there were, in the future, providers of this type of EV and if there was a good adoption of EV by the distributors, it would be positive to migrate from motorcycles to electric bicycles or electric tricycles</li> </ul>
E-Vehicle OEMs	SADAR	- Pilot projects are crucial for further sale-up projects
Local Authority	MIEM	- The pilots could contribute to attraction of supply of EVs
Local Authority	Intendencia de Montevideo	- without an opinion
E-Vehicle EOM	Green Star SRL	<ul style="list-style-type: none"> <li>- Training on experiences in other countries</li> <li>- Exchange with other countries and markets</li> <li>- Linkage with other companies</li> </ul>
E-Vehicle OEM	WeFlow	- without an opinion
PTO	CUTCSA	<ul style="list-style-type: none"> <li>- The age of the cutcsa fleet is an average of 7 years / each conventional bus has a useful life of 16 years / the oldest buses are currently from 2008 so there is no urgency to renew buses but they do have the commitment to accompany the transition process towards electric mobility by completing the 150 buses (nationwide), of which 100 would be for CUTCSA, which would reach 100 in the next 3 years depending a little on state policies</li> <li>- the shared charging center can represent an experience that can provide data for or against this type of community charging solutions</li> </ul>

PTO	UCOT	<ul style="list-style-type: none"><li>- Being able to count on an intermediate load would allow the buses to increase their autonomy during the day, even more so as the fleet grows</li><li>- intermediate load would give flexibility to UCOT operations and increase autonomy</li></ul>
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