

User Needs Assessment – City Report

City: Hanoi

Project SOLUTIONS+

Provided by WP1 team, responsible: DLR / Mirko Goletz, mirko.goletz@dlr.de

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This document complements the User Needs Assessment Guideline.

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1 Approach

This section describes the approach for the user needs assessment that was carried out with the stakeholders in Hanoi.

1.1. User Needs Assessment Team

The User Needs Assessment (UNA) in Hanoi was performed by a team responsible within Solutions+ for the demonstration in Hanoi Vietnam. This team is led by TNO and received support from UTT, in which the local university UTT arranges the majority of the contacts with local stakeholders and TNO gathers and analyses the results.

1.2. Stakeholders

Six different stakeholders from the different stakeholder groups have participated in the interviews and surveys. The interviews were carried out in face-to-face meetings, online meetings making use of video calling and in written form. The different stakeholders from the different stakeholder groups, the people involved in the interviews and surveys and the date of execution of the interviews and surveys are listed in the table below.

Stakeholder group	Organization/ Department	Name and position	UNA activities	Date and medium
National Authorities	National Traffic Safety Committee (NTSC) [N1]	Tran Huu Minh, Deputy Chief Office	Interview, survey and KPI weighting	5 Jan 2021, Online MS Teams
	Hanoi Department of natural resource and environment	Le Thi Thuy, Staff	Interview, survey	14 Jan 2021, face to face interview
	Hanoi Department of Transport	Nguyen Tuyen, Deputy Head of Department of Vehicles Do Huong Giang, Deputy Head of Department of Transport Management	2 Survey inputs	17 November 2020
	Department of Environment,	Mai Van Hien Official	survey	30 December 2020

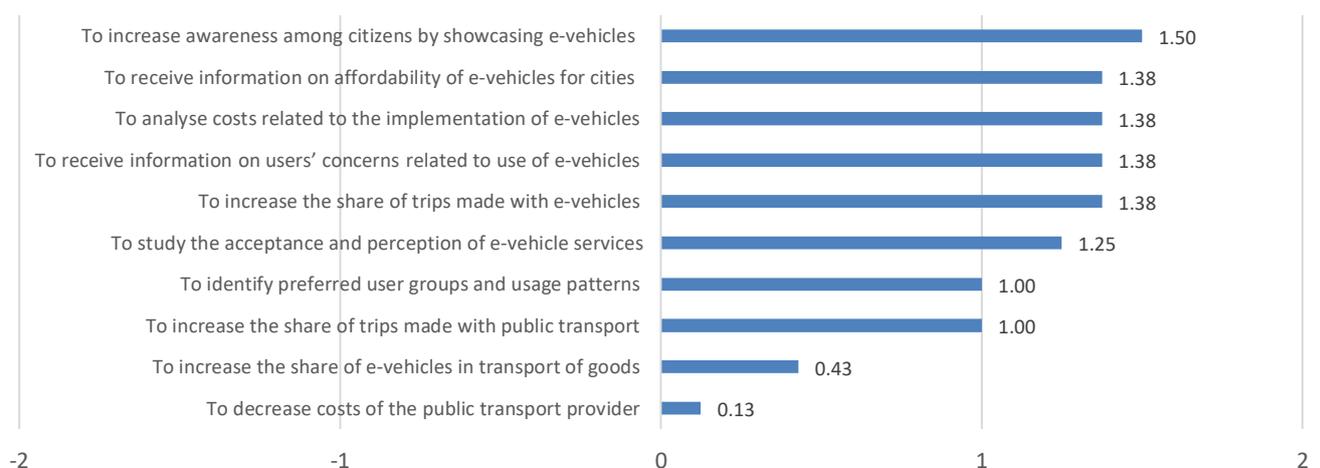
	Ministry of Transport			
Public Transport company	Hanoi Transport Service Company (Transerco)	- Nguyen Thi Hai Yen, Deputy Head of Bus Operation Center - Nguyen Manh Dat, Head of Department of Customer Service	2 Survey inputs	8 December 2020 11 December 2020
Local Manufacturing Companies	Honda Vietnam [L1]	Bui Van Dinh, GR Section manager	Interview, survey	5 Jan 2021, written interview document

2 Results – Survey

This section describes the results of the surveys that were conducted with the stakeholders in Hanoi. In total 8 stakeholders from the different stakeholder groups participated in the surveys, as indicated in the stakeholder table in section 1.2. The surveys were filled in by the stakeholders directly online or by means of a survey document that was sent to the stakeholders via e-mail. In the latter case, the survey results from the document were entered to the online survey by UTT. Even though the number of responses is low with 8 completed surveys, especially for statistical analysis, the results that are presented in this section provide a view on the stakeholders opinions regarding e-mobility in Hanoi.

The survey questionnaire consisted 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).

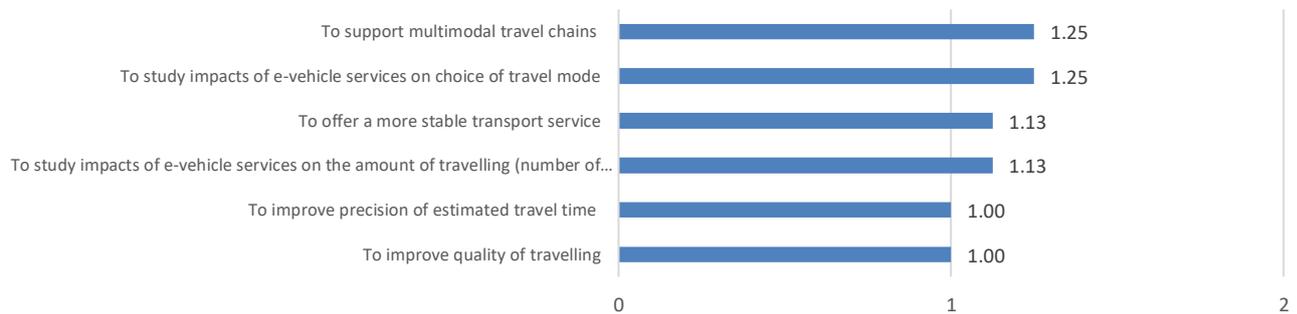
City aims- Usage and user acceptance of e-vehicles



Regarding the usage and acceptance of e-vehicles, the increase of awareness among citizens is considered the most important by the stakeholders, with a score of 1.5 out of 2. Receiving information about affordability, analysis related to the costs of implementation, receiving information about users concerns and increasing the share of trips made with e-vehicles were indicated to be almost equally

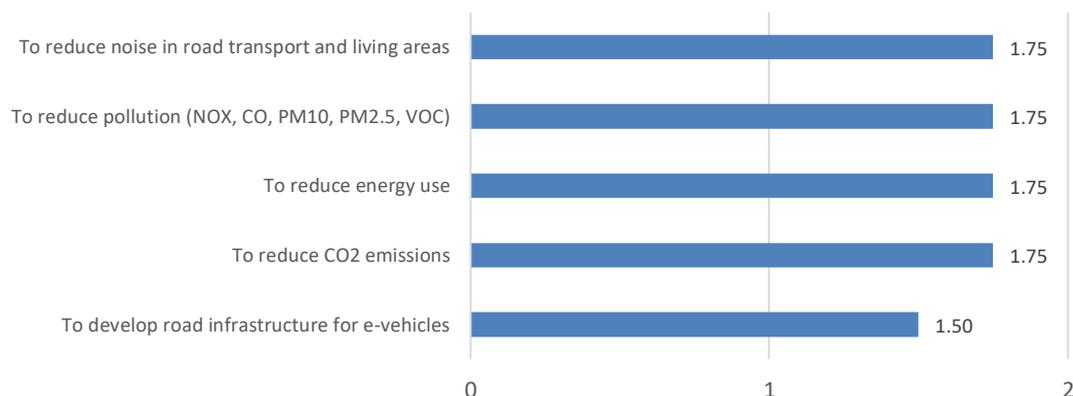
important, with a score of 1.38 out of 2. Decreasing cost of the public transport provider is found to be the least important for the surveyed stakeholders.

City *aims:* *mobility* *patterns*



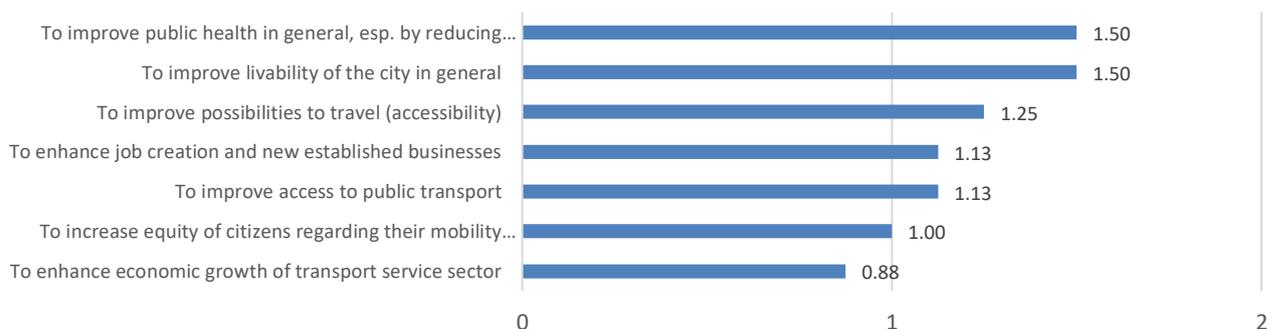
Regarding the mobility patterns, all surveyed items with found almost equally important on average. support of multimodal travel chains and studying the impact of e-vehicles services on the choice of travel mode were rated as most important, offering more stable transport service and studying the impact on the amount of traveling almost equally important.

City aims: city environment



Concerning the city environment, there is no clear difference in importance visible for the different activities based on the stakeholder survey responses. Reducing noise, pollution, energy use and CO2 emission were found to be equally necessary for Hanoi. Development of the road infrastructure for e-vehicles was considered to be slightly less important, but still important with a score of 1.5 out of 2.

City *aims:* *quality* *of* *life* *in* *the* *city*



For the aspects related to the quality of life in the city, improving the public health and improving the livability were considered the most important, with a score of 1.5 out of 2. Improving the possibility to travel was also found to be important (1.25 out of 2). Enhancing the economic growth of the transport service sector was considered by the stakeholders to be the least important with regards to quality of life.

Implementation and obstacles, limitations and barriers

Regarding the implementation (questions 12-17), the most important findings are:

- Transport of people is considered to be the most important use case for e-mobility in Hanoi. All citizens should be targeted as users according to the stakeholders. First/last mile delivery is considered the second most important use case
- The city center should be the main focus area for e-mobility according to most stakeholders, although some of the stakeholders indicate that attention should be given to all areas
- The majority of the stakeholders expect that commuting will be the main type of trip for e-vehicles
- Transporting of goods by means of e-vehicles is expected to be mainly used by shops and small to medium sized companies
- Both public and private service operators as well as the city are expected to be the main operators for e-vehicles in Hanoi
- The required investments, lack of money and financial resources and the lack of enabling policies are considered to be the biggest challenges regarding the successful implementation of e-mobility in Hanoi.

3 Results – Expert Interviews

In this section, please report about the findings from the interviews. Interviews should be carried out based on the interview guideline. Please report per topic about the findings, if so please also indicate possible differing opinions, strong common views.

3.1 Aims of the city and Expectations of Stakeholders

Expectations and needs of local stakeholders regarding e-Mobility in Hanoi in relation to the demo in Solutions+ and the upscaling afterwards

Improvement of traffic flow in Hanoi, leading to less congestion

N1 expects the demonstration in Solutions+ to demonstrate a solutions for the current traffic congestions by improving the accessibility of public transport with the implantation of e-scooters in area's lacking public transport. They expect this pilot to be a successful example, this expectation is also expressed by N2. The city will be investing in a subway network, which should be accessible by such e-mobility solutions as well. The most important KPI is the reduction of travel time to be demonstrated in the pilot. N1 expects that in future the city of Hanoi will invest in e-mobility if the Solutions+ pilot is successful. This should lead to an overall transportation system that minimizes congestion in the city.

L1 expects the pilot to provide a basis for Hanoi authorities to access customer demands and needs for e-mobility, presenting all the pro's and con's of electric vehicles. Hanoi will be able to offer safe and healthy mobility solutions, combining between private vehicles and public transportation in order to reduce emissions and congestion in Hanoi.

Additionally, N2 mentions other running demonstrations on e-mobility in Hanoi, suggesting other sectors like waste collection and transportation could also be electrified.

Long term vision for sustainable transport in Hanoi (e-mobility)

Short/Planned trip transportation can most likely be replaced by e-mobility

N1 sees the need for an social acceptance survey under the population of Hanoi, accessing the need for future mobility solutions. The most likely usage of e-scooters will on the one side be for regular trips to school and work, while on the other side a trivial usage group will also be the tourists. N2 mentions that all people should use the e-mobility solutions in future.

L1 mentions the most likely group of users will be people in need of short trip transportation during the day and people with fixed travel routes.

Usage of sustainable transport in Hanoi

Locations with a high number of visitors in big cities

The major locations with a high number for visitors, like main transport hubs (train stations, bus stops, etc.), hospitals, shopping centers and universities, have a high demand for relatively cheap transport according to N1. After that they see e-mobility being used for internal transport in big residential areas for short, on-site trips. As a last items they also see e-mobility as a viable solution for travel along the main corridors of the city, where currently approx. 20.000 – 30.000 vehicles/hour pass by. L1 sees bigger cities in general as the main usage locations of future e-mobility. While N2 suggests the whole city of Hanoi to be a area of interested for such e-mobility and especially the district of Hoan Kien, which has good government support on the running demonstration already.

Besides the transportation of people, L1 also thinks e-mobility solutions could be used for transportations of goods, although the demand at the moment is still low.

3.2 Regulation

Applicability of existing regulatory framework on e-mobility

No policy for e-mobility, meaning not blocking implementation, but potentially not beneficial for investors

There currently seems to be no relevant policy/regulations on the use of e-mobility, according to N1 such regulations need to be implemented in order to pursue people from using e.g. e-scooters instead of the commonly used and very cheap (in fuel, maintenance, purchase, etc.) gasoline motorcycles. They envisioned subsidies to be needed to support this transition to e-mobility. Without regulations and subsidies, previous research already showed investments not to be beneficial. L1 doesn't specifically see the lack of regulations as a bottleneck, since this allows them to implement their leasing construction of e-scooters without problems.

N2 confirms the lack of regulations, suggesting that this indeed means that there are no blocking conditions for implementing e-mobility.

Need for regulatory amendments to incorporate e-mobility

Lack of regulation on e-mobility and special attention needed for enforcement of regulations

According to N1 there is a need for specific regulation on e-mobility, Vietnam typically has regulations on everything, but those are insufficient for e-mobility at the moment. There are regulations for e-bikes in place already (like a maximum speed), but the enforcement of such regulations also requires attention. They specifically mentioned the need to regulations on driving locations, e.g. which lanes to drive, keeping it safe for the scooters as well as other road users (like pedestrians).

L1 mentions that there is need for regulation on vehicle management and the rental process of these scooters. N2 doesn't think there are specific regulations needed, but they do stress that the implementations need to align with the development plans of the city and private sectors should be informed properly and in time.

N1 also mentioned the lack of driving license requirements for such types of vehicles, leading to unskilled drivers driving e-scooters (and gasoline versions as well), the only requirement is age (can drive as of 16-18 years old). Hanoi already encounters this issue with the current fleet of mopeds (<50cc engine), which are often driven by young and inexperienced drivers, leading to the fact that that group is involved in 90% of the serious traffic accidents in Hanoi.

As far as N1 is aware of, there are currently only recommendations on emissions, no compulsory regulation. They also stated that they see the traffic congestion as a bigger issue than the emission issue. Although the national government does consider e-mobility as a solution for both congestion and pollution issues.

3.3 Obstacles, limitations, barriers

Obstacles, limitations and barriers in the implementation of the Solutions+ demonstration and the scale-up afterwards

Safety, security and parking space are the main challenges when it comes to e-scooter implementation in Hanoi

A major obstacle identified by N1 is the of lack of space for these e-mobility solutions, especially shared versions like those planned in Solutions+ require public parking spaces and space for their chargers as well. At the moment only 8% of Hanoi's available space is dedicated to parking, which is already a very low value compared to the recommendation of approx. 20-25%. This bottleneck on infrastructure is shared with N2, who also see a barrier in involvement of authorities which needs to happen in time for a pilot and the scale-up.

Another major concern identified by both N1 and L1 is the security of those e-scooters being parked on the street, especially overnight. Where during the day a normal lock would be sufficient to prevent theft, during the night N1 expects more advanced solutions are needed to keep the e-scooters from being stolen.

Both N1 and L1 also identified the barrier of safety, where they consider people to be reluctant of using e-scooters if they turn out to be relatively unsafe, especially if it considers usage by their kids.

N1 also indicates that a poor public transport system could also block the acceptance of the e-mobility solution, since it is likely that a large amount of trips will be realized by a combination of e-mobility and public transport.

Other aspects like way of charging, maintenance issues and investment benefits are also identified as potential dealbreakers.

How can these obstacles be addresses as early as possible in Solutions+?

Pursued users and decision makers with proper reporting and a media campaign

According to L1 it is to be advised to start building prototype charging stations as early as possible, e.g. within the Solutions+ pilot already. Linked to this both N1 and L1 suggest to arrange location for parking/storage of the vehicles as early as possible and consider the future in e-mobility for this as well.

N1 also sees a role for Solutions+ in persuading users and decision makers in an early stage, especially by providing proper reporting and making sure that these are available at with the right people. They also think a media campaign during the project could help in spreading a positive message to the people of Hanoi, which is supported by N2.

To make such pilots successful N1 envisions that regulatory changes should also be initiated early, not only on city level, but also on national level. N2 suggests to assign a local authority as project manager and ensure the pilot/project objectives align with the city targets.

3.4 Sustainability of the e-Mobility solutions to be implemented

Usefulness of e-mobility for improving urban mobility

Dependent on proper implementation

The electricity grid of Vietnam is quite far from being sustainable, which causes zero-emission vehicles to indirectly still emit polluting gasses. This could be a barrier for this improvement according to L1, as well as the lack of regulation on battery recycling and disposal. They however also think that the exchange of motorcycles for e-scooters doesn't change anything regarding traffic and congestion of the city. While N2 thinks it should help the issues with traffic congestion.

N1 claims this improvement is dependent on the actual implementation of the project, hinting to previous lessons learned with introducing bus lanes. These were placed next to the normal lanes, without any barriers, leading to drivers of other vehicles not respecting them busses ending up in the congestion after all.

Usefulness of e-mobility for improving sustainable mobility, especially in ecological and social sense

There is a high potential to improve with sustainable mobility, when all aspects are covered

Hanoi has an air-quality monitoring system, which clarifies the poor air quality throughout the year, they typically have pollution above the WHO limits for more than 300 days per year. From this N1

concludes that e-mobility for sure could improve the sustainable mobility in Hanoi from ecological point of view. Especially keeping in mind that at current the car and motorcycle fleet grows respectively with 10% and 6-7% per year. L1 also adds to this that the electricity grid in Vietnam is far from sustainable and therefore the emissions and pollution of e-mobility won't be fully zero. N2 also mentions the potential improvement of air quality that e-mobility could realize.

The lack of skilled drivers on e-scooters is still a potential risk according to both N1 and L1, this puts the safety of both the scooters and the other traffic at risk and might therefore lower the user acceptance. N1 also add the lack of space and proper driving lane guidance as key items to make e-mobility a success. While L1 stresses that the production of batteries also requires rare and toxic materials, which can end up in the environment if not handled properly.

Contribution of the e-mobility solution towards the fulfillment of public and official sustainability plans

Very likely, if properly applied on the large scale

Both N1 and L1 claim that this pilot could help fulfilling these plans, when all aspects are covered and a proper plan for the entire city is made. This should be supported by decent reporting from the pilot in Solutions+, preferably accompanied by a media campaign. N2 agrees that these solutions have the potential to improve air quality and reduce traffic congestions.

3.5 Impact on existing business models

Impact on existing business model, jobs and services

Mostly positive for public transport and e-mobility services, potential negative impact on other existing modes of transport

A positive impact in several areas is envisioned by N1, specifically mentioning increased usage of public transport by better accessibility and more business for graph services (apps for planning and routing e-scooters). L1 appends to this in the area of production, trading, warranty and repair services for e-scooters.

Due to a potential shift in travel plans (e.g. e-scooters instead of mopeds) other type transport might reduce as well according to N1. But specifically mentioning that they envision most impact to be positive.

Impact limitation on existing business model, jobs and services

Good information towards the people of Hanoi is key in this

A proper transition roadmap is necessary to minimize the impact on other business models according to L1, they also mention the need for ensured product quality to make e-mobility a success. N1 states that the negative impact aren't too big and that proper communication to the people of Hanoi would be sufficient to make them support government and ensure successful implementation of e-mobility. Media communication should be careful to position e-mobility properly in parallel to public transport, rather than placing them as competition.

3.6 Implications for Planning and Urban Development

Planning implications for urban development

Early integration into the urban planning is needed

The size of the pilot is rather small according to N1, therefore the impact on planning will be small as well. When it comes to the scale-up it should be very well integrated with the urban planning, since the impact on the whole city will be significant. N2 also expects limited impact due to the experience with currently running e-mobility solutions in Hanoi.

Planning implication for the transport system

Auxiliaries like charging and other infrastructure should be tackled early on

L1 sees the main challenge in synchronizing the planning between the implementation of e-mobility in combination with infrastructure and charging locations. Charging systems need to be setup on a large scale as well, and regulations on battery disposal should also be implemented. N1 sees the pilot mainly as a small start-up phase that allows the city to learn what is needed for the implementation of e-mobility on a larger scale.

Planning implications for the energy network

National strategy on clean energy is needed

With the increase of e-mobility the government needs to develop an overall strategy and solution for clean energy to meet the industrialization and modernization needs according to L1. N1 sees the pilot as a point to learn about the needs for the energy network.