

User Needs Assessment – City Report

City: Pasig

Project SOLUTIONS+

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This document complements the User Needs Assessment Guideline.

https://drive.google.com/file/d/12F3_C5g0doKrdDYdzgLQKFHj1c8VLbqV/view?usp=sharing

1 Approach

The user needs assessment (UNA) was carried out in the City of Pasig through the collaborative efforts of the SOL+ partners that are directly working on the Pasig City demonstration activities - City Transportation Development and Management Office (CTDMO) of the City Government of Pasig City, Clean Air Asia, and the Wuppertal Institute. Information was collected through key informant interviews and an online user needs assessment survey. The interviews were conducted in a semi-structured manner, while the online user survey utilized the same form that was disseminated to all the SOLUTIONS+ cities.

Identification of Respondents

The relevant stakeholders that were targeted for the UNA were jointly identified by the SOL+ partners. The stakeholders were primarily separated into two levels: national and local. The CTDMO was assigned to conduct the interviews for the local (city-level) stakeholders, while Clean Air Asia was assigned to conduct the interviews with the national (and other relevant stakeholders that are not specifically based in the city).

In the case of Pasig, the target respondent groups include representatives from relevant government offices at the local and national levels, as well as potential end users of the multi-purpose electric quadricycles that are to be developed under SOLUTIONSPlus. It must be noted that only selected institutions were requested to respond to the UNA online survey questions (end-users were not asked to respond to the survey but were interviewed using a different set of questions).

Table 1. List of stakeholders approached for Either Surveys or Interviews or Combined

Institution	Short Name	Category
Philippine Postal Corporation ¹	PHLPost	Project partner/ Government-owned and controlled postal services provider; end-users
Department of Energy	DOE	National government
Department of Environment and Natural Resources	DENR	National government
Department of Transport - UNDP Low Carbon Transport Project ²	DOTR-UNDP LCT	Development agency
City Transportation Development and Management Office	CTDMO	Project partner/ City government
City Environment and Natural Resources Office	CENRO	City government
General Services Office	GSO	City government
Medical Depot		City government

Tricycle Operation and Regulation Office	TORO	City government
Medical depot	-	City government
Clean Air Asia	CAA	Civil society organisation
Senior Citizens' Association – Barangay Sta. Lucia		Other; end users
Tricycle Operators and Drivers' Association – Driver	TODA	Other; end users
Commuters		Other; end users

¹For the Philippine Postal Corporation, interviews were conducted with 3 mail carriers and 4 management representatives.

²The Promotion of Low Carbon Urban Transport Systems in the Philippines (LCT) Project is implemented by the Department of Transportation (DOTr) and the United Nations Development Programme (UNDP) and supported by the Global Environment Facility. The DOTr endorses the coordination including interviews for SOL+ to the UNDP LCT team.

Conversations were conducted with potential end-users of the EVs to get an idea of the practical user considerations which need not to be undermined (i.e. PHLPost letter carriers/ drivers, tricycle driver/operator, senior citizen's association representative). The questions asked to these stakeholders differed from the questions used for the institutional representatives.

Contextualization and Tailoring of the Assessment Questions

The common user assessment guidelines were detailed and tailored to the specific needs and context of the City of Pasig. The drafting of the bespoke interview questions based on the general guidelines was led by the Wuppertal Institute. These questions were then commented on/edited by the other partners.

Conduct of Interviews and Surveys

The interviews were conducted from November to December 2020 (listed in Table 1), while the surveys were kept open up to the second week of January 2021. Pasig CTDMO conducted the interviews for relevant stakeholders situated within the City of Pasig, while Clean Air Asia conducted the interviews for other stakeholders.

2 Results – Survey

In this section, we will be presenting results from the online survey. The results are prepared through the online portal by the WP1 team and made available to the respective city teams.

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 “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).

A total of 13 respondents answered the UNA survey:

Table 2. Survey Respondents by Type of Organisation

Row Labels	Count of Type
Local Government	6
NGO/Academe	3
National Government	2
Government-Owned and Controlled Corporation	1
Development Agency	1

2.1 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 through Figure 1 to Figure 4.

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

User and User Acceptance of E-vehicles

The top scoring goal related to “usage and user acceptance” of e-vehicles are: to study the acceptance and perceptions of e-vehicle services”; and to increase the share made with public transport. These are also quite related to the second highest goals relating to the analysis of costs of implementation, and increasing the trips made by e-vehicles.

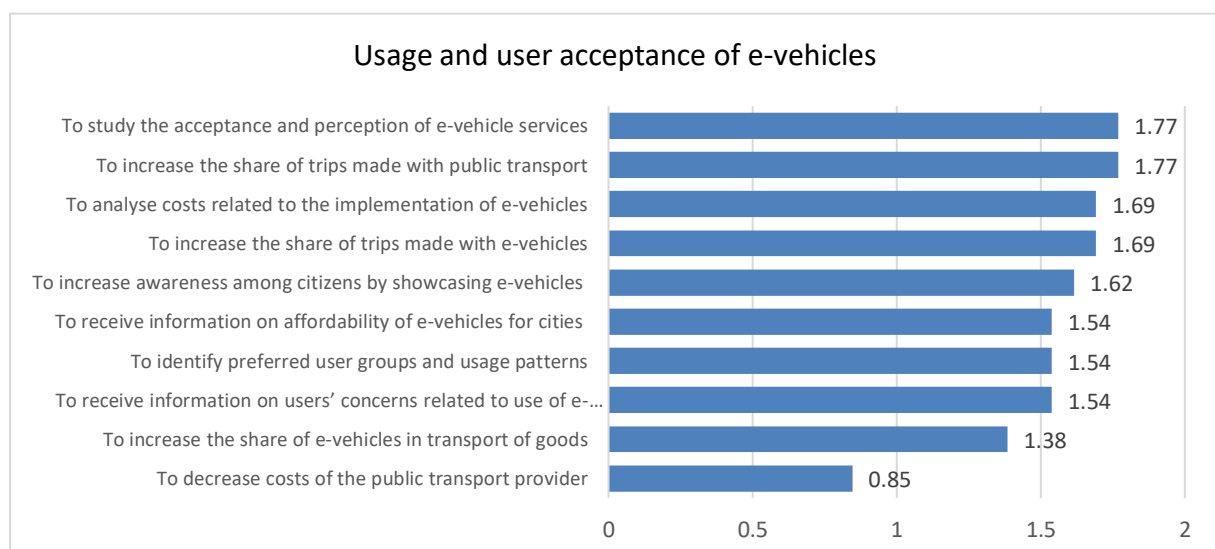


Figure 1. Aims: Usage and User Acceptance of E-Vehicles

Mobility Patterns

In terms of influencing mobility patterns, the respondents, rated the provision of stable transport services as the highest aim, on average.

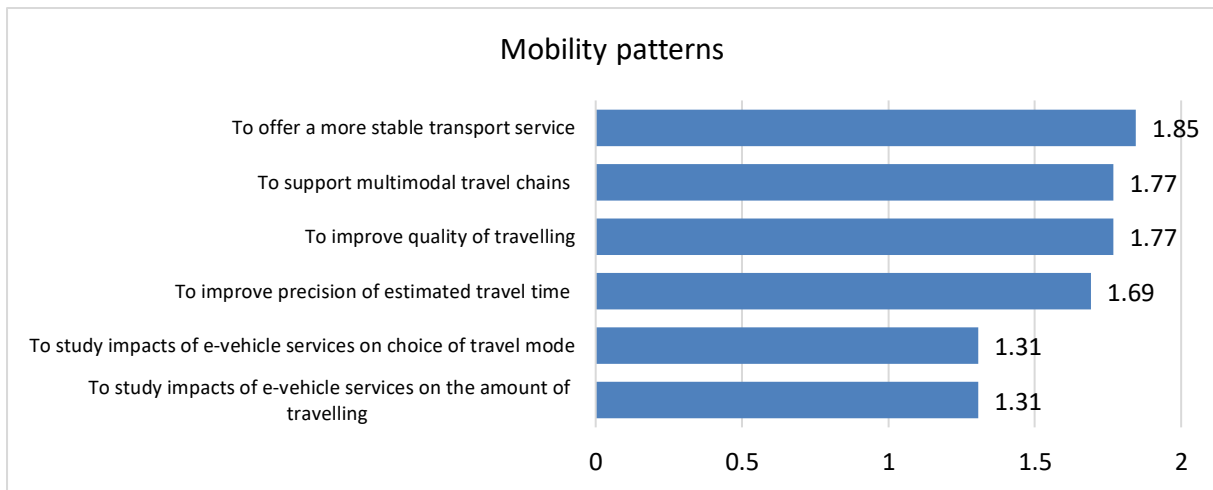


Figure 2. Aims: Mobility Patterns

City Environment

The reduction in CO2 emissions is rated as the top aim in relation to the city environment. This closely followed by the aim towards developing road infrastructure for e-vehicles.

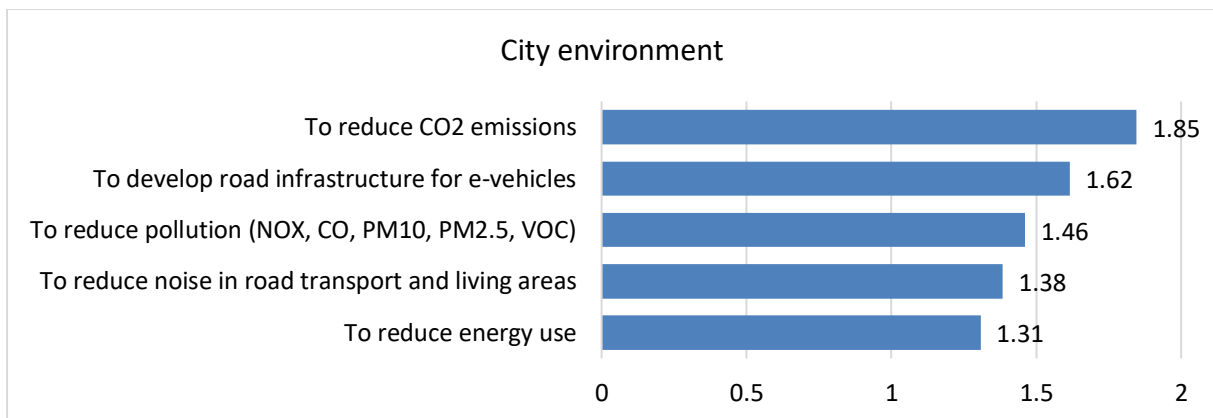


Figure 3. Aims: City Environment

Quality of Life in the City

Improving public health was rated as the highest in terms of aims relating to the quality of life in the City, followed by improving the livability of the city in general.

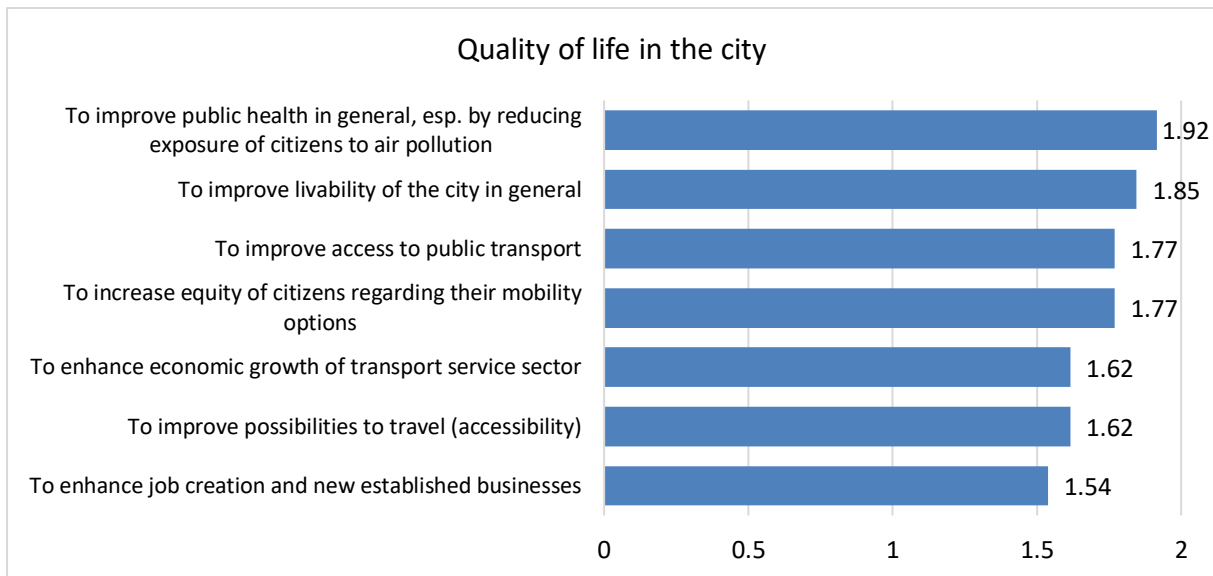


Figure 4. Aims: Quality of Life

2.2 Implementation

Target Use Cases for E-Vehicles

The results of the survey shows that the respondents expect or are envisioning the penetration of e-vehicles in different use cases: passenger (yes = 13) ; goods (yes = 10, with 9 respondents stating yes to last mile deliveries). Two respondents mentioned that e-vehicles would be used for the conduct of local government services/operations.

Areas where E-Vehicles are to be Used

Twelve (12) out of the 13 respondents expect that e-vehicles would be operating within the city centre. Five of them envision that e-vehicles will be used in suburban areas. Two (2) respondents expect that they would also be used in rural areas, and 1 respondent say that e-vehicles would be used in all the three area types.

E-Passenger Transport: Target User Groups

The graph below shows that majority of the respondents think that e-mobility should target all citizens in the city.

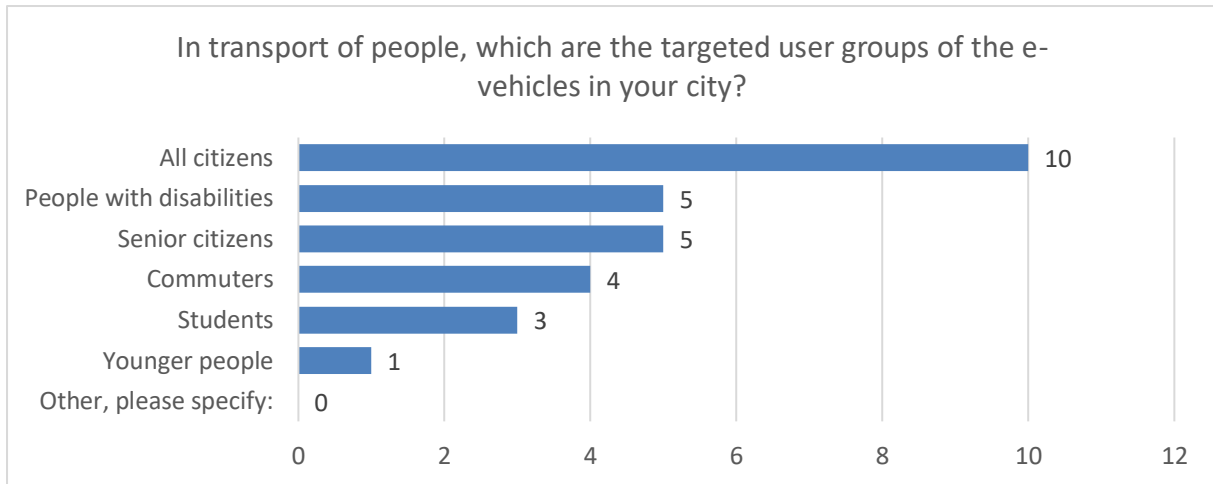


Figure 5. E-Passenger Transport Target User Groups

Passenger Transport: Types of Trips

All the respondents agree that e-vehicles will be adopted in the conduct of commuting trips. Twelve (12) respondents agree that e-vehicles will also impact job-related trips, and 10 respondents believe that e-vehicles will also impact school trips. One respondent mentions that tourism trips would also be influenced.

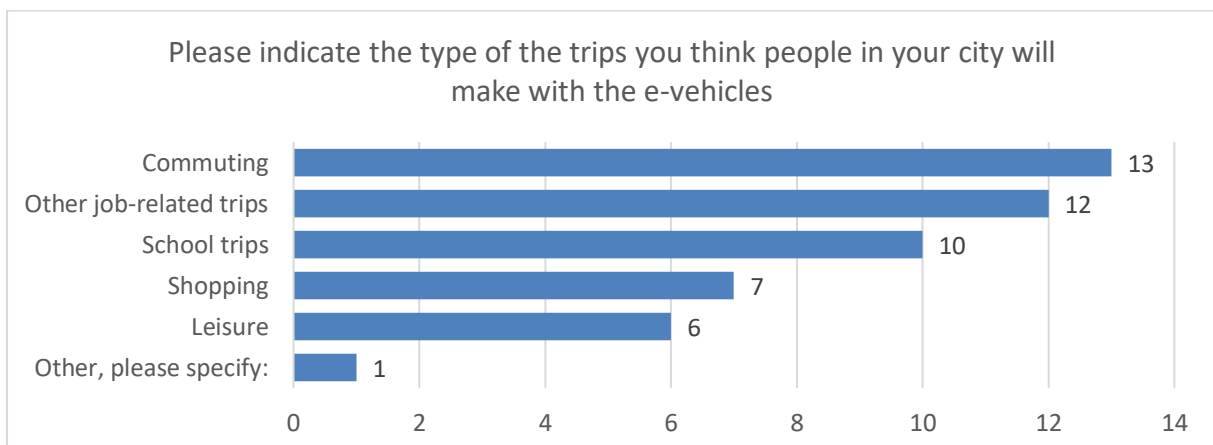


Figure 6. E-Passenger Transport : Type of Trips

E-Goods Transport: User Groups

Eleven (11) of the respondents expects that the city government would be using e-vehicles in its own goods distribution-related tasks.

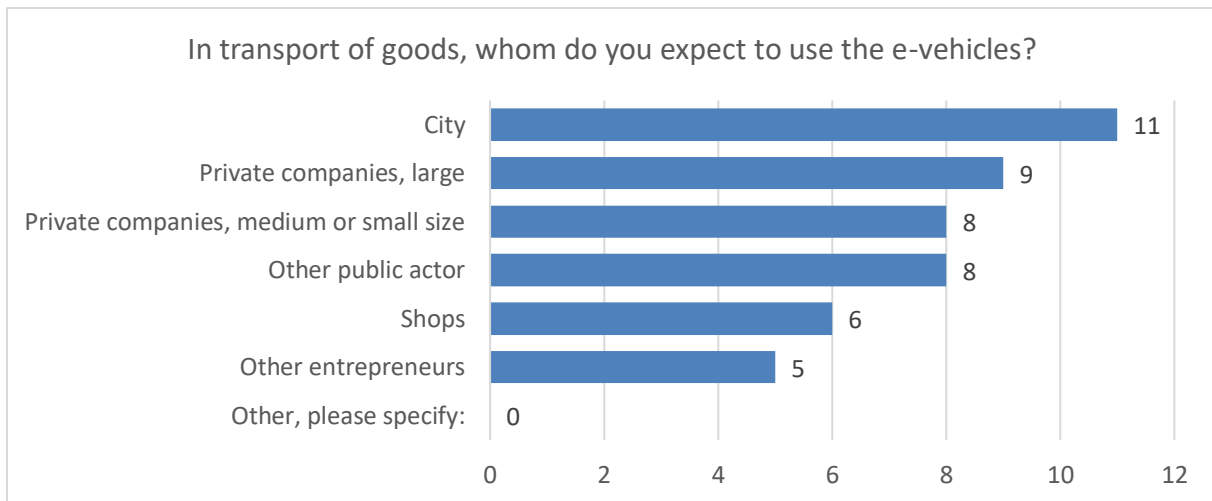


Figure 7. E-Goods Transport User Groups

Service Operator

The respondents were asked about their sentiments as to which type of organisation should be the main service operator of e-vehicles. Eight (8) respondents chose the “city government”, and “other private service operators” respectively. The following were mentioned under as potential private sector operators:

- Local post office
- Local logistics/ mobility companies (including e-commerce companies)
- Meralco (electricity distributor)
- Electric Vehicle Association of the Philippines (and/or its members)
- Other corporations which would provide e-shuttle services

One of the respondents mentions that the operations should be left to the private sector, but with strict oversight by the government.

2.3 Obstacles, Limitations and Barriers

The graph below summarizes the responses highlighting the most important barriers in implementing e-mobility programs/projects. The top response relates to the infrastructure investments needed (12), followed by (11) the low acceptance of e-vehicles by actors (e.g. transport service operators, drivers, authorities).



Figure 8. Challenges / Barriers to E-mobility Implementation

The following points were provided by selected respondents in relation to barriers towards the adoption of e-mobility:

Regulatory

- The draft guidelines of the national government's Land Transportation Office severely limit the places where e-vehicles can be operated legally. Essentially, light e-vehicles are proposed to be limited to recreational use, and we hope this project can provide a good counter test case
- The existing procurement law will always be on the lowest cost of acquisition for the vehicles or services. This regulation puts EVs acquisition at a lesser priority compared with petroleum-fuelled vehicles that are cheaper
- Franchising and green route identification within the route plans headed by local governments; standards that truly capture comfort and safety and quality of service; a marrying of range, capacity, route planning and infrastructure planning
- Necessary permits for operating e-vehicles (e.g. in the tricycle sector)
- Lack of national policies (regulation, incentives, etc)
- There is also a need for the clear roadmap on EV for both the government agencies and the private sector
- Need for a harmonize roadmap amongst champion agencies, the DOTr, DOE and DTI, in particular
- Lack of common charging standards

Infrastructure and Funding

- Limited public land ownership limits places where city can unilaterally place charging infrastructure
- Lack or limited counterpart funding
- Lack of charging facilities
- Lack of incentives for users to shift from ICE to EVs

Institutional and Behavioural

- Lack of support from the local leadership and *sanggunian* (local council) officials to accelerate EV adoption
- Shift to the more energy efficient and environment- friendly EVs is not the LGU's priority
- Political will of the LGU to implement new activities like e-mobility
- Capacity to assess performance and validate Strategic Tactical and Operational indicators
- Concern of the operators and drivers of conventional jeepneys and tricycles who may be displaced and will not benefit individually on EV deployment.

Others

- Lack of full pilot implementation from EV deployment/units and charging stations applicable for urban areas.
- Lack of after-sales supply chain limits the willingness of business users to take up e-vehicles

3 Results – Expert Interviews

This section presents the findings from the interviews. The findings are reported per topic; commonalities and differing views are highlighted whenever possible.

In total, there are 28 interview respondents (Table 3) for the 12 institutions for which interviews were completed as several agencies provided representation from relevant divisions internally. The list of questions were mostly shared beforehand and the interviews were conducted through a mix of in-person meeting, online call (e.g. Zoom, Google Meet, Skype), as well as typewritten responses given the time constraints and scheduling conflicts.

Table 3. Interview Respondents by Type of Organisation

		Number of Interviewees	Date of Interview
Government-owned and Controlled Corporation			
1	Philippine Postal Corporation ¹ (management)	4	Nov 27 & 28, 2020
	Philippine Postal Corporation (mail carriers)	3	3 rd week of November
National Government			
2	Department of Energy	6	Dec 3, 2020
3	Department of Transport - UNDP Low Carbon Transport Project	4	Nov 19, 2020
4	Department of Environment and Natural Resources ²	2	Dec 28, 2020
City government			
5	City Transportation Development and Management Office	3	Dec 4, 2020

6	City Environment and Natural Resources Office	1	Nov 17, 2020
7	General Services Office	1	Nov 16, 2020
8	Tricycle Operation and Regulation Office	1	Nov 15, 2020
9	Medical depot	1	Dec 15, 2020
NGO/CSO			
10	Senior Citizens' Association – Barangay Sta. Lucia	1	Nov 18, 2020
11	Commuter representative	1	Nov 16, 2020
12	Tricycle Operators and Drivers' Association – Driver	1	Nov 15, 2020
Total		28	

Notes:

¹PHLpost is a government-owned and -controlled corporation and is target beneficiary of the electric vehicles.

²There were a total of 10 attendees from the Department of Environment and Natural Resources coming from different divisions during the project introduction and interview; however, only the Hazardous Waste Management Section provided immediate answers to the interview and the rest of the respondents from Climate Change Section and Air Quality Management Section intend to provide their responses typewritten in late January. Only the Hazardous Waste Management Section's response is reflected in this report.

3.1 Aims of the city and Expectations of Stakeholders

The interviews were asked about the aims that their institutions have in relation to e-mobility, as well as the expectations that they have in relation to the SOL+ project (e.g. demonstration components such as the e-vehicles and charging solutions), and e-mobility in general.

Aims

The City of Pasig is a trailblazing city in the Philippines in terms of promoting the use of environmentally friendly vehicles, and both the CTDMO and CENRO deem that the activities done through the SOL+ project would support the city's push towards the acceleration of e-mobility to support their initiatives towards **mitigating the negative externalities of urban transport** in the City. The City is also looking forward to gauging the **feasibility of transformations** that can be brought about by e-mobility – e.g. transforming the *tricycle* sector; filling in transportation services gaps (temporal and spatial); exploring cooperation models with the private sector.

The Philippine Postal Corporation (PHLPost) representatives expressed that the SOL+ project is consistent with the entity's goal of **moving towards sustainable fleets**. It is aligning itself with the global sustainability standards and goals by the Universal Postal Union (UPU).¹ PHLPost is also envisioning that e-vehicles would ultimately help them financially (through **cost-efficient operations** and **reductions in fuel spending**). They view e-mobility as a key approach towards supporting the national government's programs towards **reducing emissions from road transportation**. They seek evidence on how might e-mobility support their aims towards improving their social impacts (i.e. number of volume of transactions of pieces of mail items injected into PHLPost chain and availability of services to every settlement in the country); improving the satisfaction of their customers and their partnerships with other government agencies and business partners; supporting the financial growth

¹ The Universal Postal Union is an intergovernmental organization of 191 member countries. It is also the United Nations specialized agency for international postal services. The UPU is the main forum for cooperation among governments, Posts and other postal sector stakeholders. The organization's mission is to develop social, cultural and business communication between people through effective postal services. It also plays a role in constantly modernizing such services.

of the institution; improving the efficiency and reliability of their services through continuous improvement of processes and application of operational Information and Communications Technology (ICT) and efficient transport means; and in supporting the learning and growth of their staff.

The Department of Energy (DOE) views e-mobility as a key strategy towards **alleviating the heavy reliance of the country on imported petroleum fuels** by reducing the demand for such. Moreover, e-mobility is a promising approach to **mitigate the continuous increase of greenhouse gases (GHG), noise, and criteria air pollutant emissions** from the transportation sector due to the existing dominance of old and dilapidated vehicles.

The representatives of the Low Carbon Transport project co-implemented by the Department of Transport and UNDP (DOTR-UNDP LCT) also recognizes the importance of e-mobility in **addressing environmental externalities** brought about by road transportation. The transformation of the fleets towards electrification should also ideally realize the **wider transport system transformation** -e.g. integration of technologies into newer fleets that improve service reliability and predictability, rethinking of networks to improve connectivity. They also mention that e-mobility is critical in future directions that concern **land use planning** (e.g. green routes identification for public transport). They also see that engaging higher **participation and investments from different sectors** is critical in the acceleration of e-mobility in the country.

Expectations

General Expectations about SOL+

The CTDMO of the Pasig City Government expects that the SOL+ demo becomes **a testbed for viable e-mobility solutions**, including infrastructure-related elements, which can then be scaled-up not only in the City of Pasig, but to other cities in the country as well (supported by a feasibility plan to achieve this at scale).

The DOTR-UNDP LCT project expects that the SOL+ activities will open possibilities for generating **private sector support** for EV and charging facility development **through visibility and awareness raising**. They expect that SOL+ and the LCT project **find synergistic opportunities to cooperate** as they are also working with the City of Pasig. Potentially, cooperation can be sought in the following types of activities: conduct of studies; business planning; policy recommendations formulation, and capacity building activities for local stakeholders. Currently they are in a preliminary stage of exploring solar charging in Pasig.

Vehicles

The CTDMO expects that the vehicles be **compatible with current commercial electric vehicle technology standards** including those that are related to charging (e.g. standards at the regional/ ASEAN level). They expect that the SOL+ vehicles use of lithium-ion batteries instead of (still predominant) lead-acid batteries. The interviewed current users of e-vehicles (pax tricycle and PHLpost letter carriers) all identified poor battery range as the key challenge in using (current) e-vehicles. One PHLPost staff mentioned that the current e-three-wheeler that they have runs up to around 24 kilometres per charge. Their primary concern as users is battery depletion while conducting their tasks.

The CENRO hopes that the vehicles are **cheap to maintain**. Similarly, PHLPost hopes that the vehicle units are cost-efficient. CENRO also expects that the vehicle units are **energy efficient**, even though they are locally assembled.

PHLPost mentions that **after sales service** should be taken into consideration in the formulation of recommendations, particularly for scaled up projects later, as their Bids and Awards Committee is quite strict with this.

The DOTR-UNDP LCT agrees that the integration of **advanced telematics and automated data collection and analysis systems** into the vehicle would be beneficial. With the telematics technology that will be part of the SOL+ Project, DOE expects that the cost of operation and maintenance of the EVs will be less and more services can be provided by the e-quads.

The General Services Office of Pasig City (GSO) expect that the vehicles would be useful in the mobilization of our staff, as well as in the delivery of supplies. Suitability towards the conduct of the primary tasks such as delivery of supplies would be the priority. The GSO expresses its concern about the **use of the vehicle in cases of floods** and suggests that this be considered in the vehicle design (e.g. use of protective casings or place batteries higher). They also highly suggest that **support towards troubleshooting and maintenance, and training for relevant staff and users (e.g. drivers)** be included in the project design. The GSO also suggests the exploration of innovative ideas such as the integration of solar power into the system.

The Medical Depot, which is under the Pasig City government, also sees the potential of the vehicles for the delivery of medical supplies of Pasig Health Aide, Pasig City General Hospital, and Child's Hope (Pasig City Children's Hospital) and would like to see any EVs for their use as being able to carry the supplies of these institutions.²

Charging

In terms of charging, CENRO suggests that **centralized common charging stations be explored** to maximize the utility of such stations by opening them up to multiple users. This identification process for strategic locations for charging facilities is also something that DOE suggests.

PHLPost suggests that **fast charging solutions be explored**, with cost considerations in mind. They also suggest that **accessibility to charging stations** be given priority in the program design (e.g. temporal and geographical access to common stations).

For the Medical Depot, they would like the charging stations to also be close to the Pasig City Hall (e.g. parking area) to make the transportation of medical supplies easier.

This sentiment is shared by the DOTR-UNDP LCT project representatives who think that exploration of **charging facilities that can be co-used** by passenger (private and public transport) and cargo e-vehicles might be beneficial. They suggest that a comprehensive study be done for charging infrastructure (including elements such as siting, policy development, financing, business models).

² To serve as a reference, the presently used Mitsubishi L300 transports 10 boxes with 144 bottles of syrup.

The DOTR-UNDP LCT also suggests the integration of proper **user interfaces for public charging stations** so that usage becomes easier and informative. They also agree on the importance of setting up a central hub for monitoring the state of the charging stations and their operations.

The GSO suggests that the project explore **battery swapping** mechanisms to address that excessive vehicle downtimes due to charging. DOE expects that the demonstration will be able to establish a systematic method in charging the vehicle fleet viz a-viz the operational demand for the e-quad units.

The concern on usage and charging during wet situations (e.g. rains) was shared by an existing driver of e-vehicle from PHLPost, and stresses the importance of **proper space allocation, and practical design considerations** for charging facilities.

3.2 Regulation

The interviewees were asked regarding their sentiments on the relevant regulations that they think are critical in shaping e-mobility in the City of Pasig (and the Philippines, in general). They were also asked to provide information on the most relevant policies and regulations that they have instituted in relation to e-mobility.

At the city-level, CTDMO states that Pasig City is **updating guidance on bicycle-related ordinances and active transport** to consider e-bikes, electric kick/standing scooters, and other similar light electric vehicles. The COVID pandemic has also opened some opportunities for prioritizing active transport for essential mobility. An executive order was issued by the Mayor in early 2020 that enables the development of a safe bicycle network in the city which is also inclusive of light electric vehicles (e.g. electric bicycles, scooters). The provision of such is granted to local governments under the Philippine Local Government Code (RA 7849). However, the regulation of larger vehicles and charging standards is within the jurisdiction of national agencies higher than the local government.

CENRO shared that the City of Pasig has implemented a **Tricycle Upgrading Ordinance** (2016). This ordinance is pursuant with the responsibilities of city governments under RA 7849. The said ordinance phased out two-stroke tricycles and provided an incentive program for realizing the transformation. CTDMO shared that the city is now looking into policy options to ensure continued improvement of the tricycle fleet (e.g. perhaps electrification).

The City is also looking into potential options for incorporating e-mobility considerations (e.g. provision of charging facilities) into its **Green Building Ordinance** (2016). The said ordinance provides for tax credits for constructing a green building, or rehabilitating/ retrofitting a building into a green one (based on the standards set by the Philippine Green Building Council). The ordinance also became the basis for the creation of a Green Building Division within the CENRO.

The DOTR-UNDP LCT suggests that **revisiting the Land Transportation and Traffic Code** (RA 4136) and EO 628-2007 (Harmonization of Vehicle Standards and Regulations). The draft “**Administrative Order on the Registration and Recording of Electric Vehicles**” of the Land Transportation Office (LTO) which is still officially under review is a critical regulation to monitor. Standards are still needed for covering the following: vehicle fuel efficiencies; whole-vehicle standards for electric vehicles; standardization of technologies and infrastructure; guidelines for selecting green routes for public transport. Incentive mechanisms (c/o the Department of Finance and the Department of Trade and Industry) should also

be strengthened. Better alignment with the national regulations and local ordinances needs to be aimed for.

Regarding taxation, the DENR has mentioned that the Department of Finance's Bureau of Internal Revenue (BIR) has begun using DENR certification in 2018 to determine whether the EVs qualify for tax exemptions following the issuance of **BIR Revenue Regulations (RR) No. 24-2018** in November 2018. This amends the guidelines for the processing of the request for tax exemption of hybrid or purely electric vehicles (HEV/EV). This responsibility was previously with the DOE. For EVs, instead of a certificate of conformity (COC), a Certificate of Non-coverage (CONC) shall be presented by the manufacturer/ assembler/importer, which contains a statement that the vehicle applied for COC is an EV and has no tailpipe emission, and therefore, not covered by RA No. 8749 or the Philippine Clean Air Act. The said CONC shall also be issued by the DENR-EMB.

The DOE has issued **Department Circular Number DC2020-10-0023** and is scheduled for publication soonest. The DC prescribes the policy framework for the fuel economy rating, fuel economy performance, and related energy efficiency and conservation policies for the transport sector and other support infrastructures. There will be consultations to be conducted and that include the relevant metrics on e-mobility. The DOE expresses a need for **reviewing the authority granted to local governments** towards franchise provision for three-wheeled vehicles for public transport. Local officials are elected by their constituents and most likely their decisions are influenced by what their constituents desire. A significant percentage of the voters are tricycle drivers and operators and can make or break a local official political career. Also, a **comprehensive plan for the routes** of the e-trikes, e-quads, e-bikes must be developed or enhanced to accommodate this new transport technology.

The mandate of DENR is regulatory in nature, such as the proper management of hazardous substances. Used **lead acid batteries** are just among the hazardous wastes being regulated by the **Department Administrative Order 2013-22**. The DENR requires all agencies, in this case Pasig city local government unit and the PHLPost, to register online as a hazardous waste generator³ should they own an EV, and thus suggests ensuring that the ownership of a shared-use EV be clear. Each of these agencies will have their own pollution control officer. Philippines has a recycling facility for lead acid batteries, and the DENR suggests having Pasig City government and PHLPost collaborate with initiatives such as *Balik Baterya* done in partnership with Philippine Business for Social Progress. (PBSP) and/or *Bantay Baterya* with *Bantay Kalikasan* of the ABS-CBN. The DENR-Hazardous Waste Management Section is still formulating the guidelines for lithium ion and nickel metal hydride batteries. At the time of interview, li-ion are exported for final recovery and disposal. There is minimal generation, so the country does not have the sizeable volume to attract investors to set up recycling facilities.

3.3 Obstacles, limitations, barriers

This section presents the discussions regarding the views of the interviewees regarding the main obstacles, limitations, and barriers to e-mobility.

³ <https://emb.gov.ph/hazardouswastemanagementsection/>

The PHLPost management mentions that the **perceptions of the letter carriers/vehicle operators** towards the use of e-vehicles is one of the main obstacles for transitioning towards e-mobility within the institution. This is perhaps due to two primary reasons: **concerns with the current models of EVs** (e.g. limited range, long charging cycles), and the fact that the current scheme provides “**gasoline allowance**” to the users (i.e. letter carriers) of conventional motorcycles (roughly 2,000 pesos per month or 35 Euros). Proving the **financial viability** of integrating e-mobility solutions into the current business model of PHLPost is also key challenge. This concern is intertwined with concerns regarding the **reliability and sustainability** of the e-mobility solutions packages when infused into the operations of the institution. In terms of regulations, one key consideration is the **registration process** with the Land Transportation Office of such vehicles. As per the current rules, if the vehicle is not registered with LTO, the vehicle cannot be covered under the government insurance scheme (Government Service Insurance System – GSIS).

The CTDMO deems that the adoption of e-mobility is constrained by the **lack of charging infrastructure**. Furthermore, unclear guidelines at the national level seem to unreasonably restrict lighter vehicles to small village roads instead of enabling their usage throughout the road network. CENRO sees budget constraints and the availability of locally available technologies, charging infrastructure, and suitable parking areas for EVs are key challenges to be addressed.

The DOE identifies the following as key barriers: **high acquisition costs of EVs, limited knowledge on the sustainability of EV operations, limited support from local leadership** (perhaps due to lack of funding, limited counter funding, and lack of priority and political will towards pushing for energy efficiency and environmental sustainability at the local level); **lack of charging infrastructure**. Early engagement and consultation among LGUs, transport groups, electric utility, developers, funding institutions, technology providers and other concerned groups for EV adoption in the area. The existing government procurement regulation which favours the “**least-cost principle**” favours lowest cost of acquisition for the vehicles or services. This regulation puts EVs acquisition at a lesser priority compared with petroleum-fuelled vehicles. Also, the franchising regulation that will support e-mobility.

The DOTR-UNDP LCT project mentions **costs recovery** and **sustainability in operations** as key local concerns, while other factors such as **lack of policy and budget, bureaucratic red tape, and lack of institutional buy-in** are some of the key obstacles for wider adoption of e-mobility. Operational concerns such as **range anxiety, battery safety** (e.g. explosions) and **the useful life of the vehicles** are also important. It agrees that **lack of infrastructure, awareness and successful precedents, and supportive policies** (e.g. charging standards, facility siting) are also important challenges to address. It suggests that initiatives towards **strengthening private sector participation** through lobbying be supported. **Integrating e-mobility into existing local plans** (e.g. GHG management plans, sustainability plans, traffic, and transport plans) is also important.

3.4 Sustainability of the e-Mobility solutions to be implemented

The respondents were asked about their views regarding the sustainability of the e-mobility solutions to be implemented. The questions revolved around the identification of enabling factors that would support sustain and expand e-mobility solutions.

The CTDMO believes that e-mobility is an important approach towards reducing motor vehicle kilometres travelled, fuel use, air pollution, and ambient noise levels. The SOL+ project can maximize

benefits and achieve scale by presenting use cases that can feasibly be scaled into larger-scale, commercial applications. CENRO mentions that the demonstration can contribute towards impulses that can be useful for **upgrading the city-owned vehicles**, as well as insights towards the **development of a bicycle and e-scooter loan assistance program** (for city employees) that they are currently exploring. Moreover, it can provide further insights towards supporting the promotion of the use of modernized jeepneys for public transportation.

In terms of the sustainability of the e-Mobility solutions to be implemented, PHLPPost suggests that special consideration towards ensuring the **longevity and quality of components** (particularly the battery), as these would weigh in heavily towards the determination of the overall feasibility of integrating these into their operations. Similarly, **“after-sales”** (or after-project) service would be highly essential. This is a sentiment shared by the DOE.

Apart from the components, PHLPPost would also like to understand other related costs they might need to invest in after the project closes.⁴ PHLPPost also said that the pilot should be able to demonstrate there are savings so that they can better justify the scaleup of their EV fleets. Savings could come from reduced motorcycle allowance and reduced fuel consumption (for PHLPPost’s own vehicle fleets).

The DOE mentions the following as critical elements towards ensuring the sustainability of the e-mobility initiatives: **engagement of key stakeholders** that include LGU and concerned offices, fleet operators, electric utility, technology providers, funding institutions, etc.; **further provision of supportive policies from the LGUs** such as incentives, parking spaces, green routes; information, education and communication activities that will demonstrate the benefits of EV adoption.

The DOTR-UNDP LCT project believes that the provision of adequate **local budgets, policy support, capacity building, and infrastructure support** are key towards supporting the long-term sustainability of the initiatives.

3.5 Impact on existing business models

The respondents were asked about their sentiments as to how might e-mobility might impact business models (taking PHLPPost as the primary example). The intended demo was explained to the national stakeholder respondents beforehand. The discussions also included envisioned impacts of e-mobility in general.

The integration of the quadricycles into the PHLPPost operations can potentially lead towards **transformative effects towards enabling the expansion of their parcel business**. The PHLPPost management shares that currently, their parcel deliveries are limited as their system is designed as a “pick up by customers” model wherein parcels are held in post offices and customers are given notices to pick them up.

In terms of operations, the **vehicle range** would play a key role in determining how the e-quads can be integrated into the operations. Similarly, the **charging modality** is key (e.g. minimizing vehicle down time during operations due to charging), and PHLPPost prefers a fast-charging vehicle. Moreover, **charging facility networks** is also key as to how e-mobility can be integrated into the operations. As

⁴ The current electric 2- and 3-wheelers in PHLPPost uses GPS tracking system by <https://manilagpstrackers.ph>. The cost is PHP 549 per unit (about EUR 9.40 per unit).

mentioned earlier, a key consideration to address is the **uncertainty towards what would happen to the “fuel allowance”** that is given to the PHLPost letter carriers/drivers who currently use gasoline motorcycles.

The DOE envisions that the e-quads can potentially lead to the following impacts to the business operations of PHLPost: **optimized and improved delivery of services; modernisation of the delivery services; operational and maintenance savings**. PHLPost needs to be **creative in designing possible revenue streams** in the operations of the e-quads through mobile ads and collaboration with other establishments in the area as part of their Corporate Social Responsibility (CSR).

At a wider level, DOE deems that e-mobility will **generate new jobs** in the design, manufacturing, assembly, repair, and maintenance of electric vehicles, and charging stations. Such a transition would require **skills upgrading** of workers to be able to meet the demands of the industry.

The DOTR-LCT sees that e-mobility can deliver business benefits through the **enhancement of the safety and quality of services, and the company’s image**, in general. **Competency frameworks for enhancing jobs/skillsets** those in the e-mobility sector need to be created.

3.6 Implications for Planning and Urban Development

The respondents were also asked how e-mobility might impact or interact with higher level planning (e.g. in terms of urban planning, wider transport planning, etc...).

The CTDMO highlights that Pasig City (and many of the Philippine cities, in general) have strong potential for e-mobility adoption, especially light electric vehicles, and the utilization of EVs in public transportation, and business operations. The **relative compactness of Metro Manila's** urban design leads to most travel being well within the range of e-mobility. Urban noise is a negative feature of the Metro Manila landscape, which can be directly alleviated by higher adoption of e-mobility. Right now, what the Philippines needs more a way to **introduce e-mobility into popular imagination**. The SOL+ demonstration can build momentum for e-mobility by showing people that everyday e-mobility applications extending beyond simple private ownership can be built in the Philippines. Introducing charging, e-vehicle sharing and business use of e-vehicles into the landscape of possibility, it would help make large steps towards higher e-vehicle adoption.

DOTR-UNDP LCT stresses the need to integrate e-mobility into relevant local plans such as the **comprehensive land use plan, GHG management plans, and green route plans**. Similarly, the DOE sees that the strengthening of the integration of EVs (particularly in public transport) may require **amending the LGUs' existing local public transport route plans** and the **zoning requirements** for charging infrastructures. Also, the **annual investment plans and the identification of priority programs and projects** need to better incorporate e-mobility considerations (including infrastructure).