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**Powering E-Mobility Hubs in Underserved Communities:
Lessons Learned**

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Executive Summary

E-mobility hubs have an important role to play in the transition to e-mobility, especially in underserved communities, which have transportation deserts and often lack essential electric vehicle (EV) charging infrastructure. This discussion will examine the importance of e-mobility hubs in these communities and the role of utilities in driving the transition to e-mobility. We will discuss the need for e-mobility hubs and lessons learned from Sacramento's first hub, the Del Paso E-Mobility Hub. This case study is the result of an innovative partnership between government, non-profit, and for-profit organizations, and the Sacramento Municipal Utility District (SMUD), benefiting one of Sacramento's underserved communities. The lessons learned included the importance of integrating the unique needs and expectations of each community in designing the hubs, the role of e-mobility hubs in advancing transportation equity through shared and micro mobility options, and how utilities can incentivize the widespread adoption of e-mobility hubs.

1 E-mobility Hubs in Underserved Communities

1.1 What Are E-Mobility Hubs?

Mobility hubs are facilities where different modes of transportation intersect, making it easier for people to move from one mode to another. Typically, mobility hubs offer a range of transportation options such as public transit, bike-sharing, car-sharing, and parking facilities, and may also include amenities such as retail shops and public spaces [1].

The goal of a mobility hub is to make it easier and more convenient for people to move around a city or region, reducing the reliance on single-occupancy vehicles and promoting more sustainable and efficient modes of transportation. Mobility hubs are also often located in dense, urban areas with existing public transit systems and transportation infrastructure.

In addition to providing transportation options, mobility hubs serve as community gathering places, enhancing the vibrancy and livability of a neighborhood or city. E-mobility hubs share many of the same

features as conventional mobility hubs, but they only offer clean transportation options, such as electric vehicles and bikes, as well as charging stations.

1.2 Why E-Mobility Hubs in Underserved Communities?

In many underserved communities, access to reliable and affordable transportation options is limited. This leads to fewer job and education opportunities, longer commutes, and higher overall transportation costs [3]. E-mobility hubs help address these challenges because they are designed to integrate various modes of transportation, such as public transit, shared mobility services, cycling and walking.

Moreover, e-mobility hubs can help mitigate problems such as air pollution. Underserved communities often have a higher incidence of asthma due to increased exposure to air pollution from transportation and sometimes industrial emissions. E-mobility hubs, which only provide clean transportation options such as electric cars and bikes, help reduce local transportation emissions and improve air quality in these areas.

Another benefit of e-mobility hubs in underserved communities is that they help address the issue of inadequate infrastructure investment. By building the required infrastructure for e-mobility hubs, such as power transformers, roads, sidewalks, streetlights, and WiFi, underserved communities gain access to additional infrastructure and services, which can gradually attract further investment and development opportunities to the neighborhood.

Developing e-mobility hubs in underserved communities is a complex process that requires an understanding of the community's unique needs and priorities. Engaging with community members and building their capacity and ownership of the project can enhance the chances of its success and sustainability. By involving underserved communities in the planning and development of e-mobility hubs, these projects can better serve the needs of the community and promote greater transportation equity.

Ultimately, e-mobility hubs have the potential to promote sustainable transportation, reduce environmental impact, and help build more equitable communities.

1.3 Case Study: Del Paso Heights E-Mobility Hub

The Del Paso Heights e-Mobility Hub is an innovative transportation outlet designed to improve transportation equity and provide access to job centers and job training opportunities, while simultaneously contributing to improvements in air quality through the provision of zero-emission vehicles. The Hub is the result of an innovative partnership between African American-led non-profit – Green Technical Education and Employment (Green Tech), the Sacramento Metro Air Quality Management District (SMAQMD), the Sacramento Municipal Utility District (SMUD), and consultants – Aura Planning Inc.

Unlike conventional mobility hubs, which are usually built in dense, affluent urban areas, around frequent and high-capacity transit, the Del Paso Heights e-Mobility Hub is built in a low-density suburban disadvantaged (SB 535) and low-income (AB 1550) community. It is specifically designed to promote transportation equity, clean transportation, education, and training in a neighborhood that needs it most. The

hub's design was also informed by a community needs assessment that included map-based surveys, interviews, and focus groups.

The hub will serve as a meeting place for community members with free Wi-Fi, a green park space, a digital kiosk for accessing important community information, and electric benches for charging personal devices, such as cell phones, tablets, and laptops. The hub will also feature a secured parking lot with space for 11 shared vehicles, 7 charging stations, and 12 electric bikes and bike racks. This will give the hub the capacity to host an innovative rideshare program, known as PlanShareGo, and an electric bikeshare program. Both programs will provide the Del Paso Heights community much needed access to reliable and affordable transportation options.

2 Challenges and Lessons Learned from Sacramento's First E-Mobility Hub

2.1 Challenges

As the first e-mobility hub in a disadvantaged community, operated by a non-profit organization, we encountered several financial, technical, and logistical obstacles. Despite their complexity, these challenges also created new opportunities for collaboration and generated valuable lessons and insights for the future development of e-mobility hubs in underserved communities.

Our most pressing challenge was securing sufficient funding to bring the project to life. The initiation of the project owed much to SMAQMD's crucial funding, without which the project would not have been possible. However, due to a lack of clarity around the scope of work, we found it difficult to estimate the project's costs accurately. For example, determining whether the electrical capacity would meet the proposed demand proved challenging. Requirements for an additional transformer, added an extra \$200k to the project cost. Moreover, eligibility criteria for various funding sources varied significantly, making it difficult to combine them effectively. For instance, while one funding source required the chargers to be accessible to the public 24/7, another required exclusive access to low-income households.

Furthermore, we faced the challenge of balancing community input with regulatory compliance. For instance, while some community members opposed the fencing around the hub, safety regulations necessitated it. Additionally, obtaining the required zoning permits proved exceptionally challenging, as the Mobility Hub is not a defined zoning typology. Consequently, we had to identify a comparable typology for the zoning permits, which presented unique challenges.

Although the financial, technical, and logistical challenges faced during this project were complex, they also opened up a world of opportunities for collaborative and innovative solutions that can not only be applied to other similar projects but can also pave the way for the development of future e-mobility hubs. By identifying and addressing these challenges, we can not only improve the performance and efficiency of urban

transportation systems, but also ensure that underserved communities have access to clean, affordable, and reliable transportation solutions.

2.2 Integrating Communities' Needs into the Design of E-Mobility Hubs

The importance of integrating community needs and expectations into the design of e-mobility hubs cannot be overstated. To achieve this goal, we realized it is necessary to employ both high touch and high-tech strategies. Our case study provides several examples of how this can be done.

Firstly, we used high touch strategies, such as hiring local high school students as Community Ambassadors. These Community Ambassadors were tasked with surveying family and friends to understand their transportation needs and expectations. By using local students as Community Ambassadors, we were able to bridge cultural and language barriers and ensure that the community's participation in program design was maximized. This engagement helped to gain valuable insights into the transportation challenges faced by the community, which were then incorporated into the design of the e-mobility hub.

Secondly, we employed high tech strategies, such as GIS mapping to analyze quantitative transportation access data and evaluate existing mobility options. This data analysis helped to identify transportation deserts and areas of the community where the e-mobility hub could have the greatest impact. This information was then used to guide the placement of the e-mobility hub and determine the most effective modes of transportation to include.

During the early stages of the project, we also developed 3D models and virtual reality experiences to allow community members to visualize the proposed hub and provide input on its design and services. This approach helped to ensure that the e-mobility hub was tailored to the needs of the community and that community members felt a sense of ownership and investment in the project.

Overall, these strategies helped to gain the support of the community and ensure that the e-mobility hub best served their needs. By incorporating both high touch and high-tech strategies, we were able to bridge cultural and language barriers, gather valuable data, and engage community members in the design and implementation of the project.

2.3 Advancing Transportation Equity Through E-Mobility Hubs

The case study also highlights how e-mobility hubs can advance transportation equity in underserved communities. One of the ways this was demonstrated was through the Green Tech Pilot Microtransit Program and the Aura Planning PlanShareGo project.

The Green Tech Pilot Microtransit Program is a ride-share initiative that operated from March to August 2022. The program was designed to serve low-income, disadvantaged communities that lack access to essential destinations, such as workplaces, medical centers, and schools. Riders would book pre-planned trips through a call center. The rides and drivers were then coordinated using a Microsoft Excel spreadsheet. The

program was also community-based, with both drivers and call center operators residing in the neighborhood. In this way the program was able to provide employment opportunities for members of the community. Rides were free of charge meaning that the program was able to provide affordable and reliable transportation options and increase access to job opportunities, healthcare, and education.

The Aura Planning PlanShareGo project is another community-based ride-share initiative designed to provide transportation options to underserved communities. The project proposes to use an app-based platform that connects drivers with riders and allows them to share rides to essential destinations, such as workplaces, medical centers, and schools. The program will be specifically designed to address the transportation needs of underserved communities, who often have limited transportation options. The program will help to improve the quality of life for these individuals by providing reliable and affordable transportation to medical appointments, social events, and other essential destinations. Additionally, because the program will be community-based, it will provide employment opportunities for members of the local community.

These ride-share initiatives demonstrate how e-mobility hubs can promote transportation equity in underserved communities. By providing additional transportation options and facilitating access to essential destinations, these programs help to address transportation-related challenges, such as limited job opportunities, longer commutes, and higher healthcare costs. Additionally, because these programs are community-based, they provide employment opportunities for members of the local community, which can help to stimulate the local economy and promote community development.

2.4 Partnering with Utilities to Incentivize E-Mobility Hubs

The third lesson learned from our case study is how strategic partnerships with utilities can help drive the development of e-mobility hubs, especially in underserved communities [4]. With their extensive knowledge of grid capacity, local energy demand, and charging infrastructure standards, utilities are well-positioned to provide technical support for e-mobility hubs to communities most in need of infrastructure and support [5]. Through a partnership with SMUD, developers of e-mobility hubs will ensure that communities in Sacramento benefit from clean energy transition, including health benefits from improved air quality, access to high paying jobs, and resilience to climate change [6].

3 Next Steps

Since its inception, the Del Paso Heights Hub has sparked multiple conversations to build more hubs in the Sacramento region. Although to make this a reality, a cost/benefit analysis of e-mobility hubs and measures of their success are needed. This involves collecting and analyzing project data, such as facility performance, vehicle utilization, vehicle charging profiles, user/beneficiary experience and social impact, greenhouse gas reduction calculations, and economic analysis to inform the economic feasibility of the facility and similar facilities.

References

- [1] Aono, Saki. 2019. *Identifying Best Practices for Mobility Hubs*. Vancouver: Translink.
- [2] Arseneault, Doug. 2022. *Mobility Hubs: Lessons Learned from Early Adopters*. Los Angeles, CA: Institute of Transportation Studies, UCLA.
- [3] The Greenlining Institute. 2021. *Clean Mobility Equity: A Playbook - Lessons from California's Clean Transportation Programs*. Oakland, CA: The Greenlining Institute.
- [4] Gauquelin, Alexandre. 2021. *How energy suppliers could benefit from the shared electric mobility revolution*. November 22. Accessed October 26, 2022. <https://www.electricfeel.com/blog/energy-shared-mobility-utility>.
- [5] Gonzalez, Jorge. 2022. *Powering e-mobility forward: critical opportunities for energy and utility companies*. April 27. Accessed October 26, 2022. <https://atos.net/en/blog/powering-e-mobility-forward-critical-opportunities-for-energy-utility-companies>.
- [6] SMUD. 2021. *Del Paso Heights Mobility Hub*. Accessed October 27, 2022. <https://www.smud.org/en/Corporate/Landing/Sustainable-Communities/Partnership-spotlight-archive/Del-Paso-Heights-Mobility-Hub>.

Presenter Biography



Angelina Rahimi

Angelina is the Founder and President of Aura Planning Inc. and has practiced transportation planning, urban design, project management, and community engagement for over 20 years. She has initiated several projects for utilities, city agencies, and community-based organizations in Canada and the United States. Her work efficiently merges economic development, energy conservation, and community empowerment to promote constructive change. Projects she has led include Sacramento's first eMobility Hub, a Franklin Boulevard Transformative Climate Communities (TCC) planning project, and two Clean Mobility Options (CMO) Community Transportation Needs Assessments. In recognition of her work in clean energy, Angelina was nominated for a California Energy Commission Hall of Fame Award in 2022.



Marco Lemes

Marco Lemes has been a Project Manager with SMUD's Research & Development (R&D) department for over 18 years. Marco has focused on transportation electrification R&D efforts for the past 5 years, with projects with varied objectives such as, increasing the amount of EVs in TNCs service, demonstration of autonomous vehicles, deployment of mobility hubs, V2G demonstration, and deployment of charging infrastructure in MUDs. Marco has a B.S. in Mechanical Engineering Technology from California State University Sacramento (CSUS).