HANOI, VIETNAM

SOLUTIONSPLUS I SCALE-UP CONCEPT NOTE

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PROJECT PARTNERS

ABOUT

This scale-up paper has been prepared for the project SOLUTIONSplus to improve the ridership and effectiveness of the newly operated Metro line 2A to BRT stations and commercial destinations.

TITLE

Solutionsplus Scale-up Note: Hanoi

CONTRIBUTORS

CODATU and UTT

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DISCLAIMER

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LAYOUT

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PICTURES

All the pictures are provided by the SOL+ partners

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Scale-Up Concept Note

Project Title: EVs sharing for last mile connectivity

City/Country: Hanoi, Vietnam

1. Background

Pilot project on shared electric two wheelers:

A pilot project for shared electric two-wheelers (e2Ws) or e-mopeds aimed at enhancing last mile connectivity has been implemented in Hanoi for six months from Nov 2022 to May 2023. The pilot deployed 50 Vinfast Ludo electric mopeds, each equipped with IOT devices connected to management software, enabling remote monitoring, control, and vehicle management. The 2.3 km pilot route starts on the sidewalk in front of the Anland Complex building (opposite Van Khe BRT Station) and the ends in the parking area at AEON Shopping Mall Ha Dong.

The pilot achieved initial success by meeting the community's transportation needs, increasing the public transport usage, and fostering awareness and habits around using shared electric vehicles. On the top of it, the Hanoi government has recognised the benefits of this service and expressed interest in integrating shared electric vehicles service into the city's transport system.

Needs and potential impacts of prospective scaled-up intervention:

Hanoi launched Metro Line 2A on November 6th 2021, making it as Vietnam's first urban rail transit line. The line spans approximately 13km, with the maximum design speed of 80km/h and consists of 12 stations, with an average distance of 1.1km between them.

Metro Line 2A is expected to address both social and environmental challenges in Hanoi. However, like many public mass transit systems, it faces the common issue of 'first and last mile' connectivity. The extra time needed and inconvenience of travelling from home to the station and then to the final destination deter potential users. To boost ridership and efficiency, it is crucial to improve access to the metro stations. The limited space available at these stations poses challenges for constructing parking lots for private vehicles, presenting an opportunity to develop an electrified two-wheeler sharing system as a sustainable complement to the metro stations.

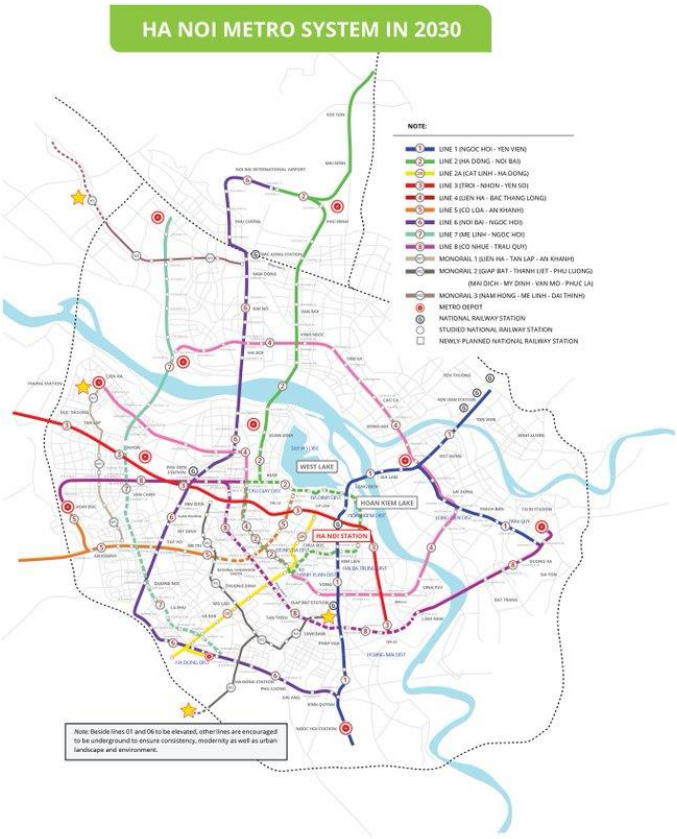

Figure 1: Hanoi metro system in 2030

Challenges and barriers for shared electric two-wheelers:

1. Safety concerns: The routes between two docking stations normally lacks dedicated two-wheeler lanes, such as also in the route between Van Quan metro station and Van Khe BRT station, exposing users to risks from other vehicles. To address this, safety information must be clearly communicated to users beforehand, with prominent signage and highlighted instructions. Additionally, since e-2W rentals are new to many users, they may lack experience with the usage. A brief training session before the first ride can mitigate this risk. Another concern is that drivers may misjudge the duration of their trip, leading to battery depletion before returning the vehicle. As tried in the demo phase, an administrator can monitor battery levels using the backend system and arrange recharging as needed.

2. Policy gaps: Vietnam currently lacks specific regulations for shared mobility systems. Securing approval from local authorities will require time and effort, presenting a barrier to implementation.

3. Space constraints: Limited space at BRT and metro stations is a significant challenge. Parking and charging facilities may need to be located on sidewalks or nearby sites such as offices, universities, or shopping malls. Careful consideration is necessary to ensure these locations are convenient and accessible. Additionally, the implementation of battery swapping stations should be planned once Vietnam establishes standards for such system (currently under development by UTT researchers).

4. The availability of energy: Meeting the electric demand for a large fleet of shared vehicles is another challenge. Charging could be done on the parking spaces near the stations. Although each vehicle requires minimal power, an energy management system will be essential to efficiently distribute power across the fleet.

5. App Integration: The sharing app and IoT system must be compatible with the vehicles used. During the demo, Vinfast Ludo vehicles were equipped with the necessary IoT devices. If other brands are used in the future, installing compatible IoT systems will require additional time.

Figure 2: Van Quan metro station

2. Scale-up project concept

2.1. Goal

The scale-up project aims to enhance the usage of public transportation, such as the metro and BRT systems, by developing an e-moped sharing service for last-mile connectivity.

2.2. Climate policies alignments

At the 2021 UN Climate Change Conference in Glasgow (COP26), Vietnam's Prime Minister, Pham Minh Chinh, announced the country's commitment to phase out coal power generation by the 2040s and achieve net-zero carbon emissions by 2050.

Vietnam's National Strategy on Climate Change announced 43.5 percent emissions reduction target by 2030, with sector-specific emissions targets for 2030 and 2050, and qualitative suggestions for achieving these goals.

These commitments align with those of other Association of Southeast Asian Nations (ASEAN) member states with net-zero commitments. Vietnam's greenhouse gas emissions primarily stem from the power sector (30%), industry (30%), and transport (10%). To address emissions in the transport sector, the Prime Minister has promoted electric vehicle (EV) adoption, EV charging infrastructure, and the electrification of public transit. In response, public stakeholders have taken action: the Ministry of Finance has reduced EV registration fees, while Hanoi, Ho Chi Minh City, and Da Nang are advancing metro projects to decrease reliance on personal vehicles. Discussions are also underway about banning internal-combustion engine (ICE) two- and three-wheelers, with some pedestrian zones already established. The Ministry of Transport is also planning high-speed rail, which could reduce the number of flights within the country.

This scale-up project, focused on deploying e-mopeds for last-mile connections to BRT and metro systems, directly supports Vietnam's net-zero carbon emissions goal by 2050 and aligns with the government's policies encouraging EV adoption in transport.

2.3. Project details

This scale-up project aims to implement shared electric vehicles in Ha Dong District, enhancing last-mile connectivity between public transport systems like the BRT and

metro, and passengers' final destinations. The project is expected to boost public transport usage within the community while supporting Vietnam's commitment to achieving net-zero carbon emissions by 2050 and aligning with government policies promoting electric vehicle (EV) adoption in transportation.

Key aspects

- The project will introduce "electric mobility," "shared vehicles," and "last-mile connectivity" to the community, offering residents the opportunity to experience this new mode of transport within Hanoi's public transport system for the first time.
- The scale-up will help refine policies related to shared electric vehicle services in Hanoi.
- The project will increase awareness of shared electric vehicles among both the community and Hanoi's government authorities, aligning with the city's roadmap for public and green transportation.

Key components

- Number of stations: 14
- Vehicles: 140 electric mopeds (10 vehicles per station), in partnership with MBI Sharing Vietnam, a company currently providing shared e-two wheeler services in residential areas of Hanoi.
- Apps & IoT: The vehicles are equipped with IoT devices for real-time monitoring and management. The app connects directly to the CMS software, offering full bike-sharing functionality, including integrated payment gateways.
- Docking stations: The provision of availability of space should be arranged. In case, the limited space at some stations, alternative parking solutions will be explored, such as using nearby sidewalks, streets, or facilities like offices and universities.
- Charging: A battery-swapping system can be considered to address space limitations and enhance user convenience.

Expected Outcomes:

- Implementation of a fully functional last mile connectivity system that addresses the shortcomings identified during the demo phase.
- Elabortaion of policy advice document incorporating financial aspects.
- Recommendations on two-wheelers-sharing service revenue models and proposed subsidy levels for businesses deploying the service.
- Facilitation of market access for businesses offering two-wheeler-sharing services.
- Development of a replicable model for other cities.

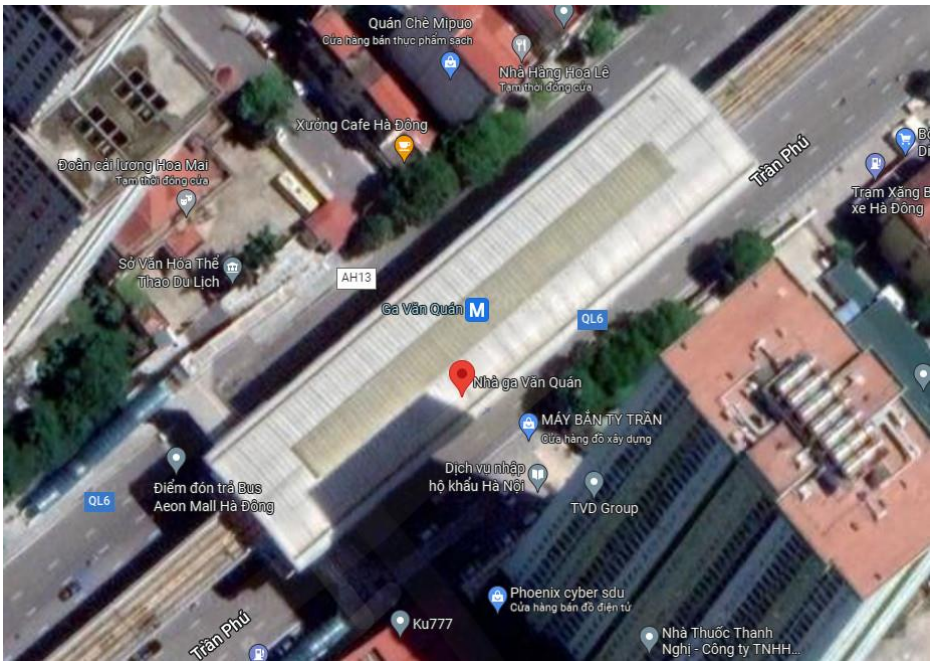

Figure 3: Available spaces at Van Quan metro station

Tentative timeframe for the implementation:

4 months: Planning and preparation for the scale up (Proposal planning, Permission from the local authorities, V-share app upgrading, e-mopeds preparation)

6 months: Operation of the scale up phase 1

4 months: The first review of the scale up and necessary adjustment

1 month: The second review of the scale up and necessary adjustment for phase 2

3 months: Preparation for the scale up at one more route (Phung Khoang metro station to University of Transport Technology Hanoi campus)

3 months: Operation of the scale up phase 2

1 month: Review of Phase 2

Note: This timeframe depends on the time needed for project approving procedure and related activities and it can be adjusted due to actual conditions.

2.4. Stakeholder Engagement

Major partners for the concept development: University of Transport Technology, UEMI, WI, CAA, CODATU

Vehicle manufacturers: MBI Motors, VINFAST, Selex Motors

Operators: MBI Motors Sharing

Stakeholders: Hanoi People's Committee, Hanoi Department of Transport, Hadong District People's Committee, Hanoi Metro, Transerco

3. Budget and major costs

Planned budget: 150,000 euros

Cost: Construction of parking lots, other facilities at the stations

Charging equipment: charging pods and lockers

Sharing app: Operational cost of the app/ hardware/ sim

Vehicles: Repairing/maintenance cost

And facilities for operators

Operational costs: Operators wages

Expenses at the location

4. Masterplan for the shared two-wheeler stations to further scale-up

In addition to this scale-up concept for 14 stations, the University of Transport Technology developed a master plan for the shared two-wheeler stations in 10 central districts of Hanoi City. This master plan helps provide a reference document for Hanoi Department of Transport to develop detailed plans and policies for implementing shared electric two-wheeler system in Hanoi city.

The master plan objectives:

1. Create an online map of borrowing and return station locations based on the planned areas.
2. Provide statistical tables showing the number of stations in each ward administrative unit, along with the coordinates of each station location.
3. Provide statistical data on bus and train stations in each ward administrative unit, along with their corresponding coordinates.

Scope:

Identify the locations of shared electric two-wheeler borrowing and return stations that connect to the public transport system in 10 central districts, including: (1) Ba Dinh District; (2) Hoan Kiem District; (3) Tay Ho District; (4) Cau Giay District; (5) Dong Da District; (6) Hai Ba Trung District; (7) Hoang Mai District; (8) Thanh Xuan District; (9) Ha Dong District; and (10) Nam Tu Liem District.

Methodology and Implementation Process:

- Analyze the current status of shared two-wheeled vehicles in Hanoi.
- Assess the public transport network, including bus stations and current stops, within the 10 research districts.
- Conduct literature reviews, including the ITDP's (Institute for Transportation and Development Policy) guidelines, for determining the locations of shared vehicle borrowing and return stations.
- Conduct surveys to gather the needs and opinions of traffic participants in the research area regarding public transport and shared two-wheeled vehicles.

- Organize workshops to collect feedback from experts, business representatives, and representatives of the city's traffic management agencies on the necessity, methodology, results, and implementation strategies for the project.
- Gather spatial data on:
    - Administrative boundaries and local population within each district.
    - Locations of bus stations and stops in the current transport network.
    - Locations of key attractions, such as residential areas, apartment complexes, commercial centers, schools, tourist sites, entertainment venues, etc.
    - A base map that includes the transport network.
- Establish criteria for determining borrowing and return station locations, considering the characteristics of the public transport network, population distribution, and the preferences of traffic participants.
- Use ArcGIS software to layer data, create a planning map of borrowing and return station locations, and develop an online planning map on Google Maps.

Main Results of Implementation:

- Survey Outcomes: Collected 2,650 responses from transport participants.
- Workshop: Successfully organized the workshop titled “Developing a Master Plan for Shared Electric Two-Wheeler Stations: Proposal for 10 Central Districts in Hanoi City,” with participation from experts, business representatives, and representatives of Hanoi's traffic management agencies.
- Online Map: Created an online map on Google Maps that integrates various layers, including the locations of shared two-wheeler stations, bus stations, residential areas, and main attractions within each district's administrative units.
- Statistical Data: Compiled a statistical table listing the coordinates of shared two-wheeler stations, bus stations, residential areas, and main attractions.

The master plan for the shared two-wheeler stations in 10 central districts of Hanoi City offers numerous practical benefits to the city's transportation system. The online maps

and dashboards provide detailed, easily accessible information, enabling traffic management units to plan and deploy borrowing and return stations effectively and scientifically. The survey results, featuring 2,650 responses from citizens, alongside input from experts, businesses, and traffic management agencies, offer valuable insights into public needs and experiences. This consensus on implementation methods and plans ensures the project's effective and sustainable execution.

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