



Horizon2020  
European Union Funding  
for Research & Innovation

**INTEGRATING URBAN ELECTRIC MOBILITY SOLUTIONS IN THE CONTEXT OF THE PARIS AGREEMENT, THE SUSTAINABLE DEVELOPMENT GOALS AND THE NEW URBAN AGENDA – SOLUTIONSPUS**

**HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY**

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# PROJECT: INTEGRATING URBAN ELECTRIC MOBILITY SOLUTIONS IN THE CONTEXT OF THE PARIS AGREEMENT, THE SUSTAINABLE DEVELOPMENT GOALS AND THE NEW URBAN AGENDA – SOLUTIONSPLUS

## HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY

The map displays various urban electric mobility solutions across different countries:

- USA:** E-bus charging: Inverted pathographs
- HAMBURG (Germany):** Shared e-scooters
- ARMENIA:** Diesel bus to E-bus & redesign e-3 wheeler
- HANOI (Vietnam):** Shared e-mopeds
- PASIG (Philippines):** Smart e-quadracycles
- DAR ES SALAAM (Tanzania):** E-3 wheelers at DART
- Other locations shown on the map:** MADRID (Spain), KATHMANDU (Nepal), NANJING (China), QUITO (Ecuador), MONTEVIDEO (Uruguay), KIGALI (Rwanda), SOUTH AFRICA, BRAZIL, PERU, CHILE, URUGUAY, SIERRA LEONE, TOGO, NIGERIA, KENYA, SEYCHELLES, MALDIVES, INDONESIA, AUSTRALIA, SOUTH AFRICA, MOSAMBIQUE, MADAGASCAR, ZAMBIA, UGANDA, BURUNDI, CAMEROON, IVORY COAST, MOROCCO, PORTUGAL, ITALY, AUSTRIA, HUNGARY, TURKEY, ISRAEL, THAILAND, VIETNAM, CHINA, NEPAL, INDIA, MALAYSIA, PHILIPPINES, JAMAICA, ANTIGUA & BARBUDA, SAINT LUCIA, COSTA RICA, COLOMBIA, MEXICO, BRAZIL, PERU, CHILE, URUGUAY.
- Other solutions shown:** Multimodal e-mobility hub, E-bus charging & e-cargo bikes, Shared e-2 wheelers.

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# 1. VIETNAM AT A GLANCE



*Vietnam is in the Southeast Asia*



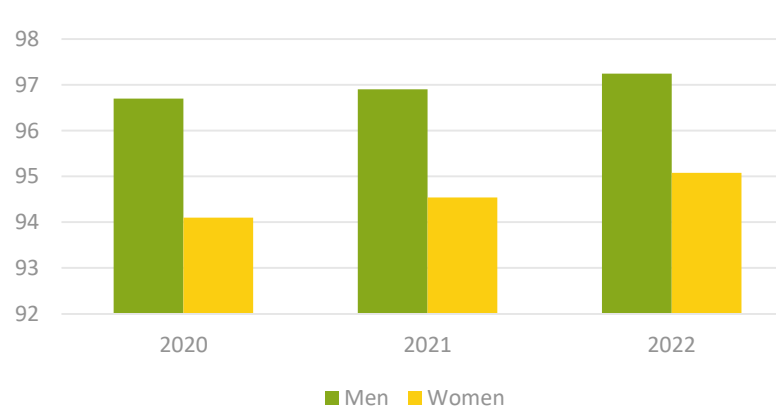
*Population*



*Employed workers*



*Average income per month*

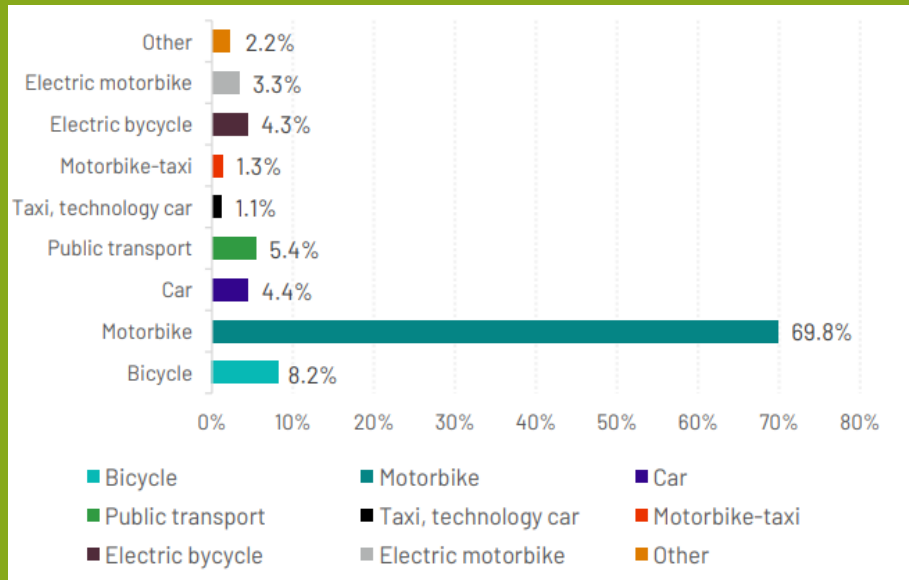


*Vietnam Literacy*



*Unemployment rate*

## 2. VIETNAM TRANSPORTATION



Vehicle use in transportation

City/Province	Number of motorcycles in circulation (vehicles)
Hanoi	2,985,571
Ho Chi Minh city	4,458,534
Hai Phong	778,540
Da Nang	556,140
Can Tho	532,030
Quang Ninh	406,178

Number of motorcycles in big cities  
(Total: 72 millions)

Source: GIZ, 2021



# 3. E-MOBILITY IN VIETNAM

## Context

- Electric cars: 20,000
- Electric motorcycles: 2 Millions
- Electric buses: 239
- Electric taxis: 2700, motorcycle taxis: 60,000
- Major manufacturers: Vinfast, Honda, TMT

Source: Vietnam Register

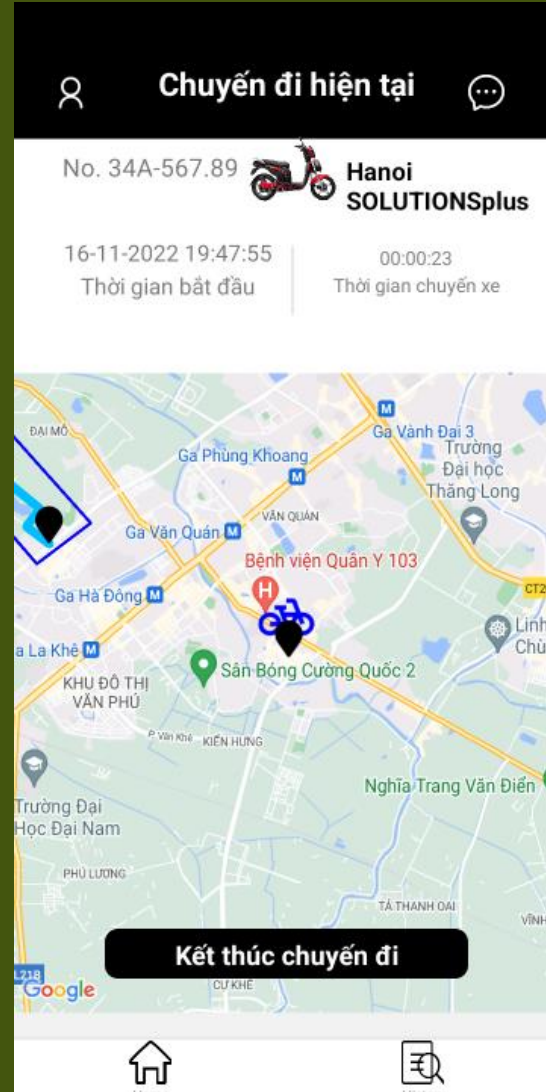


## Pilot

- UNEP Project: Mainstreaming E-mobility in Vietnam: pilot of 150 Honda e-motorcycles
- EU SOLUTIONPLUS Project: Electric vehicle sharing for last mile connectivity
- UTT Pilot of electric motor-taxis



## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY OVERVIEW



### HANOI DEMONSTRATION OF EV SHARING FOR LAST-MILE CONNECTIVITY FROM BRT VAN KHE STATION TO AEON MALL HA DONG

*(Project: Integrating Urban Electric Mobility Solutions in the Context of the Paris Agreement, the Sustainable Development Goals and the New Urban Agenda – SolutionsPlus).*

- Funded by: European Commission

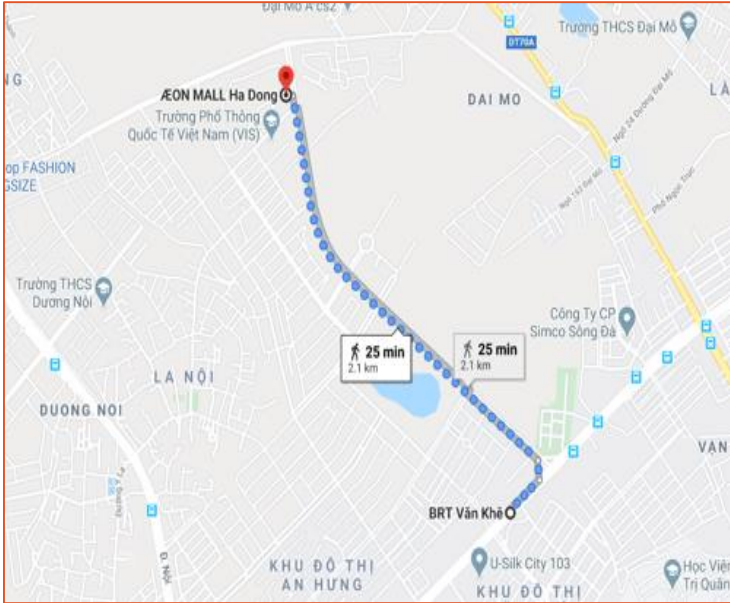
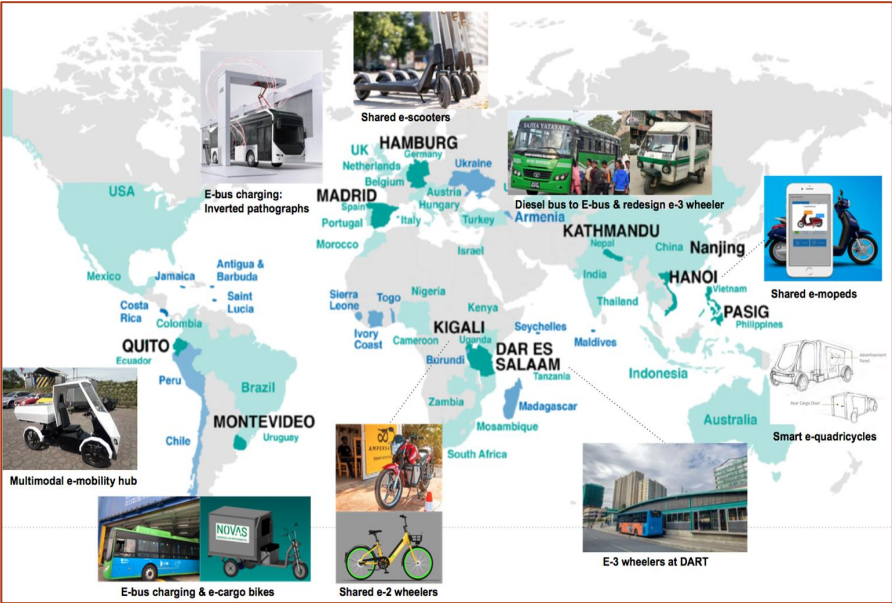
- Detail targets:

+ Contributing to the introduction of a "new" sharing service into the Hanoi public transport system; forming people's habit of using public transport, contributing to reducing traffic congestion, pollutant emissions and greenhouse gas emissions.

+ Proposing policies to contribute to the construction and development of "EV sharing" system for Hanoi city

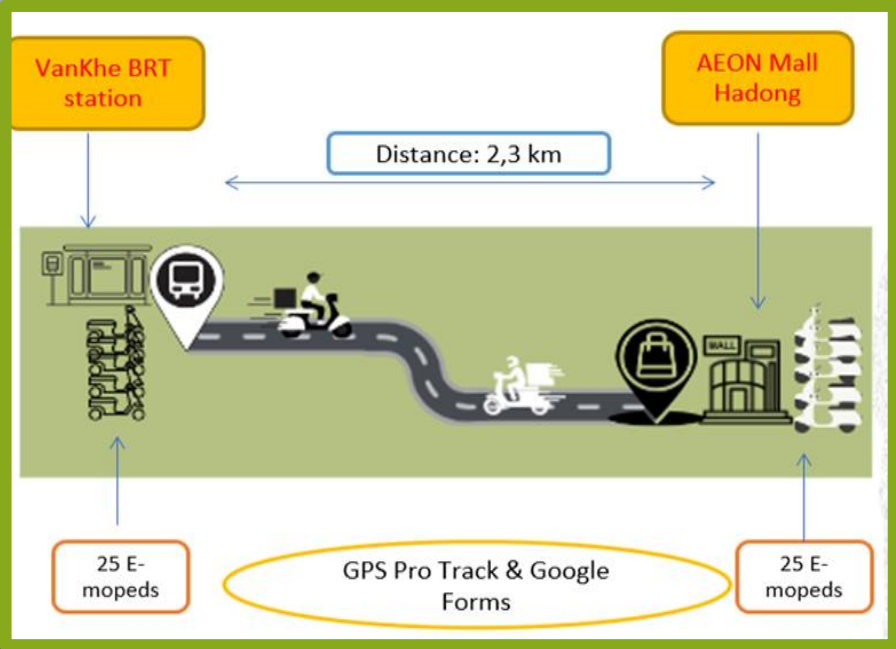
# 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY

## OVERVIEW





# 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY



## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY

### SELECTION OF PARKING STATIONS



#### Advantage

- The size of the parking space is 1x2 meters, the sidewalk for traveling has a width of 5 meters
- The station is 20m from Van Khe BRT station, public bus stop
- The station is easy to attract and recognize

#### Limitation

- No grid connection
- Lack of parking during peak hours
- The station at Van Khe BRT station has no roof



## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY

### SELECTION OF VEHICLES



#### Advantage

- Quality control by: TCVN 14:2015/BGTVT, QCVN 90:2019, QCVN 91:2019
- The size and design are suitable for Vietnamese people and weather, climate, traffic conditions in the pilot area.
- Driver licence is not required; purchased insurance for the vehicle and its occupants.
- IP57 waterproof, dustproof level 5 standard, with anti-theft alarm.

#### Limitation

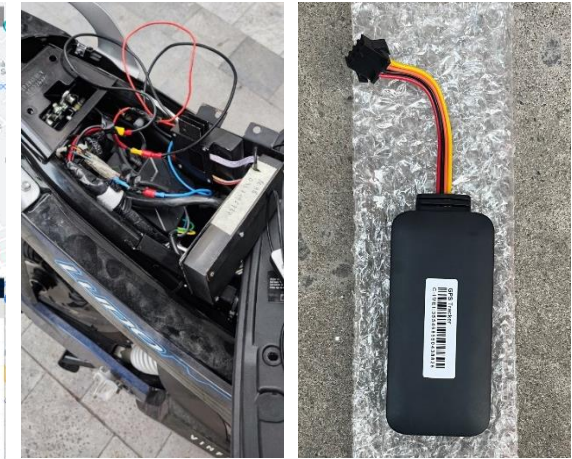
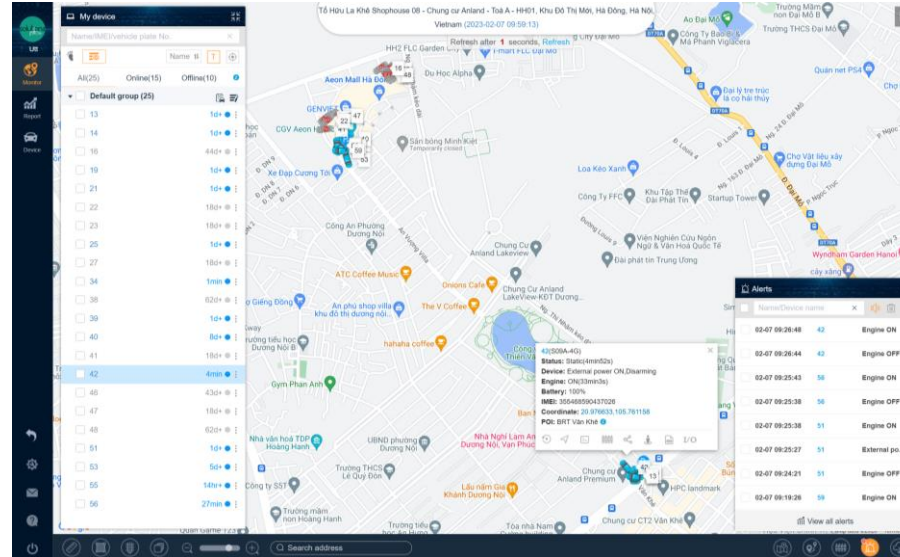
- Easy to conflict when installing IoT devices
- The unique identity of the pilot program is not guaranteed
- Vehicle must open the trunk when charging
- There is no precedent for issuing state license plates for electric motorbikes
- The transfer of vehicles between stations is done by the operator, there is no dedicated vehicle for transporting vehicles.

Power Rating	Maximum power	Maximum speed
<b>500 W</b>	<b>1.100 W</b>	<b>35km/h</b>
Battery Capacity	Maximum distance	Standard charging time
<b>22Ah</b>	<b>75km/full charge</b>	<b>3 – 4.8 hours</b>

# 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY APPS & IOTS



- The users automatically lock/unlock the vehicle
- Using Protrack software to manage vehicles, users
- Capable of integrating warning, notify users when the vehicle goes out of the specified area



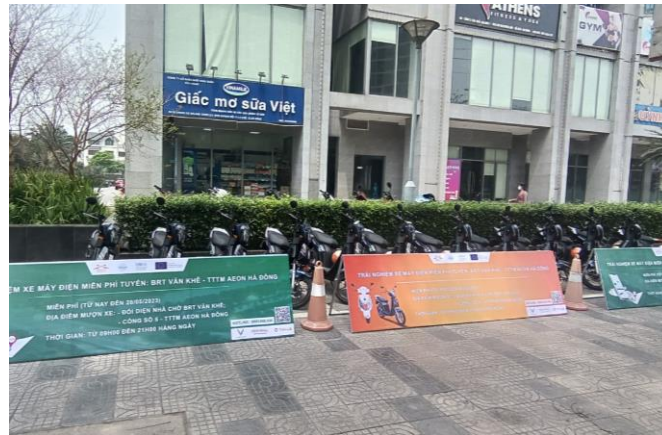
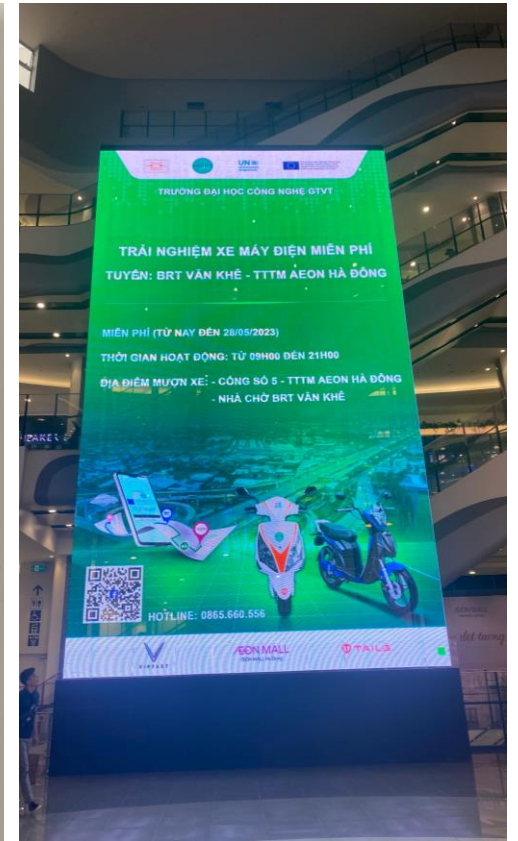
## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY CHARGING INFRASTRUCTURE



- The charging location ensure fire safety and suitable for weather conditions (*the ambient temperature in the charging area is below 42 degrees Celsius*).
- Various charging options:
  - Directly charging at Van Khe BRT Station or AEON Mall Ha Dong;
  - Using BetterGen mobile charger provided by Batteries AMPS GmbH;
  - Battery swapping.



## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY COMMUNICATIONS FOR PEOPLE AWARENESS RAISING



At the stations

At AEON Mall Ha Dong

# 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY COMMUNICATIONS FOR PEOPLE AWARENESS RAISING

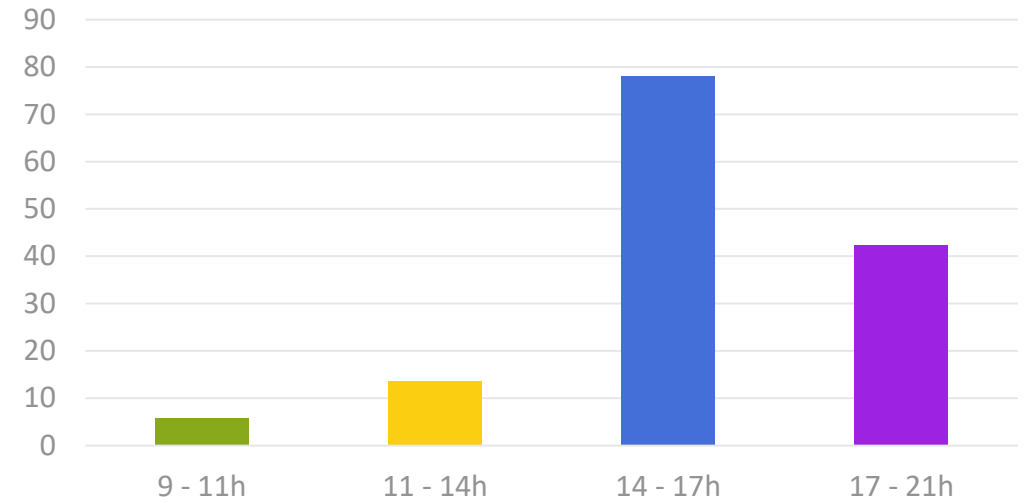
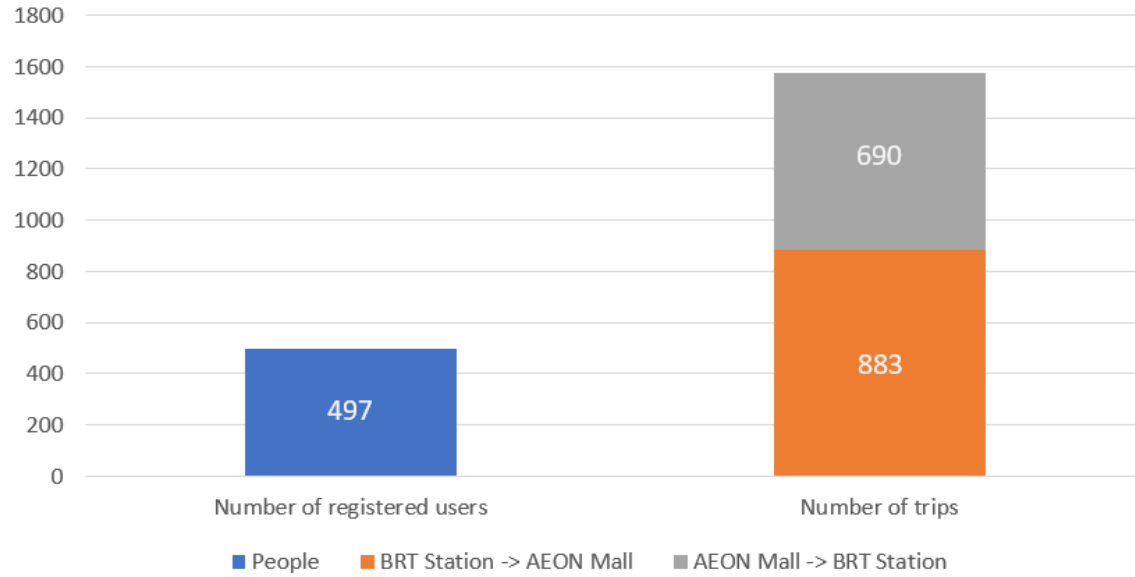


More than 40 TV channels, newspapers, electronic newspapers ave broadcast and published information about the project

# 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY

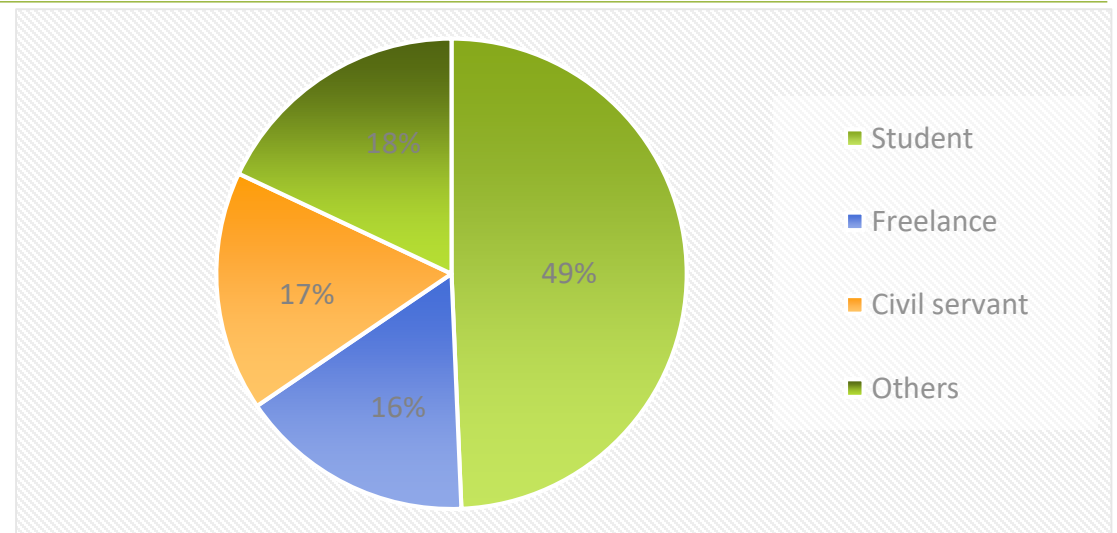
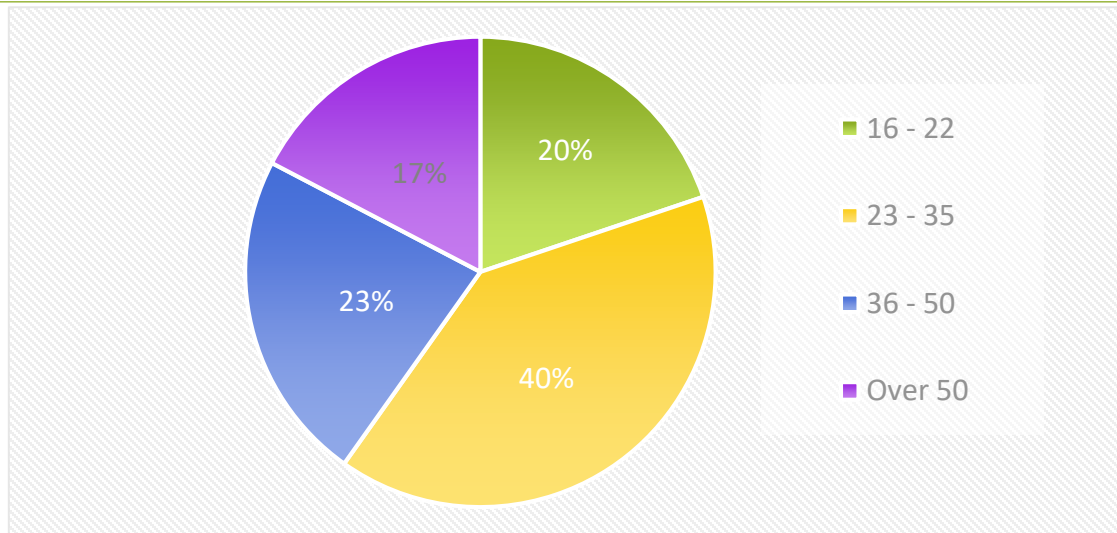


## RESULTS



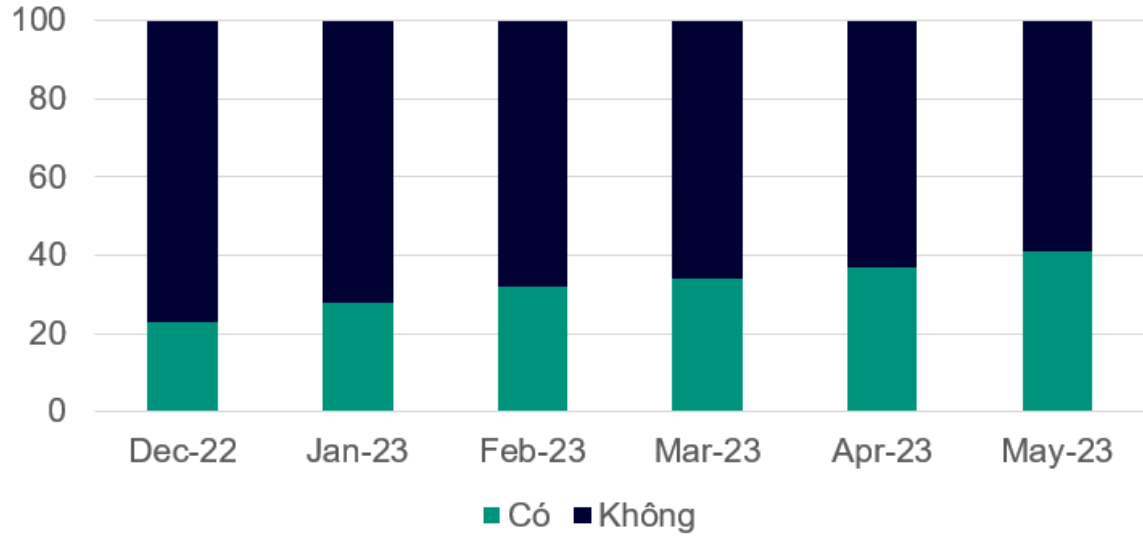
Operating results from Nov 28, 2022 to May 28, 2023

Customer survey data: service usage time

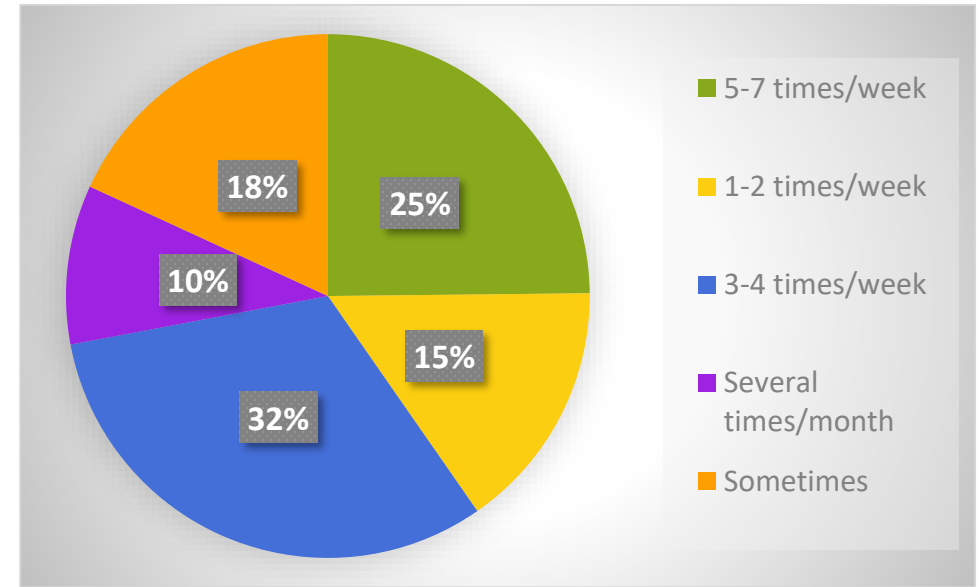




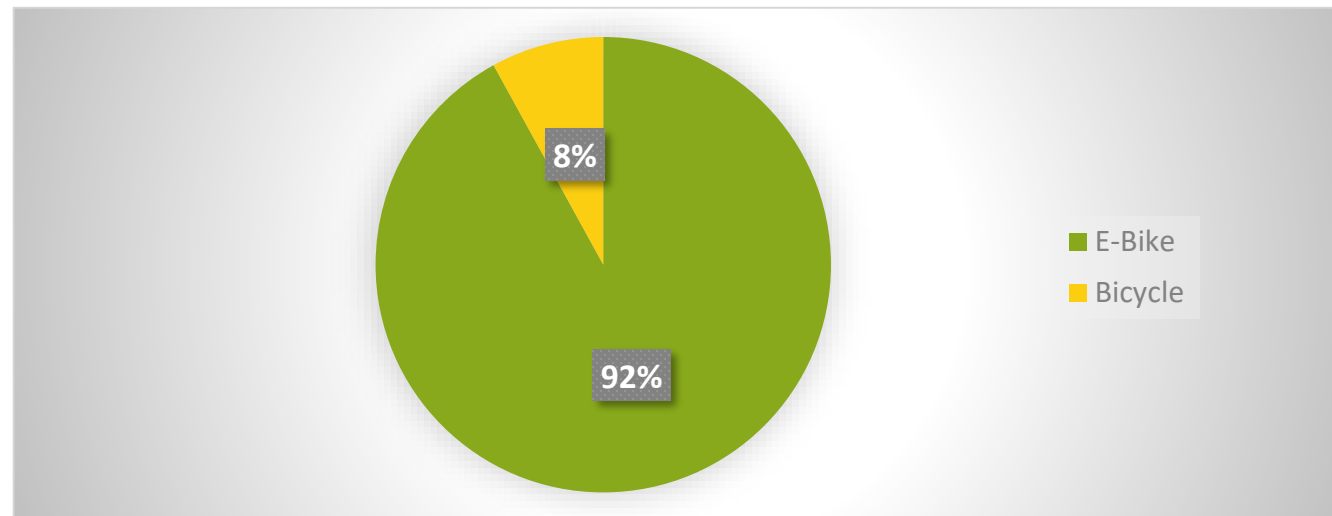
## 4. HANOI E-MOBILITY SOLUTION: ELECTRIC VEHICLE SHARING FOR LAST MILE CONNECTIVITY RESULTS



Statistics of customers using the service for the purpose of connecting public transport



Frequency of making trips



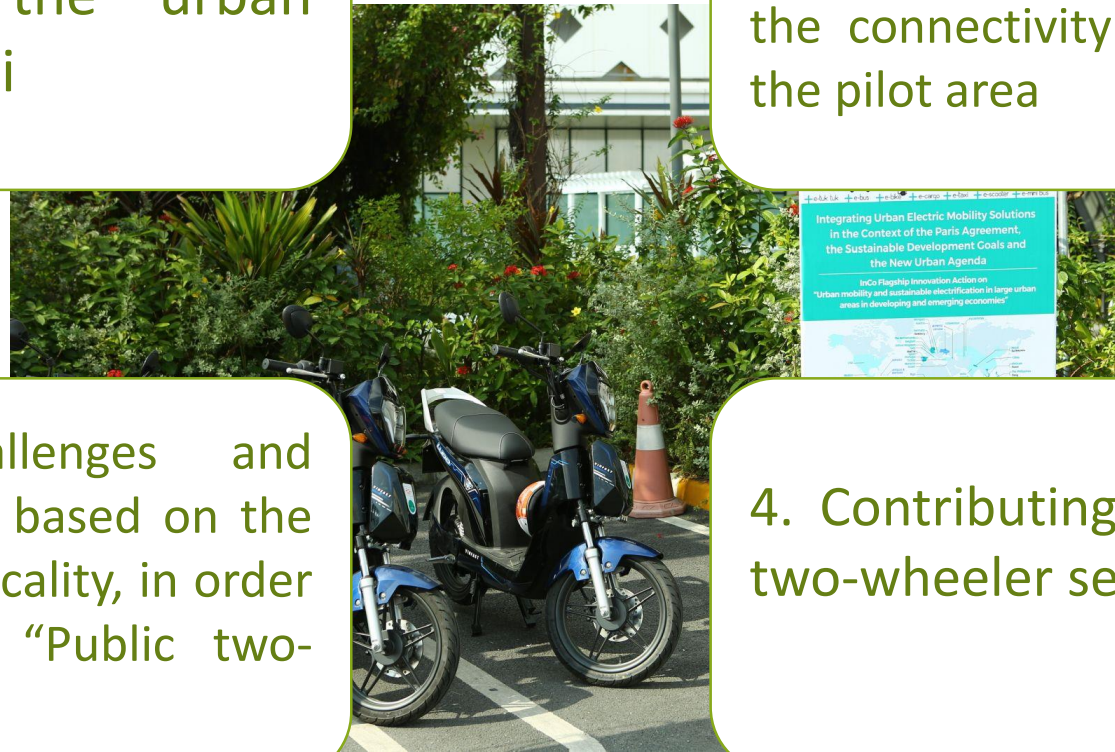
### RESULTS

1. Bringing the image of "Public two-wheeler" into the urban traffic picture of Hanoi

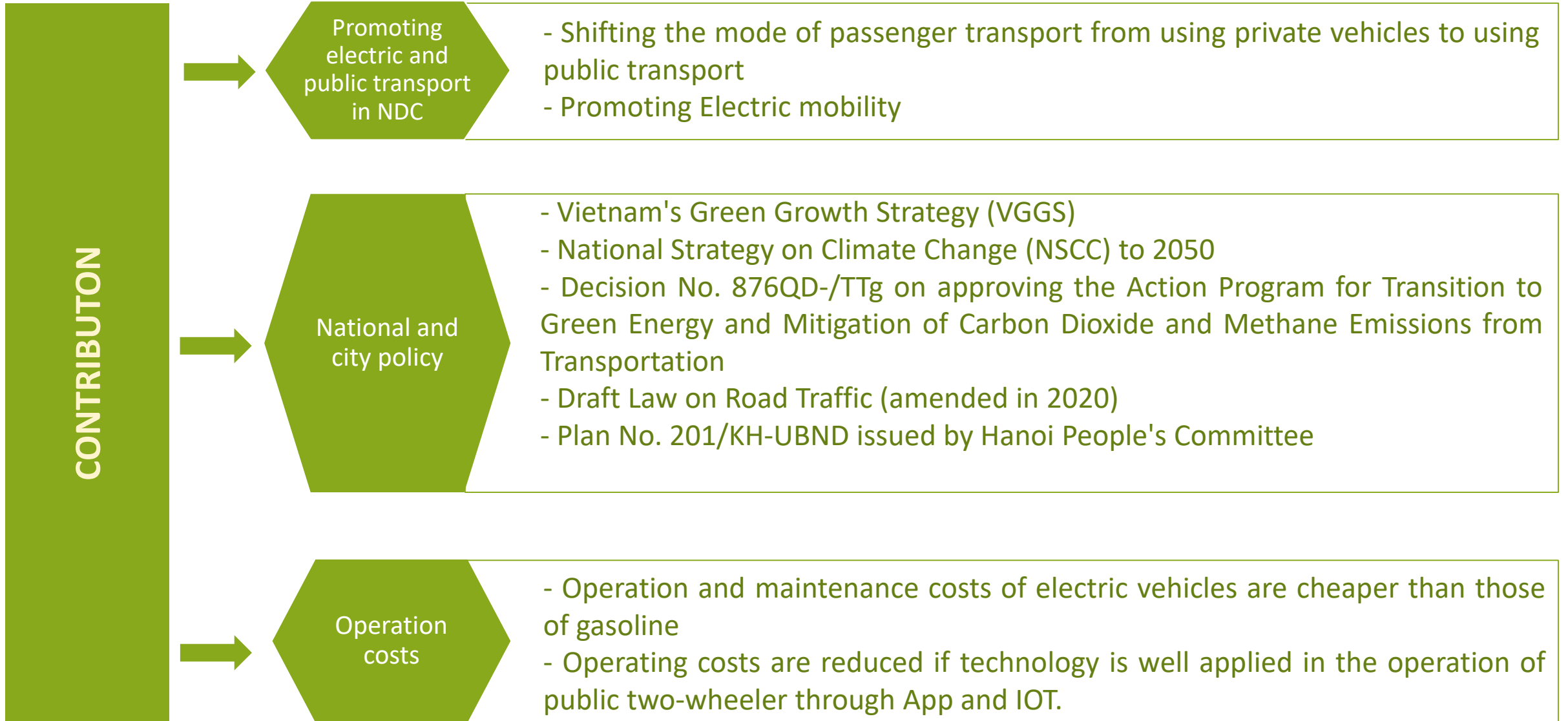
2. Initially building people's awareness about the new traffic model; improve the connectivity of public transport in the pilot area

3. Analyze the challenges and advantages of the model based on the actual conditions in the locality, in order to propose policies on "Public two-wheeler" in Hanoi.

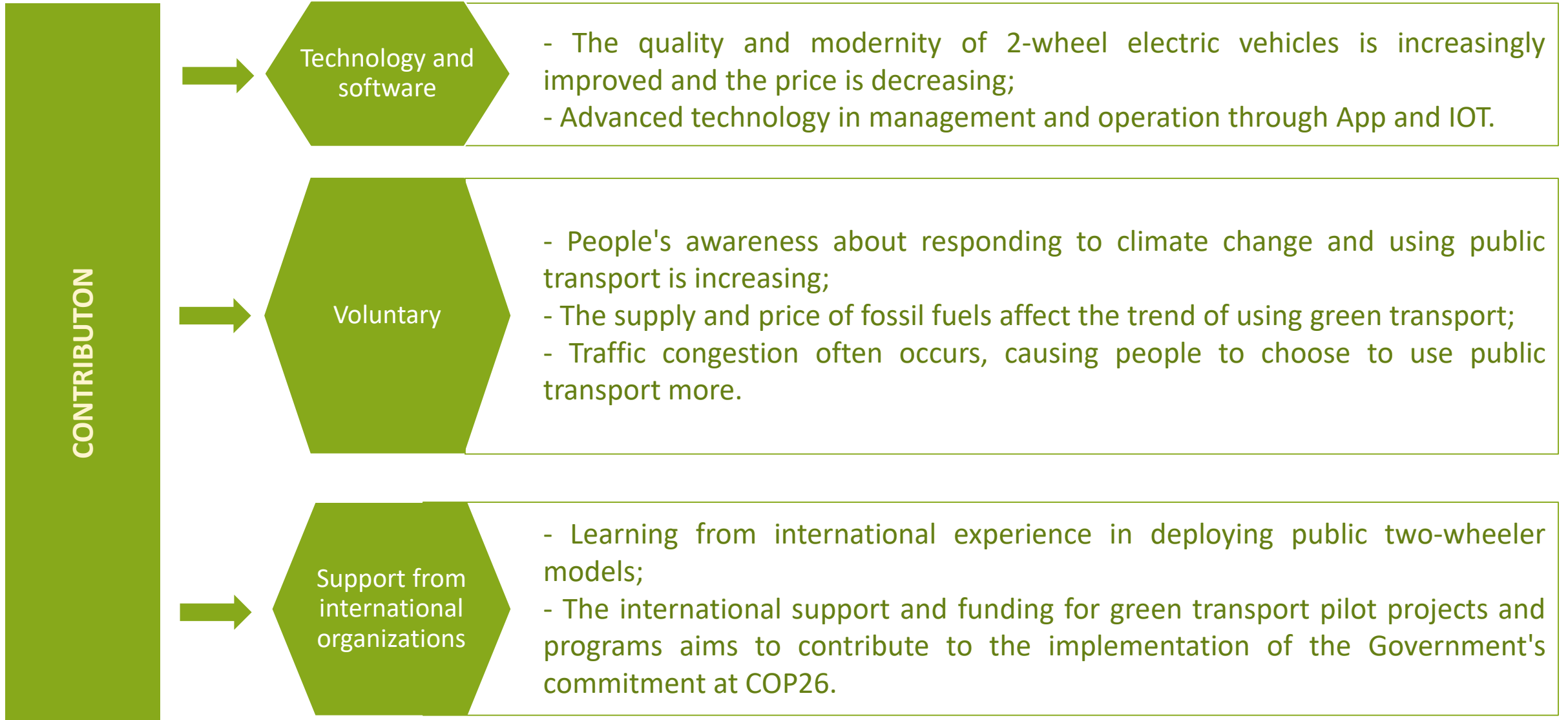
4. Contributing to building a public two-wheeler service business model



## 5. CONCLUSION



## 5. CONCLUSION



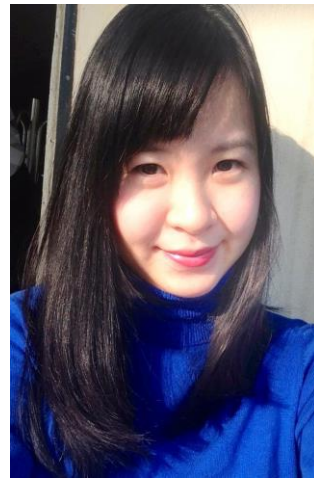


# UNIVERSITY OF TRANSPORT TECHNOLOGY, HANOI, VIETNAM

## IMPLEMENTATION TEAM



### Project Management



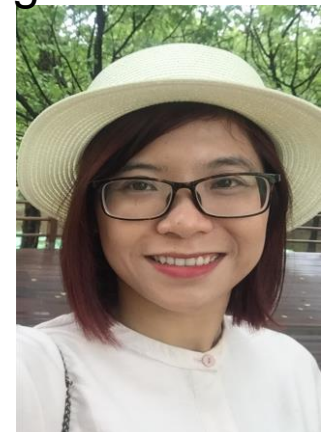
### Vehicles and Technical Aspects



### Transport Operation



### Software and Integration





**THANK YOU FOR YOUR KIND ATTENTION!**



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