LEADING THE WAY TO CREATE THE FUTURE

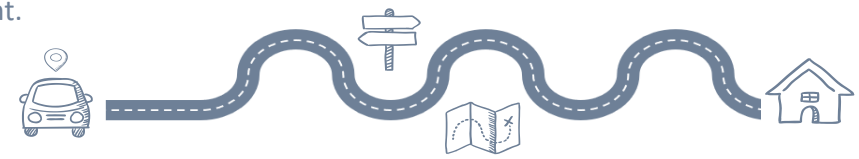
PASCO (Thailand) Co., Ltd.

Idea Outline

Based on the Smart Mobility concept of Bang Sue Grand Station which is the largest railway transit hub in ASEAN surrounded by a Transit Oriented Development area (TOD) with the goal to be a smart city that focuses on convenience, efficiency, and safety in transportation and being environmentally friendly.

We propose the idea to develop a smart public transportation system which is the key to connecting the Bang Sue Grand Station with other facility zones through exploring and collecting the physical road data by using MMS which is the high-accuracy survey method combined with the route planning to design the best route for allocating public transportation by using network analysis technique to create the 3D platform as a virtual space and 3D point cloud for autonomous driving for the smart public transportation system (auto-driving) covering the Bang Sue Smart City.

If this idea is developed and implemented concretely, it will help to create a safer, more sustainable, and more efficient public transport system. In addition, the 3D data obtained from the MMS survey can be further applied in data management such as road asset management, access point, road or pedestrian ways design, and road safety which is in accordance with the concept of urban development to be Smart Mobility, especially convenience and accessibility development.



Data to be used

Data provided by PASCO

- MMS survey equipment.
- High-precision 3D coordinate point data from MMS.
- Road physical data such as road surface, road furniture.

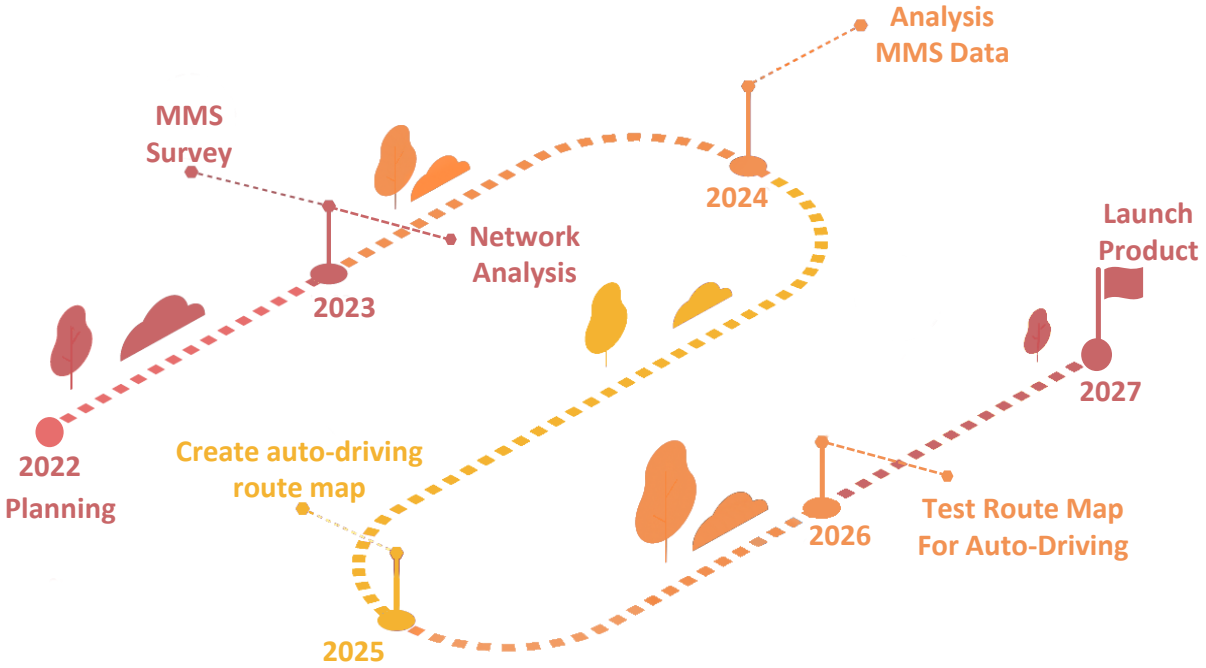
Data provided by City OS (or relevant agency)

- GIS Data e.g., road network data.
- Dynamic data e.g., people flow data.
- Probe data e.g., traffic data from GPS installed in vehicles.

Approximately budget for Pre & Post process ≈ 200K THB / KM.

Compatibility with Theme

- Category-1: Data for Bang Sue Area Development
  - **ID 1-9 :** (Bang Sue Area information > Connecting points with outside facilities > MRT, Bus, etc.
- Category-2: Data for Bang Sue Grand Station
  - **ID 2-7 :** Bang Sue Grand station (drawings) > Facility information > Access roads, Connection to transfer.
- Contributes to enhancing the smart mobility and accessibility of the Bang Sue area through autonomous driving route maps for public transportation service.
- Compatible with the smart mobility vision (accessibility) of Bang Sue Smart City by developing digital twin.



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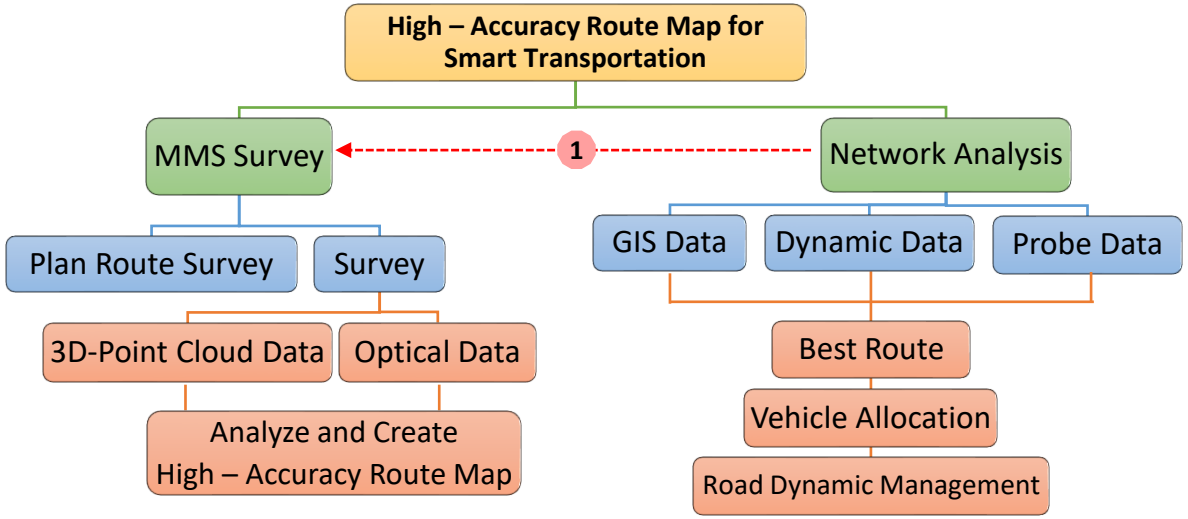
Technical aspects



1 = Network Analysis method provide the best route data for MMS survey process.
(Officer will plan MMS survey route following the result (Best route) from network analysis process)

- Integrate the Bang Sue Area information (ID: 1-9) and Bang Sue Grand station data (ID: 2-7) combined with the MMS and network analysis for the service provision smart transportation route map.
- PASCO has implemented these techniques in Japan and Thailand, for example;
  - **Mobile Mapping System (MMS):** Using a laser-measurement system mounted on a measuring vehicle to collect high-precision 3D coordinate point data of surrounding areas while driving the vehicle. This measurement result is used to create dynamic maps required for auto-driving cars as well as for 3D data creation technology in i-Construction.
  - **Network analysis:** using geospatial data to support Logistic service and vehicle allocation and delivery planning. It solves issues such as reducing costs and streamlining work by vehicle allocation support system and mobile object management system, particularly for transportation via trucks, buses, and other vehicles.

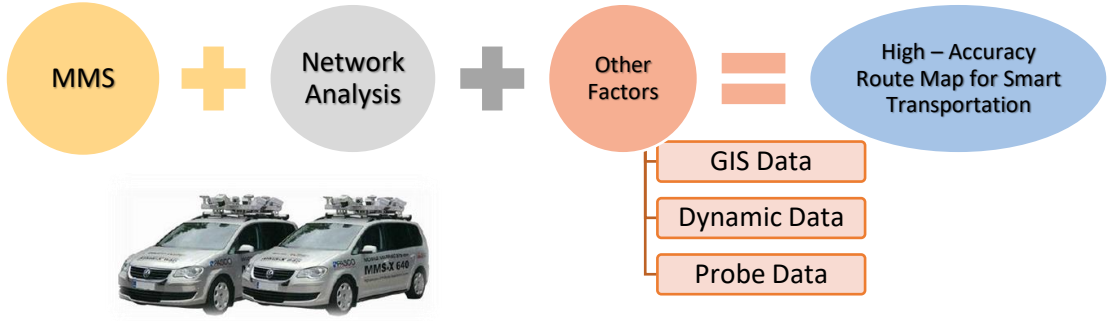
How innovative

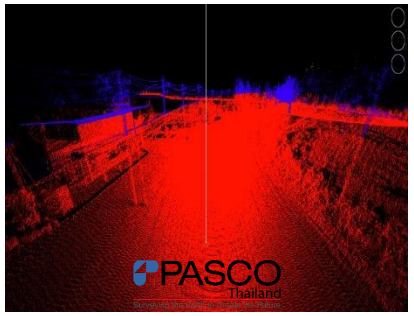
Auto-driving vehicles require a high-resolution mapping database to design accurate and safe transport routes.

The high accuracy route map generates by exploring and collecting the physical road data by using Mobile Mapping System (MMS) which is the high-accuracy survey method combined with the road network analysis technique to create the best and safest route map for the smart public transportation system (auto-driving).

Apart from analyzing MMS data and Network analysis, we also used other essential information, such as dynamic data, people flow data, probe data, and GIS data to create a high-accuracy route for the most optimal use.

In addition, the 3D data obtained from the MMS survey can be further applied in data management such as road asset management, access point, pedestrian way, and road safety.





Feasibility

Our idea based on the smart mobility concept by using a high-accuracy route map can solve the issues in Bang Sue Smart City as follows:

- Data Accuracy
The results of detection by MMS are highly reliable and accurate, meanwhile it can be apply to improve road management and create high-accurate and efficient route map innovations.

- Traffic Management
The presence of a high-accuracy route map for public transport in the Bang Sue Smart City area can reduce the number of private vehicles which is the main cause of traffic jams as well as reducing the number of accidents that may occur in the future, make more road safety, and increase accessibility which is the best solution for the smart city.

- Save energy & Reduce Pollution
This ideal can generate a convenient and safety route map; moreover, it can also reduce energy consumption from fuel which is the cause of carbon dioxide emissions and various greenhouse gases, that are the main cause of global warming.

- Utilization in the future
When this area is ready for service, we will be able to analyze the MMS data to manage road asset, access point, pedestrian way, road safety, create the people flow data and public traffic information .

This project has provided Route Map in Bang Sue smart city area

Bang Sue Grand Station (Krung Thep Aphiwat Central Terminal) and Bang Sue Smart City located in the new central business district of Bangkok which is connected to various facilities areas. In addition, several train lines from Bang Sue Grand station can connect across the country as well as other neighboring countries such as China, Laos, and Malaysia in the future. Thus, connecting with the international will exalt the domestic economy and increase investment in Thailand.

Figure 2 shows the design of the future road network. The yellow line connects to the surrounding facilities area in Bang Sue Smart City, such as parks, flea markets, train stations, mass transit stations, government offices, and residential areas.
The quick and easy accessibility will encourage more people to turn to the amenities in this area which could be a smart city model or master plan for other areas in the future.