

Facts about PONS – a new way to get around

PONS is primarily a connected transport ecosystem enabling mobility as a service. It comprises three parts:

- Self-driving electric vehicles providing people in cities with mobility services (Sango)
- A fleet management system including tools for maintenance and data services (Koro)
- An app for journey booking and payment (Okulo)

PONS mobility services are aimed at private citizens as well as companies and cities. PONS' main objective is reducing the number of vehicles in cities where the system will complement public transport.

The price for PONS mobility services depends on how far you need to travel and whether you wish to travel alone or with others. If you are prepared to share your journey, it will cost less but even if you are not, it will be cheaper than owning your own car and significantly cheaper than using a taxi.

Sango – the vehicle built for autonomous driving and for sharing

NEVS' first generation of self-driving vehicles, *Sango*, is based on a design optimized for shared mobility in city environments. The electric-powered and autonomous *Sango* is made to be shared with others while retaining the feeling of travelling in private. With its unique design, *Sango* combines the feeling of privacy while sharing a journey with strangers. The development team at NEVS has built upon the know-how and innovative ways of working from its Saab heritage, together with expertise and influences from other industries, to optimise the user experience. A lot of focus has been put into ensuring that all vehicle systems and components are highly durable to cope with the wear and tear of operating in city traffic with maximal utilisation at all hours of the day.

Sango is fitted with a self-driving system for up to SAE¹ level 4. The system is designed around the following sensors:

- A roof mounted Lidar², four side-mounted Lidars and five side-looking cameras for full 360° coverage close to the vehicle.
- Three forward-looking cameras, with different fields of view for enhanced detail over a greater distance.
- An RTK³ GNSS⁴-receiver with integrated IMU⁵ for supporting localization.

¹ SAE (Society of Automotive Engineers), is an organization of people working in vehicle technology development.

² LDD (Light detection and ranging), is a type of radar that uses laser light instead of radio waves.

³ RTK (Real Time Kinematic), is a satellite navigation technique used to enhance the precision of position data derived from satellite-based positioning systems.

⁴ GNSS (Global Navigation Satellite System)

⁵ IMU (Inertial Navigation System), is an electronic device that measures and reports a body's specific force, angular rate, and sometimes the orientation of the body, using a combination of accelerometers, gyroscopes, and sometimes magnetometers.

All sensors are connected to a powerful computer that processes information about complex road conditions and the surrounding environment to give the appropriate commands to the vehicle.

The system is designed to be modular and scalable to meet future functionality needs.

Sango has an adaptive interior design that fulfills different ride demands. The flexible seating system can be easily switched between *private*, *social* and *family* settings. *Sango* has six movable seats in three rows and is fitted with automatic privacy walls that can be raised and lowered to divide the vehicle into four smaller and more private areas. With the dividing walls raised, private areas are created for up to four people. In social setting, the dividing walls are lowered to allow four people to travel together facing each other. In family setting, up to six people seated in three rows can travel comfortably together.

Future versions of *Sango* will be equipped with individual climate control and ventilation systems, with air filters, to ensure a high level of hygiene in the vehicle.

Passengers will be able to select their own personal settings with ease when booking journeys via an app.

Unique enablers:

- A platform for electrically-powered, autonomous and shared mobility
- Cutting-edging sensor technology that allows full autonomy even in complex road conditions
- Highly flexible interior with a unique system with a range of seating settings for different ride needs
- Privacy walls to enhance ride-safety and privacy in the vehicle
- Optimized for urban traffic

Facts:

- **Length:** 4 266 mm
- **Height:** 1 950 mm (2 018 mm including Lidar)
- **Width:** 2 021 mm
- **Operating weight:** 2 500 kg
- **Battery energy:** 62 kWh
- **On board charger:** 11 kW
- **Charging time:** 2 hours and 45 minutes (30% - 80%) or 5 hours and 30 minutes (0% - 100%)
- **DC fast charging:** Yes
- **Range:** >200 km (WLTP⁶ for city driving). Range is adapted to the area of use and is of less importance for users because the vehicles will not be privately owned. *Sango* charges its batteries when needed and whenever convenient at any time of the day.
- **Autonomous Driving (AD) system:** software from AutoX
- **Maximum speed:** Tailored to the city environment in which the vehicle is used and will be gradually increased. 70 km/h is enough for most cities. The current version of *Sango* is set to 15 km/h and will gradually increase. The next version will have a top speed of 50 km/h.

⁶ WLTP (Worldwide Harmonized Light-Duty Vehicles Test Procedure) is a global, harmonized standard for determining the levels of pollutants, CO2 emissions and fuel consumption of traditional and hybrid cars, as well as the range of fully electric vehicles.

- **Capacity:** 1 to 6 passengers depending on private or shared travel. Each seat is equipped with its own ventilation system and air filter.

Koro – fleet management

NEVS has developed a mobility service platform that orchestrates the customer interfaces and supports service operations. The platform is built on cost-efficient, reliable and globally scalable modern architecture.

NEVS Fleet Management system *Koro* takes care of all maintenance, repair and backstage services for the vehicles to ensure efficient operations. The system automatically optimizes the balance between customer demand and supply of the rides at any given time.

Through highly developed predictive diagnostics, the system processes real time notifications on battery status, service alerts and more. The Traffic Control optimizes route selection for each individual vehicle in real time based on actual traffic flow enabling vehicles to react to various events and traffic congestion, selecting an alternative route to avoid queues for example.

Enabling factors:

- Scalable architecture which is cost efficient and works on global markets.
- A system that manages an entire fleet of vehicles, tailored to live up to customer commitments, maximum operating time for the vehicle and running an effective business.

Okulo – user interface in an app

The *Okulo* app is an important customer interface. It is designed to be simple to use, personalized and filled with all the relevant functions. The intuitive design enables an effortless experience during the whole customer journey, from booking to payment. Personal settings in the vehicle, change of destination and other route choices are all done simply in the app, minimizing contact with surfaces in the vehicle. Help is close by whenever customers need it, via the app or directly in the vehicle if preferred.

For journeys where a user has booked the entire vehicle, several other choices are made available in the app. Among other things, you can connect a playlist from your own device to the speaker system in the vehicle or adjust the interior lighting.

The Customer Relations Management (CRM) system ensures that users will receive the best possible service.

Enabling factors:

- An intuitive user interface easily accessible by anyone throughout the entire experience, from booking to payment.
- Minimal interaction with surfaces in the vehicle because the user interface enables settings in the vehicle to be controlled, together with all other functions during the journey.

General

The first version of *Sango* is currently being test driven at the NEVS site in Trollhättan, together with the first version of *Koro* (fleet management system) and *Okulo* (user interface in the app). Focus is on evaluating the user experience and enabling further technical developments. The next version of *Sango* is planned to be used in a test pilot scheme in limited city traffic in Stockholm over the next few years. The ambition is that the operating area will be gradually increased and eventually cover the entire city. NEVS has also been approached by other cities from around the world who are interested in implementing the mobility system.