We believe in artificial intelligence, but we believe even more in the intelligence of humans.

Constantly looking for new talents.

Safety is our priority.

We are constantly looking for new solutions to help us adapt to the needs and wishes of our customers.

Been involved since the beginning.

Working for NAVYA guarantees full immersion in a rapidly changing and developing industry.

Expand the image of NAVYA worldwide.

Customer satisfaction as a driver of our organization.

Ensure the compliance and quality of our vehicles.

Rally technical teams around the same quality and innovation requirements.

Ensure the proper operation of vehicles every day.

It’s really exciting working on tomorrow’s technologies.

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Supporting Customer Project Manager

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The company

NAVYA specializes in developing autonomous driving systems. The fully autonomous, driverless, and electric AUTONOM® SHUTTLE was launched in September 2015 as a first and last mile passenger transport solution.

- **2 plants**: Vénissieux, France and Saline (Michigan), USA
- **=280 employees**: in France (Paris and Lyon) and in the USA (Michigan)
- **Strategic agreements**: with key partners: Valeo, Keolis, Axa, Esmo
- **=21 certifications**: with authorization to drive on public roads
- **Incorporated in 2014** with the support of Robolution Capital, an investment fund managed by 360 Capital Partners, its main shareholder; Cap Decisif Management (Gravitation & Paris Region Venture Fund [Ile-de-France Region]), Valeo, Keolis and Esmo are also shareholders of NAVYA.
- **160 NAVYA SHUTTLES**: sold in 20 countries
- **One of the most advanced driverless technologies on the market**
- **Deployments**: in France, USA, Germany, Switzerland, Japan, Australia, and many other countries
- **One of the most experienced R&D teams in the world**
- **Our other autonomous vehicle**: AUTONOM® TRACT AT135
- **Our other autonomous vehicle**: NAVYA's autonomous vehicle

**ABOUT NAVYA**

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**Figures as December 2019**
NAVYA TECHNOLOGY, autonomy lever for any kind of platform

In order to safely manage all situations related to a completely autonomous vehicle in a given environment, NAVYA technology is based on three pillars:

- **Perception**
  Understands the environment in which the vehicle is located, knows its position, detects, categorizes, and monitors.

- **Decision**
  Calculates and determines the route and trajectory.

- **Action**
  Makes optimum use of the decisions taken based on the data collected in real time by the sensors.

1. 3D vision and environment recognition
2. Localization and prioritization of objects
3. Real-time obstacles detection and continuous optimization of the vehicle’s route
4. Definition of the vehicle’s behavior on the route and configuration of its decision-making (position on the road, priorities, etc.) using algorithms
5. Continuous monitoring and supervision of operating fleets
6. Safety

NAVYA technology designed for the highest levels of safety:

- **Vehicle safety**: software updates for continuous improvement of safety.
- **Human safety**: NAVYA technology designed to avoid remote takeover of control of the vehicle.
- **Data security**: high level of data encryption.
Service cycle

A leader and pioneer in autonomous driving systems, NAVYA is committed to provide a solution tailored specifically to its customers and partners in a continuous improvement process.

**INTELLIGENCE**
- **TAILORED ARCHITECTURE**
  Design technological solutions based on platforms and their environment
- **NAVYA DRIVE**
  Take the most appropriate decisions using the fusion of data perceived by the sensors architecture

**DEPLOYMENT**
- **NAVYA ENTRY INTO SERVICE**
  Adapt commissioning according to vehicle needs on a given route
- **TRAINING**
  - Build your team’s skills
  - Deployment officer
  - Shuttle operator

**MONITORING OF OPERATIONS**
- **NAVYA SUPERVISION API**
  Manage and optimize the operation of the vehicles in service 24/7
- **NAVYA MAINTENANCE**
  Guarantee reactive assistance from diagnosis to part or component replacement
- **TRAINING**
  - Build your team’s skills and foster their autonomy
  - Supervision technician
  - Maintenance technician

**RETURNS ANALYSIS**
- **COLLECTION AND STUDY**
  - Manage and analyze NAVYADRIVE’s smart data
  - Capitalize on feedback (control of KPIs) to meet the customers’ needs

**CONTINUOUS OPTIMIZATION OF NAVYA TECHNOLOGY**
- - Software updates
- - Sensors architecture
- - Deployment process optimization
- - Supervision API
- - Maintenance
The most proven technology on the market

This unique architecture is composed of high-performance sensors that allow vehicles to locate and analyze the environment. With this technology, vehicles move efficiently and can make the best decisions without a driver. Here is an example of use on AUTONOM® SHUTTLE.

1. **LiDAR sensors**
   2D and 3D perception to map the environment, guarantee precise positioning and obstacles detection.

2. **Odometry**
   Measures wheel speed to estimate vehicle speed and confirm its position.

3. **GNSS antenna**
   Communication between a GPS sensor and a reference beacon to determine the exact position of the vehicle at all times.

4. **Cameras**
   Obstacle detection and estimation of their position relative to the vehicle, environment analysis (signs, traffic lights, etc.) and information extraction.

---

**TECHNOLOGY**

- **Dimensions**
  - Length 4.75 m - Width 2.11 m
  - Height 2.65 m - Empty weight/MAM 2,400 kg / 3,450 kg

- **15 passengers**
  - 11 Seated
  - 4 Standing

- **Average range**
  - 9 hours

- **Operating speed**
  - 25 km/h
Deployments

HOSPITALS

MICHIGAN - MCITY
MICHIGAN - UNIVERSITY OF SALFORD
HELSINKI - METROPOLIA UNIVERSITY OF APPLIED SCIENCES
PERTH - CURTIN UNIVERSITY

LYON - KEOLIS
LYON - ABB
LYON - TOTAL
LYON - MIA

INDUSTRIAL SITES

CAMPUS

MICHIGAN - MCITY
MICHIGAN - UNIVERSITY OF SALFORD
HELSINKI - METROPOLIA UNIVERSITY OF APPLIED SCIENCES
PERTH - CURTIN UNIVERSITY

LYON - LEONARD
PONT-À-MOYEN - CAM
LYON - MIA
CONTINENTAL - LENTZ
CONCERT - LENTZ

CITY CENTERS

LYON - KEOLIS
LYON - POSTAUTO
MONACO - CAM
ABU DHABI - MASDAR
VIENNA - WIENER LINNEN

ORLANDO - BEEP
GENEVA - TPG
SYDNEY - OLYMPIC PARK

TOURISM

VAL THORENS - BERTOLAMI
SINGAPORE - GARDENS BY THE BAY - STELS
HELSINKI - AURINKOLAHTI - HOLO
OSLO - OSLO WATERFRONT - HOLO
VINCENNES - RATP
HONG KONG - WKCDA
3 AUTONOM® SHUTTLES
operated on the TEPCO nuclear power station in Fukushima

Challenge
Provide employees with efficient transport adapted to the constraints of a nuclear power station.

Solution
3 AUTONOM® SHUTTLES

Results
An efficient transport service and a scalable solution capable of adapting to developments on site.

The advanced autonomous shuttle is the focus of visitors attention. It has been used by over 2,000 people so far.

Tomohide Hosoda
Manager, Decommissioning Engineering Company
Tokyo Electric Power Company Holdings, Inc.

View our videos and use cases
City Centre - Sion

Over 50,000 passengers used AUTONOM® SHUTTLES in Sion

Challenge
Connect the train station and city centre on a 3.5 km route.

Solution
2 AUTONOM® SHUTTLES were entered into service in June 2016.

Results
A transport system used by over 50,000 passengers, visitors, and tourists which contributed to develop the city centre's transport network coverage.

With the technological advances proposed by NAVYA, we have been able to broaden our horizons. Customers (youngest to oldest) get onto the shuttles curious and get out happy.

Vishala Haxhe
Safety driver / teleoperator
PostAuto

View our videos and use cases
Challenge
Improve mobility on the campus and foster autonomous vehicle acceptance

Solution
› 2 AUTONOM® SHUTTLES were entered into service in June 2018

Results
In service from 9am to 3pm Monday to Friday which allowed autonomous vehicles acceptance by the population to be assessed.

NAVYA was a great partner for us when we started the Mcity Autonomous Shuttle service to the University of Michigan’s North Campus Research Complex. This deployment is a research project that helps us assess the acceptance of automated vehicle technology by consumers.

Greg McGuire
Associate Director
Mcity
Special case - Scheemda Hospital

Private and public road transit for Scheemda Hospital (Netherlands)

Challenge
Supplement the local transport offer between Scheemda hospital and the bus stop with a roundabout to negotiate.

Solution
1 AUTONOM® SHUTTLE since August 2018.

Results
A 850-metre mobility solution between public and private roads.

NAVYA’s autonomous shuttle allowed us to set up an efficient transport solution from the entrance of Scheemda Hospital to the bus station and its vicinity. This service has been highly appreciated by hospital staff, visitors, and patients over the year.

Tahir Ehetasham
Technical Director Self Driving Mobility
Provincie Groningen

View our videos and use cases
## Technical characteristics

### Capacity
<table>
<thead>
<tr>
<th>Passengers</th>
<th>Seated</th>
<th>Standing</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>11</td>
<td>4</td>
</tr>
</tbody>
</table>

### Energy
- **Battery**: LiFePO4 battery pack
- **Theoretical capacity kWh**: 33
- **Theoretical battery life in hours**: 9
- **Time to charge to 90% in hours**: 8 (plug 3.6 kW), 4 (plug 7.2 kW)
- **Changing temperature °C**: 0 - +40
- **Operating temperature °C**: -10 - +40

### Dimensions
<table>
<thead>
<tr>
<th>Length m</th>
<th>Width m</th>
<th>Height m</th>
<th>Minimum ground clearance m</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75</td>
<td>2.11</td>
<td>2.05</td>
<td>0.20</td>
</tr>
<tr>
<td>Tires</td>
<td>Wheel rims</td>
<td>Empty weight kg</td>
<td>Maximum allowable mass kg</td>
</tr>
<tr>
<td>215/60 R17</td>
<td>Alloy</td>
<td>2,400</td>
<td>2,400</td>
</tr>
</tbody>
</table>

### Engine
- **Drive wheels**: 2
- **Engine**: Electric
- **Power kW**: 15 nominal (25 peak)
- **Maximum operating speed km/h**: 25
- **Maximum slope %**: 12

### Equipment
- **Temperature regulation**: Automatic regulation
- **Airconditioning**: (2 x 4 kW cool)
- **Heating**: Automatic regulation (1.4 kW)
- **Doors**: Double doors
- **Bodywork**: Polyester
- **Windows**: Glass
- **Visual information**: Cabin 15” touch screen
- **Sound information**: Internal speakers

### Obstacle location and detection
- **LiDARs 1**: Two 360° multi-layers LiDARs
- **LiDARs 2**: Six 180° single-layer LiDARs
- **Cameras**: Front/rear cameras
- **Odometry**: Wheel encoders + Inertial sensor
- **GNSS**: 2 x RTK

### Safety
- **Emergency stop button**: 2 buttons
- **SOS intercom**: 1 button / via monitoring
- **Emergency brake**: Automatic
- **Parking brake**: Automatic
- **Safety pack**: Safety vest, triangle and first aid kit
- **Handgrips (x4), Grab bars (x2), Emergency hammer (x1), Safety pack (Triangle, yellow vest, first aid kit)**
- **Fire extinguisher**: Cabin camera
- **Mobile access ramp for passengers with disabilities**: Manual ramp
- **Lighting**: Two-way pack
- **Audible warning devices**: Buzzer, Horn
- **Guiding equipment**: Automatic regulation (3.4 kW)
- **Double doors**: Polyester, Glass
- **Visual information**: 38” screen to the outside (x2)
- **Sound information**: Internal speakers

### Options
- **- GNSS base**
- **- Seat pack with lap seat belts**
- **- Lap seat belts for folding seats**
- **- Thermal filter (vehicle window insulation)**
- **- Metallic paint**
- **- Automatic access ramp**
- **- 4 wheel drive**
We look forward to seeing you on board!