

Holo

# Presentation of Holo



# Introduction

Based in Copenhagen, Denmark.

Founded in October 2016 by Semler Group, Denmark's largest automotive distributor.



Semler Group is a **104 year old** family-owned company that imports, sells and services VAG vehicles

Semler Group is a diversified company operating in 8 countries:  
**Denmark, Sweden, Norway, Iceland, Finland, Lithuania, Estonia, Latvia**

**Holo** is a 100% owned company in the group, but **operates independently**

Holo was founded as a **response to the emergence of autonomous vehicles.**

# Holo's business segments - status

holo Air

holo Ground

Holo Sea?

People transportation

Freight transportation

Utility

Technology not yet mature -  
looking for vendors

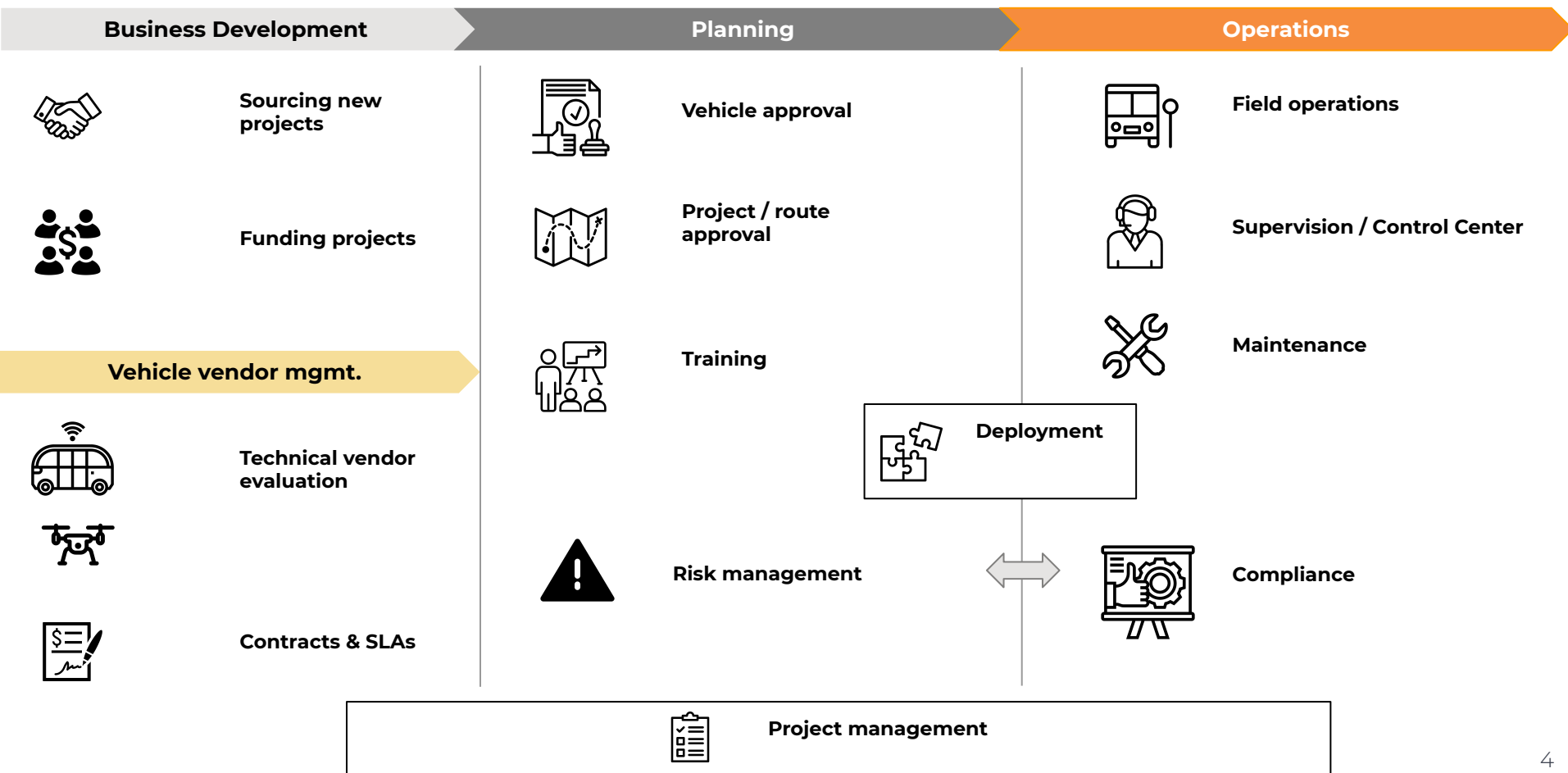
Building experience -  
implementing first project and  
looking for new ones

Extensive experience -  
multiple projects and multiple  
vendors

Building experience - looking  
for vendors and projects

# Holo's has broad knowledge across the value chain of autonomous mobility projects

More at <https://www.letsholo.com/services>





# Holo has extensive and unique operational experience from different projects across the Nordics and the Baltics

## Being planned



### Oslo - Ski

*Passenger vehicles*



### Slagelse Hospital

*Passenger vehicles*

## Healthdrone



### Odense University Hospital

*Air freight*



### Ærø

*Air freight*



### Svendborg

*Air freight*

## In operation



### Aalborg - Aalborg East

*Passenger vehicles*

## Completed



### Gothenburg - Chalmers University

*Passenger vehicles*



### Gothenburg - Lindholmen phase 1

*Passenger vehicles*



### Køge - SUH Køge Hospital (indoors)

*Passenger vehicles*



### Helsinki - Aurinkolahti

*Passenger vehicles*



### Tallinn - Sohjoa Baltic

*Passenger vehicles*



### Oslo - Akershusstranda

*Passenger vehicles*



### Oslo - Kongens Gate

*Passenger vehicles*



### Oslo - Ormøya

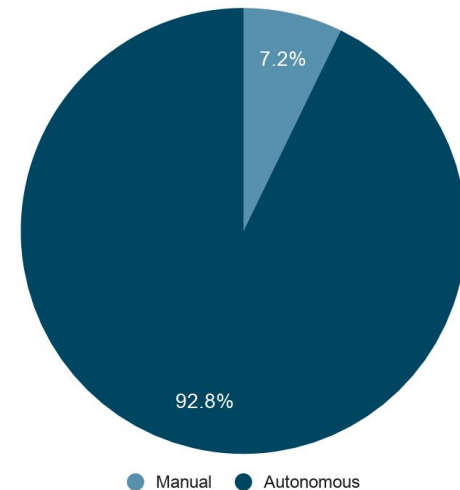
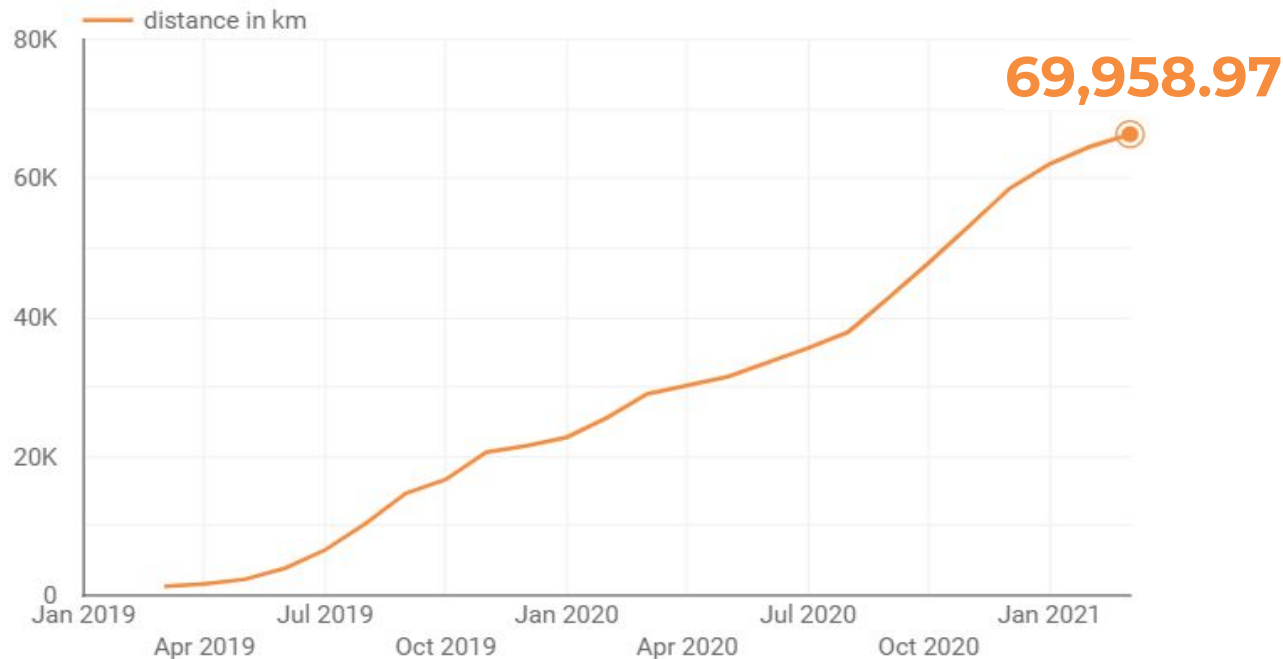
*Passenger vehicles*



### Copenhagen - Nordhavn

*Passenger vehicles*

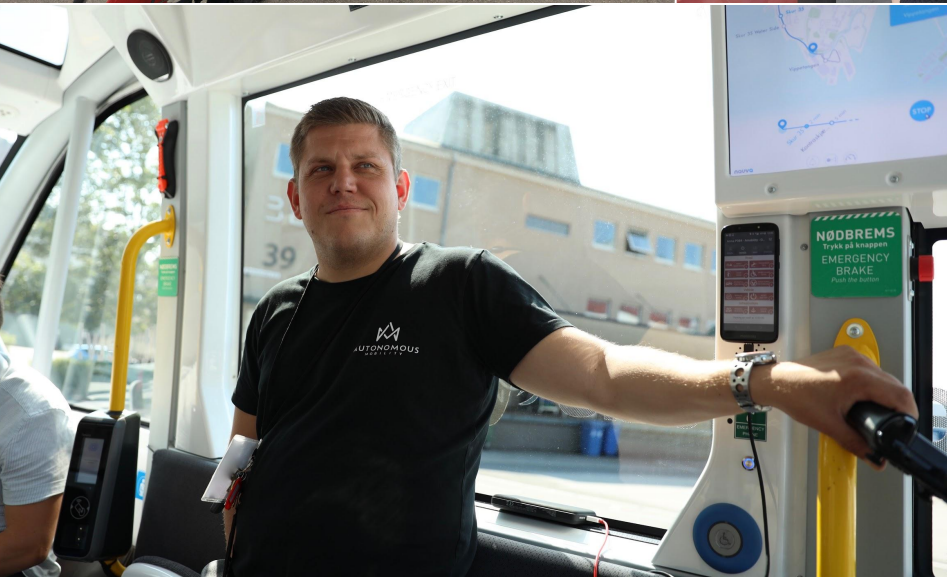
Holo's operational experience is constantly increasing - adding more kilometers and passengers every day



\* Updated March 2nd 2021

**Distance in total:** +69.000 kilometers\* (since Holo started receiving data)

**Passengers in total:** 54.909



















# Healthdrone, Funen

More at

<https://www.letsholo.com/healthdroneproject>



## The use case

Odense University Hospital have two satellite hospitals, one in Svendborg and one on Ærø. They saw a need for a fast transportation connection between the hospitals where blood samples and medicine could be transported.



## The route

The route connect the three hospitals on Funen. All the hospitals are located in urban environment and requires extra fail safe. The route from OUH-SVE-ÆRØ is about 65 km.



## The drones

A Rigi Tech drone has been customised for the project. The drone can fly the distance on a single battery charge, and a fail safe with parachute has been integrated in the drone for urban flights,



# Holo's operational experience has informed Toyota Motor Europe's decision to choose Holo as operator for a new project in Norway

Ruter#

sensible<sup>4</sup>



## Members of the project

- Holo - responsible for project approvals and operating the vehicle
- Toyota Motor Europe - supplying vehicles
- Sensible 4 - autonomous software and modification of vehicle to include sensor stack
- Ruter - public transport authority responsible for communication to end-customers

## Basic facts about the project

- Location: Ski, Norway
- Route type: Mixed traffic
- Project duration: 2 years
- Number of vehicles: 2

## Special characteristics

- Collaboration with OEM
- Type-approved vehicles with AD kits mounted
- Preparation for vehicles with different form factors and improved autonomous performance
- All-weather operations



## User interfaces



Holo end-user app  
(iOS / Android)



Holo Supervision Portal



Holo Operator app



Operational dashboards



Control panel



Follow site  
[follow.letsholo.com](https://www.letsholo.com)



Fleetio

Fleet Maintenance Management

## Backend

Dispatch + Routing management  
Licensed by Holo



holo Platform

Cloud computing

Storage



Various connectors



## Hardware



Technology vendor's platform



Sensors

More at

<https://www.letsholo.com/platform>

## External partners:

Holo custom integrations



Dispatch + Routing management



Holo API consumers



# As the operator Holo has a valuable combination of operational data to optimize performance

## Manually collected data

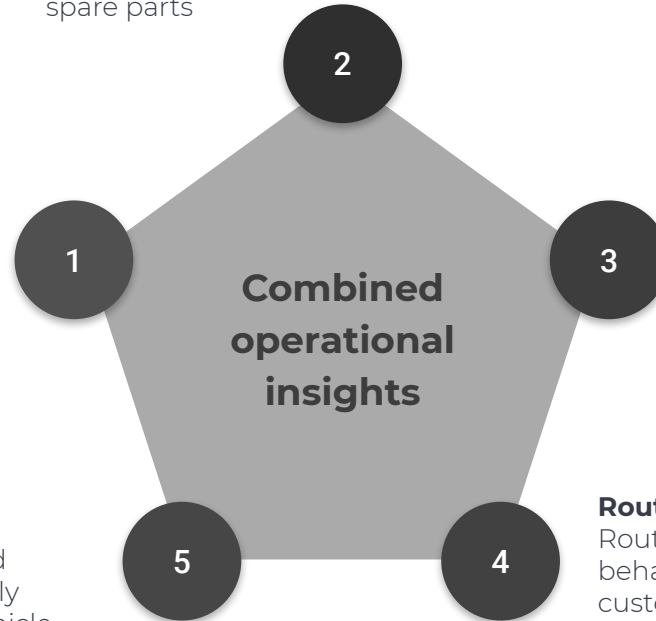
- Data registered manually by the safety steward in the vehicle, covering safety situations and customer interactions not registered elsewhere.
- Vehicle maintenance data and information about spare parts

## Vehicle telemetry data

From vehicle vendor or using Holo's own sensors on the vehicle.

## Safety & compliance-related targets

Safety targets from authorities, matched with vehicle telemetry data and manually reported data from safety steward in vehicle.



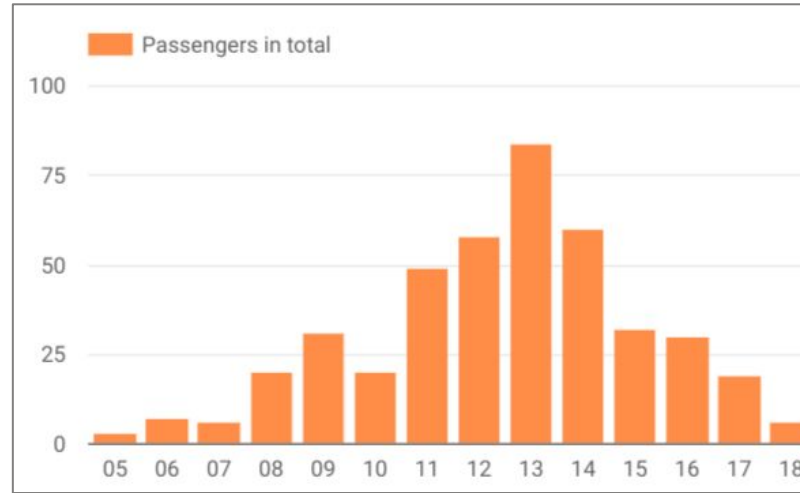
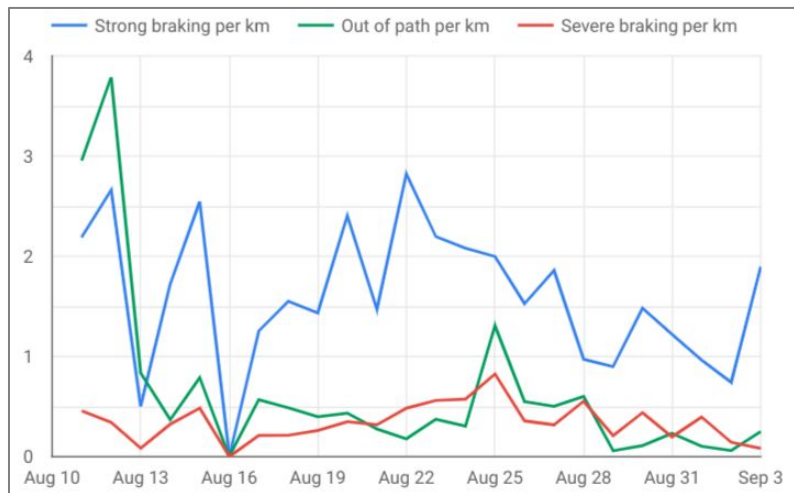
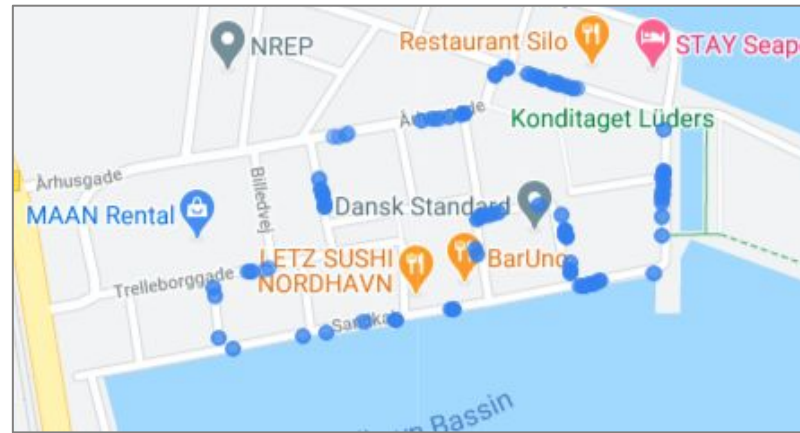
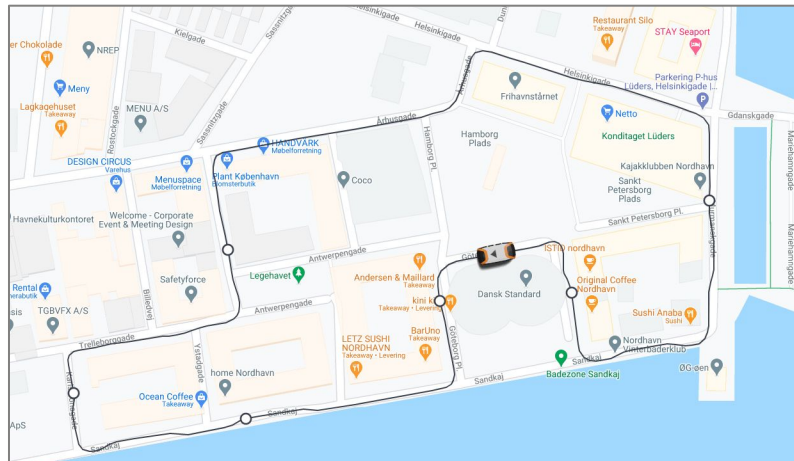
## Data sourced from 3rd parties

- Weather data
- Traffic data
- Power production data (CO2 emissions)

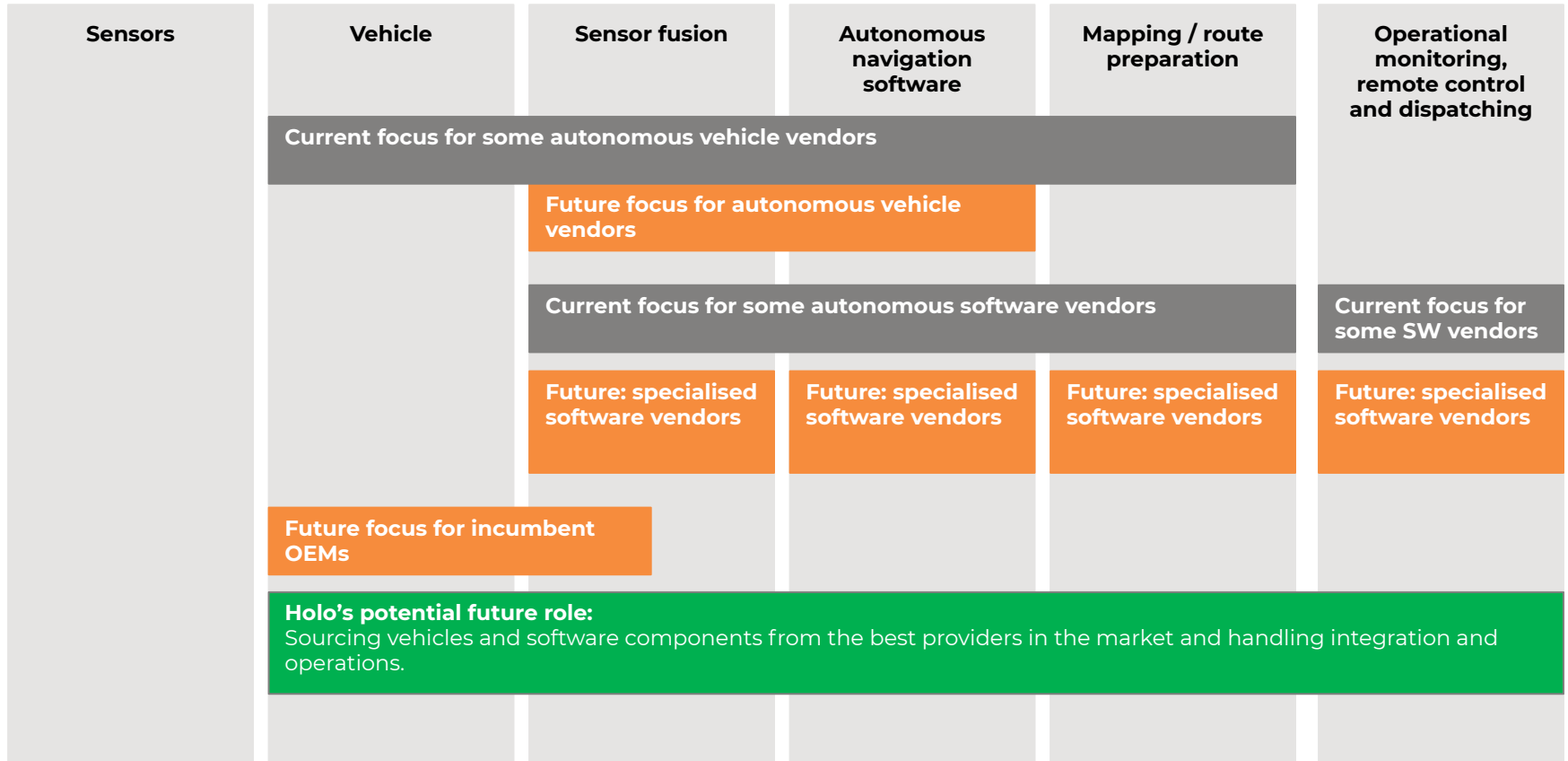
## Route-related data

Route, schedules, road rules and vehicle behaviour planned in collaboration with customer, vehicle vendor and local road authorities.

# Digging into the details to improve operations



# As the market develops Holo's future role could be as an integrator of components to deliver autonomous operations



# A partnership or collaboration with Holo will provide strategic benefits across the value chain of operating autonomous vehicles

## Business Development

### New projects and customers

Contact to Holo's network of potential customers with a confirmed interest in autonomy

### Business case validation

Verification of pricing levels and commercial options for various autonomous projects

## Vehicle vendor mgmt.

### Vehicle vendor overview

Access to Holo's expert knowledge on maturity of different autonomous vehicle vendors

## Planning

### Vehicle approval

Approval pre-review of autonomous platforms - does Holo think a vehicle can be approved in Scandinavia?

### Project / route application + risk assessment

Approval pre-review of various routes and use-cases - does Holo think it can be approved for autonomous operation?

### Deployment

Insight into the complexities and challenges of mapping a route and deploying autonomous vehicles.

### Safety driver training

Understand what it takes to train safety drivers for autonomous driving in Scandinavia.

### Compliance:

How does an autonomous project stay compliant during operations and ensure that commitments made during the application phase are delivered?

## Operations

### User experience

Access to data collected manually on routes and the experience of safety drivers

### Control center and remote control

Access to experience monitoring and controlling vehicles remotely

### Maintenance

Insight into operational maintenance requirements for autonomous vehicles

### Operational data

Insight into operational data requirements



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