

Autoware AW1



Vehicle Definition

Vehicle Definition & Features	
Autonomous Delivery Vehicle	
Exclusively driving on private campus	
Symmetric Vehicle	optional
4-wheel steering	
Crab steering	
HVAC	optional
Agile battery swap	optional
1 side cargo door with latch opening	
Variable height to facilitate unloading	optional

Vehicle Definition & Features	
Light sensor, temperature sensor, door sensor	
Front lights, rear lights, turn singles, licence plate lights	
2 LiDAR (rear/front), 4 cameras, 1 short-range radar, 1 GPS/IMU unit	
Headlight and taillights with turn signals	
Horn	
Interior light	
AVAS system	
5G/BLE	
Exterior screen	optional
Control via phone app (BLE or 5G)	

Dimensions (mm)	
Length	3500
Width	1900
Height	2350-2660
Internal clearance	2100
Ground clearance	40-200
Variable height	160
Wheelbase	2800

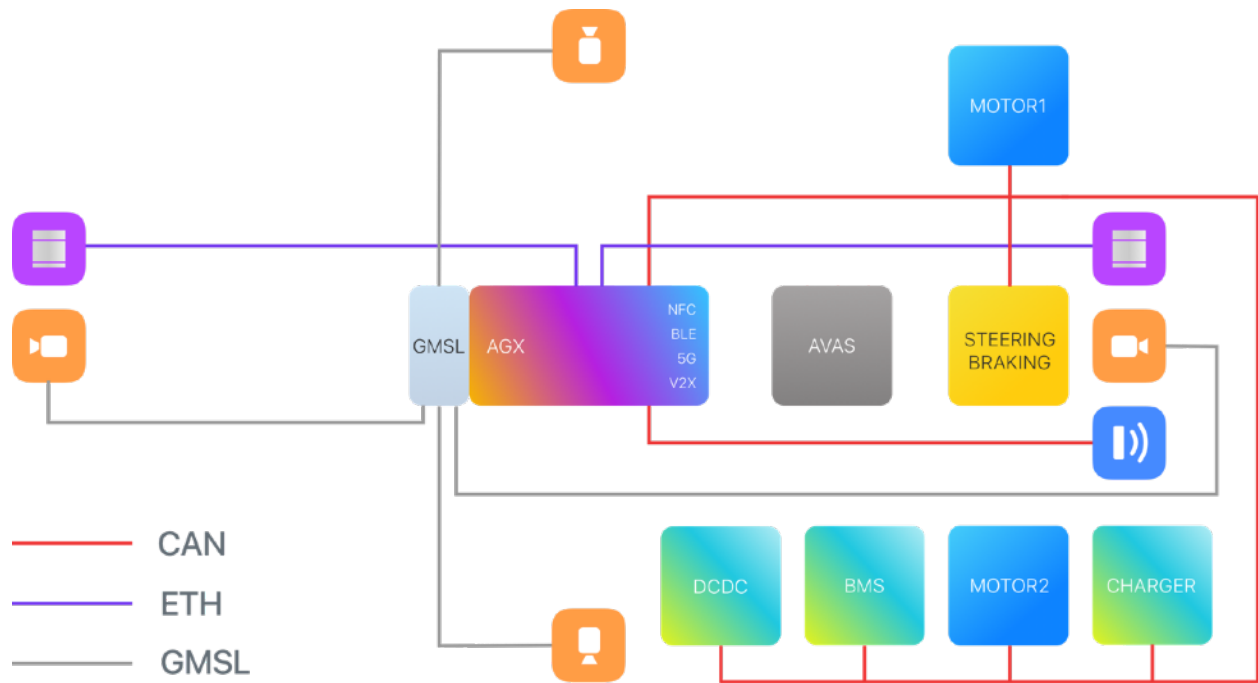
Specs	
Tires	15"
High Voltage	96 V
Battery	23 kWh
Max speed	20 km/h
In-wheel motors (4)	22 kW
Wheel torque	840 Nm
Payload	1000 kg

Timeline (to be adjusted after details have been refined):

- First prototype in 8 months
- Next 4 pre-series units in 4 to 5 months
- Next 5 units in 4 months

Electronics & Electrical Architecture

- Add EE connections (make ECU choices)
- Depends on the chosen skateboard/moteurs/batteries (use VDK)
- Estimate power consumption
- Figure out the door, as simple as possible
- Engineering development hours estimation? Not in this proposal



Autonomy
Drive-By-Wire
Gateway
Connectivity
Body Controls

Nvidia AGX Orin based industrial computer

- GMSL cameras
- Ethernet LIDAR
- CAN for Radar

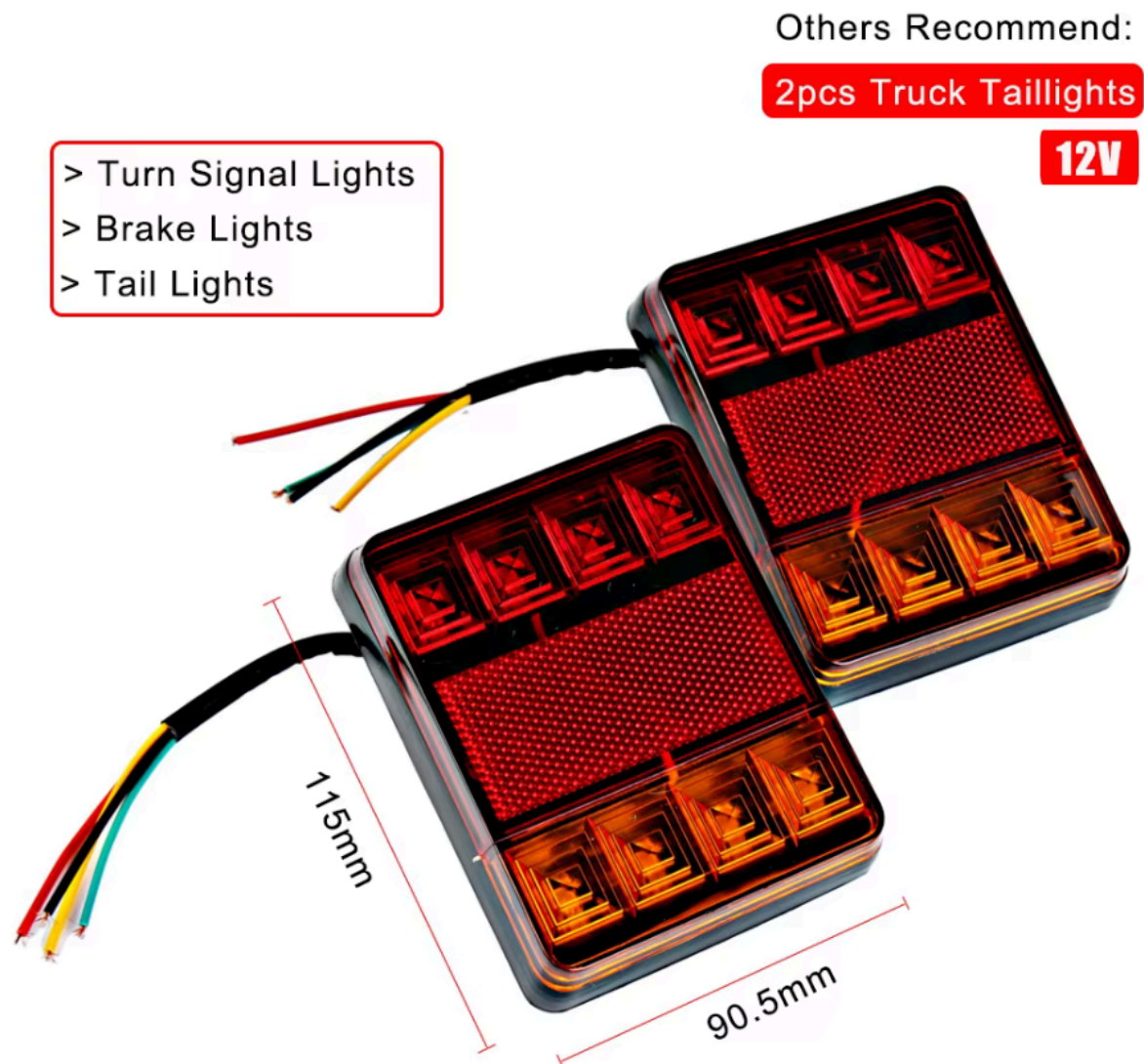
Sensor Suite

Examples

- 2 LiDAR: Velodyne VLP-32 or VLP-32C
- <https://icave2.cse.buffalo.edu/resources/sensor-modeling/VLP32CManual.pdf>
- 4 Cameras: TierIV C1
- https://www.amazon.com/TIER-IV-Autonomous-Monitoring-C1-120/dp/B0D3KMMCP4?ref=ast_sto_dp&th=1
- Radar: Continental ARS
- https://www.continental-aftermarket.com/media/3751/continental_longrangeradar_salessheet_v1.pdf
- IMU/GPS: TBD

Options for sensors/actuators

Exterior lighting



https://www.aliexpress.us/item/3256806254504252.html?spm=a2g0o.productlist.main.3.49695b8clgVp3n&algo_pvid=c3e08bb4-7855-495e-a497-000fb77eb0d5&algo_exp_id=c3e08bb4-7855-495e-a497-000fb77eb0d5-1&pdp_npi=4%40dis%21USD%2112.39%210.99%21%21%2189.36%217.19%21%40210318e817322132049237963e5dcb%2112000037175242435%21sea%21US%210%21ABX&curPageLogUid=My5RydWTgrtC&utparam-url=scene%3Asearch%7Cquery_from%3A



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To simplify, existing offroad lighting can be used.

Interior lighting



<https://www.ledvance.com/professional/products/luminaires/professional-luminaires/downlights/flat-downlight-luminaires/flat-downlights-with-integrated-driver--square-shape-c8467?productId=44900>