



The intermodal transport system ConnX

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Challenge

Challenge

Definition transport network

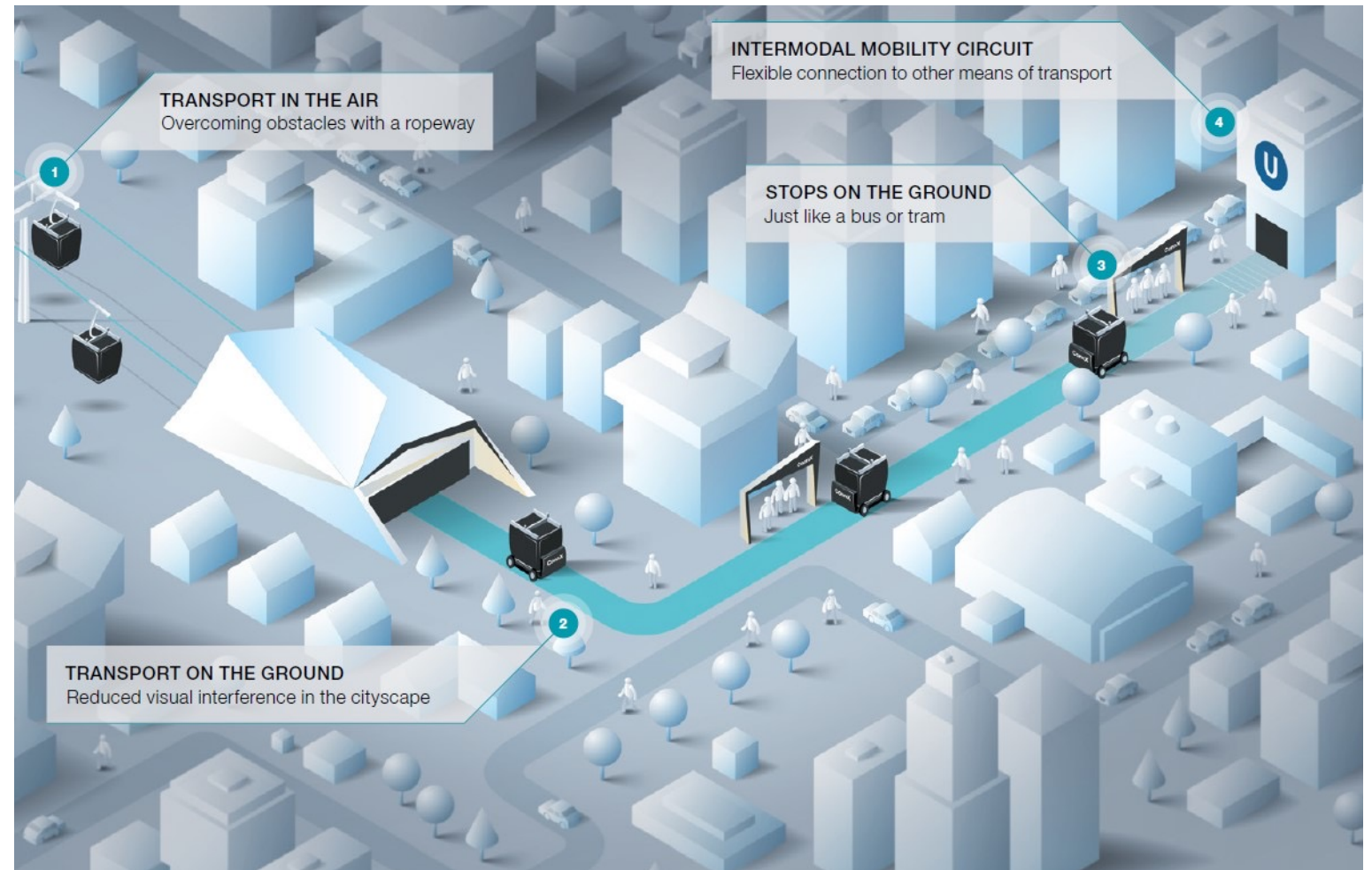
In public transport, individual transport routes are connected at junction points to form a transport network

Challenges to integrate a cable car in a transport network

- Appropriate location for station close to junction points of transport network
- Reduce visual impact of cable car
- Direct connection to other means of transport
- Flying over of public terrain and buildings
- Curves in the line

Intermodal transport

- Intermodality refers to a transport route for which different means of transport are combined
- In passenger transport, individual means of transport are linked together for a journey to be made. Passengers change from one means of transport to another
- In freight transport, we speak of intermodal transport when standardized transport units, e.g. containers or semi-trailers, are used which are moved by different load carriers during transport



Requirements

- Direct transport from junction point to junction point
- Minimize walking distances when changing to another mean of transport
- Flexibility in designing connections
- Simple bypass of infrastructural barriers on the ground - such as buildings or monuments;
- Reliably maintain intermodal mobility cycles and avoid traffic jams;
- Implement stops on the ground, similar to buses or trams;
- Reduce visual impact in the cityscape;
- Realize connections between cable-guided and terrestrial systems without passengers having to change trains;
- Quick and cost-effective mobility solutions.

The ConnX system

The ConnX concept

- Combination of cable car with self-propelled vehicles
- Cabin is handed over to a self-propelled vehicle at the cable car station
- Flexible ground track connecting traffic junction points
- Stopping points along air- and ground-section
- Low visual impact
- Easily bypass infrastructural barriers on the ground



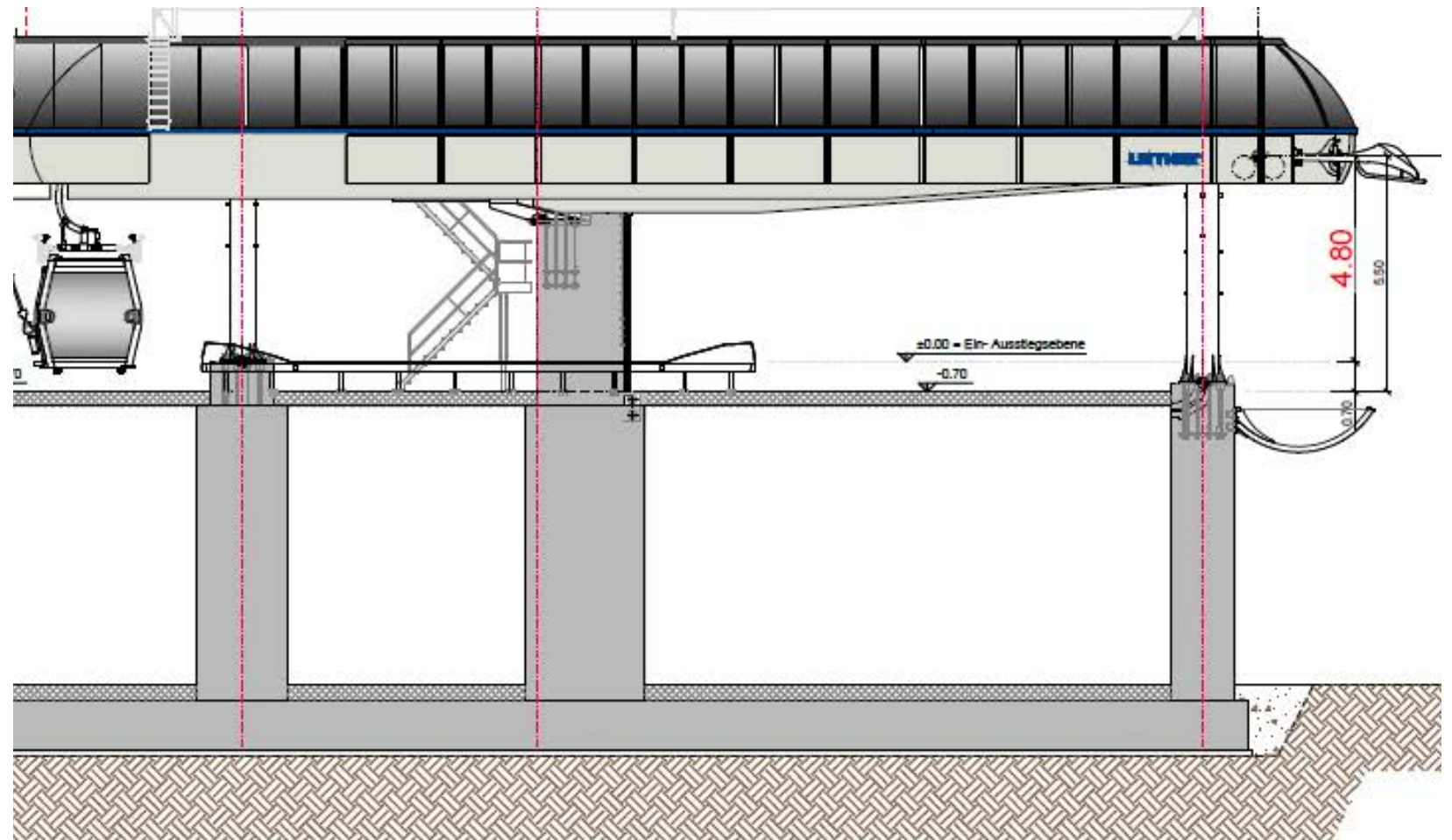
ConnX subsystems

The ConnX system consists of several subsystems

- Cable car section
- Transfer station
- Cable car vehicle
- Self-propelled vehicle
- Ground section
- Stopping point
- Control and monitoring system

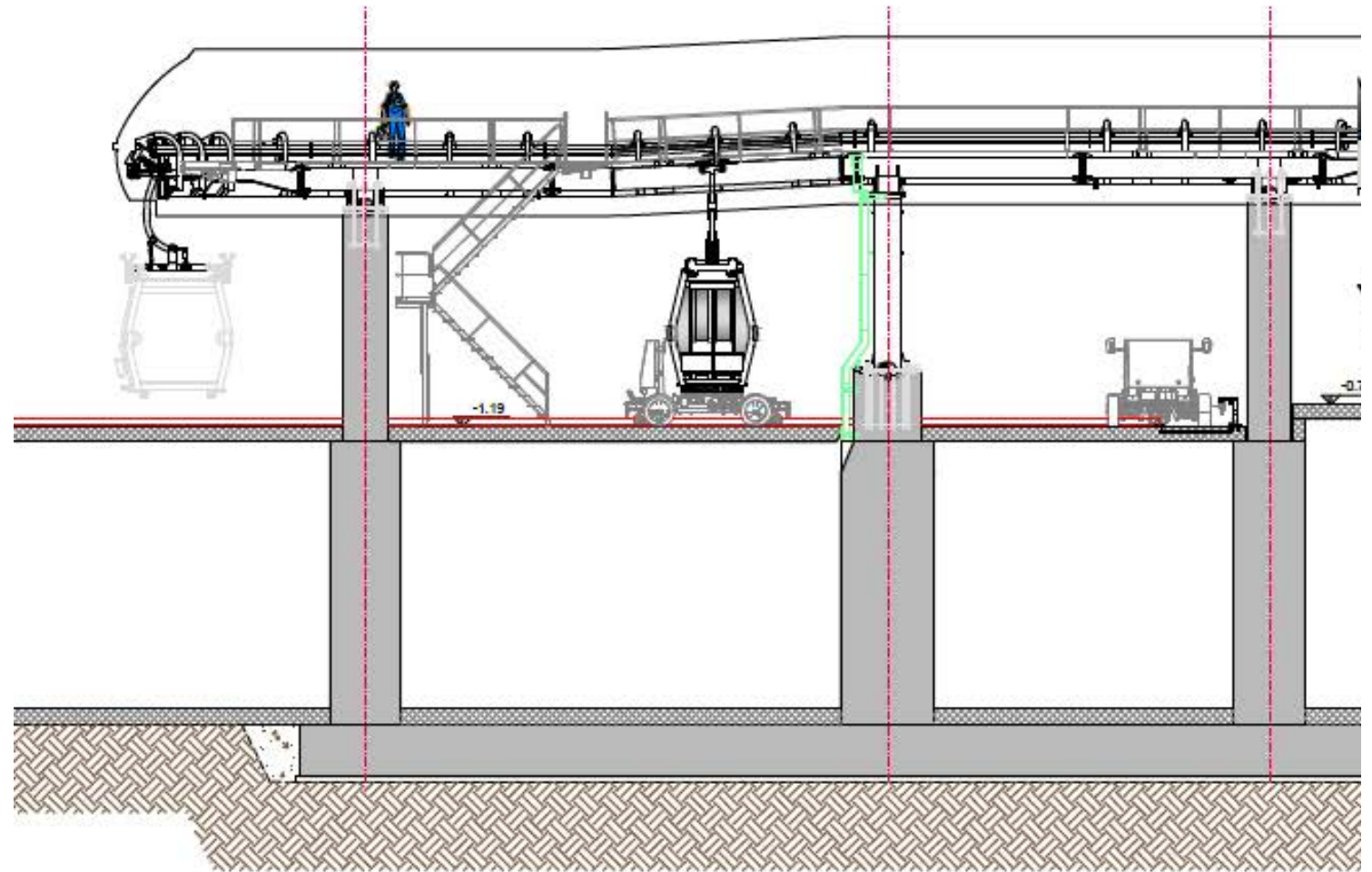
Cable car section

- Classic gondola lift
- Acceleration and deceleration of cabins
- Standard cable car line
- Standard garaging system for cabins
- Full or partially decoupling from ground section possible

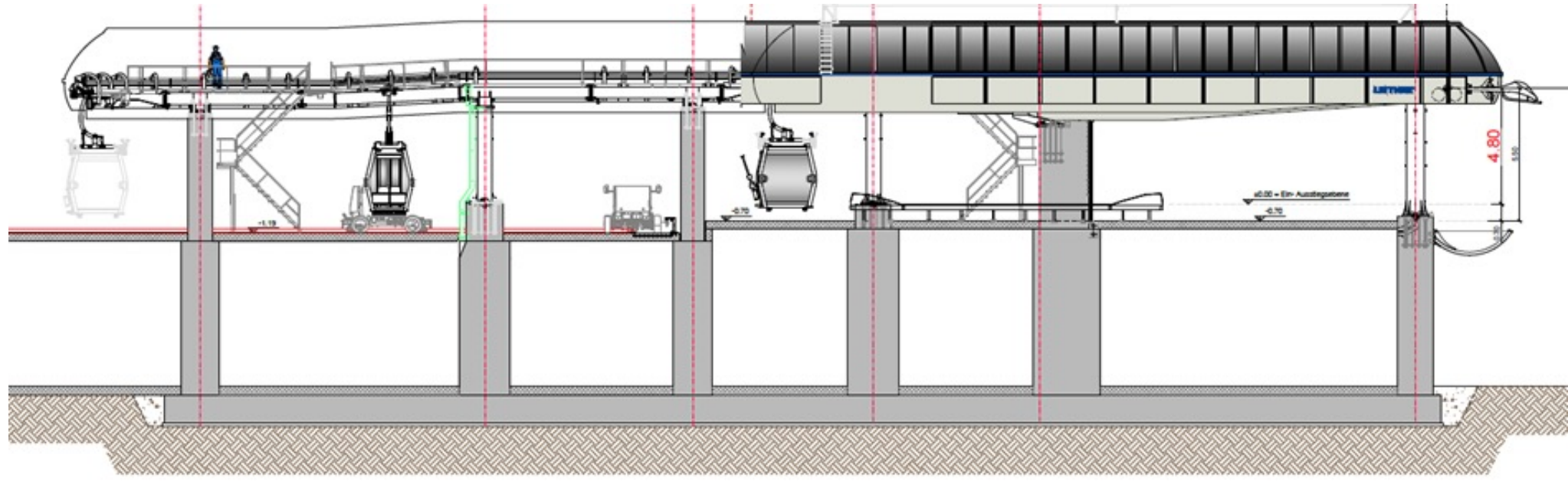


Transfer section

- Transfer of cabin from cable car hanger to self-propelled vehicle
- Propelled tyre conveyors
- Rail switches
- Advanced sensor system



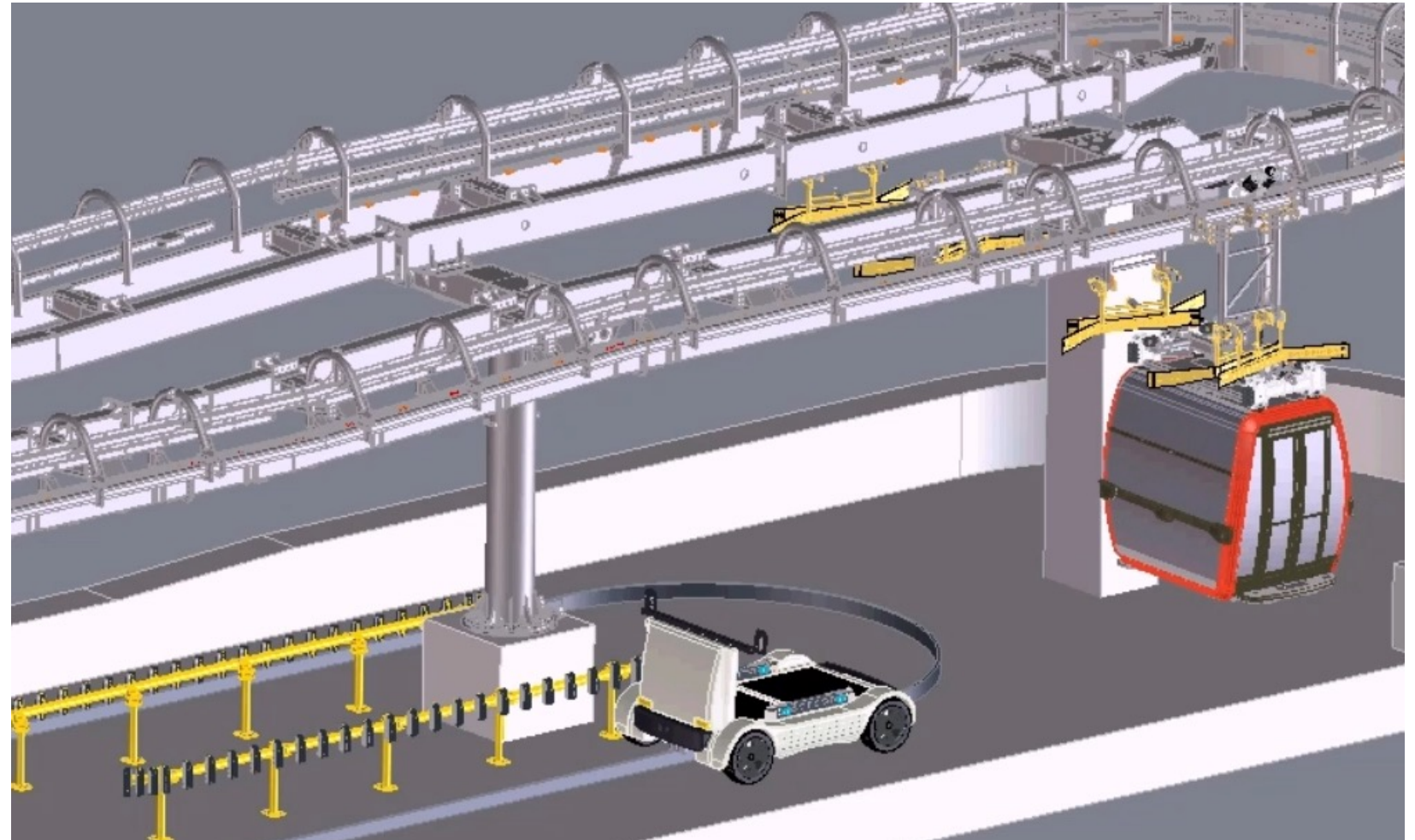
Transfer station



Transfer section

Approach of the vehicle

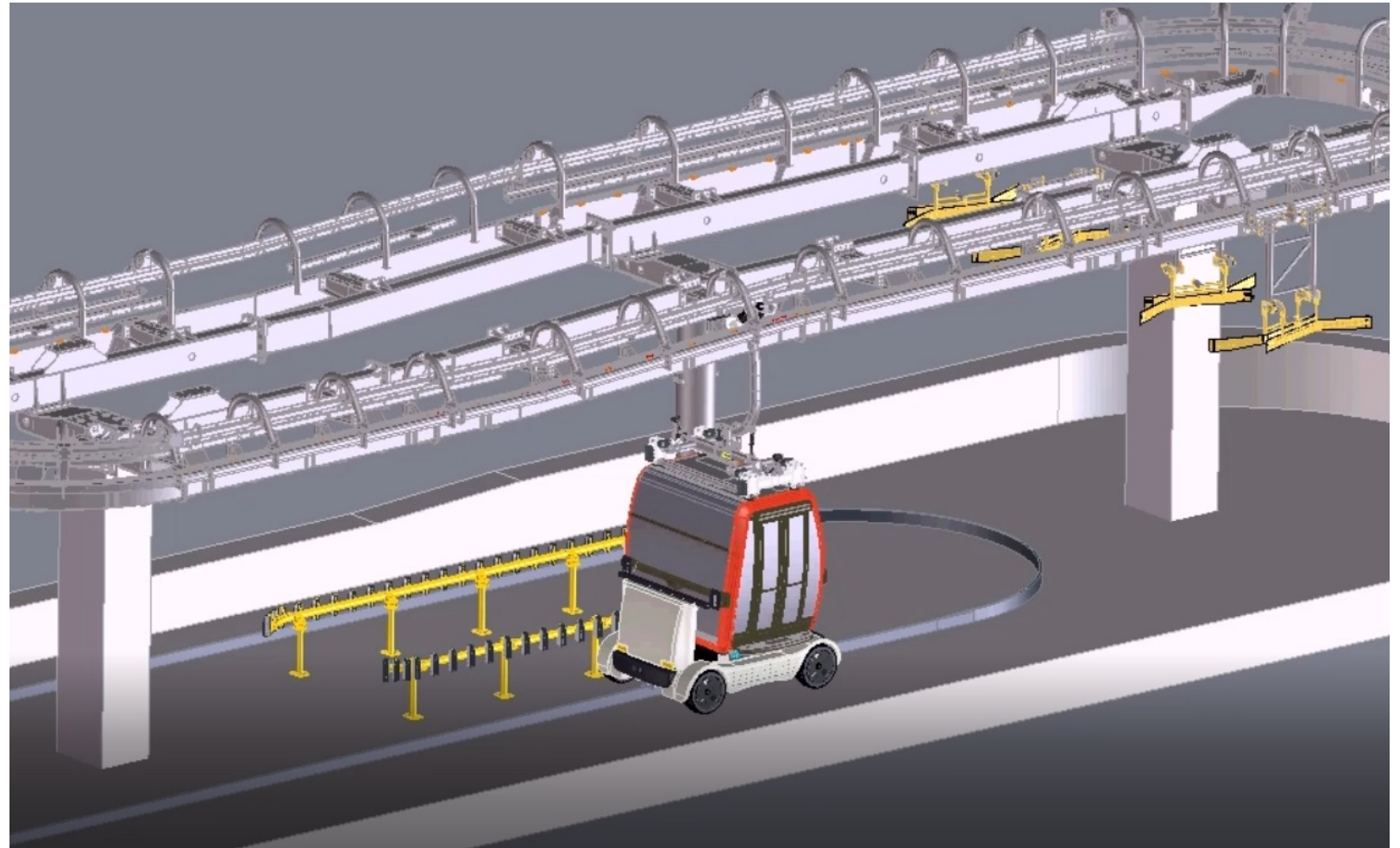
- Cabin is moved with propelled tyre conveyor
- Self-propelled vehicle is moved in front of cabin
- Suspension is unlocked



Transfer section

Synchronized running of the vehicles

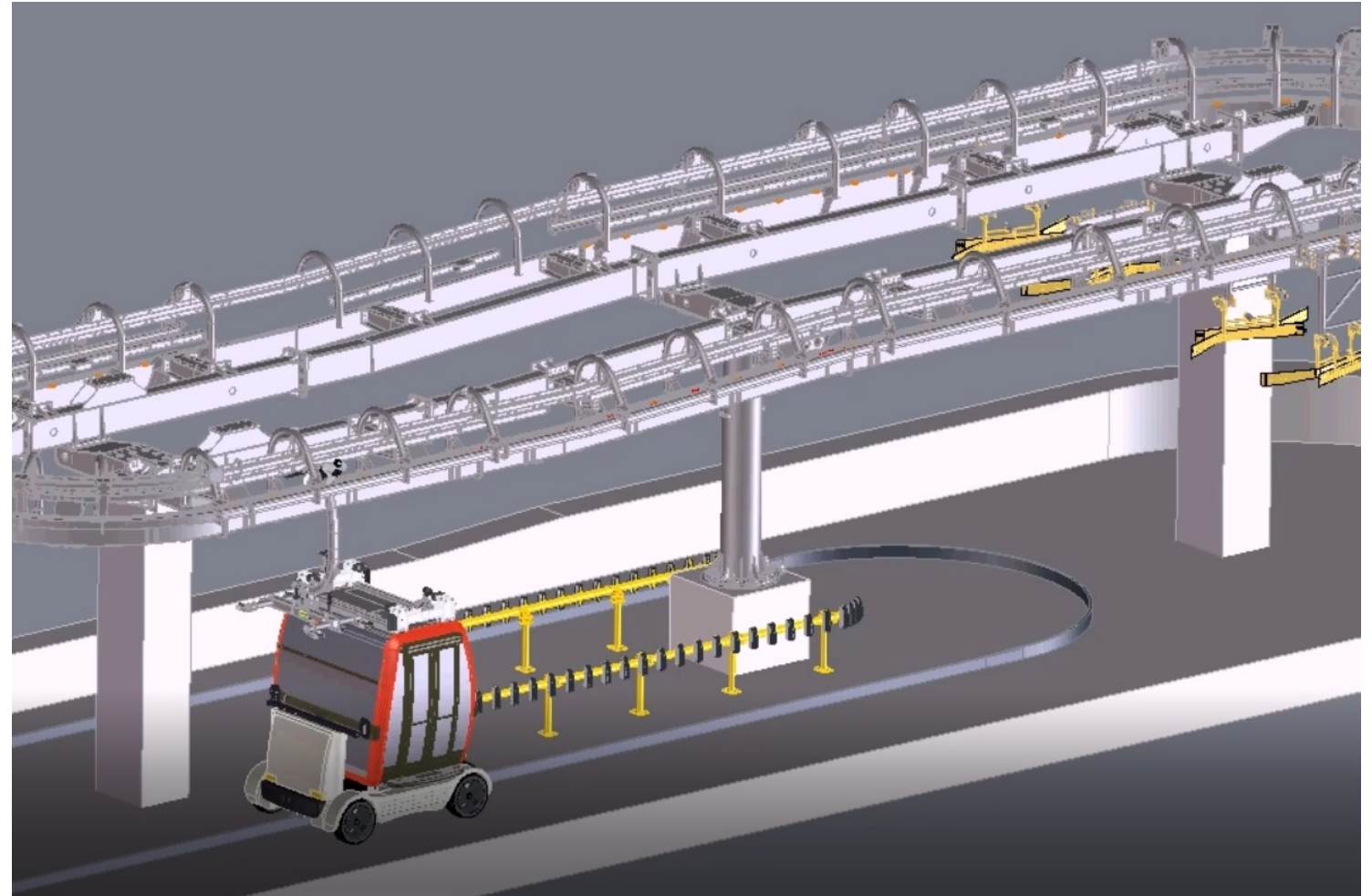
- Vehicles are approached
- Vehicles are moving synchronously
- Cabin is lowered on self-propelled vehicle



Transfer section

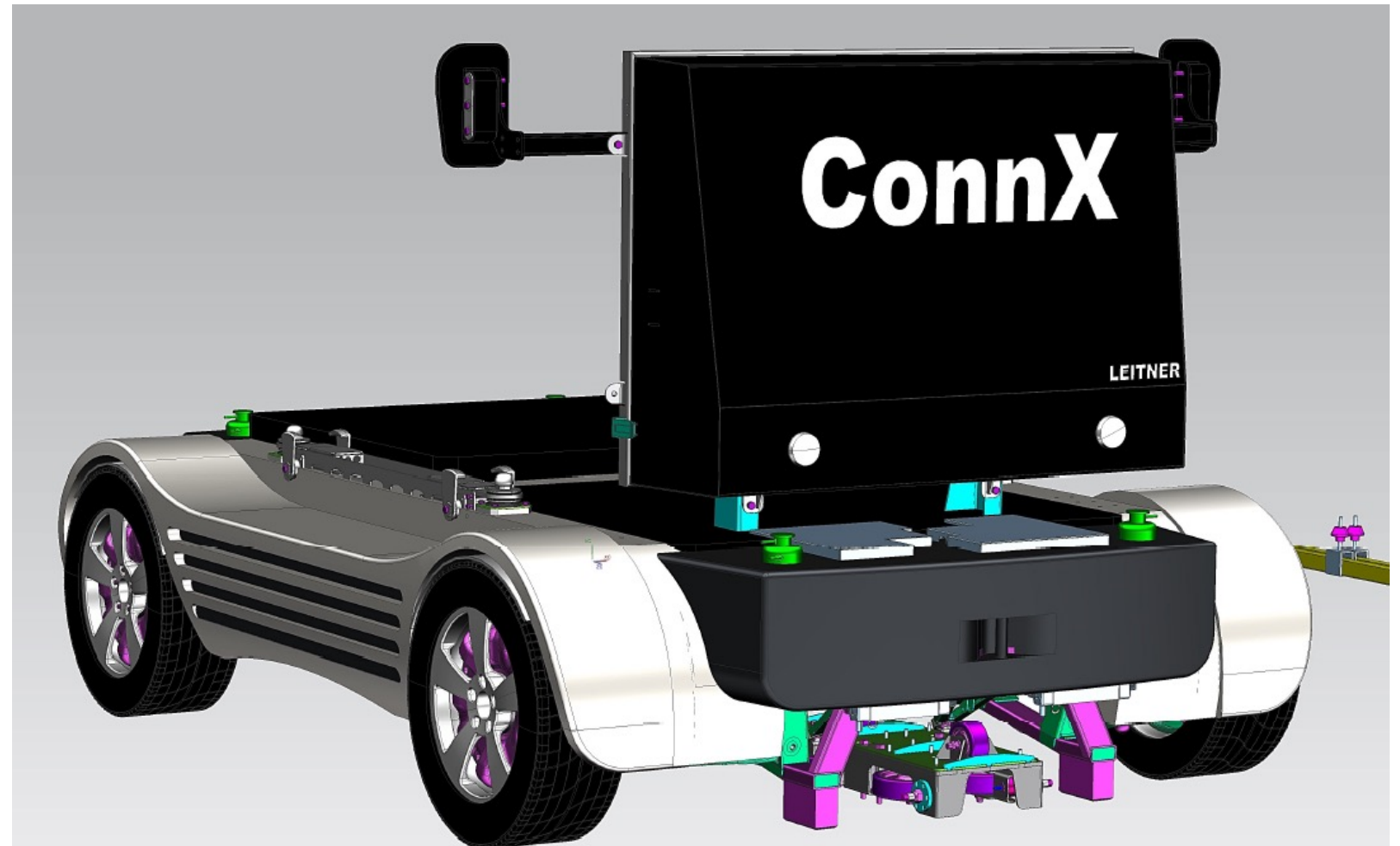
Separation of cabin from suspension

- Cabin sits on the self-propelled vehicle
- Suspension with intermediate frame accelerates
- Cabin is locked on self-propelled vehicle
- Self-propelled vehicle moves on ground track



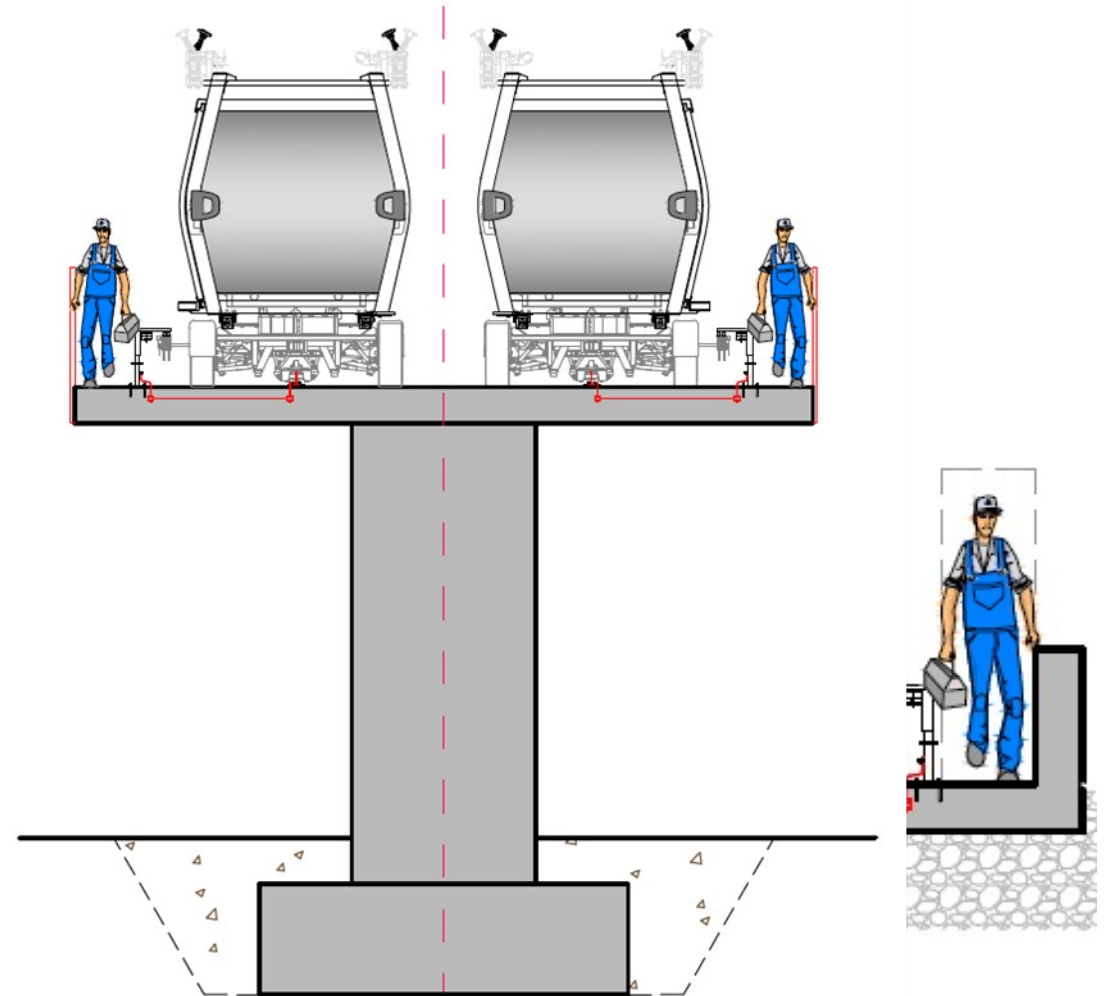
Self-propelled vehicle

- Electrically driven by in-wheel motors
- Rubber tires
- Battery-powered
- Recharge along ground track and in station
- Mechanical steering
- Vehicle supervision functions on board



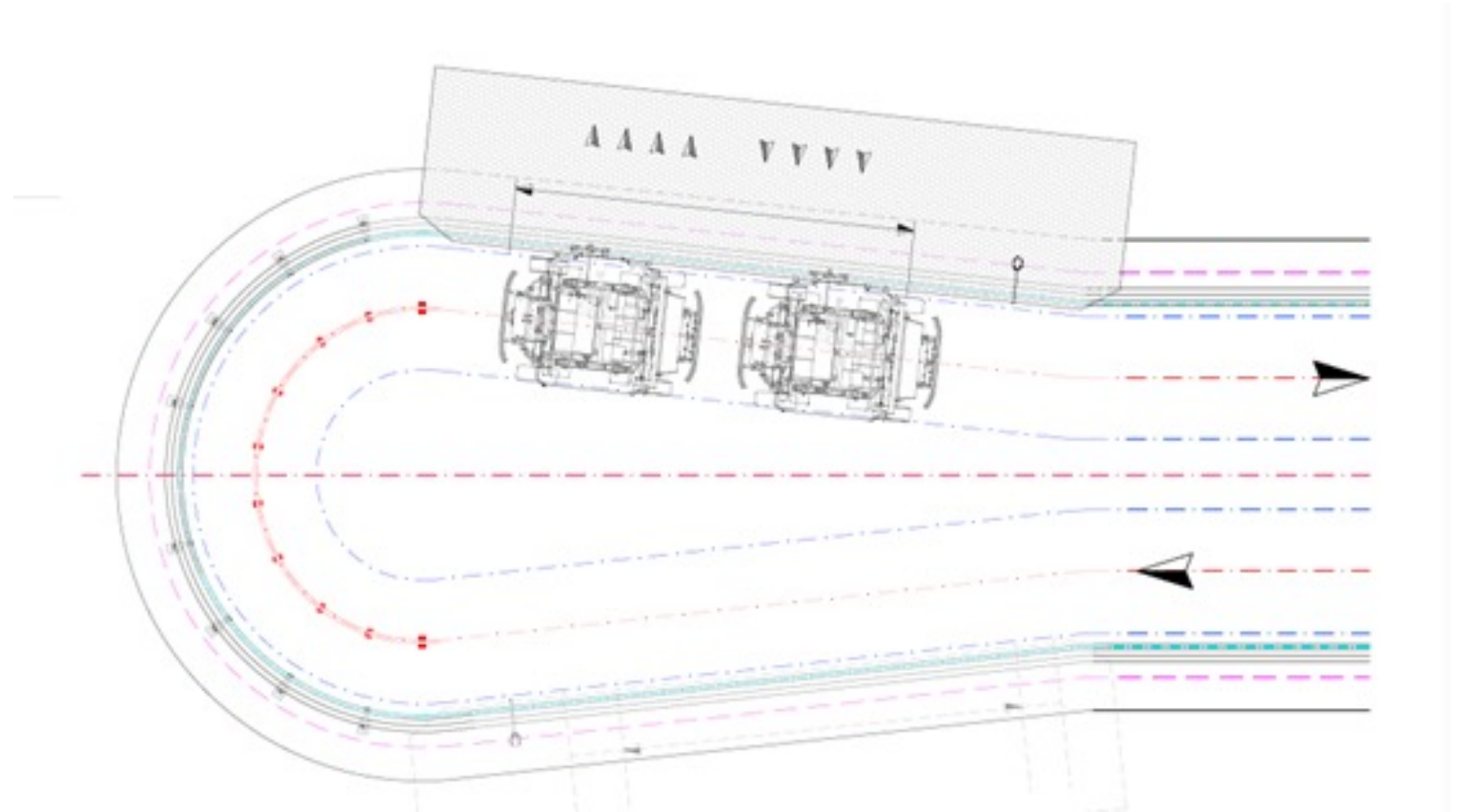
Ground track

- Exclusive driveway
- Physically separated
- Ground track or bridge
- Tunnel section possible
- 10% inclination
- Lanes can be separated



Stop station

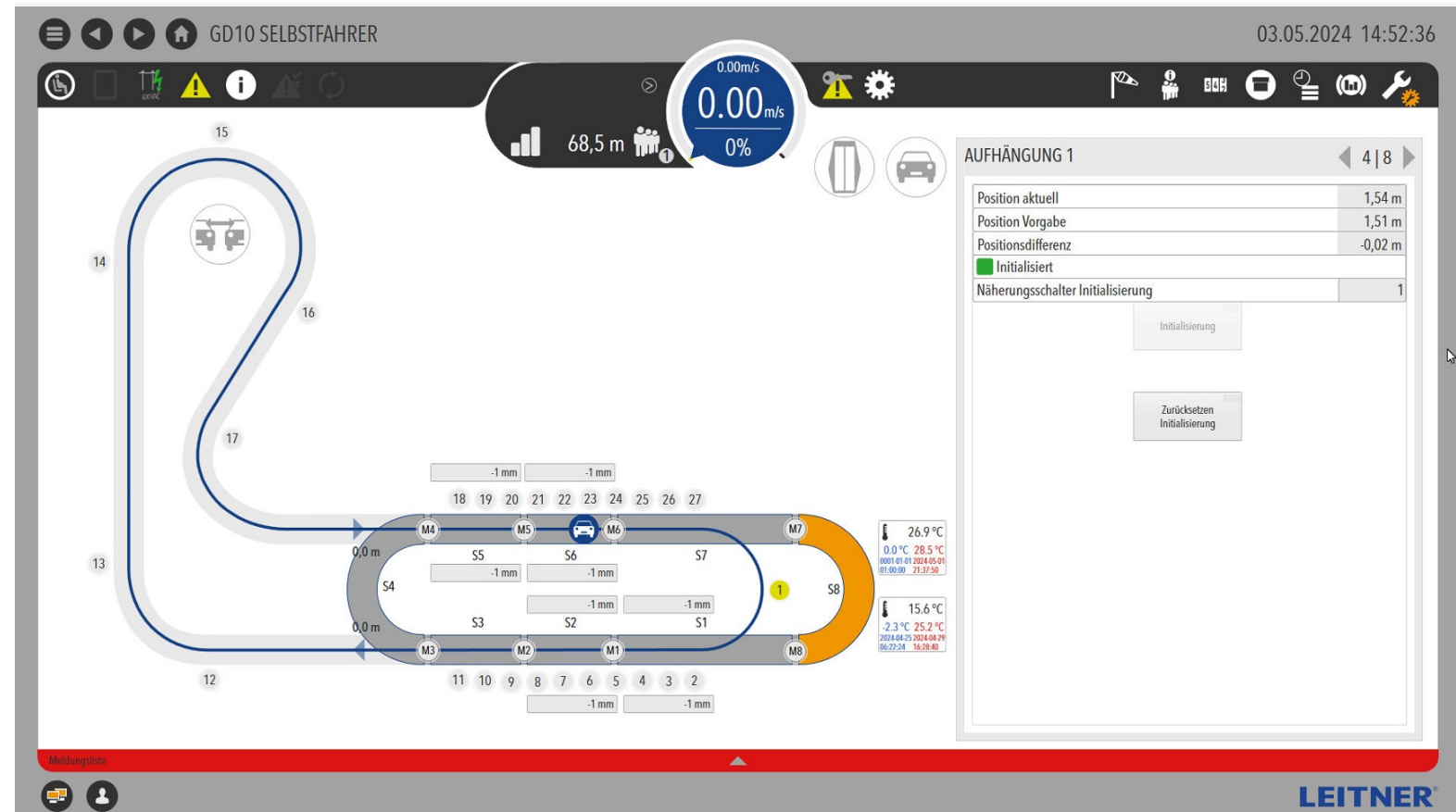
- Small size
- Positioned along the track
- Several stops possible
- Door opening and closing at platform
- At low capacity vehicle can stop at platform



Control system

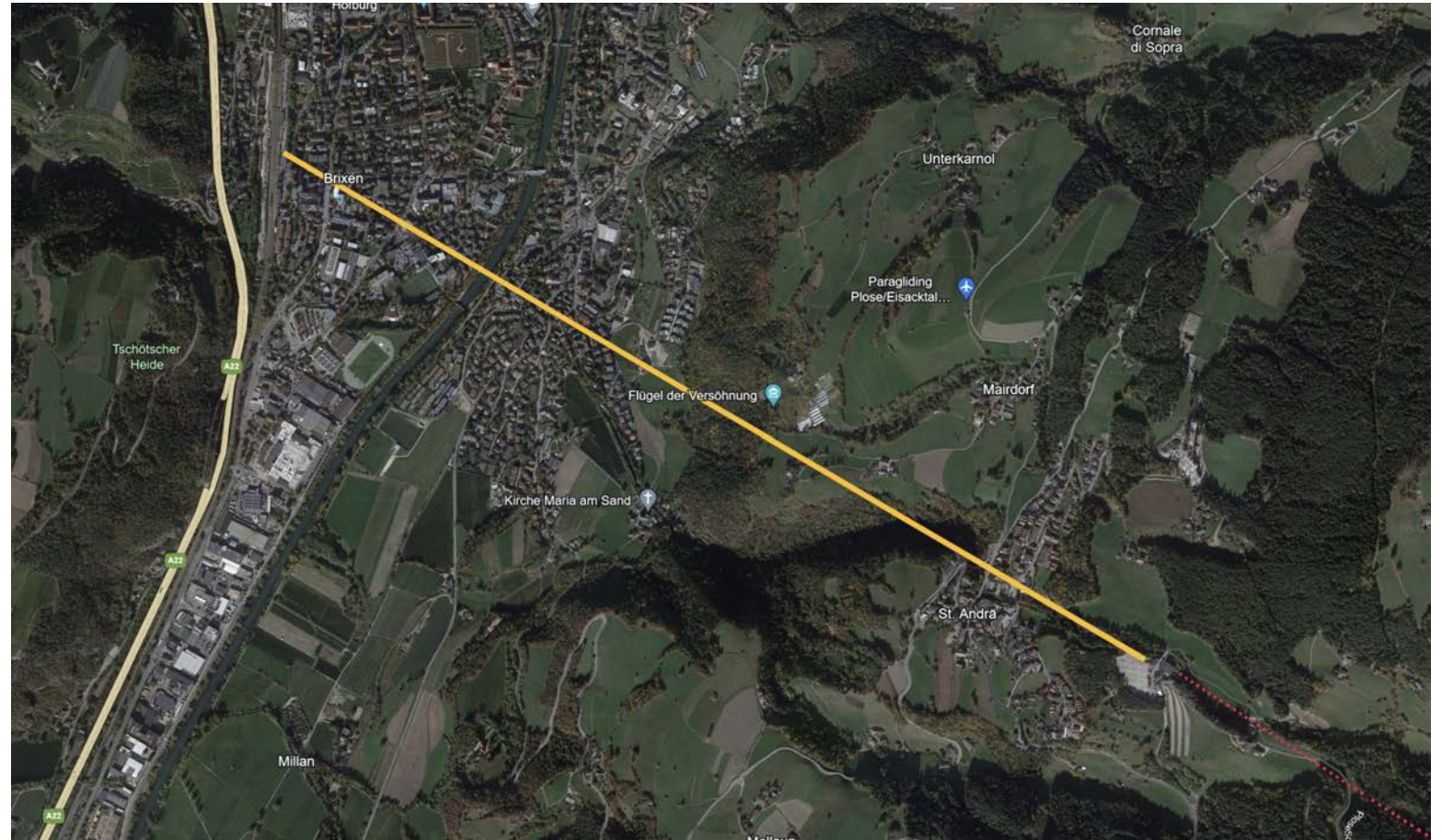
- Control function of system
 - Speed
 - Doors
 - Handover process
 - Manage power supply

- Safety function of system
 - Distance monitoring
 - Speed monitoring
 - Vehicle safety



Usecase Brixen/Bressanone Italy

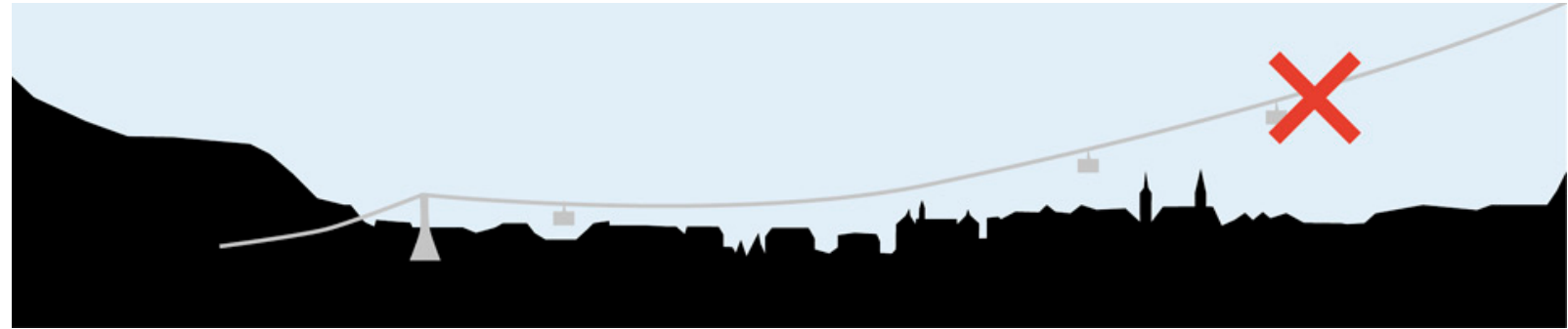
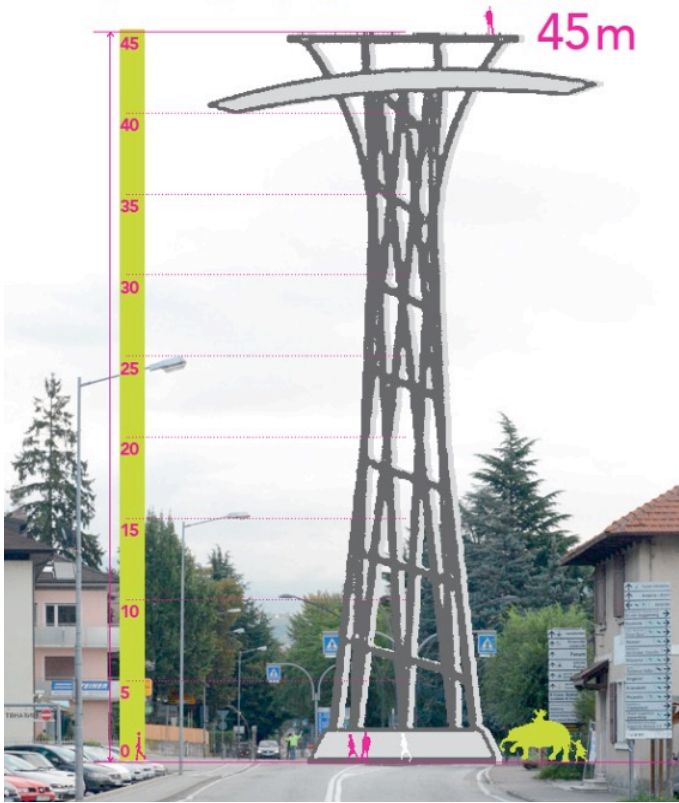
Usecase Brixen/Bressanone Italy



Type:	3S
Length:	2820m
Height:	490m
Drive power:	980kW
Capacity:	2000p/h

Usecase Brixen/Bressanone Italy

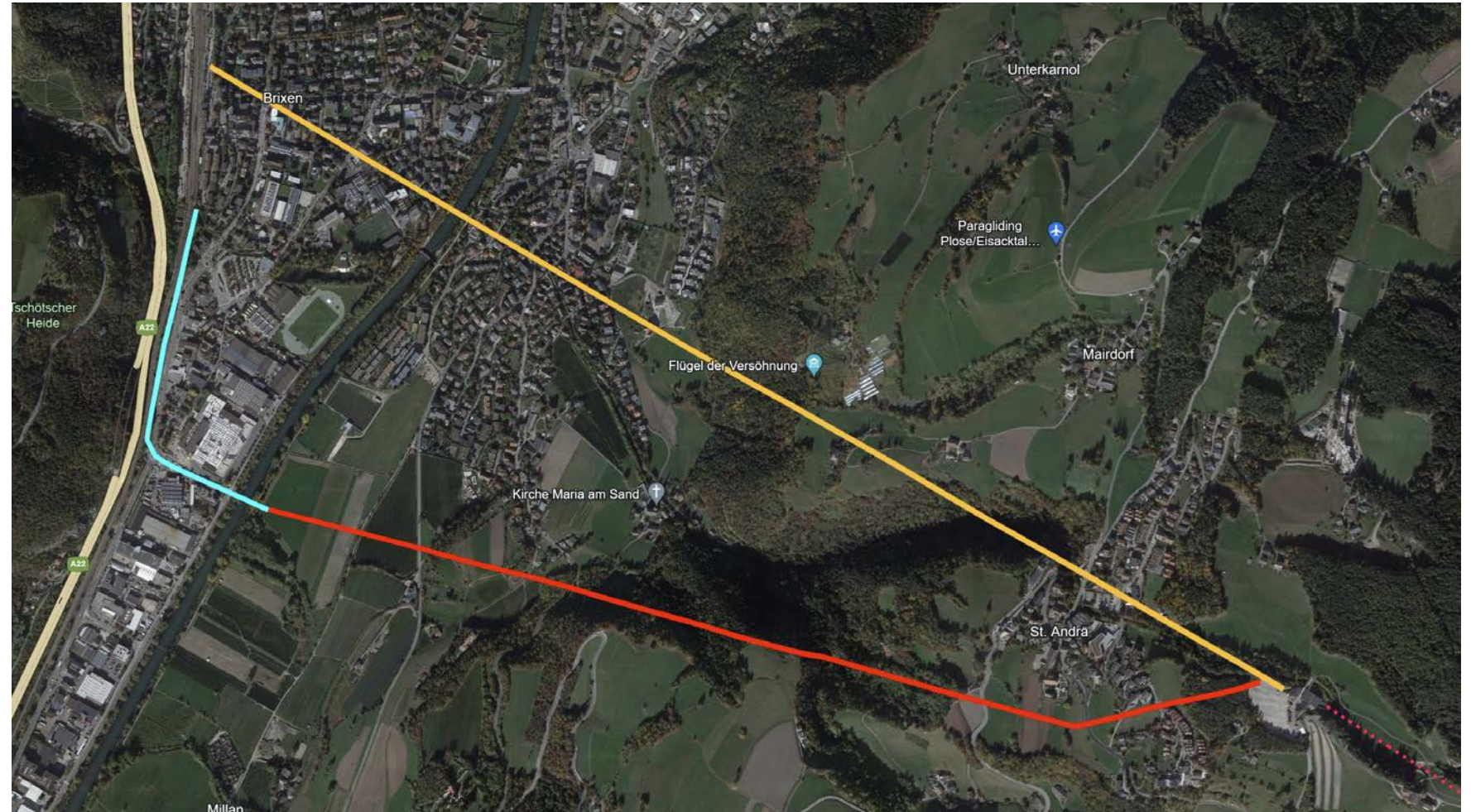
Vota per l'autobus.
Wähle den Bus.



Usecase Brixen/Bressanone Italy

Variant A with ConnX

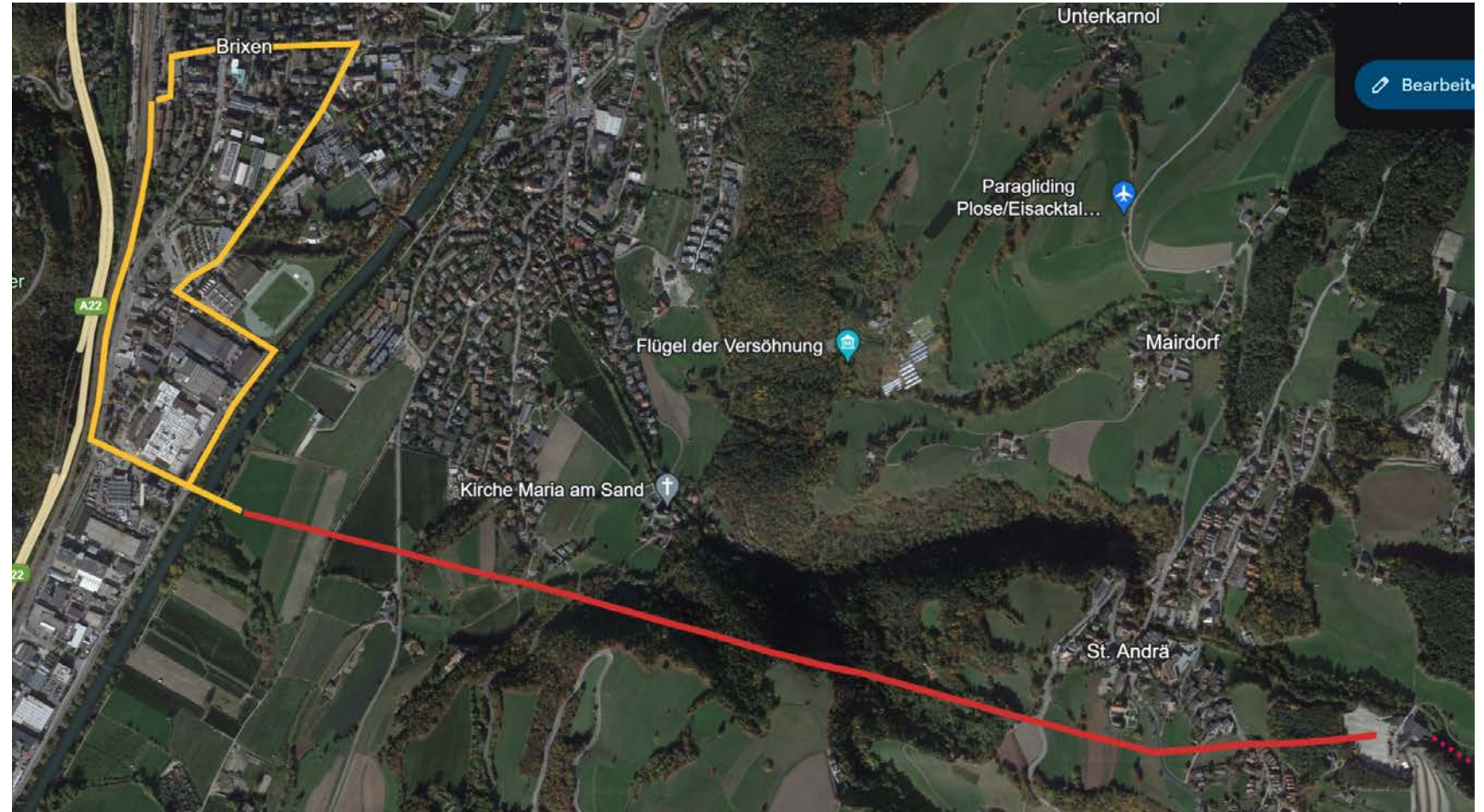
- ConnX line and cable car line combined
- Start from train station
- Cable car station out of city center
- No fly-over necessary



Usecase Brixen/Bressanone Italy

Variant B with ConnX

- ConnX line and cable car line combined
- Start from train station
- ConnX section as a loop
- ConnX stops at several public points, e.g. shopping, school, court
- No fly-over necessary



Special challenges of project

Special challenges of project

- No existing regulation for such a system
- Combination of different normative approaches
- Uniform safety standard for all sections
- State of the art of self-driving vehicles
- Energy supply of vehicles
- Steering system
- Control system

Test self-propelled vehicle



**Thank you for
your attention!**