

# EV Charging Event Data Aggregation Project



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Thur: 10:15h – 12:30h



# EV Charging Event Data Aggregation Project

## Scope

Signal	Desc
	<b>High-level vehicle data.</b>
Roadinfrastr Charging Chargingstation	Information about the current charging station as seen from the vehicle
Roadinfrastr Charging Chargingstation ChargingProzess	Information about the current charging process as seen from the vehicle
Roadinfrastr Charging Chargingstation ChargingProzess AvgPower	average charging power of the current charging process
Roadinfrastr Charging Chargingstation ChargingProzess ActPower	Current charging power of the running charging process
Roadinfrastr Charging Chargingstation ChargingProzess MaxPower	maximum charging power of the running charging process
Roadinfrastr Charging Chargingstation ChargingProzess Time2End	Planned time to complete charging process seconds
Roadinfrastr Charging Chargingstation ChargingProzess DataExchange	Data exchanged from vehicle to Charging equipment
Roadinfrastr Charging Chargingstation ChargingProzess Complete	describe if charging process is ongoing
Roadinfrastr Charging Chargingstation ChargingProzess ErrorOccurred	Indicates if an error occurred during charging station
Roadinfrastr Charging Chargingstation ChargingProzess Error	error code according charging protocol (e.g. OCCP, ISO15118, ...)
Roadinfrastr Charging Chargingstation Occupation	Information about the reservation of a specific Charging station done from the driver via HMI
Roadinfrastr Charging Chargingstation BaseData Last updated	Last update of base data according to ISO 8601 with UTC time zone.
Roadinfrastr Charging Chargingstation BaseData Max Power	maximum charging power of the charge station
Roadinfrastr Charging Chargingstation BaseData Max Voltage	maximum voltage of charge station
Roadinfrastr Charging Chargingstation BaseData Authentication Meth	Methods to start charge event ["App", "RFID", "Credit Card", "PnC"]
Roadinfrastr Charging Chargingstation BaseData is_roofed	Indicator if Charge Station has roof or Rain Protection
Roadinfrastr Charging Chargingstation BaseData is_lit	Indicator if Charge Station has good lightening during night
Roadinfrastr Charging Chargingstation BaseData Hardware Vendor	Vendor of Charge Station
Roadinfrastr Charging Chargingstation BaseData Firmware Version	Firmware Version
Roadinfrastr Charging Chargingstation ParkingLocation	Information about the infrastructure of the parking location
Roadinfrastr Charging Chargingstation ParkingLocation is Parking Garage	Flag if Charger is located in parking garage
Roadinfrastr Charging Chargingstation ParkingLocation Parking Name	Name of Parking Garage
Roadinfrastr Charging Chargingstation ParkingLocation Floor Level	Floor Level
Roadinfrastr Charging Chargingstation ParkingLocation Space Number	Name / Number if parking space has floor marking
Roadinfrastr Charging Chargingstation ParkingLocation Longitude	Current longitude of vehicle in WGS 84 geodetic coordinates, as measured at the position of GNSS
Roadinfrastr Charging Chargingstation ParkingLocation Latitude	Current latitude of vehicle in WGS 84 geodetic coordinates, as measured at the position of GNSS
Roadinfrastr Charging Chargingstation ParkingLocation MaxWidth	Max width of the parking slot
Roadinfrastr Charging Chargingstation ParkingLocation MaxLength	Max length of the parking slot
Roadinfrastr Charging Chargingstation ParkingLocation MaxHeight	Max height of the parking slot
Roadinfrastr Charging Chargingstation ParkingLocation SecuredAccess	secured access available (e.g. barrier) [1= yes, 0 = no secured access]
Roadinfrastr Charging Chargingstation ParkingLocation toilettes	Info about Toilettes
Roadinfrastr Charging Chargingstation ParkingLocation Amenities	nearby amenities
Roadinfrastr Charging dynamic	information about dynamic chaging during driving (e.g. wireless, or via catenaries)

## Goal

How to find the best charging station:

I need

- Precise location of my charging slot
- space for my trailer,
- a kids-playground
- illumination at night, ...

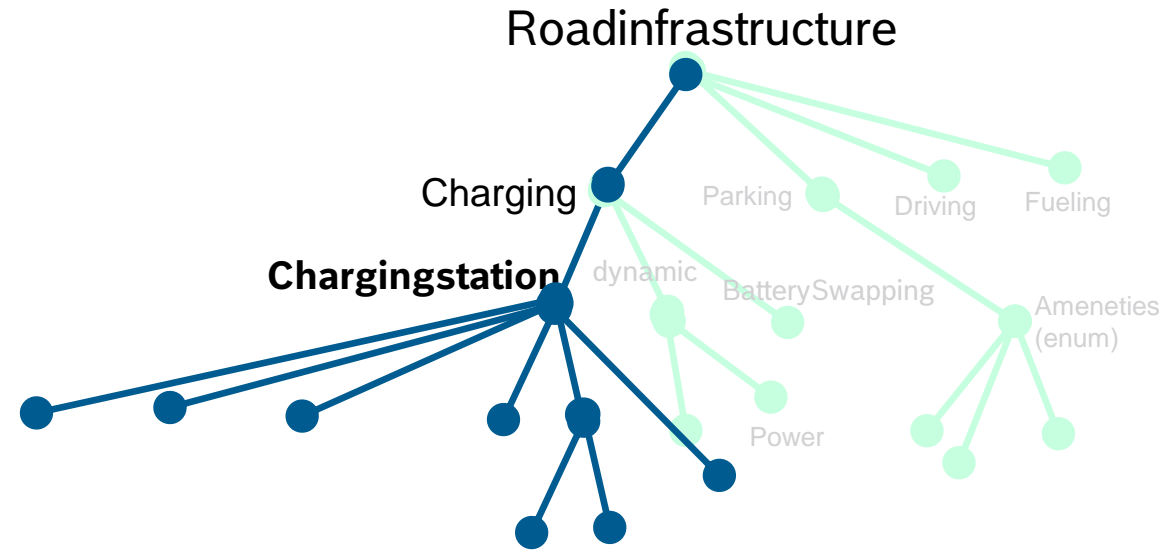
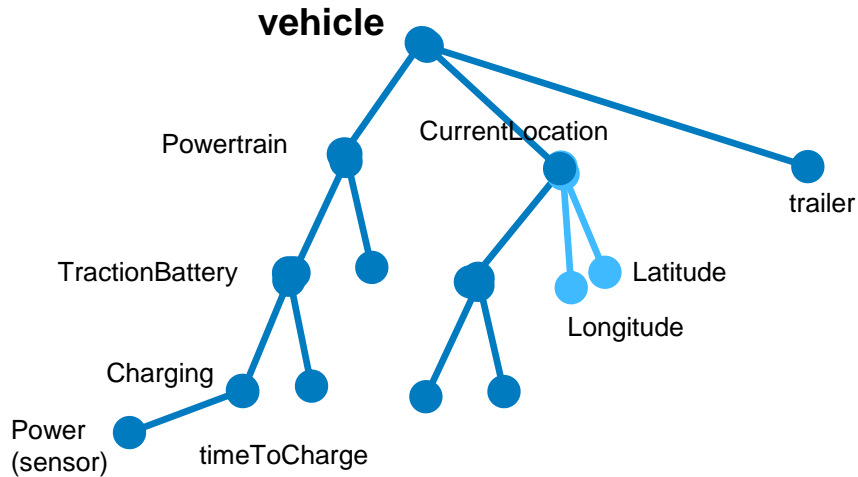
Result up to now: Extend VSS to charging station data

# EV Charging Event Data Aggregation Project

## A new data tree for infrastructure data

Vehicle signal Specification (VSS)

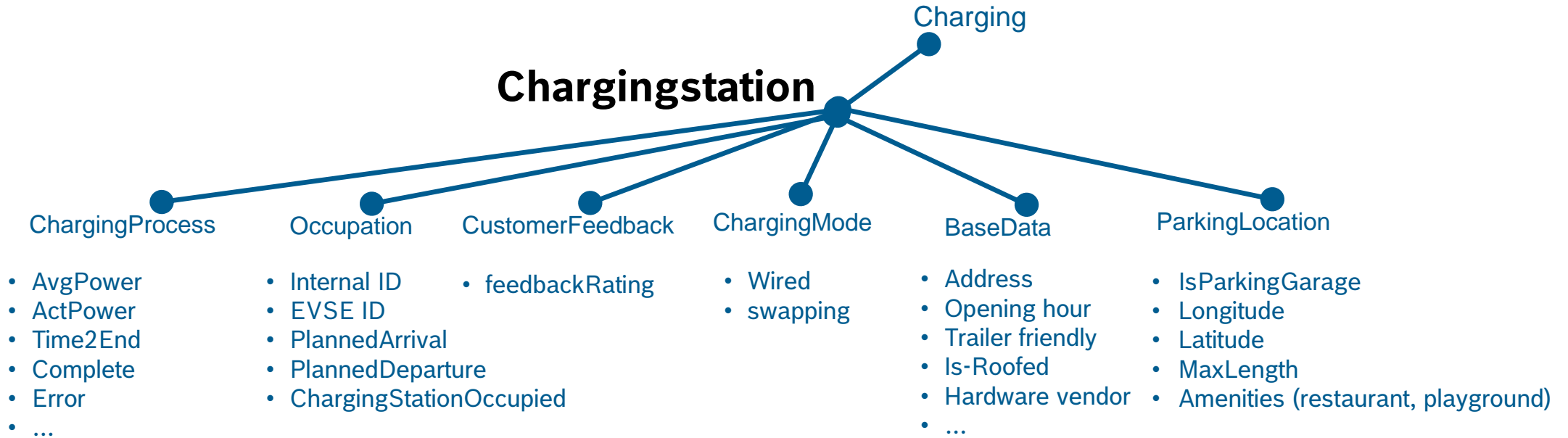
Extension to Road infrastructure incl. Charging station



# EV Charging Event Data Aggregation Project

## Road infrastructure data tree except (V0.1)

### Chargingstation



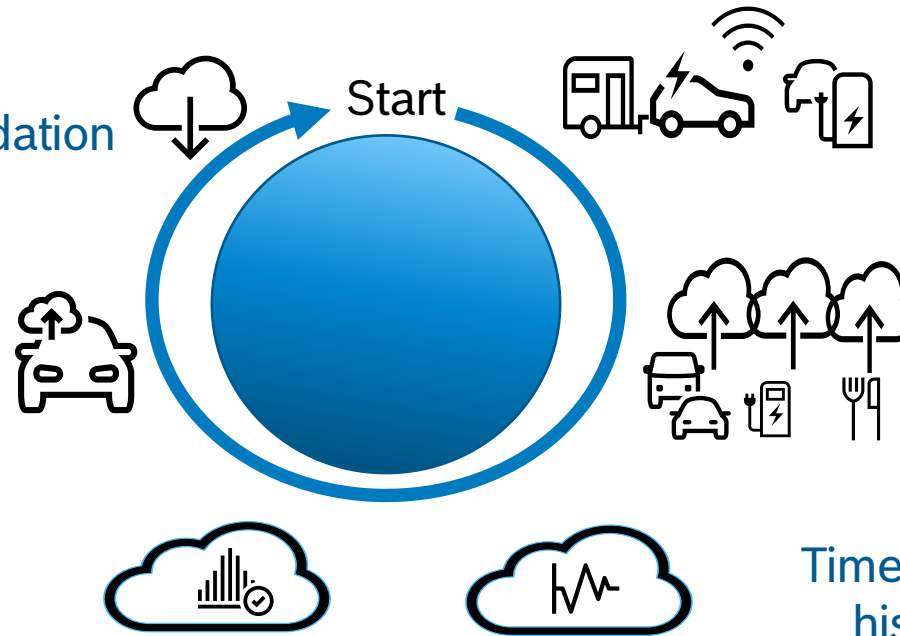
# EV Charging Event Data Aggregation Project

## User journey = data journey for better charging experience

Cloud sends individual charge station recommendation down to vehicle

Vehicle uploads preferences (e.g. I've a trailer)

Prediction of occupation probability over time



Data acquisition

Standardize data aggregation over many fleets in the cloud + merging with charge point operator data + restaurant

Time-profile per charging station history available in cloud

A self-enhancing data system: the bigger the fleet the better the prediction and recommendations

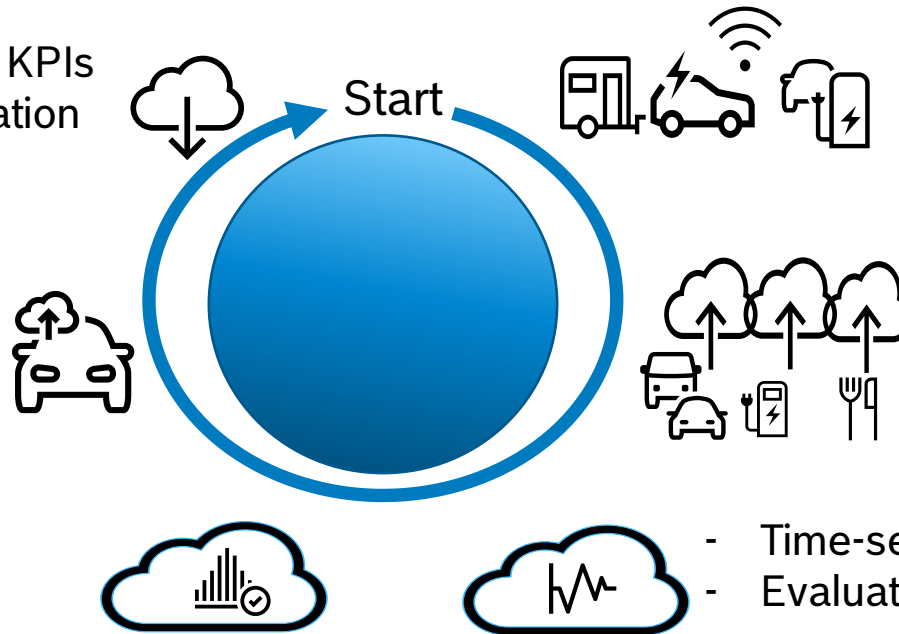
# EV Charging Event Data Aggregation Project

## Enablers for Data Journey

- Multi objective optimization of KPIs
- individual station recommendation for all contributing parties

In-vehicle HMI for input of personal preferences and trip destination

Forecast based on crowd data



- Harmonized data model ✓
- multi-data-tree model in COVESA incl. special KPI's (e.g. trailer suitable)
  - Neutral server and data ingress handling
  - Update of charging station data during charging
  - Link to ETSI and *EU ITS Directive* to be assessed
- Time-series data-base for charging station data
- Evaluate difference between prediction and current value (e.g. Plug broken)

A new data eco-system : more suitable charging point recommendation thanks to crowd data

# Thank you

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