The Pains (and Fixes) of Public Charging an EV in Europe and North America

Private and confidential
About Parkopedia

- Founded 2007 - to answer any parking question, anywhere
- Global operations and presence
- A leader in parking and vehicle-centric commerce
- Huge footprint across global OEMs and tier 1s.
Who we work with

We power cloud-based parking services in millions of connected cars for blue-chip customers globally

**Tier 1 suppliers**
- TomTom
- BOSCH
- Harman (a Samsung company)
- Cerence
- Tencent
- AutoNavi
- HERE

**Auto manufacturers / OEMs**
- Audi
- BMW
- Citroën
- Honda
- Hyundai
- Toyota
- Skoda
- Volkswagen
- Mercedes-Benz
- Peugeot
- Mazda
- Jaguar
- Land Rover
- Ford
- Mini
- Ferrari
- Chrysler
- Renault
- GM
- Lexus
- SEAT

**Mapping & navigation providers**
- Apple
- Garmin
- Sygic
- NNG
- Here
- Telematics
Adam Woolway: Head of EV @ Parkopedia

- >10 years experience in EV industry
- Co-founder Plugsurfing - a leading European eMSP
- Acquired in 2018
- Accelerating Parkopedia's EV ambitions
Finally, the EV is Coming - Government Led

Euro & N.Am ICE Vehicle Phase-Out Targets From 2025

- 2025 Norway
- 2030 Sweden
- 2030 Ireland
- 2030 UK
- 2030 Denmark
- 2030 Netherlands
- 2030 Austria
- 2030 Slovenia
- 2030 Greece
- 2040 Spain
- 2040 France

2035 Canada
2030-2050 US States
2035 Chile
The EV is Coming - OEM Led
Selected OEM ICE Phase Out Targets

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<th>Year</th>
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- Jaguar
- Audi
- Hyundai
- Volkswagen
- Ford
- Mercedes-Benz
- GM
- VW
- PSA
- Nissan
- Ford
- Renault
- Honda
We're about to see a seismic shift in mobility
Involving people who don't even use the word 'mobility'.

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<th>2010s EV Driver</th>
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The Problem: Charging a Car is a Nightmare

Potential Problems in EV Driver User Journey for Public Charging

- Finding a charger
- Is it working?
- Right plug?
- How can I pay?
- Right speed?
- What is the cost?
- Is it available?
The Problem: Charging a Car is a Nightmare

Potential Problems in EV Driver User Journey for Public Charging

- Charging points can be small & discreet
- Often GPS Coordinates provided are wrong
- Not all charging points are for members of public
The Problem: Charging a Car is a Nightmare
Potential Problems in EV Driver User Journey for Public Charging

- Different cars might need different plug-types
- Do you need CHAdeMO or CCS?
The Problem: Charging a Car is a Nightmare
Potential Problems in EV Driver User Journey for Public Charging

- Finding a charger
- Right plug?
- Right speed?
- Is it available?
- Is it working?
- How can I pay?
- What is the cost?

- AC or DC Charging?
- 3kw or 300kw?
- What is the real speed vs the ‘list speed’
The Problem: Charging a Car is a Nightmare

Potential Problems in EV Driver User Journey for Public Charging

- How ‘real-time’ is real-time availability data?
- Will it be available in 10 minutes when you get there?
- Will it be available tomorrow at 19:00 when you arrive?
The Problem: Charging a Car is a Nightmare
Potential Problems in EV Driver User Journey for Public Charging

Finding a charger → Right plug? → Right speed? → Is it available?

Is it working?

EV Charging Infrastructure Needs To Work, Not Just Be Installed

Forbes
The Problem: Charging a Car is a Nightmare

Potential Problems in EV Driver User Journey for Public Charging

- Closed-networks mean drivers need multiple apps & RFIDs
- ISO15118?
- Credit Card?
- Fleet billing? Monthly billing?
The Problem: Charging a Car is a Nightmare

Potential Problems in EV Driver User Journey for Public Charging

- Multiple variables dynamic pricing mean infinite outcomes
- Chargeprice.app showing same charging session costing between €20 and €60!
Our own Tests Found this to be a Global Issue

- Surveying in global cities unearthed inaccurate charging point data everywhere
- Particular focus: Paris, London, Turin, Florida, Munich
- Charging points missing, access information wrong, charging speeds wrong…
Public EV Charging Pain Points Summary

- **Poor Quality of EV POI Data**
  - CPOs focus on becoming EMSPs of their own infrastructure
  - EMSPs focus on transactions, not data
  - Mapping vendors integrate EV POI sources without verification

- **Fragmentation of Value Chain and Industry Players**
  - OEMs have to select a reference EMSP partner for EV Charging
  - Lack of roaming across EV charging networks
  - OEMs locked with the **geographic coverage** of the selected EMSP
And the Situation is about to get much more complex

- 10x increase in infrastructure needed in major markets
- Greater reliance on public charging: longer journeys & less home-charging
- Increase of 'public charging on private ground'
‘Public’ Charging on Private Ground
Charging Operators/Retail Car Parks is a Winning Formula
But, Public Charging Points in Private Locations are Complex

- DC Fast charger. Picture taken in Berlin 05.01.22
- Free of charge to use
- ...every EV drivers’ dream!
...Hidden Parking Restrictions...

- Drivers can only charge for 90 minutes...may not be enough for a full battery
Hidden Accessibility Restrictions

- Parking barriers and shut on Sundays
- EV POI databases do not reliably give this information
...and a Bad User Experience that follows

- Guardian article from 17.01.22
- Lack of parking data accompanying EV POI led to driver being fined.

'Unfair' Drivers slapped with £120 private parking fines while charging their EVs

EV OWNERS are being fined up to £120 a time by private parking firms while charging.
We Need to Re-Define the EV Charging User Journey
For a Mass-Market User Experience, OEMs need to provide Parking AND Charging Data
We are already Global Leader in Parking
Over 1.4 million on-street locations
Over 350k off-street locations
Over 750k locations with dynamic space availability
Over 340k locations with payment capability

89 countries
15,000 cities
70 million spaces
Parking Data Coverage

Off-Street

On-Street
Static Data

350,000 off-street locations
- Basis for off-street bookings and access & pay services

1,400,000 on-street locations
- Basis for payment services and on-street availability information

Detailed information for every location
- Entrance and exits, opening hours, pricing, restrictions, payment types and much more
- Enables contextual parking recommendations
- Enables intelligent parking user experiences of automotive personal assistants
Dynamic Data

Patented predictive availability technology
- Fusion of floating car data (FCD), transaction data, ultrasonic sensor data (USS) and more

Critical for autonomous parking
- An autonomous car must be able to locate an available parking space without driver assistance

High consumer demand meets poor infrastructure
- Dynamic space availability in over 4,000 cities
- Real-time visibility of parking operator’s assets
- Key data for yield and traffic management
- Essential for efficient routing
Parkopedia Metrics

- Parking data in 89 countries
- 15,000 cities worldwide
- 1.4m on-street locations
- 400k off-street locations
- 70 million spaces around the world
- Data is validated and refreshed regularly

50% All new vehicles built in EU have Parkopedia services installed
Park & Charge Data - What We Do

Computer Vision & Indoor Maps

Parkopedia Data Team
Remote Verification

On-site Surveying

EV POI Base Layer

Complete & Accurate static EV POI data

Dynamic Information
(CPOs, EMSPs, Parkopedia)

High Quality static & dynamic EV POI data

High Quality Static & dynamic Parking data

Combined EV Charging & Parking solution

Location ID Matching
Indoor Mapping

Navigation directly to the charger
And, we provide multi-domain payment for vehicle services
When the first transaction is initiated for a new payment provider, Parkopedia dynamically provisions a user account, using only necessary user information, with the payment provider and establishes a link between the new account and the Parkopedia account registered by an OEM. Parkopedia also creates/amends/deletes user accounts with each provider, unique ID/PW.
Multi-domain payment platform

Transaction platform that started with parking is now leveraged in other transaction domains

### Parking
- Reservation/booking
- On-demand
- Access & pay
- Supporting different payment architectures

### Fueling
- Pay at the pump systems
- Integration of sub-aggregators and service providers

### EV charging
- Charging is mostly paid service
- Highly fragmented landscape
- Complex pricing

### Tolling
- Electronic toll collection for vehicles (US, EU)
- Based on connected ANPR solution

Parkopedia "One transaction API" Platform:
Single Sign-On, PCI compliant, fully integrated
Transactions

World's broadest coverage of integrated parking transaction services

- We aggregate parking payment and reservation partners and expose global inventory through a single API
- Our transaction integration platform enables cars and mobile devices to initiate and execute parking transactions at scale
- Our integration with 3rd party user accounts secures usability for autonomous parking and other strategic use cases

Example Payments Providers

Example Reservations Providers

Example Access & Pay Providers
By partnering with EMSPs on transactions, Parkopedia gains access to dynamic data which remains out of reach for traditional EV POI Data Suppliers.

We aggregate payment partners and expose a unified higher quality EVSEs inventory through a single API.

Our transaction integration platform will then enable cars and mobile devices to initiate and execute EV Charging remote sessions transactions at scale.
Contact me

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Thank you.