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The role of location in enabling a sustainable transportation ecosystem

HERE Technologies

Combating global warming and air pollution...

... across geographies and industries in mobility ecosystem.





Electrification Of Personal Vehicles And Commercial Fleets Is Pivotal To A Sustainable Transportation Ecosystem

Factors driving adoption

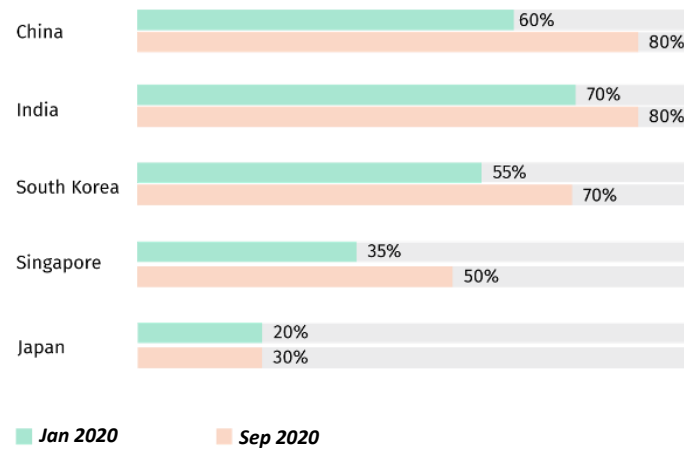
- **Increased Affordability** - R&D, economies of scale, new business models, and government subsidies are making EV vehicles affordable
- **Enhanced User Experience** – Growing EV charging infrastructure coupled with higher battery capacities resulting in higher driving range is increasing the driver confidence

The Installed Base Of EV Vehicles Is Set To Rise In APAC

DEMAND

More people are now interested in buying an EV than they were at start of 2020

“Are you considering buying a battery electric vehicle as your next car?”



Jan 2020 Average

40%

Sep 2020 Average

50%

Germany

25%

40%

USA

25%

35%

UK

25%

40%

Netherlands

30%

45%

France

30%

40%



Growing interest in electric vehicles and increasing sales



50% of all potential car buyers say they are now considering a battery EV

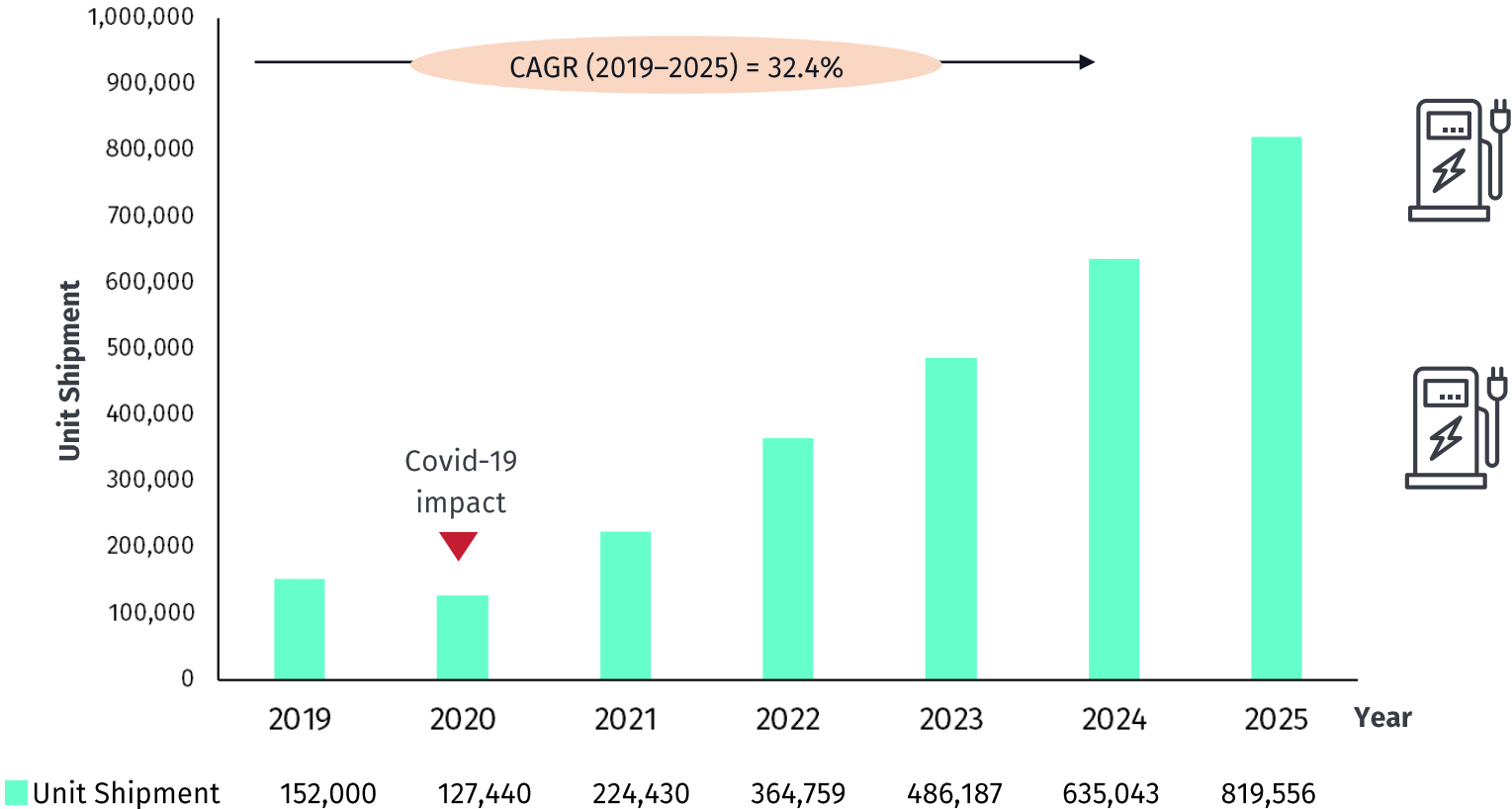


Highest average interest in APAC countries with India and China topping the list

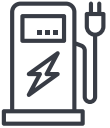
Matching demand and supply is a key challenge for all stakeholders in the value chain

SUPPLY

Forecast electric 2W Market, India, 2019 - 2025



Despite the COVID-19 pandemic having a major impact on two-wheeler, electric 2W market will gather momentum as economy recovers



New players and newer models from existing OEMs are expected to boost sales further



Multiple Challenges Along The Way



Mobility Providers

- Reduced range will require charging during shift
- Limited availability of charging stations in city centers and compatibility challenges
- Job allocation depends on battery status



Infrastructure Providers

- What is the demand for EV charging here?
- Where should charging stations/points be located?
- How and where does charging demand impact the energy provision and the grid?



Technology & Solution Providers

- Lack of integrated comprehensive set of services to drivers
- Siloed datasets owned and managed by multiple stakeholders
- Inaccurate estimation and range anxiety



Government and city authorities

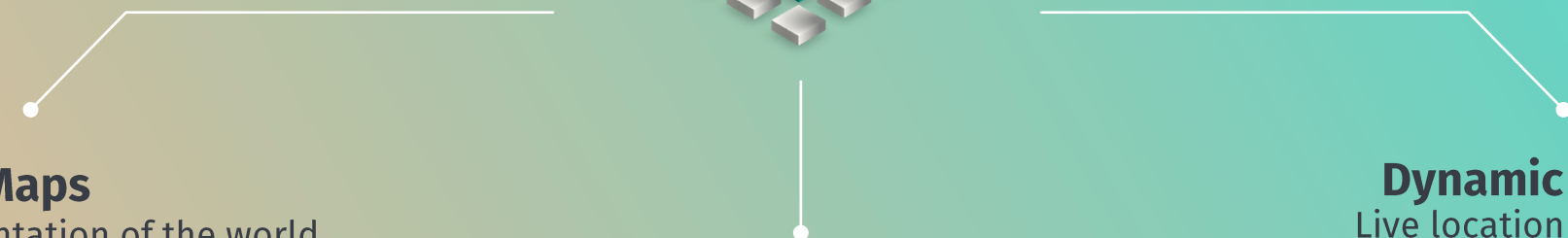
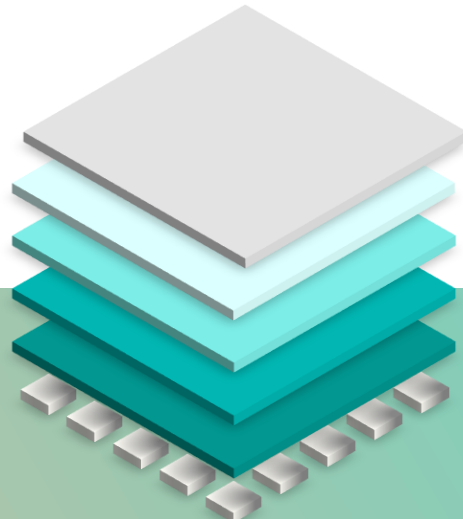
- Emission goals
- Provisioning of infrastructure
- Data privacy and security



Orchestrating demand and supply is a location data play

HERE uniqueness starts from our leadership in building and maintaining maps and location data at scale

Platform provides seamless access to enterprise grade location data in a standardized format



Maps

Digital representation of the world



SD Map HD Map

Third-party location-centric assets



Via Marketplace

Dynamic content

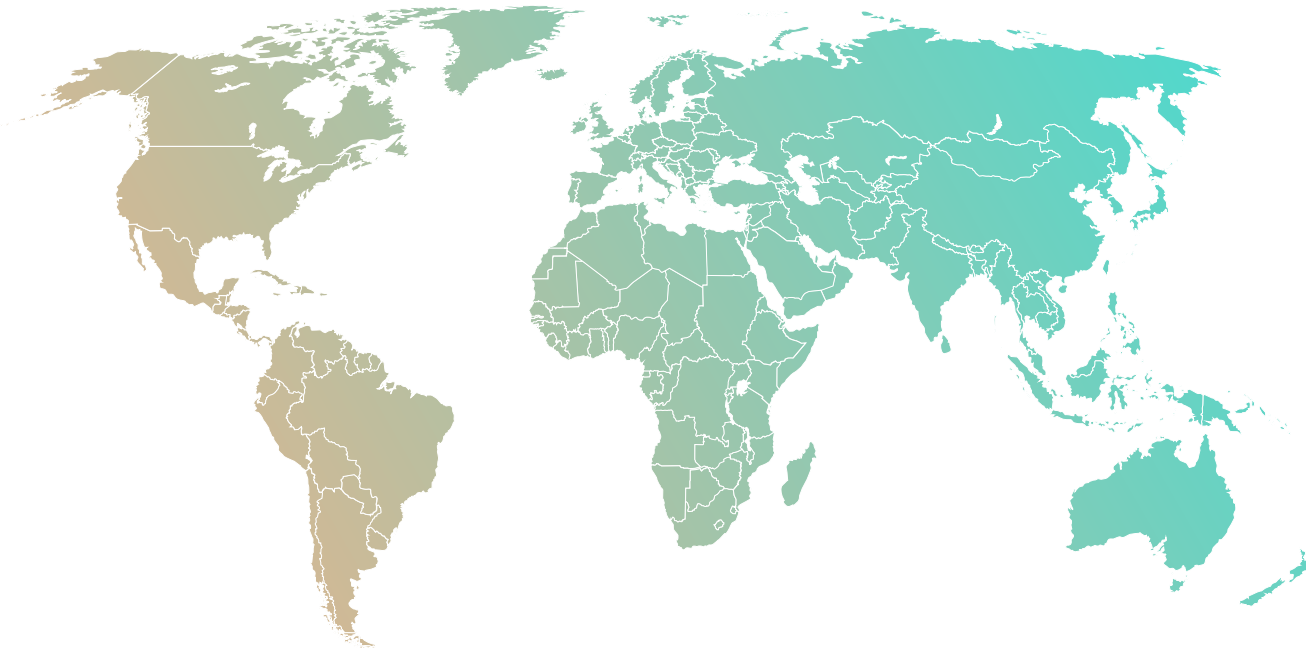
Live location intelligence



Real-time Traffic HD-Live Map HERE Hazard Warnings Road Signs 3rd Party Approved Sensor Data

HERE EV Charging Stations

Find and navigate EV Charge Points reliable, easy and a convenient around the world



247,000

EV stations globally

99,9%

of EV stations with
connector type

78,000

EV Stations in APAC

91

countries

99,9%

of EV stations
with power feed type

130,000

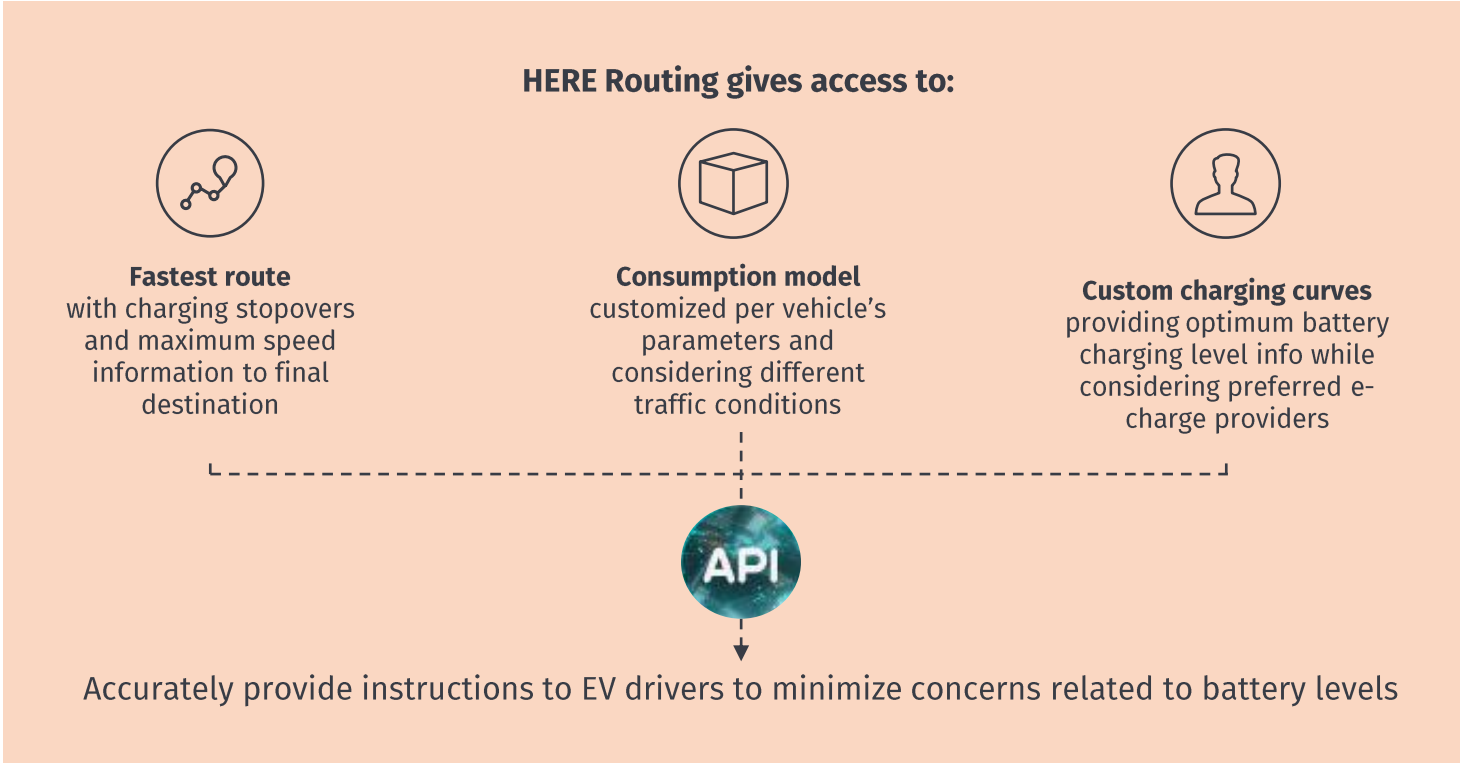
EV stations with
Real-time connector
availability



Range anxiety

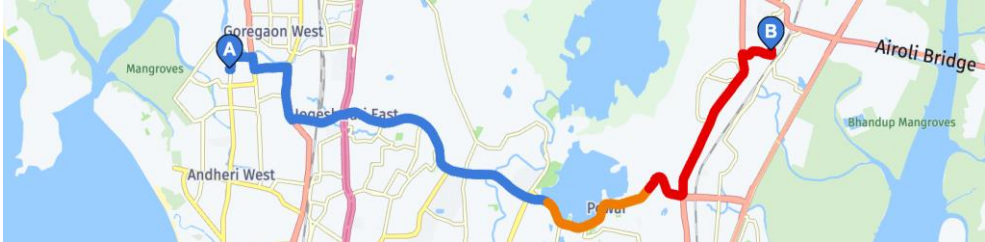
- Provide fastest routes with charging stopovers
- Allow customization of consumption model per vehicle
- Give drivers piece of mind with trip information

Alleviate drivers concerns related to trip completion on current battery charge







EV Routing: Consumption calculation along a route

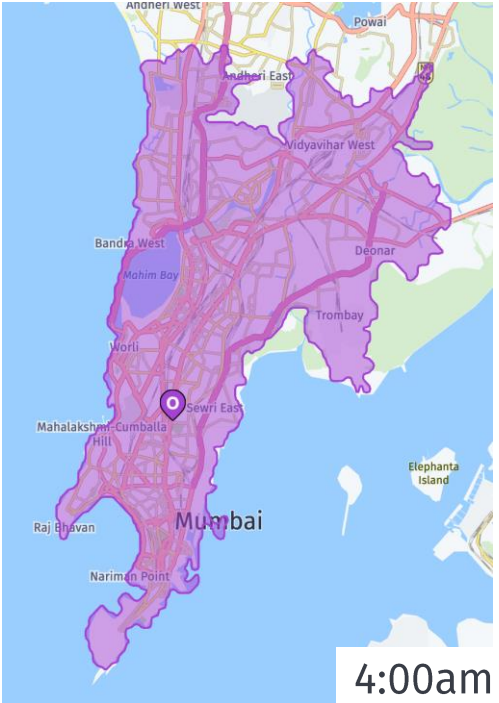
How far can a car travel on current charge



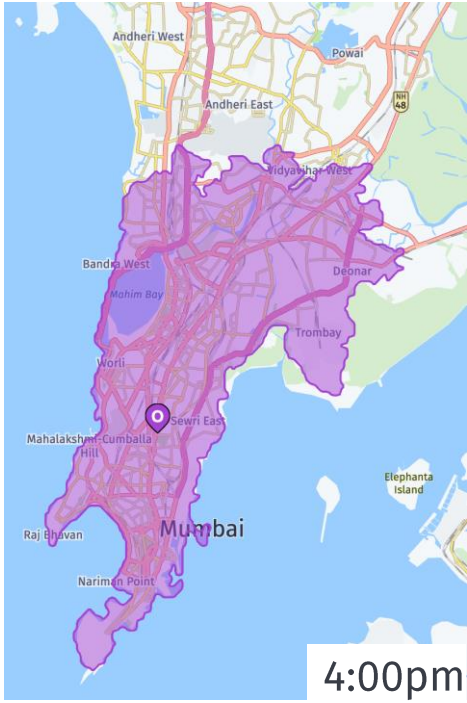
HERE calculated route enhanced with estimated energy consumption along each link and Range Map

Example use cases

-  Check reachability of destinations, even for different drive modes
-  Low energy warning and recovery scenario triggering
-  Route profile generation to optimize powertrain control
-  Return journey check



4:00am

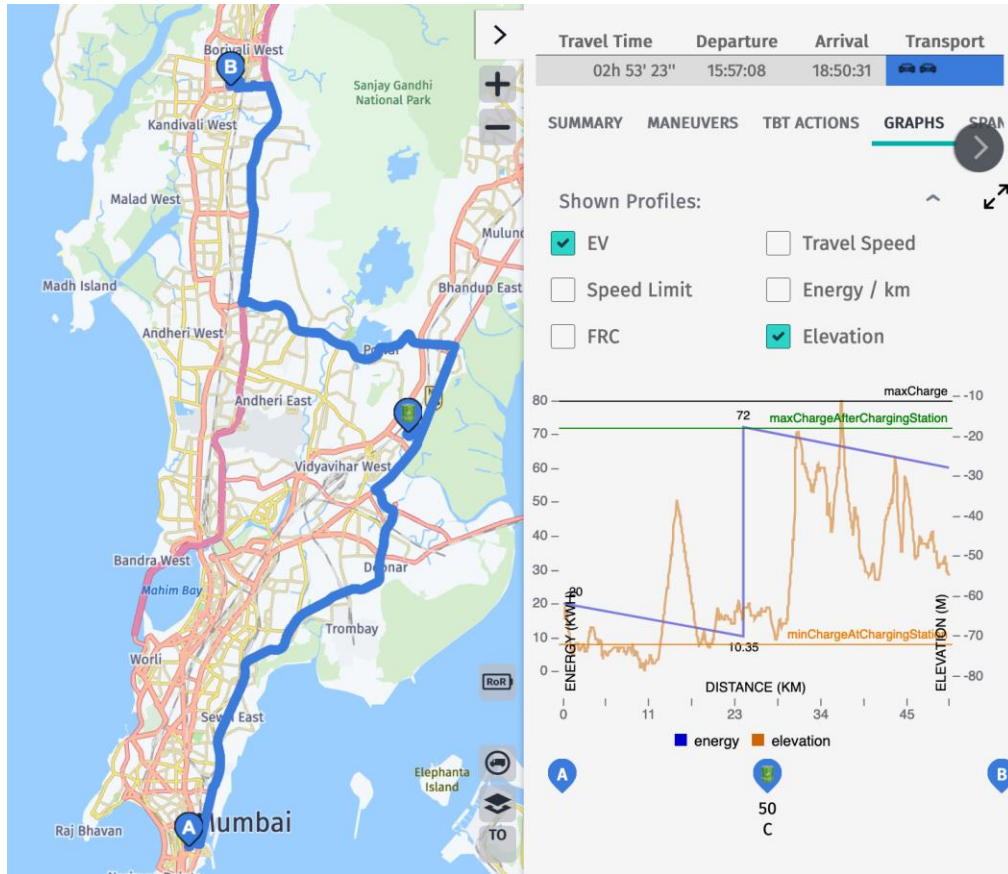


4:00pm







EV Routing: Multi-stop EV routing

How to reach destination beyond initial range

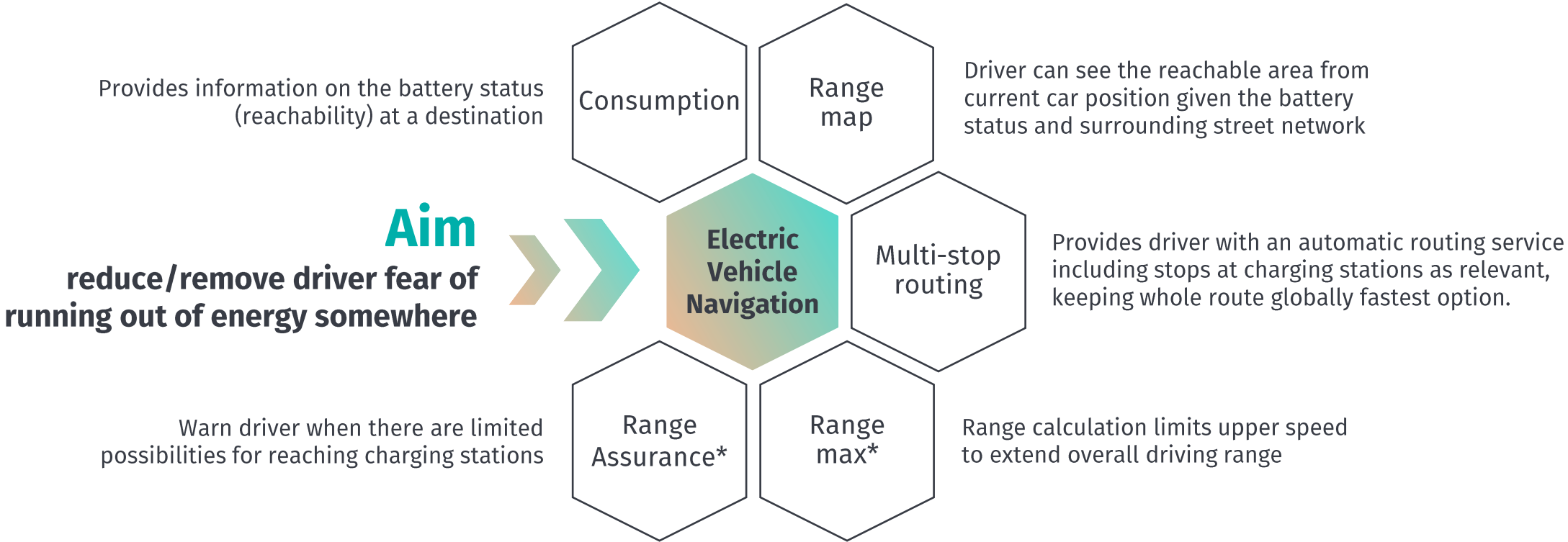


HERE calculated route with optimal charging stops, taking into account charging time, battery state and driving style

Example use cases

-  Fastest route for cars with charging stopovers, optimizing for total time of the trip.
-  Supports battery status/age, driving styles and drive modes
-  Provides real alternatives and supports preferred charge point operators
-  Journey continuation from destination without range issues

EV Routing: enabling a full range of solutions



* Not Available as a HERE Service



Providing solutions for sustainable journey

Key commitments for a green ecosystem



**Localised
location data**



**Technology &
platform leadership**



**Smart & sustainable
mobility solutions**

Sulaizah Saptoe, HERE Technologies

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