

WHAT'S NEXT IN PERSONAL MOBILITY



A look into 2022 and beyond

eKline

Introduction

- With 2021 in the rearview mirror, Kline is identifying which trends will impact the new year, bringing heretofore unseen changes and curveballs.
- Among the most significant: the end of the ICE (internal combustion engine) age for personal mobility in most parts of the world, triggered by the increasing popularity of EVs (electric vehicles) as consumers demand cleaner, greener options in their now-substantial interest in sustainability. But with progress comes challenges: a rapid expansion of charging infrastructure is essential, and oil companies now face several threats, including the inevitable contraction in their fuel and lubricants businesses.
- So what, exactly, will comprise the charging infrastructure? And how will oil companies respond to their new dilemmas? Kline answers those questions in What's Next in Personal Mobility: A Look Into 2022 and Beyond, in addition to providing an overview of digital technology — and more.

➤ End of the ICE Age

1. **Sustained and inevitable growth of EVs** (electric vehicles) in most parts of the world signals the end of the ICE (internal combustion engine) age for personal mobility.
 - Among the major markets, Europe and China lead electrification; most markets are following at different speeds.
2. **Rapid expansion of charging infrastructure** will power the EV age.
 - A number of companies, including auto OEMs, oil companies, power companies, and other new entrants, are developing the charging infrastructure; it will include at-home, highway, commercial spaces, and battery swapping.



➤ End of the ICE Age (continued)



3. Penetration of digital technology in personal mobility (passenger cars, vans, and two-wheelers) will accelerate the end of the ICE age.

- New modes of mobility and passenger car ownership are being promoted by the suite of digital technologies being deployed.

As a result of these three trends, the personal mobility landscape will undergo a sea change.

- Oil companies face a significant contraction in their fuel and lubricants business, as well as a change in business models. How are they responding?

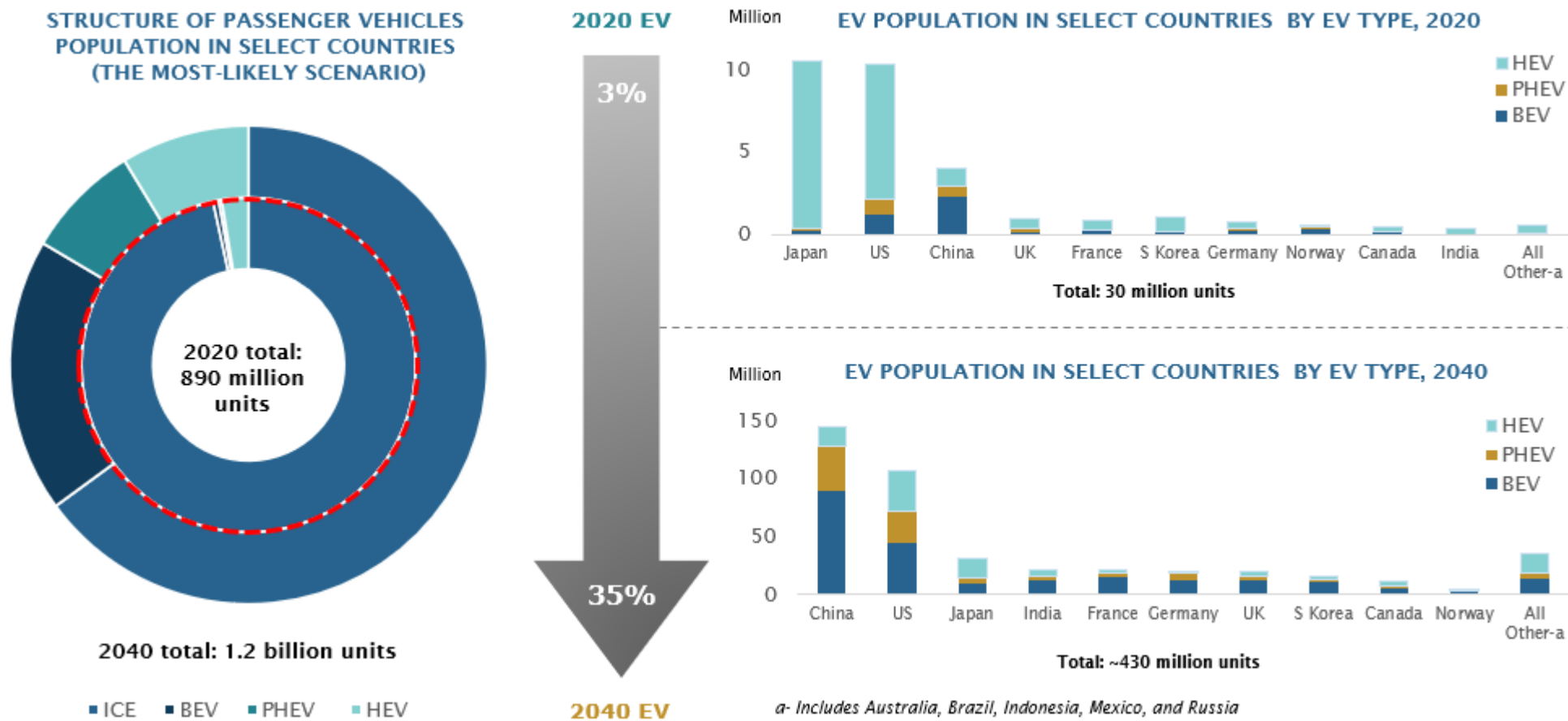
➤ Sustained and Inevitable Growth of EVs

- Between 2020 and 2021, sustainability became a megatrend.
 - Emissions from transport are a major target for CO₂ reduction.
 - Public opinion has decisively shifted in favor of EVs.
 - Responding to public sentiment, automotive OEMs have one by one declared their intentions to go full/partial electric in the next 15-20 years.
 - While not grabbing headlines, the motorcycle market is electrifying at an even faster pace in Asia and Africa.



➤ Sustained and Inevitable Growth of EVs

- An in-depth study of 15 leading markets carried out by Kline in 2021 reveals that the share of EVs will grow 10-fold, from 3% in 2020 to 35% in 2040.



➤ Rapid Expansion of Charging Infrastructure

- There are several categories of companies in the race to establish the charging infrastructure, including at-home, commercial spaces, highways, and battery swapping.
 - The existing fuel retailing network is a ready resource for offering charging points.
 - This, however, is a grave threat to oil companies — if the new modes of electrification take the lead, EVs have no need to even visit gas stations, making them irrelevant.



➤ Rapid Expansion of Charging Infrastructure

- As per Volta, a startup company in the EV charging space, U.S. gasoline sales will drop by 90% in the near future.

**We no longer go to fuel up,
we fuel up where we go.**

The biggest economic opportunity isn't in fueling dollars,
it's in the behavior shift surrounding fueling habits.



➤ Rapid Expansion of Charging Infrastructure Examples: Volta and ChargePoint

- EV charging companies like Volta envisage making advertising-supported, free/low-cost charging ubiquitous at high-traffic commercial spaces.

Media enabled charging

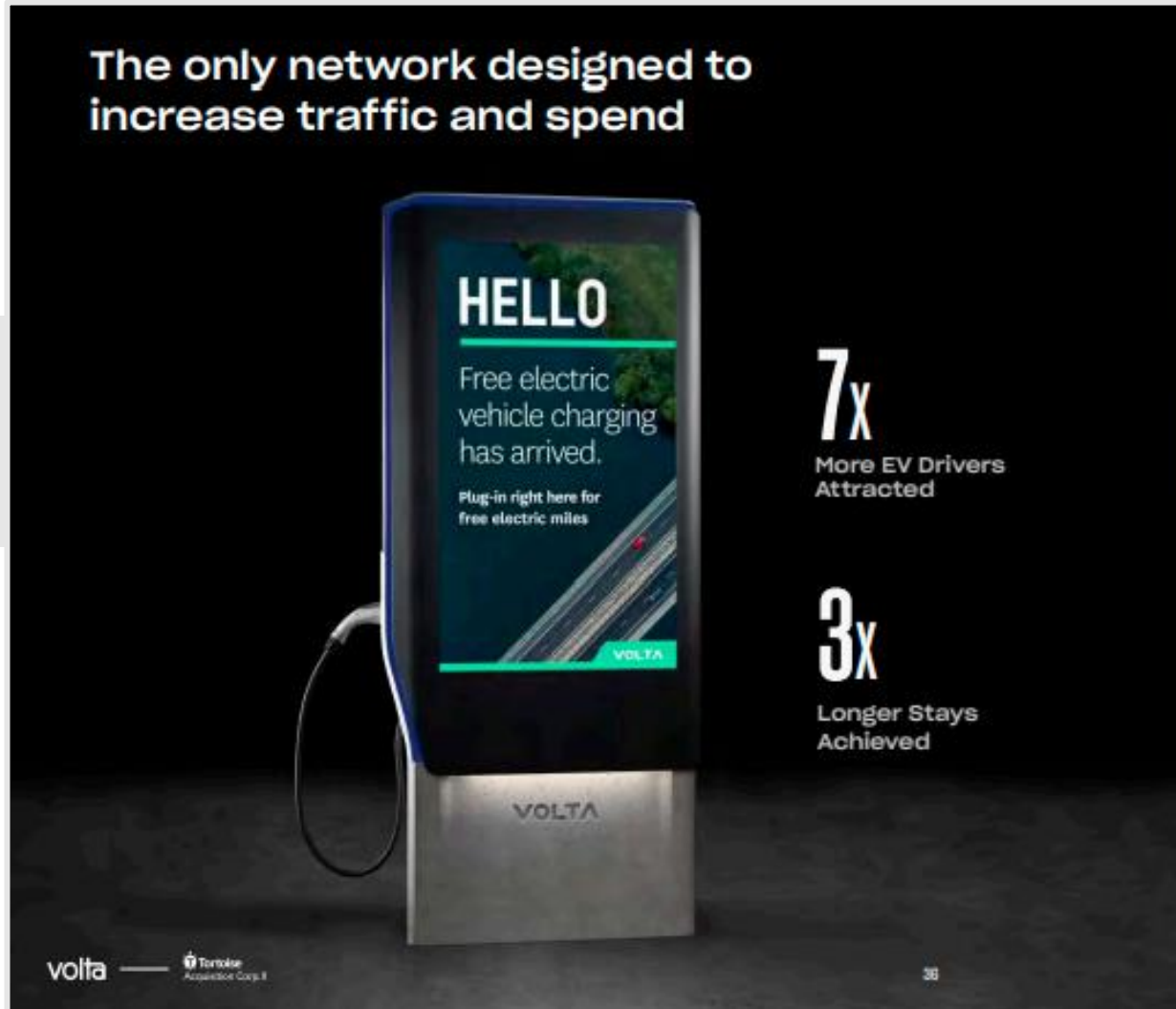
- Access to prime locations
- Multiple advertising budgets
- Proven messaging efficacy
- Full-funnel behavioral understanding and impact (store choice, dwell time, product choice)
- Halo-effect raising consumer perception of participating brands

volta — Tortoise Acquisition Corp. II



Rapid Expansion of Charging Infrastructure Examples: Volta and ChargePoint (continued)

The only network designed to increase traffic and spend



A Volta charging station is shown with a digital screen displaying a 'HELLO' message and information about free electric vehicle charging. The screen also shows a map and the Volta logo. To the right of the station, two statistics are listed: '7x More EV Drivers Attracted' and '3x Longer Stays Achieved'.

HELLO

Free electric vehicle charging has arrived.

Plug-in right here for free electric miles

7x
More EV Drivers Attracted

3x
Longer Stays Achieved

VOLTA

volta — Torstar Acquisition Corp. II

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“When a nearby Safeway got free L2 Volta charging, I immediately switched grocers and haven’t looked back.”

ELECTREK

2019

Note: Volta network data based on actual CA utilization compared to a single representative competitor.
Source: Company data and publicly available filings.



Rapid Expansion of Charging Infrastructure Examples: Volta and ChargePoint (continued)

MarketModelMoatsGrowth

Product Portfolio Leverage

One Portfolio Serves Many Geos and Segments

chargepoint

+

ACDC

+

ASSURE

One comprehensive portfolio deployed globally, with modest regional variations as needed

Commercial Business

North America

+ Proven model, de facto leader

+ Expected gross margin in the 40s

Europe

+ Large addressable market

+ Billings growth > North America as we capture share

+ Global product in 2021 expected to drive up margin

+ Leasing Company path to market

Fleet Business

North America and Europe

+ Largest contributor to growth

+ Stabilization of new products expected to yield improved gross margin

+ Excess commercial capacity available to fleet (off-hours charging)

Residential Business

North America

+ Scaling Multi Family and direct-to-consumer channels

+ Utilities expanding their residential programs

+ Common product powers Fleet and residential

Europe

+ Leasing Company path to market includes home and work charging solutions

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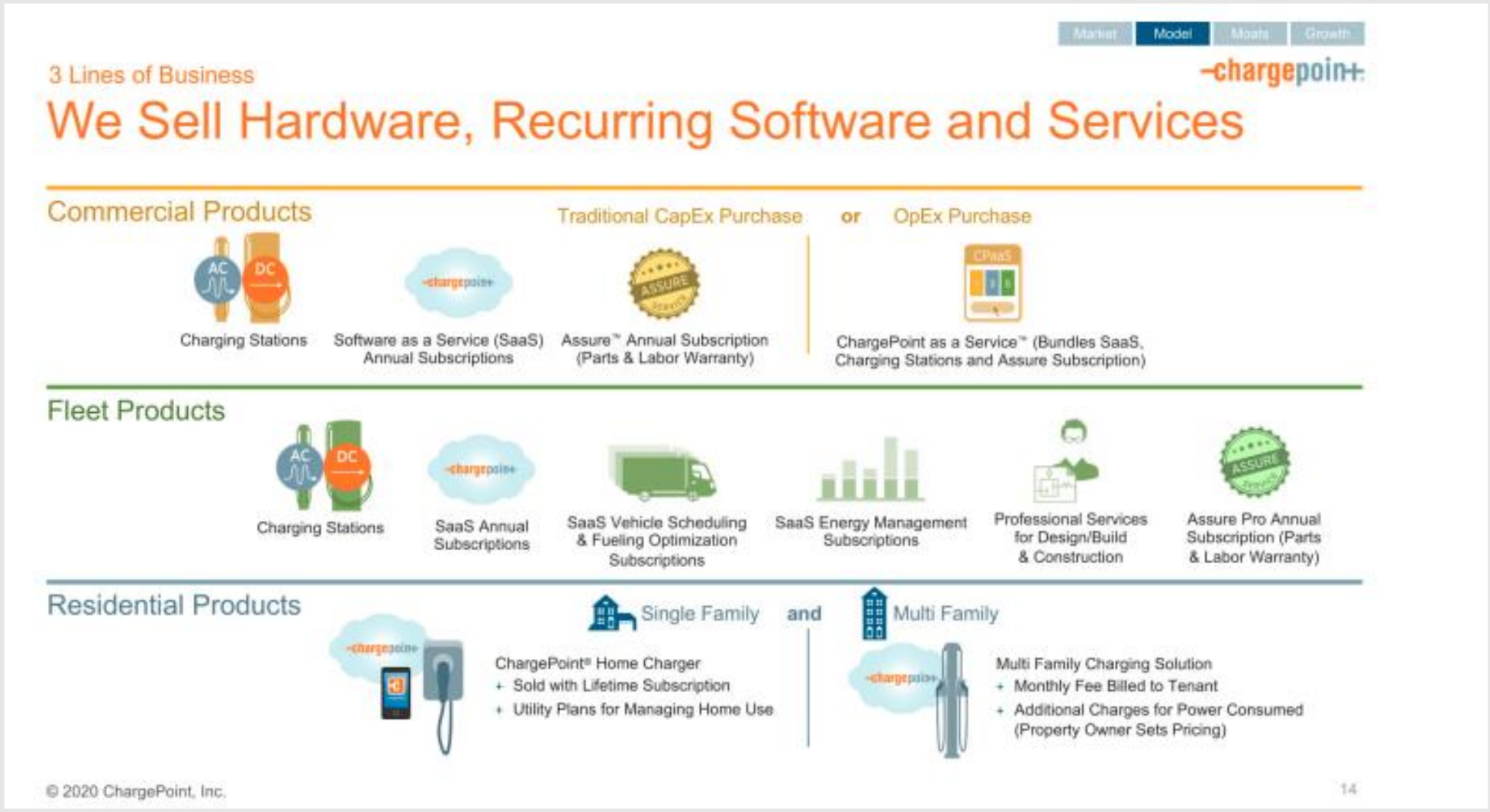
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Rapid Expansion of Charging Infrastructure Examples: Volta and ChargePoint (continued)



➤ Penetration of Digital Technology in Personal Mobility



- Many digital technologies are being incorporated into passenger cars, including keyless entry, autonomous parking, and remote monitoring. Upwards of 90% of new car sales in developed markets will be “connected cars.”
 - One automotive data services platform — Otonomo
 - claims to monitor over 150 real-time car operating parameters.
- These technologies allow new modes of vehicle operation and ownership while reducing costs and increasing safety and convenience. Car-sharing/car-subscription services, for example, increase vehicle utilization. By increasing vehicle utilization, the number of vehicles needed to support a given population cluster is reduced, thereby reducing associated CO₂ emissions.

➤ Penetration of Digital Technology in Personal Mobility (continued)

- These digital technologies permit many new modes of shared mobility, and the number of startups in this space is growing rapidly.
- From the perspective of oil companies, this leads to changes in the route to market as well as a general reduction in fuel and lube consumption.

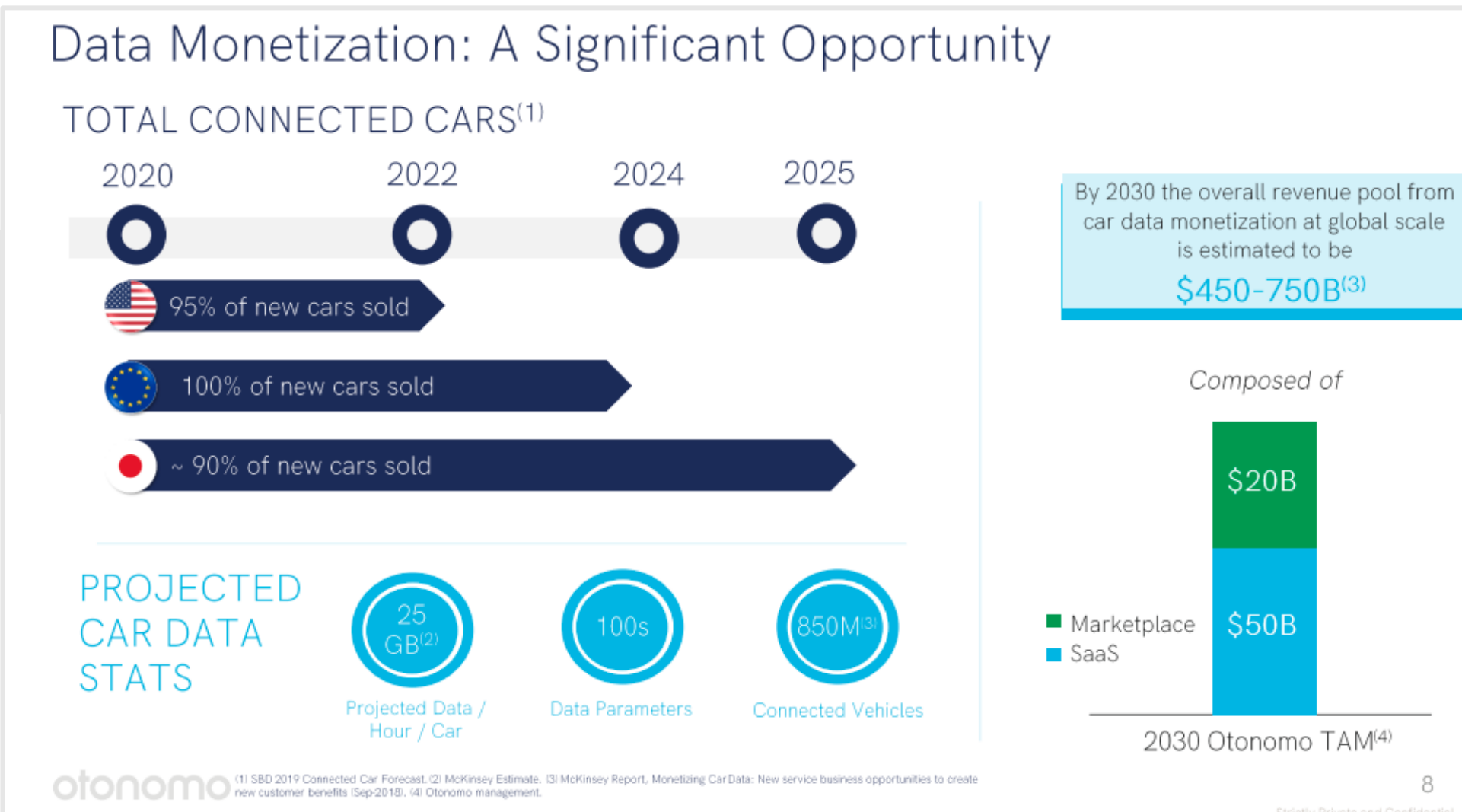
VARIOUS FORMS OF SHARED MOBILITY

Ride sharing	Passengers and drivers find each other via a digital platform.
Ride pooling	Ride service provider operates on fixed routes to underserved areas/high-congestion areas.
Ride hailing	App-linked taxi/chauffeur service.
Car sharing	Users share from a fleet of freely available cars. Car usage is paid by app, car is unlocked via app.
Car subscription	Similar to a lease, user pays a fixed monthly fee and the cost of fuel/electricity to use the vehicle.



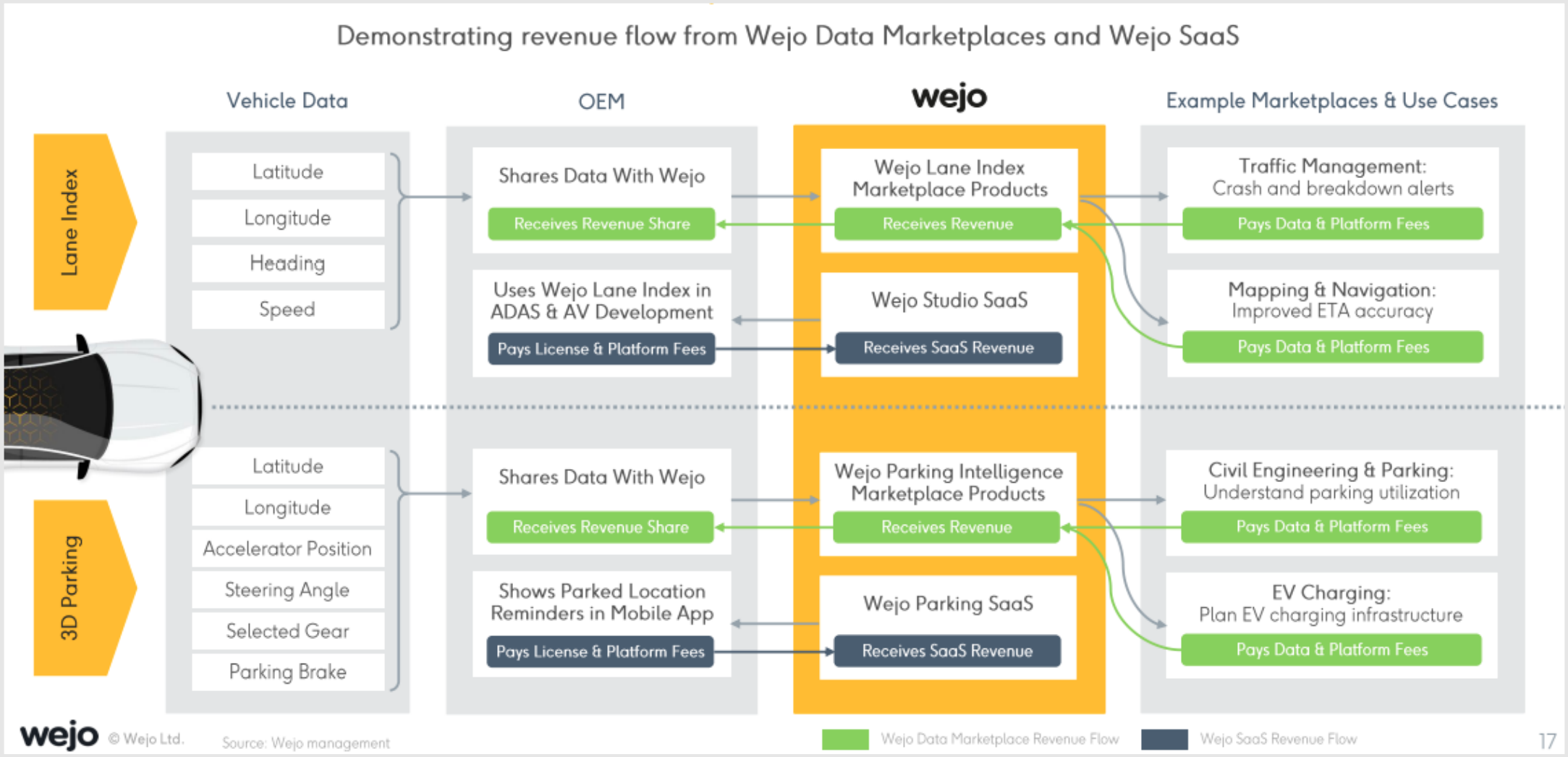
Penetration of Digital Technology in Personal Mobility Examples: Otonomo and Wejo

- Otonomo projects that by 2025, more than 90% of new cars sold in developed markets will have a host of digital technologies. This will allow the emergence of new modes of car subscription services.





Penetration of Digital Technology in Personal Mobility Examples: Otonomo and Wejo (continued)





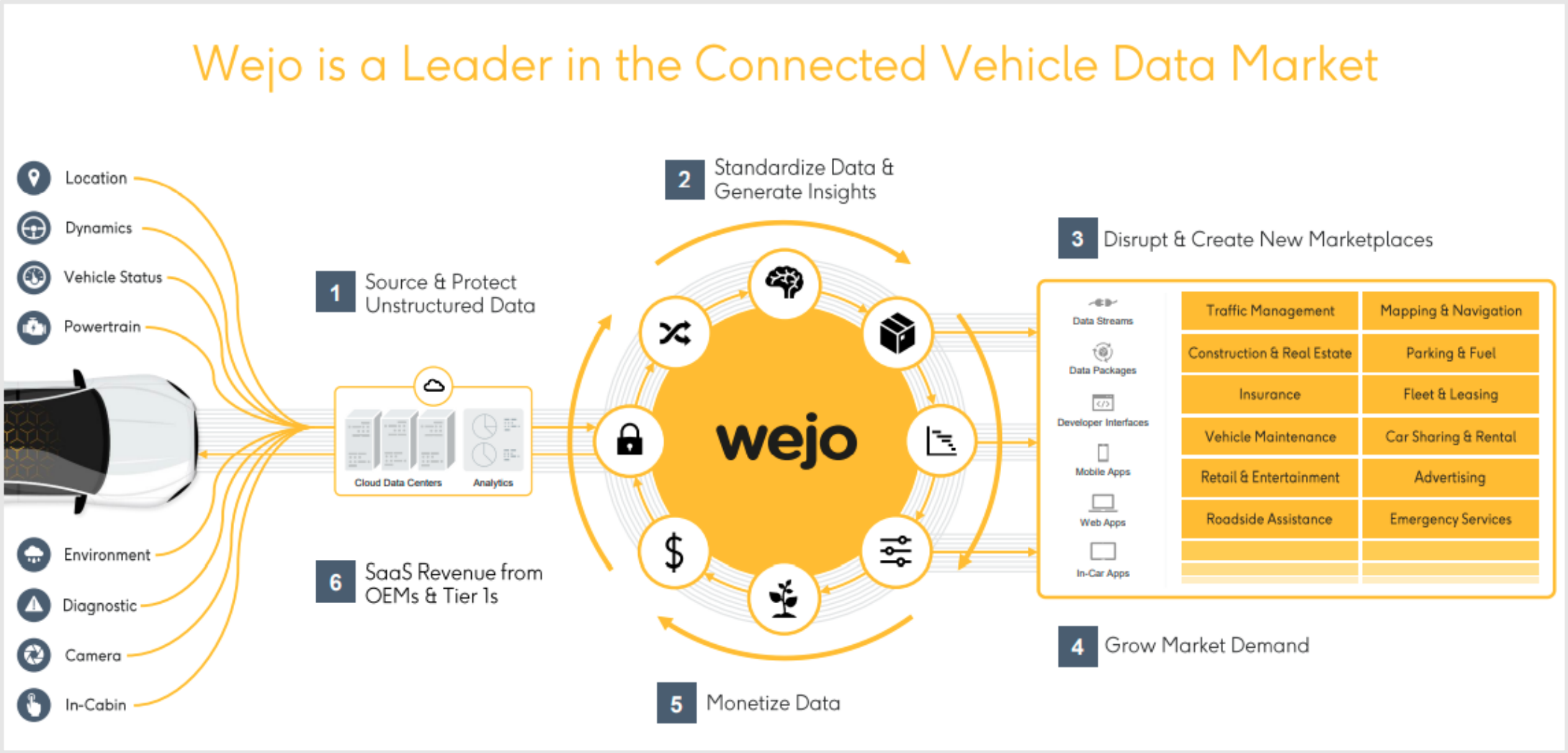
Penetration of Digital Technology in Personal Mobility Examples: Otonomo and Wejo (continued)

- Otonomo collects data on a large number of parameters, allowing cost optimized car maintenance that leads to a reduction in engine oil consumption.





Penetration of Digital Technology in Personal Mobility Examples: Otonomo and Wejo (continued)

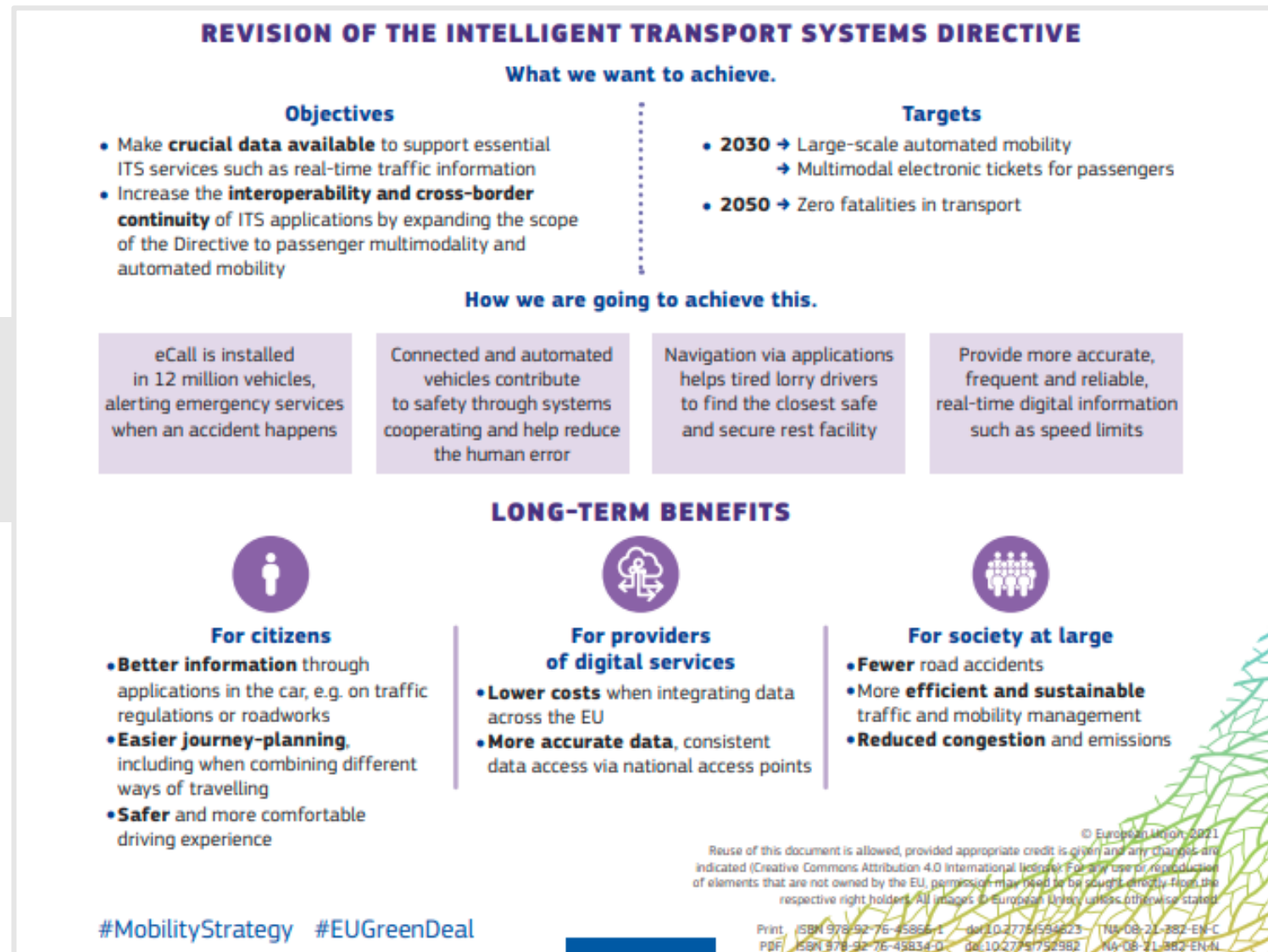


➤ Penetration of Digital Technology in Personal Mobility: Supported by EU Policy

- EU policy for efficient and Green mobility promotes digitalization for the benefit it brings in improved road safety and driver comfort.



Penetration of Digital Technology in Personal Mobility: Supported by EU Policy



➤ Summary: Oil Companies Face Several Threats



Sustained and inevitable growth of EVs:
loss of fuel and lube volume

Rapid expansion of charging infrastructure:
shrinking traffic through gas stations

Penetration of digital technology in personal mobility:
growth of shared mobility, which drives growth of passenger car fleets → reduced value of engine oil brands?

➤ How Are Oil Companies Reacting?



- The growth of EV penetration is inevitable.
 - However, it is still not clear where these vehicles are charged and how digital technology will change the modes of vehicle ownership and use.
- Oil companies are making investments to address the threats they face and to continue to have a strong position in the emerging personal mobility economy.

➤ How Are Oil Companies Reacting? (continued)

- A good way to frame what is happening vis-à-vis oil companies rushing to buy/build charging networks is provided by the concept of the “super-app.”
 - As per Wikipedia, a super-app is a mobile application that provides multiple services including payment and financial transaction processing, effectively becoming an all-encompassing, self-contained commerce and communication online platform that embraces many aspects of personal and commercial life.



➤ How Are Oil Companies Reacting? (continued)



- There are four domains of personal mobility, like intersecting circles of a Venn diagram:
 - Mobility devices (cars, motorcycles, scooters, bicycles, minivans).
 - Electrification (public chargers, charging infrastructure, zero-carbon power, batteries, battery swapping, battery end-of-life).
 - Digital (keyless access, route planning, remote monitoring, automated parking, battery in the Cloud, various levels of autonomous driving).
 - Services (car subscription, B2C, B2G, last-mile delivery, ride hailing).

➤ How Are Oil Companies Reacting? (continued)

- Whoever captures the most crucial pieces of the environment (buy or build) will be on their way to being the super-app.
 - Success in one city center brings more resources and backing to build more city centers.
- Oils companies start with one big advantage: their fuel retail network, which is a natural home for a future charging network. They are enhancing this by also building zero-carbon power supplies (solar, wind). They will also supply most of the fluids that are required and can perform maintenance. The rest will buy their way to a strong position.



➤ Why we are the industry's #1 data and insight go-to provider

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of top 20
lubricants'
producers
served

70+

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covering all key
market segments

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