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Rethinking Transportation 2020 – 2030

Rob Bailey
APSE



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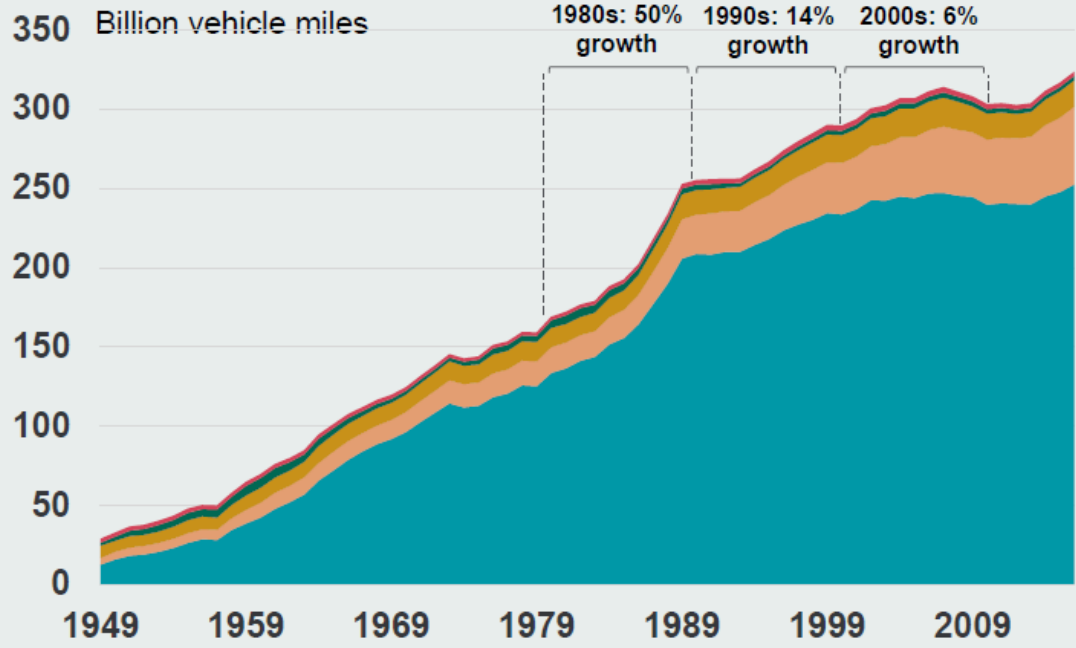
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Long-term traffic trends

Since 1949 motor vehicle traffic has increased more than ten-fold from 28.9 to 323.7 billion vehicle miles, largely driven by steady growth in car traffic.

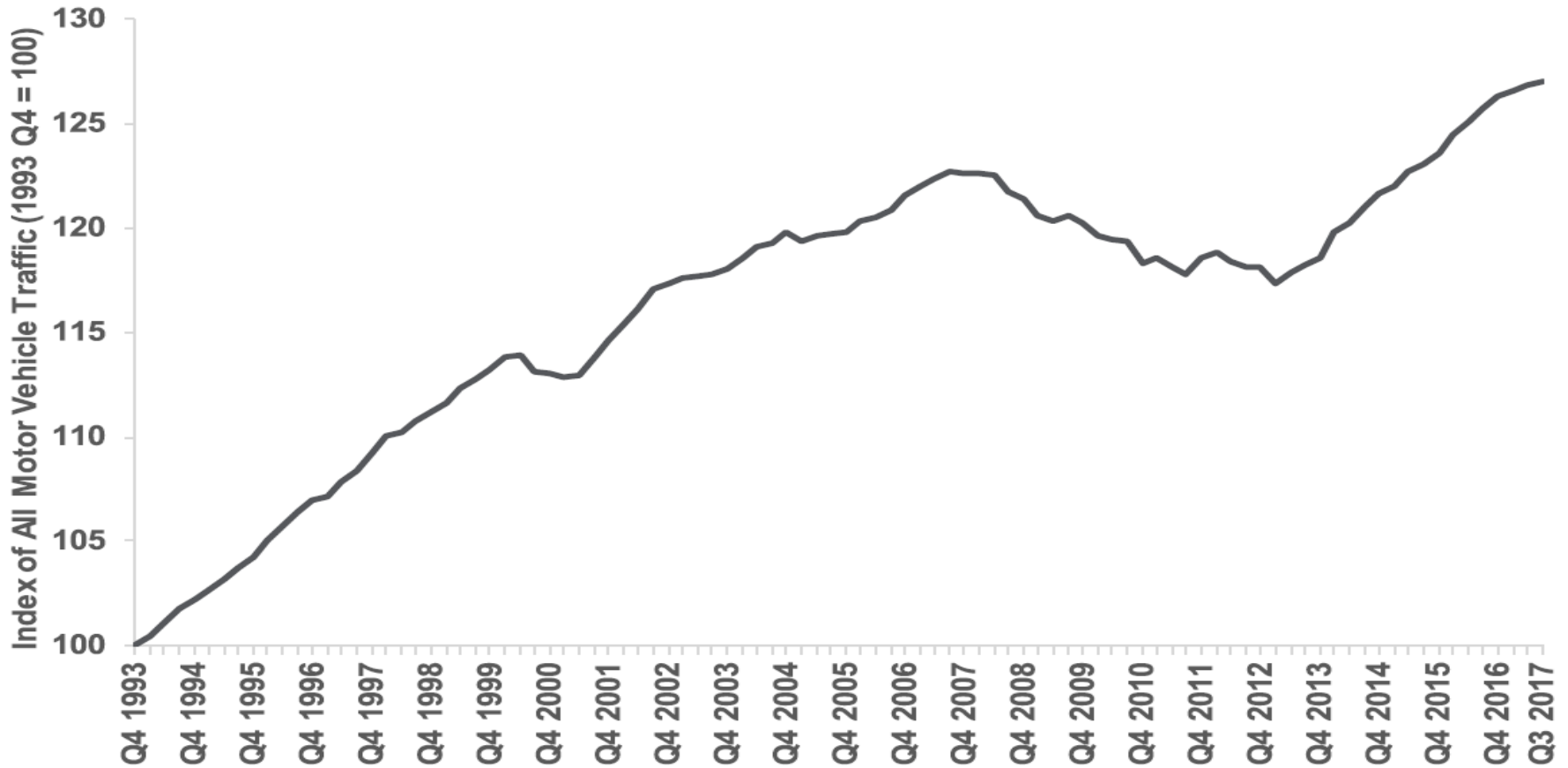
Motor vehicle traffic in Great Britain, since 1949



	Change 1949 - 2016
Buses & coaches	-1.2%
Motorcycles & scooters	+49%
Heavy Goods Vehicles (HGV)	+113%
Light Commercial Vehicles (LCV)	+1098%
Cars & Taxis	+1905%
All motor vehicles	+1020%

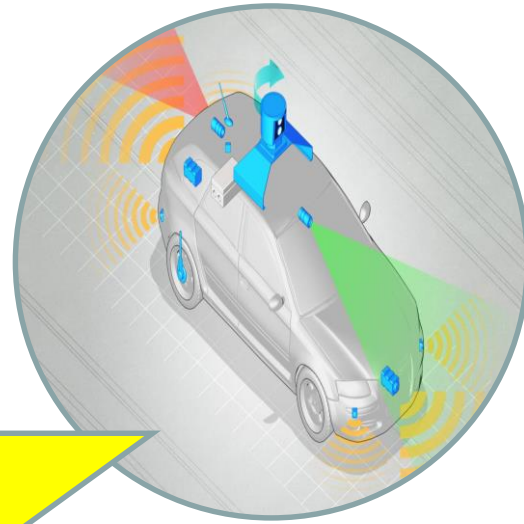


Chart 1: Rolling Annual Index of Road Traffic in Great Britain, from 1993





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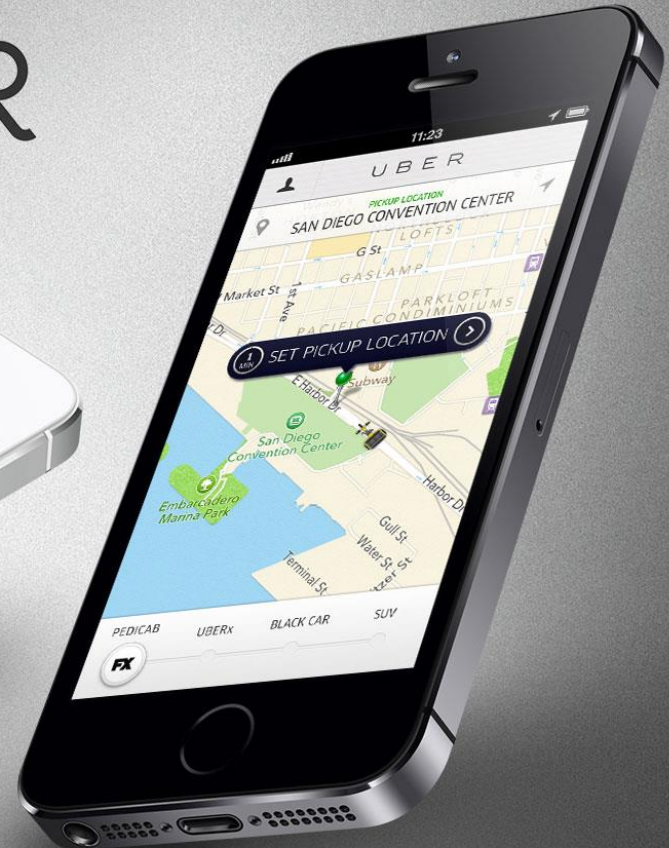




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UBER





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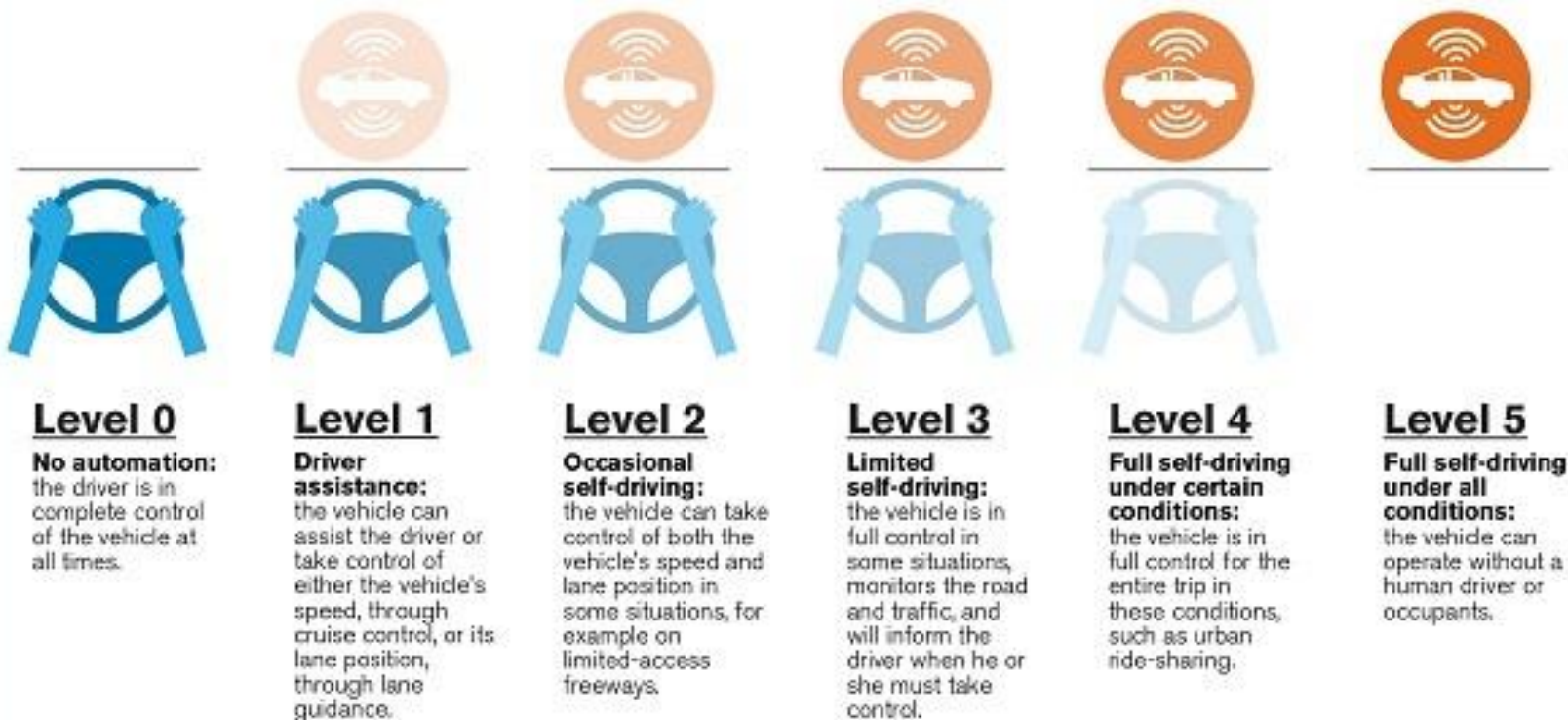




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Five Levels of Vehicle Autonomy





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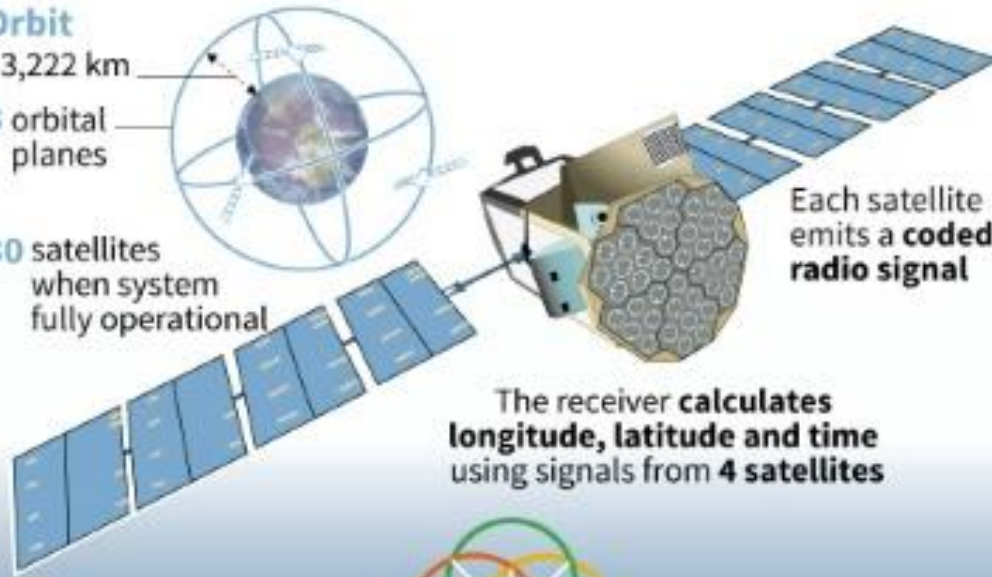
The Galileo satellite navigation system

Orbit

23,222 km

3 orbital planes

30 satellites when system fully operational



Each satellite emits a **coded radio signal**

The receiver **calculates longitude, latitude and time** using signals from **4 satellites**



Angle to the equator



56°

Accuracy

Within 1 metre for professionals

Within 5 metres for general public

Communications centre

Synchronises the signals



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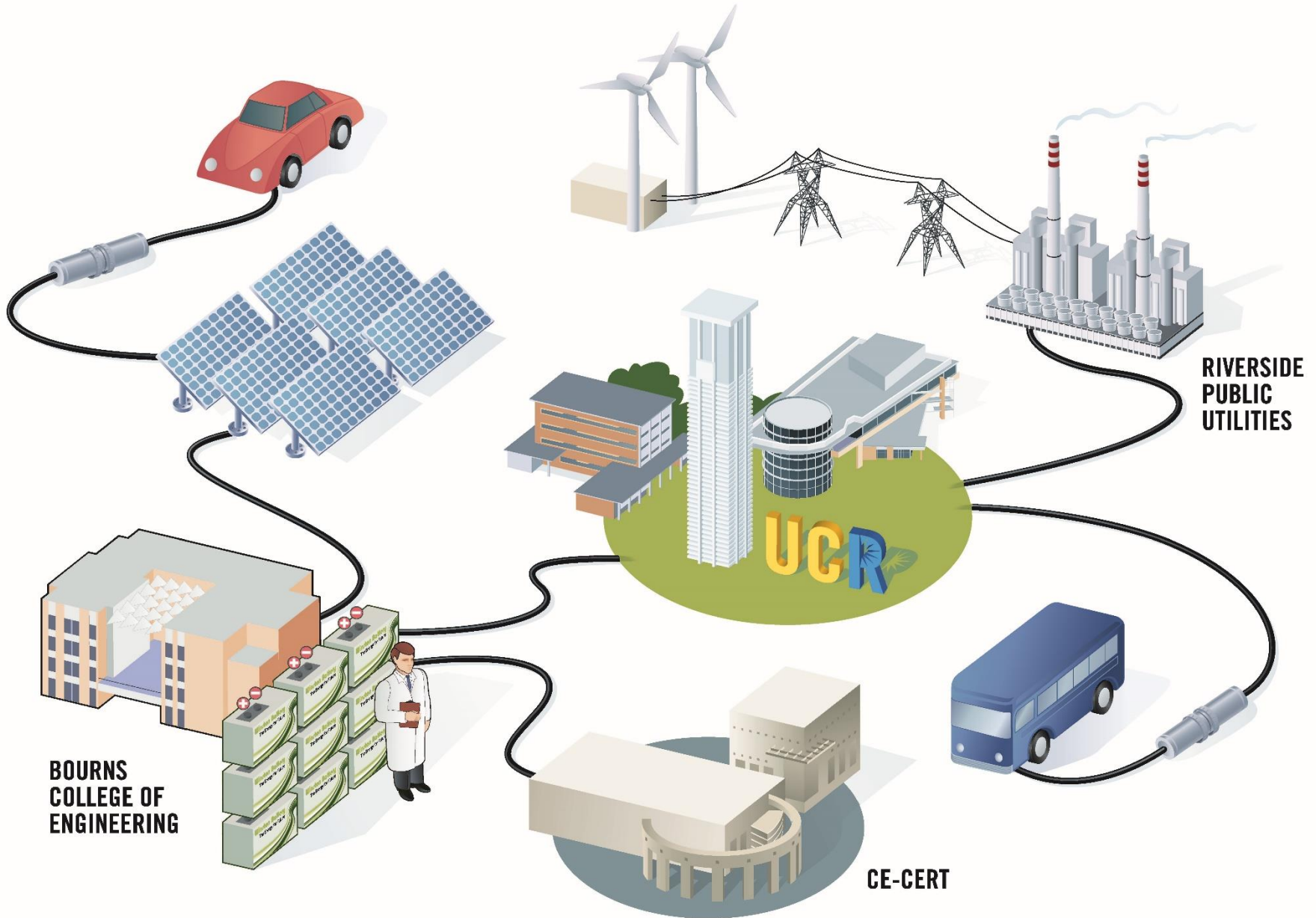


Richard B.
2014





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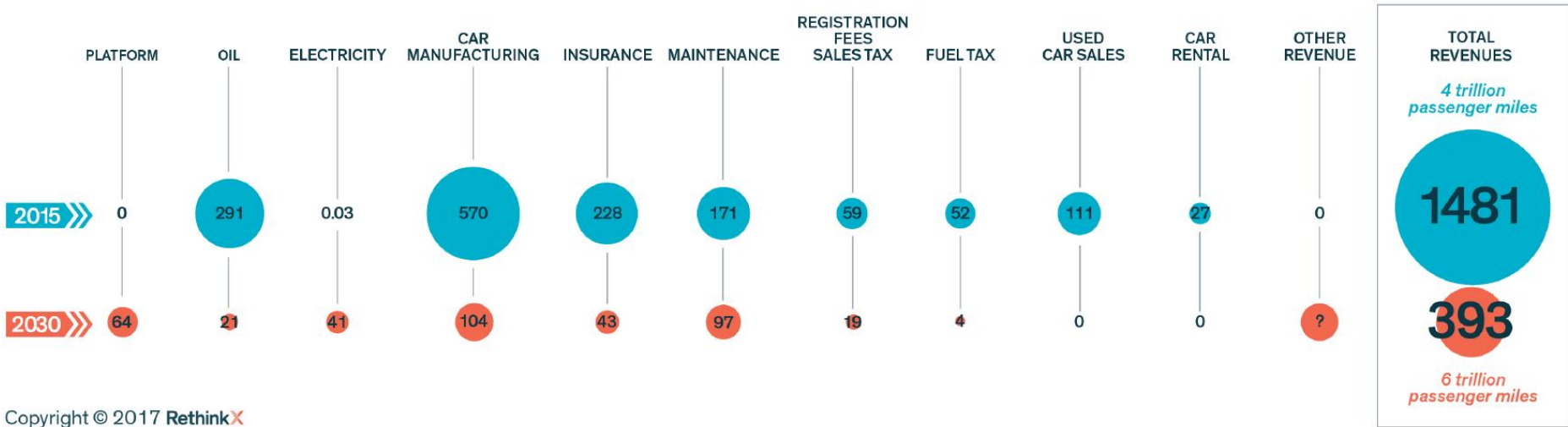
S-Curve Adoption Model





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» Revenue distribution along the car value chain in billions of U.S. dollars



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CNN tech



TESLA LIVE

» *Potential impacts*



POSITIVE IMPACTS

- Significant consumer savings and productivity gains
- Increased mobility and accessibility for those who cannot drive
- Fewer road accidents, fatalities and hospitalizations due to human error
- Lighter and less material-intensive vehicles
- Improved air quality and public health
- Decoupling of energy and geopolitics
- Potentially less military spending overseas
- Lower infrastructure costs
- Less traffic congestion
- Reclaiming parking spaces and infrastructure for productive uses
- Lower CO₂ emissions

NEGATIVE IMPACTS

- Formation of oligopolies/monopolies among TaaS providers
- Job losses
- Shrinking of government revenues from oil and parking



Disruption

- Number of passenger miles will increase from 4 trillion miles in 2015 to 6 trillion in 2030.
- Cost of delivering these miles will drop from \$1,481 billion in 2015 to \$393 billion
- The size of the U.S. vehicle fleet will drop from 247 million in 2020 to 44 million in 2030.
- Annual manufacturing of new cars will drop by 70% during the same period.
- Annual manufacturing of new ICE mainstream cars sold to individuals will drop to zero. Car dealers will cease to exist.
- Huge opportunities will emerge in vehicle operating systems, computing platforms and TaaS fleet platforms.
- Global oil demand will drop from 100 million barrels per day in 2020 to around 70 million barrels per day in 2030.
- The price of oil will drop to around \$25 per barrel. Oil prices might collapse as soon as 2021.
- High-cost oil fields will be completely stranded. North Sea – Shale oil



Oil Demand

- 40% decline in Oil demand
- Huge decrease in \$ price
- Instability in petro nations – Middle east

LOCAL SERVICES

LOCAL SOLUTIONS



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