



Autonomous Vehicles

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The start....

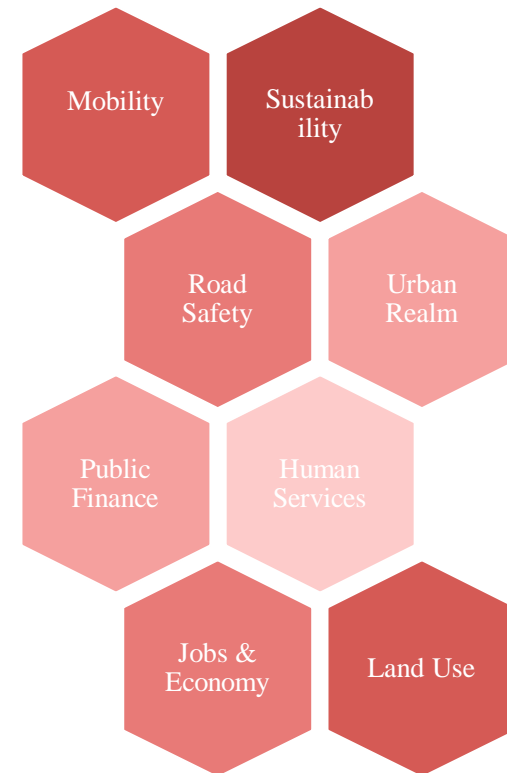
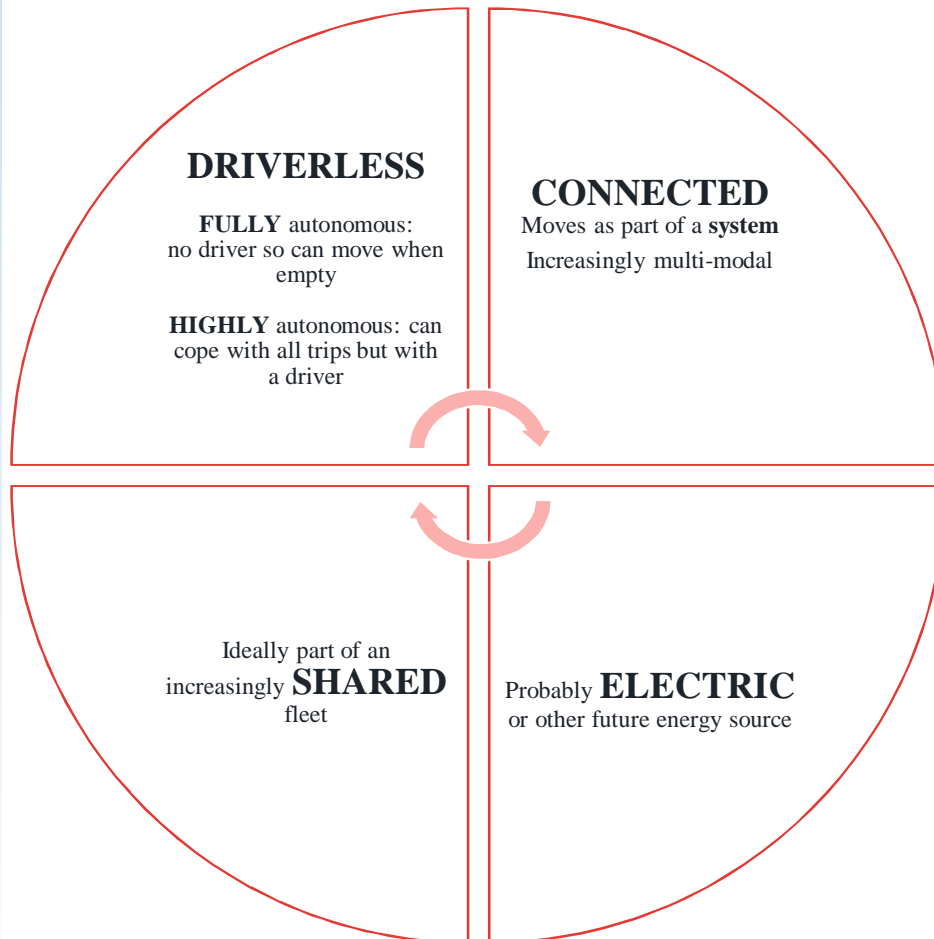


Connected & autonomous vehicles (C/AVs) are coming.
They will be **transformational**

The transition has **already started** – it will affect **vehicles** (cars, buses, freight etc), **routes**, land use, urban realm, economics and future **places**



What Will the AV Revolution Mean?



1. Impacts...

1. Potential effects of C/AVs on road infrastructure & traffic demand...and the opportunity for “pay-as-you-go”



1. Road Network: Drivers of Supply/Demand changes

Trip ends will decouple

A C/AV will not have to finish its trip at the same place as its "driver(s)"

Road network becomes a system

Joins other modes to form wider, integrated system
Both local & strategic routes



C/AVs provide a rare opportunity to manage the road network more proactively

Quality & quantity of movement

Desired quantum of movement becomes a system input, not a derived demand



2. Place making

2. C/AVs and the added long-run potential for better place-making, homes & jobs growth



Regeneration Potential for New Places: an “AV zone”



Regeneration Potential for New Places: the "AV zone"

Fully accessible places, designed for people and C/AVs from the start

Could be large self-contained regeneration areas (growth areas, opportunity areas, housing zones etc)

Extra development land

15-20%

extra land area is freed up compared with a today's urban areas. Single site land value uplifts worth **£'00s of millions** - if not £billions



Upgrading City Centres - Without Major Infrastructure Investment...



Congestion relief & smoother flows

30-45%

of drivers in urban centres today are
searching for parking



Safety

If **50%+** fewer urban accidents,
hundreds of lives and thousands of
serious injuries saved every year

Improving Suburban Lifestyles and Places



Reducing car ownership without reducing mobility

80% of the time, our cars are parked at home. Many of us buy cars because of a lack of suitable alternatives



Safer - with a better quality of life

Up to **500%** reduction in fatal accident risk when suburban vehicles travel <30mph

Residential roads become social spaces for people.

Safer, more efficient motorways and major routes



Capacity transformation

1.4 x capacity

uplift if a route
was fully connected

...or up to **3.7 x**

if fully autonomous

Safety benefits
**£240 - 400m
p.a.**

savings in UK
motorway
accident costs/yr,
excluding delays

Route impact
reduced

Adjacent land could
be converted to other
purposes or could
remain as roadspace
but with much larger
headroom for the
future

Rural market towns: redesigned for the community



Improved access and mobility
Different business case for rural
areas. Wider benefits at the
forefront.

Initiative Cities

1 Los Angeles, USA is a leader in planning for the AV transition, with the adoption of a pioneering comprehensive transportation technology strategy in 2016. As the world center for automotive design, and the cradle of car culture, the region will be an important lab for understanding consumers' views of AVs.

503
3,971,883
8,282
700

2 Austin, USA, one of North America's fastest growing cities, was also the world's first site for large-scale testing of AVs, following Google's deployment of test vehicles on city streets in 2015. This year, the city is working to pilot an AV people mover to demonstrate last mile connectivity between a transit stop and several key destinations.

271.8
931,830
3,359
830

3 Nashville, USA is a city where AVs will be an essential key to two ambitions—to nurture the region's large and growing automotive sector, which led the state's post-recession recovery, and to restructure the region's transportation system under a plan adopted in 2010. Due in April a Mobility Action Plan will outline a vision for the integration of AVs and future transit investments.

525.94
678,889
1,300
880

4 Washington D.C., USA is transforming itself into a leading testbed for automated logistics. Estonia-based Starship Technologies began testing its rovers on city sidewalks in January 2017 with e-commerce partner Postmates. Automated delivery tests under the city's Personal Delivery Device Pilot Program are restricted to no more than five vehicles per vendor, a 50 pound vehicle weight cap, and a 10 mph speed limit.

68.34
681,170
9,967
470

5 Buenos Aires, Argentina is an internationally-recognized innovator in bus rapid transit and open government. The city will enter the AV transition in 2017 as it hosts the first of 10 "Formula E" races featuring high-performance self-driving cars.

78
2,890,151
37,000
320

6 São Paulo, Brazil, the traditional hub of Brazil's automotive industry, was an early leader in the AV test circuit, with the first on-road trials conducted in October 2013. The city's technical universities, in partnership with global automakers such as Scania, are spearheading the ongoing development of a variety of AV trucks, taxis, and passenger cars.

587.30
12,038,175
20,496
397

7 London, England is host to a portfolio of AV pilots. The GATEway (Greenwich Automated Transport Environment), launched in 2015 by the UK's national innovation agency, is a multi-year research effort testing AV use cases and obstacles. In 2017, two major automakers will begin large-scale tests on city streets.

607
8,673,713
14,290
360

8 Paris, France is taking a coordinated citywide approach to AV planning, spearheaded by the city's Mobility Agency. An initial pilot with AV minibus maker Easymile will test driverless shuttles on several routes, including a dedicated lane crossing the 800-foot (250m) span of the Charles de Gaulle Bridge. AVs are a key element in the French government's ambitious 'New Industrial France' policy launched in 2016, which cleared the way for future efforts.

40.7
2,229,621
55,000
390

9 Helsinki, Finland is a global leader in the smart city movement, and is pioneering a holistic approach to AVs. One of the world's first AV public transit pilots, SOHJOA, tested a quarter-mile microtransit route in the city's Hernesaari waterfront district. The city's recently appointed Chief Design Officer will oversee cross-cutting efforts to integrate AVs into the urban environment.

276.25
635,591
3,783
328

10 Tel Aviv, Israel has rapidly emerged as a world-leading hub for digital automotive technology innovation. Sources of new inventions include both homegrown startups like AV powerhouse Mobileye, a supplier of computer vision systems, as well as a constellation of new research centers set up by Japanese, American, and European automakers.

20
432,892
21,638
365

The 10 cities participating in the Bloomberg Aspen Initiative represent a spectrum of urban conditions and are preparing for the AV future in equally diverse ways.

Key to Symbols

Land Area (sq miles)
Population
Density (persons / sq mile)
Passenger Cars per 1,000 persons

§ Australia
§ Germany
§ Japan
§ Netherlands
§ Singapore
§ Sweden



Autonomous Vehicles

In 15 - 20 years.....

Car Battery to provide >200 miles
US\$20k/vehicle

Tesla 18 moving parts
Maintenance is almost zero

Land Transport will switch to Electric
10 x cheaper

Oil prices will collapse to below
\$US20/bar

En masse switch to EV self drive - vehicles on demand

Car Mechanic Shops will disappear

It will be hard to find petrol stations

Value of 2nd hand cars will collapse

You will need to pay to dispose of your vehicle

Car Dealers will disappear

Insurance costs will drop

Car Manufacturers will become variants of UBER

AVIS/ will become a big player

Household Income Savings of E4,000/year

UK will phase out Diesel Cars

India to phase out diesel/petrol cars by 2032
US\$60 billion savings

China:
>7million EV by 2025



16 May 2017

Thank you....

wsp