

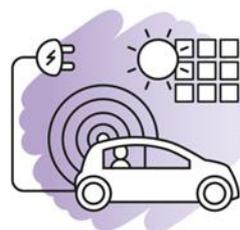
Commission of Inquiry - Vision for Hampshire 2050

Hearing summary report

Mobility, connectivity and energy

25 January 2019

HAMPSHIRE 2050
VISION FOR THE FUTURE



Mobility,
connectivity
and energy

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1. Agenda and attendance list

Item	Timing	Lead
Arrival, tea, coffee and breakfast selection	09:00-09:30	
Welcome	09.30-09:35	Cllr Perry
Housekeeping, word cloud & public opinion video	09:35-09:45	Stuart Jarvis
Theme 5 Introduction	09:45-10:00	Adrian Gray
Expert Presentation 1	10.00-10.20	Professor John Preston
Q&A and discussion	10.20-10:40	All
Refreshments	10.40-10.55	
Expert Presentation 2	10.55-11.15	John Bowers
Q&A and discussion	11.15-11.35	All
Expert Presentation 3	11.35-11.55	Mark Selby
Q&A and discussion	11.55-12.15	All
Theme 5 summary	12.15-12.25	Frances Martin
Working lunch	12.25-13.25	Frances Martin
Commissioner Deliberation & Recommendations		
Hearing Close	13.25-13.35	Cllr Perry

Attendance List

Apologies

Professor G Baldwin	Vice Chancellor, Southampton Solent University
The Rt Rev D Williams	Bishop of Basingstoke LW
Lord Wakeham	Previous Leader of the House of Commons and House of Lords

Commissioners

Mr Tali Atvars	Winchester Student Union President
Ms Lorraine Brown	Former Chair of the Southern Region Flood and Coastal Erosion Committee
Cllr David Clifford	Leader Rushmoor Borough Council
Mr Tim Colman	FSB National Procurement Spokesman
Cllr Mark Cooper	Hampshire County Councillor for Romsey

Mr Stewart Dunn	Previous Chief Exec Hampshire Chamber of Commerce
Ms Dee Haas	Chairman Hampshire CPRE
Mr Ranil Jayawardena MP	MP for North East Hampshire
The Very Revd Catherine Ogle	Dean of Winchester
Ms Elizabeth Padmore	Commissioner - Chairman Hampshire Hospitals NHS Foundation Trust
Cllr Roy Perry (Chair)	Leader Hampshire County Council
Sir Jonathan Portal	JP Directors
Mr Peer-Jada Qureshi	Founder of Court & Tribunal Solutions
External Speakers	
Professor John Preston	Head of the Transportation Group, University of Southampton
John Bowers	Chief Executive, JCC Bowers
Mark Selby	Visiting Professor, University of Surrey
Hampshire County Council Officers	
Stuart Jarvis	Director Economy, Transport and Environment
Frances Martin	Assistant Director, Planning and Environment
Chitra Nadarajah	Environment Strategy Manager (and Commission of Inquiry)
Mike Culver	Commission of Inquiry Project Delivery Manager
Amie Heath	Commission of Inquiry Project Support Officer
Adrian Gray	Head of Highways, Traffic Manager (theme five lead)
Andy Wren	Highway Manager (Traffic Systems & Street Lighting) (theme five support)
Alison Taylor	Communications Manager
Nigel Barker	Graphic Designer (Photographer)
Others	
Brian Watson	Accompanying Mark Selby (External Speaker)

2. Introduction

This theme includes the transport impact of electric powered and autonomous vehicles, impact of smart technology in homes and workplaces, communications technology, and future energy issues.

Given the potential breadth of this theme, the focus of the hearing was on mobility and connectivity, and the associated energy issues.

Hampshire is predominantly rural. Just 15% of Hampshire is defined as urban city or town, however 78% of the population live in urban areas.

Hampshire has 5,344 miles of road and 193 miles of railway track incorporating 49 stations, providing excellent transport links within the county. The Strategic Road Network of motorway and trunk roads, maintained by Highways England, provides wider connectivity beyond the county boundary. The ports of Southampton and

Portsmouth provide passenger services to the Isle of Wight and Europe and international freight distribution, while the airport at Eastleigh provides air links to an increasing number of destinations, with both London Heathrow and Gatwick also within easy reach by road and rail.

Key background trends anticipated to affect providing for future mobility include population age and traffic growth, with traffic growth affected by new housing, car ownership and modal choice. Public health issues relating to poor air quality and inactivity in the population are also key factors likely to affect future policy decisions.

The hearing included an introduction, presented by Adrian Gray, Head of Highways (Traffic Manager) from Economy, Transport and Environment at the County Council and evidence from three expert witnesses on the following topics:

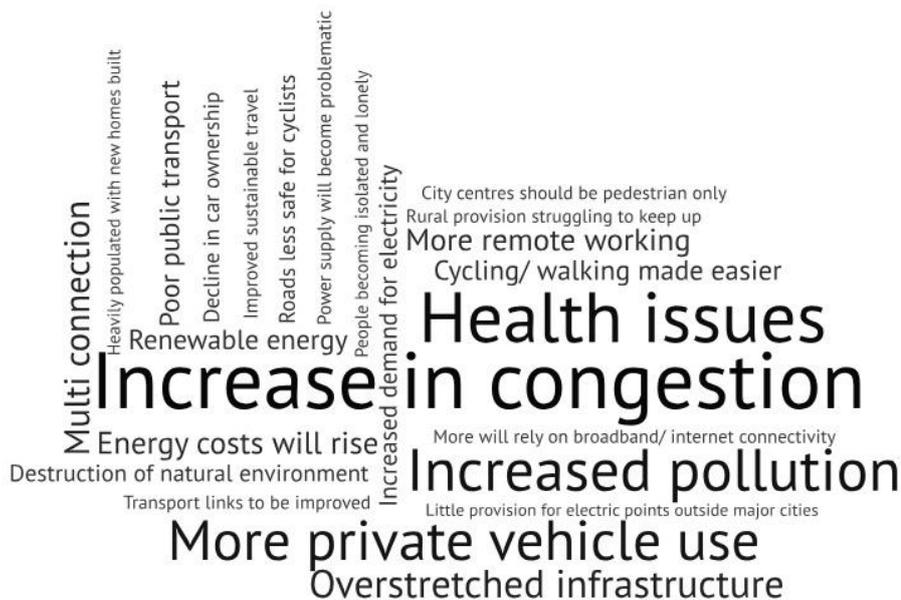
- **Future transport trends** – presented by Professor John Preston, Transportation Research Group (TRG), University of Southampton
- **Connected, intelligent autonomous systems** – presented by John Bowers, Managing Director, JCC Bowers
- **The Project Beyond Consortium** – presented by Mark Selby, University of Surrey

3. Hearing Summary

Cllr Roy Perry – Welcome and introduction

Cllr Perry welcomed everyone to the hearing.

Public Opinion – Stuart Jarvis, Director of Economy, Transport and Environment, Hampshire County Council



Presentation 1 - Theme 5 Introduction

Adrian Gray, Head of Highways (Traffic Manager) from Economy, Transport and Environment

The presentation covered achieving policy outcomes through the creation of safe, clean and vibrant community places. From a mobility and connectivity perspective Hampshire is predominantly rural, which raises some specific challenges.

The Strategic Road Network of motorway and trunk roads, operated and maintained by Highways England, provides wider road connectivity beyond the county boundary. The capacity of these road arteries is vital. Transport infrastructure is a major driver of economic growth and competitiveness.

Several challenges were identified for future mobility, including:

- Road traffic growth and congestion;
- Population growth;
- Aging population;
- Obesity;
- Plateauing reductions in the numbers of road users killed and injured;
- Commuting;
- Health costs of air pollution;
- Reduce tax revenue from Vehicle Excise Duty and fuel duties.

Investment will be needed to unlock development and to improve the performance of the wider transport network to cater for additional demand without increased congestion and overcrowding on public transport. The consequences for public health of air pollution and inactivity are severe, and future mobility solutions will need to manage traffic growth without jeopardising health.

Four emerging innovations in mobility that will allow us to tackle these challenges were highlighted:

Connectivity and automation

Autonomy offers some interesting opportunities and associated challenges for local authorities. To meet the needs of autonomous vehicles, future roads and junctions will need to be designed to provide unambiguous information and not rely on human interpretation. Highways maintenance will similarly need to change to address the needs of future vehicles.

Mobility as a Service or MaaS

Mobility as a Service envisages a single multi-modal, multi-vendor journey planning and ticketing service where travellers can plan, pre-book and pay for a whole journey using any mode or route. It would combine traditional public transport with private hire and shared transport. The benefit of Mobility as a Service in the longer term is its potential to make car ownership less of a perceived essential because combining other modes is predictable and reliable and low cost.

Sharing

Under a car sharing system, an individual might not own a vehicle, or a family might own fewer vehicles because an on-demand alternative exists either for having a vehicle to use for a period or to share a ride.

Electrification

There is potential for dramatic reductions in air pollution by a switch to battery electric cars and vans, helping us address the challenge of air quality.

Electric bike schemes would offer something to people who do not necessarily want to cycle. This may provide a good opportunity for improving accessibility for people who are less physically able to cycle and for people who are less financially able to take other modes.

Electric powered buses are also available, and these are anticipated to increase over time.

Together these elements will create a more attractive place, which is still accessible. High performing infrastructure, good air quality, and attractive public realm are all key to attracting and retaining high-skilled talent, with a well-functioning, reliable transport network playing a crucial role in supporting wider economic prosperity.

Presentation 2 - Future transport trends

Professor John Preston, Transportation Research Group (TRG), University of Southampton

“There seems to be a feeling creeping through the motor industry that the days of the internal combustion engine are numbered.” Hart and Bauen (1998)

Transport trends

The presentation provided a brief outline of the Transportation Research Group (TRG) and several trends covering the growth of both road and rail transport.

The Government publishes national Road Traffic Forecasts (RTF). The latest report was published in September 2018. At a headline level the RTF projects that by 2050:

- Total road traffic will grow by between 17% and 51%;
- Traffic levels on the major roads (strategic road network) will grow faster, by between 32% and 66%;
- Growth in Heavy Goods Vehicles will be lower than the average, at 5% - 12%, but growth in Light Goods Vehicles will continue growing significantly in all scenarios (between 23% and 108%);
- The proportion of traffic in congested conditions is forecast to range from 8% to 16% depending on the scenario, compared to 7% in 2015.

The TRG has reviewed these projections and others produced by the National Infrastructure commission. While there has been significant change in those trends

in recent years (the lower end forecasts are based on the most recent trends), the conclusion was they were broadly accurate given the uncertainty around the impact of transport technology on road traffic demand, and uncertainty about the extent to which existing trends and relationships will carry on into the future. Additionally, the projections do not take account of regional or local differences.

It was clear that interventions relating to pricing, encouraging the use of more sustainable transport and connected vehicles can prove effective measures in reducing travel demand.

Some believe that the peak demand or peak travel exists, possibly providing a constraint on future growth.

Autonomous Vehicles

Connected and Autonomous Vehicles (CAVs) will not be dominant until the second half of the twenty first century.

The US Society of Automotive Engineers (SAE) defines vehicle automation in five levels. From zero to two where the human driver monitors the driving environment; to three to five where the automated driving system increasingly monitors that driving environment. Some believe that partial automation may be a bad idea as humans are poor at low level monitoring tasks and control transition times may be longer than expected.

It is predicted that it will be at least 2040 before half of all new vehicles are autonomous, 2050 before half of the vehicle fleet is autonomous and possibly longer due to technical challenges or customer preferences. Scrappage schemes could accelerate this process providing the vehicles become very reliable and affordable to the masses.

From the Highway Authority's point of view the provision of dedicated lanes may be needed to allow autonomous vehicle platooning. Some benefits may be realised sooner from connectivity rather than autonomy.

Electric Vehicles

Most journeys can be completed within the range of current electric vehicles, but range anxiety and access to charging infrastructure remains a barrier to purchasing new electric vehicles.

Take-up to date has been slow but is increasing with National Grid predicting a significant increase from 2030 to 2040.

On-street charge points for electric vehicles will be particularly important in those urban areas where access to home off-street parking is limited, but these are the same areas where parking spaces in general will be at a premium.

Switching to electrically powered vehicles will bring about improvement in air quality in urban areas.

Shared mobility

For many people, public transport provides an alternative mobility option to their private car, but for others, public transport may be the only mobility opportunity, either because they do not have a licence or because they do not have access to a private car. For a local authority, public transport can support several policy outcomes, including providing vital accessibility, reducing congestion and the associated health costs of pollution, and also connecting people to health and social care services. Public transport also provides transport to schools. Examples of alternatives are:

- Ride sharing (lift sharing/car sharing scheme such as BlaBlaCar);
- Ride sourcing (car club schemes such as DriveNow);
- Maas (Mobility as a Service) schemes such as Ubigo a Swedish public transport, car-sharing, rental car services and taxi to one intermodal on-demand mobility service. It is based on a flexible monthly subscription with an account that is shared among all members of a household, easy to top up and with the option to save what has not been used to the next month. (There have been some difficulties in developing a viable commercial model).

Smart Logistics

Reduced waste collection mileage

Although household waste and commercial waste are similar in composition, with paper and cardboard comprising between 64% and 74% in some cases historically, they have tended to be collected separately in the UK. This may be largely due to the existing regulatory distinction between the two, which does not permit commercial waste to be counted as municipal waste, nor contribute to waste collection authorities (WCAs) recycling targets. However, trade wastes do count against an authority's Landfill Allowance Trading Scheme (LATS) targets so there is an incentive for authorities to address the recycling or composting of biodegradable trade waste to divert it from landfill.

Studies undertaken by TRG show that joint household and commercial waste collection could reduce vehicle miles by up to 10%.

Urban consolidation centres – reduced courier visits

Urban Consolidation Centres (UCCs) offer an important opportunity to reduce urban freight vehicle movements, particularly for low time-sensitive deliveries. However, the widespread implementation of UCCs faces challenges due to problems of scale and cost. The opportunities that UCCs bring in terms of reduced congestion and emissions make them attractive for local authorities. At present, UCCs rely on public subsidy through grants, EU awards, or local authority assistance in order to be viable.

Courier visits to Halls of Residences could be reduced from 56 to one a day as a result of an Urban Consolidation Centre.

On-foot portering

The UK parcel sector generated almost £9 billion in revenue in 2015, with growth expected to increase by 15.6% to 2019 and is characterised by many independent players competing in an ‘everyone-delivers-everywhere’ culture leading to much replication of vehicle activity. With road space in urban centres being increasingly reallocated to pavement widening, bus and cycle lanes, there is growing interest in alternative solutions to the last-mile delivery problem.

On-foot portering could reduce delivery vehicle driving time in central London by 60% and parking time by 86%.

Conclusion

“Change is as much a matter of recycling the old as introducing the new.” Simon Gunn (2018)

Hybrid electric drive trains have been around since 1898, but a new air quality imperative is driving adoption today, with technological innovation making electric vehicles suitable for all but heavy goods transport.

Driverless car trails were held in the UK in 1960, but are now made possible for use on public roads with advances in computing.

Technology *Push* is not always accompanied by *Societal Pull*. Technology may enable innovation, but adopting that innovation may lag behind if society does not perceive a benefit. Conversely, where a *Societal Pull* does exist then adoption may occur quickly. Technology can also be hard to change if the requirement for that specific implementation no longer exists; for example the QWERTY keyboard was developed to manage typing speed at a time when typewriters would jam if keys were struck too quickly.

Regulation is likely to be the maker or breaker of innovation. Regulation may stifle innovation if it too rigidly limits implementation. Equally regulation may be essential to consumer trust.

- Hybrid electric drive trains have been around since 1898;
- Driverless car trails were held in the UK in 1960;
- Technology *Push* is not always accompanied by *Societal Pull*;
- The role is technological ‘lock-in’ and the economics of QWERTY;
- Regulation is likely to be the maker or breaker of innovation.

Key points of the discussion:

- ❖ EVs seen to be declining in some areas of the USA.
- ❖ Lack of EV charging infrastructure in areas of high-density housing is slowing take-up.
- ❖ EVs are not 100% clean. Emissions occur at generation.
- ❖ Maas. Will this increase the use of private vehicles and Take ridership away from public transport?

- ❖ Responsibilities for collisions involving CAVs?
- ❖ Issues will arise from a mix of driven cars and CAVs.
- ❖ How secure are CAVs? Vulnerable to hijacking or cyber-attack.
- ❖ Changes regulating road users such as pedestrians may be needed.
- ❖ Public transport is seen as inconvenient. Might this be resolved by different operating models with greater regulation?
- ❖ The demand to travel will continue to grow. Capacity of the network is unlikely to grow with it (predict and provide) so peak hours will spread.
- ❖ Sustainable transport measures can make a difference to growth through policy changes. The benefits are short-lived if support is not sustained, growth continues albeit at a slightly lower level.
- ❖ Urban consolidation centres can work need subsidies.

Presentation 3 - Connected, intelligent autonomous systems

John Bowers, Managing Director, JCC Bowers

John thought autonomy was not really the end goal, but that safer, less congested transport networks could be delivered by the improved processing of information and that tailored information would allow drivers to make the best possible decisions about their travel.

The use of AI technology to provide self-driving vehicles is an area of significant development at the moment. It is expected that this technology will become mainstream within five to ten years. This may have significant impacts on, for example, public transport such as taxis and buses and additional mobility for older citizens living on their own.

Some recent examples of AI in the transport sector:

- In-vehicle AI can decrease fuel consumption and costs as cars arrive at their destinations more quickly due to fewer traffic jams, accidents and improved environmental benefits as pollution decreases.
- AI-powered traffic lights have debuted in the UK city of Milton Keynes. The £3 million technology can identify a traffic bottleneck and adjust the traffic light pattern to ease congestion.
- Computer scientists at Nanyang Technological University in Singapore have developed an AI to minimize sudden traffic snarl ups by rerouting vehicles. Their research suggests that deploying these route optimizations to just 10% of the cars on the road would improve traffic for everyone.
- JCC Bowers has developed an algorithm to predict traffic accidents and promote safe driving. Once deployed, the new AI-powered technology will make it easier for drivers, municipalities, and insurance companies to assess risk. Not only will it empower vehicle operators to avoid accident-prone hot-spots, but it will also help smart cities pinpoint where life-saving infrastructure improvements are needed.

- Combining AI and biometrics, the Swedish air transport communications firm SITA recently deployed AI-powered facial recognition to airports across the U.S. The technology has already succeeded in preventing someone using a fake passport from entering the country illegally.

Key points from the discussion:

- ❖ Getting the technology right is important, but perhaps removing the need to travel would be more effective.
- ❖ AI will help provide the information overlay, enhancing the ability to drive.
- ❖ How do you allow for deviations decided by the user?
- ❖ Are we trying to be too clever? Is the clever money on doing things differently to reduce or remove the need to travel?
- ❖ Perhaps AI could be utilised to improve the operation of public transport.

Presentation 4 - The Project Beyond Consortium

Mark Selby, University of Surrey

Mark Selby is Visiting Professor at the University of Surrey, home of the 5G Innovation Centre (Europe's largest academic communications research institute).

Mark spoke about the Project Beyond Consortium. A company focused on the intelligent movement of people and freight in geographies beyond major cities. The consortium arose from CAV research for Jaguar Land Rover at the University of Surrey. A number of areas were discussed as identified below;

In 2017 Hampshire had the highest level of road traffic of any local authority at 9.9 billion vehicle miles. Essex 9.7bn, Kent 9.5bn and Surrey 8.7bn were next in line.

Reflecting Hampshire's largely rural nature, the Office for National Statistics shows Hampshire's modal split for the journey to work to be:

- Car as driver 72%
- Walk 10%
- Train 6%
- Bus 3%
- Car passenger 5%
- Bicycle 3%
- Other 1%

Journey times to reach key services by public transport or walking are significantly higher in rural areas, often taking twice as long to reach educational establishments, a GP or Hospital. Traditional 'support systems' that people benefit from, such as the milkman, postman and paperboy are in decline.

Public transport operating costs are more expensive per passenger in rural areas when compared with their urban counterparts. Overall local bus mileage has fallen 8% since 2006/7, local authority supported bus mileage has fallen considerably over the past decade.

Most motor vehicle miles travelled in Britain are on Motorways and Rural roads. It's also worth noting most motorways are located in rural environments.

Only 53% of rural roads have mobile phone coverage across all network operators. 51% of total vehicle miles are on these roads. Ofcom are exploring opportunities to allow customers to roam across networks effectively extending their coverage. Furthermore, less than one in five aged 75 or over own a smart phone.

Traditional physical retail is in decline, affecting our High Streets. Home delivery is not new but expectations, such as next day, same-day and one-hour are rising. The growth in home delivery (and returns) has increased van use and vehicle miles, the cost of 'last mile' deliveries is significant. An additional 72 billion miles of travel could be generated in the USA by "want it now" ordering.

Younger people are driving less today; was 55% now 30%. Reasons for this include cost (learning, insurance, running a vehicle) and the declining perception of cars as status symbols. They are increasingly dependent on public transport, their parents or ride sharing for travel for getting to job interviews and commuting. There are a limited range of commutable employment opportunities. As a result the younger workforce is moving to live/work in cities close to good rail/bus services.

"To build the number of houses planned in this region we need more trained construction workers. We've built a great training centre here in Bordon but 16-year-old students have the choice of a bus that arrives 38 minutes before their first class or 29 minutes after it starts. Guess which one they choose."

Commuting to London is changing, working from home on a Friday is becoming more common, with implications for rail season tickets. Home-based working is now more dominant in rural areas than urban areas. With 22% of the rural workforce working at home, compared to 13% of the urban workforce.

People who work from home are more likely to be working in higher skilled roles. As a result, the size of large company offices is shrinking. "Hot-desking" is common and demand for co-working spaces is growing. The changing nature of work has transportation implications.

The nature of urban and rural areas are intrinsically different and mobility solutions will need to be tailored for the specific economics and user requirements. Mobility is also intrinsically linked to GVA protection and the interlinks between skills, labour and workplaces.

The co-movement of people and goods offers opportunities for parcel delivery vehicles, for example, to provide a mobility opportunity for a passengers or for public transport vehicles to carry freight.

Infrastructure, such as communications, roads and equipment will be essential to future services. Operators will need to share infrastructure to keep costs down and provide ubiquitous coverage, across institutional borders, without costly duplication. Regulation may be necessary.

Vehicle types may change to reflect a changing role e.g. greater shared mobility. There may be fewer vehicles, but mileage may increase with increased utilization, while a switch to electrification will impose new constraints and requirements.

While intelligent mobility offers potential new mobility options to solve issues such as congestion, users may require encouragement to change their behaviours. These can vary from regulation and traditional change campaigns to more subtle 'nudge' psychology.

Key points of the discussion:

- ❖ Is the private car still a desirable thing? Attitudes to car ownership are changing.
- ❖ We should be trying more to shape human behaviour. It's hard to change something that has already happened.
- ❖ Fewer young people are interested in owning a car these days (cars spend 8% parked at home, 16% parked elsewhere and only 3.5% being driven).
- ❖ We need to consider rural transport in a completely different way.
- ❖ The situation for young people living in rural areas is complex. People still need to drive, but maybe not to the supermarket for the weekly shop anymore. People are now buying smaller volumes and more local.
- ❖ People are also more interested in knowing where their food comes from.
- ❖ Students in Bath and Bristol do not need to travel as they do in Surrey and Hampshire.
- ❖ Who do we want to attract to live and work in Hampshire?

4. Summary and Conclusions

Frances Martin, Assistant Director – Planning & Environment, Hampshire County Council

Frances provided a summary of the hearing, reiterating and expanding upon the following key points made by the expert speakers;

- Can we be an early adopter of the technologies discussed; this could be a challenge in Rural Hampshire?
- Infrastructure is a major driver in economic growth and competitiveness.
- The mobility decisions we make today are key to our success in 2050.
- Partial automation could be more dangerous than full automation.
- Are the benefits of automation more for connectivity rather than the autonomous nature of vehicles themselves?
- A technological push is not always stimulated by a societal pull.
- Can we take the intelligence out of driving?
- We should make sure that roads are safer as well as efficient and reduce costs while providing the appropriate infrastructure.
- Mass transit of people is in urgent need of fundamental review.

- There is a lot of focus around smart cities however the biggest challenges come from Rural areas – we need a fundamental different approach in Rural Hampshire.
- Can the movement of people and goods be considered as one?