



Highways Agency

Vision 2030

Moving People Between Cities



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Remarks	DRAFT			
Date				
Prepared by	Project Team			



***Moving People Between Cities:
A Discussion Paper***

“Our quality of life depends on transport. Most of us travel every day, even if only locally. We need an efficient transport system to support a strong and prosperous economy but in turn, the way we travel is damaging our towns and cities and harming our countryside”

Chapter 1 of “A New deal For Transport: Better For Everyone”

DETR

MOVING PEOPLE BETWEEN CITIES

'A New Deal For Transport: Better For Everyone' published by the DETR in July 1998 sets out the Government's policy "to create a better, more integrated transport system to tackle the problems of congestion and pollution". This discussion paper looks three decades ahead and attempts to see what the imperatives will be then. It suggests further proposals, to complement those in the 'Freight' discussion paper, to that suggest how the strategic road network can make its most appropriate contribution to meeting the transport needs of the nation in the year 2030.

What are we about?

The responsibility of the Highways Agency goes beyond the operation and maintenance of the Trunk Road Network as currently defined. It has to make sure that it is prepared to meet the demands that the future may expect of it. The HA, and its predecessors, has enjoyed a reputation for being in the forefront of new developments in the fields of materials and operational systems and continues, in collaboration with partners in the UK, Europe and elsewhere, to carry out a substantial program of research and development. This exercise seeks to go further by looking over the horizon to attempt to foresee the type of infrastructure, systems and operational regimes that will be needed in the Year 2030.

Background

Over the last thirty years the Trunk Road system has evolved. The period has seen the construction of most of the Motorway Network and the dualling of many sections of other Trunk Roads. The Nation's love-hate relationship with major highways has led to repeated cycles when road construction has been either demanded or considered undesirable. But if roads have sometimes been unpopular, motor vehicles have always been desired. The period has seen a remorseless increase in the ownership of cars and the demand for freight movement. At the end of the 20th Century a car is not considered to be a luxury but an essential component of the lifestyle.

The World Moves on

What will the world be like in 2030? It can reasonably be expected that the following trends that are already apparent are likely to continue:

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- **Predict and Provide** – the provision of sufficient road-space and parking facilities for the unfettered increase in road traffic without unacceptable congestion, delays and pollution will continue to be considered impractical or even impossible.
- **Living space** – developments in transport and communication which have been a major factor in determining where people live in relation to their work and their interests during the 20th Century, will continue to do so in the 21st Century. Demographic changes will also play their part. Although many young and single people may want to repopulate inner cities, it is also likely that more families and an increasing number of the active retired will want to move to lower density rural communities that are difficult to adequately serve with communal transport. The extent to which this trend can continue will depend on the practicality of providing access.
- **Shopping** – the revolution in shopping habits that has resulted from increased car ownership during the past thirty years will change again as a result of increasing congestion, parking and planning pressures. As car usage becomes less practical and acceptable for shopping trips, successful centres will be those that are conveniently accessible by a range of modes and which attract customers by the provision of expanded delivery services for those who would otherwise have awkward journeys with heavy or bulky purchases. There will also be competition from vastly improved on-line shopping services that will provide virtual reality home shopping experiences that will rival the trip to the mall. They will enable goods to be purchased directly from anywhere in the world but their success will be dependent on the efficiency of delivery services.
- **Manufacturing** – the internationalisation of manufacturing is likely to be further developed. Continued expansion and integration of the European Union (and other similar relationships that may develop) will enable work to be relocated to those places where the appropriate skills are most economically available and efficient transport arrangements exist for the supply of materials and distribution of products. A region's prosperity will, more than ever, depend on the efficiency and capacity of its transport links.
- **Business Meetings and Routine Office Work** – the range of choices will increase. More companies will be able to decide whether they want to bring all their staff together on every working day. It will be possible to provide an acceptable level of remote

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supervision of those working at home or at “village” work centres. Vastly improved Video Conferencing will mean that people can routinely participate in important meetings from their home. If commuting becomes too difficult there will be an option to opt out. Why should people continue to endure “rush-hour” travel conditions unnecessarily? But if people work at home the distribution of business equipment, consumables and hard products to and from a widely dispersed workforce will be a complex task.

- **Leisure** - people are gregarious. If they congregate less for work they will need to congregate more for pleasure. Successful leisure complexes and venues, like successful shopping centres, will those that can be accessed conveniently. A large car park may not be enough.
- **Tourism** -. Tourism is very big business with new destinations opening up every year. Travel is an integral part of the tourism experience and will become an increasingly important component influencing choices in this highly competitive sector of the world economy. Traffic congestion is a substantial problem in areas that attract large numbers of tourist. Traffic and can spoil the experience and even cause permanent damage. Managed access strategies will need to be developed.
- **Safety and Environment** – It is unlikely that the current levels of traffic related deaths, injuries and pollution will be acceptable. Year on year improvements will be required. Public acceptance of technologies to limit individual freedom to drive at inappropriate speeds in polluting vehicles will grow.

What will it be like?

So, what can we predict for thirty years time? In summary it is likely that:-

- Although people will still value the mobility and convenience provided by their own vehicle, the number of types of journey for which it is considered to be unsuitable will be considerable.
- Growth of congestion will have led to the acceptance of the active management of the strategic road network and its operational integration with other networks.
- Current levels of traffic related deaths and injuries will not be tolerated and the detrimental environmental impacts of transport systems will have become more

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unacceptable resulting in the acceptance of technologies to limit the individual's freedom to use their own vehicles irresponsibly.

- Although people will still want to travel, they will have less need to undertake routine journeys. People will have more choice about how and when they want to travel but this will be influenced by the availability of paths in actively managed transport networks.
- There will be an increase in the movement of goods vehicles in both the long distance and distribution sectors.
- Demand on all transportation network links between major centres of population and economic activity will be at a premium. Active management will involve difficult choices in the allocation of paths on those links.

Technology

What will the possibilities be? Who is brave enough to predict what might be possible in 2030? Resources and investment can be channelled to develop technologies to provide solutions to identified problems. We must first decide where we want to go – we can then develop the tools to get there!

What will be required?

The Country's transport system will need to accommodate the following:

- A reduction in the captive rush-hour market as workplaces and work hours adapt;
- A reduction in shopping trips as on-line systems rival our existing habits;
- A reduction in the lucrative business travel market;
- A growth in the optional leisure travel market;
- A drive to create integrated, seamless transportation systems which provide a reliable, predictable and comfortable alternative to the car;
- A drive to make road travel as least as safe as travel by rail;
- A continuous drive to reduce emissions from vehicles and overall power consumption;
- A continuous drive to reduce noise from transportation systems;
- A need to minimise the visual intrusion of transportation links whilst maintaining an acceptable environment for drivers and other travellers.

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How can this be done?

It will be necessary to:

- Move to a controlled environment in which the safety, the operational efficiency and the impact upon the environment of the network are optimised by the progressive limitation of choices by drivers once their vehicle is on the strategic road network. This may ultimately involve booking a path in advance.
- Equip vehicles and the fixed infrastructure to facilitate the transfer of control of vehicles from driver to an infrastructure linked control system. This will permit optimisation of the existing roadspace as well as improving journey times.
- Improve links between modes of transport to create seamless journeys from door-to-door in order to rival the car.

As a first stage in the provision of these facilities it is planned to carry out research into the provision of ***Integrated Transport Corridors*** encompassing all modes of transport. The Strategic Road Network will evolve to include ***Automated Highway Lanes*** and ***Dedicated Long Distance Freight Lanes*** for booked through trips on the network. It is proposed that ***Multi-Modal Transport Centres*** should be created adjacent to urban areas in order to facilitate transfer between public transport, the car and other modes. The creation of such centres should provide an opportunity to encourage people to use the most suitable mode for their particular journey

The changes to the network, coupled with advances in technology, should also be used as an opportunity to review the use of street furniture and the aesthetic appearance of the road in its surrounding environment.

The following pages describe a Vision for the provision of such facilities by the Year 2030.

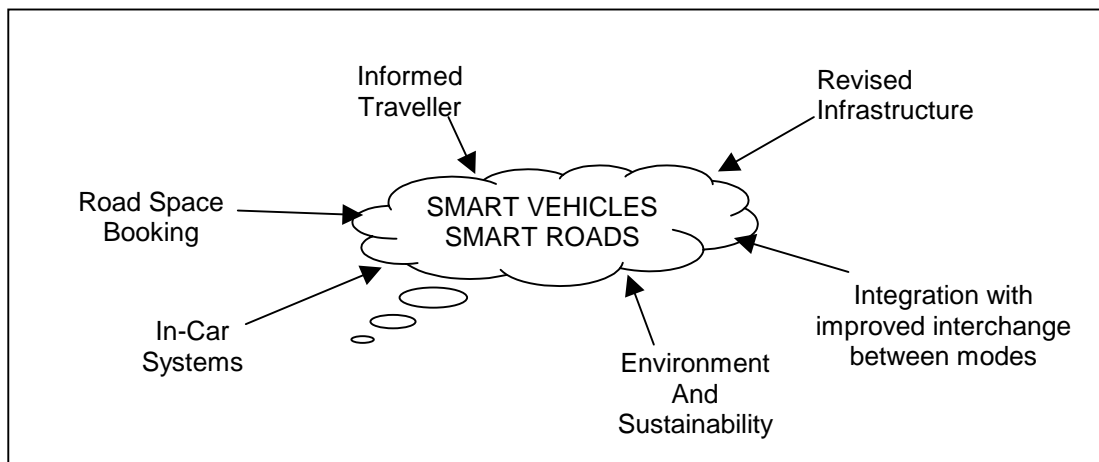
MOVING PEOPLE BETWEEN CITIES

THE VISION

The provision of national **Integrated Transport Corridors (ITCs)** to assist movement between cities and to facilitate interchange between all available forms of transport. The use suitable modes, which may not necessarily road based, will be encouraged through pricing policy. The provision of **Automated Highways (AH) Lanes** throughout the strategic roads within the ITCs with access and transparent interchange via **Multi-Modal Transport Centres (MMTCs)**.

WHY?

- The desire for personal carriers will continue to rise in accordance with the National Road Traffic Forecasts (NRTF), following similar patterns demonstrated by other countries.
- We cannot afford to improve our quality of life without a healthy economy.
- The capacity of the existing road network will need to be increased with respect to the environment - vehicle mileage should not be allowed to increase at the same rate as car ownership.
- The continued convenience of the car needs to be challenged by other forms of transport leading to integration and transparency between modes.



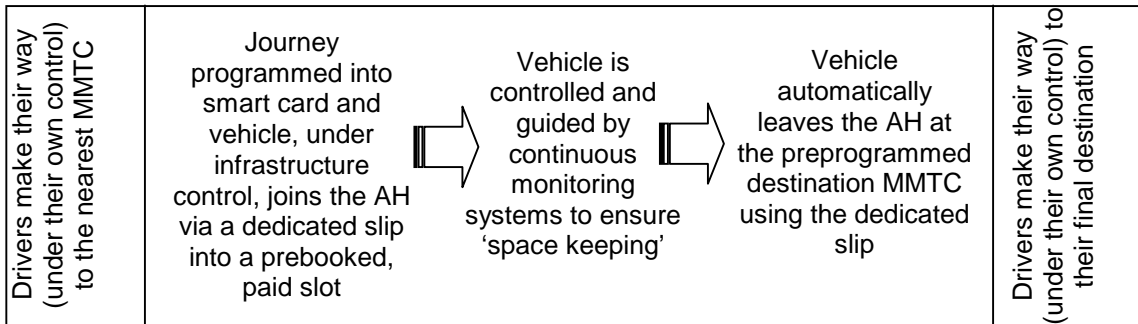
A balance, which will be different for each travel corridor, should be established between the means of control and the required flexibility – different solutions for different corridors.

Strategic Roads (Motorways)

The existing space occupied by the strategic road network will be reassigned according to the journey type. In 2030 the strategic road network will have:

Automated Highway (AH) Lanes

- The road of the future is a set of spaces moving around the network some of which are occupied and some of which are empty. The AH allows control and monitoring of these spaces to assist in the optimisation of available roadspace for long journeys



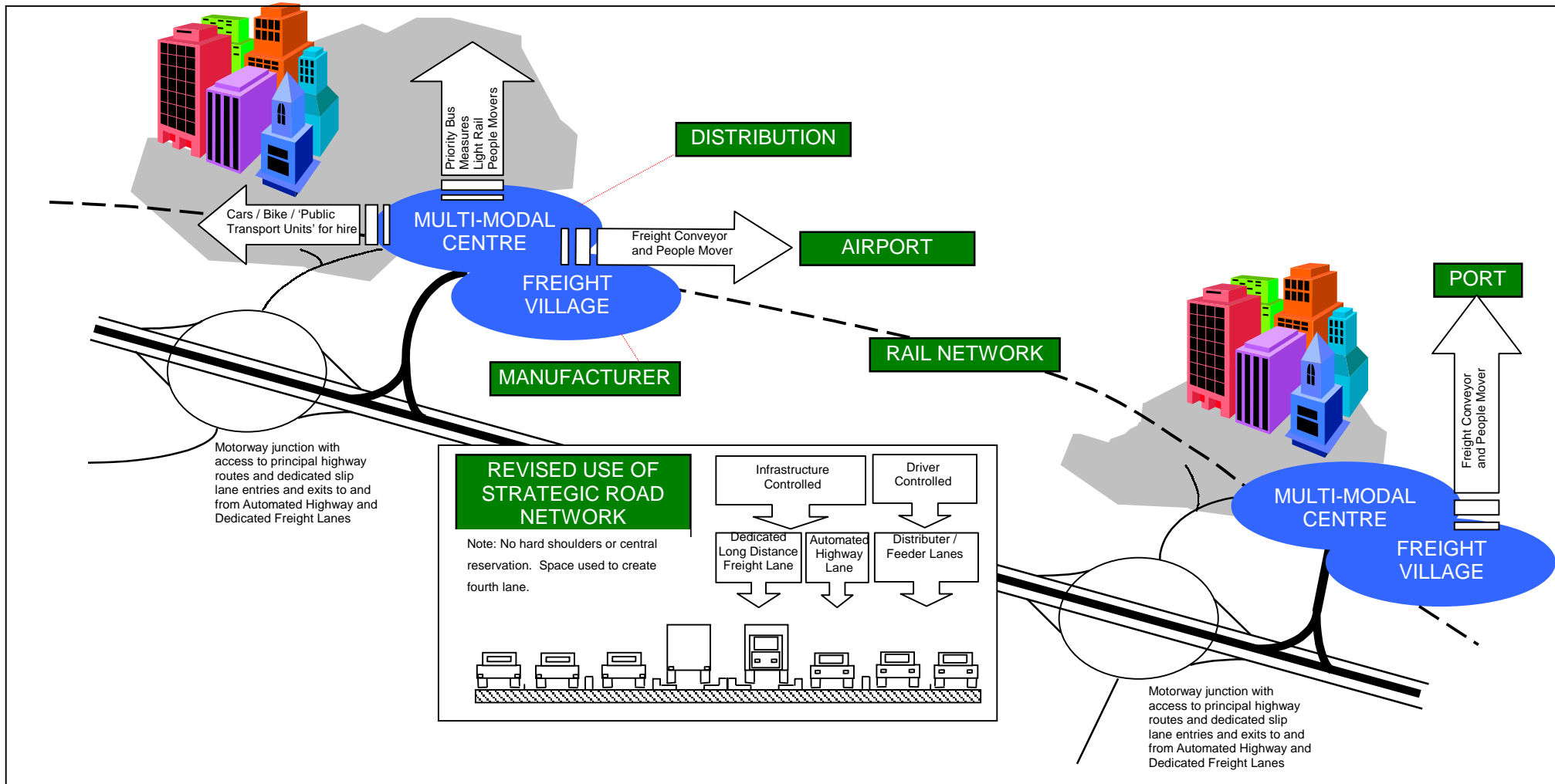
- Tolling for road space with raised revenue being reinvested - variable scale of charges depending on how far in advance the booking is made (APEX) and the type of vehicle being used
- Technology already exists – road space simulation through models such as SISTM and PARAMICS and guided loop running tests becomes reality

Distributor/Feeder lanes

- Running parallel to the automated routes to permit local trips these will allow driver controlled vehicles access to all existing motorway junctions.
- Tolling to be carried out at entry points with a sliding scale of charges to ensure appropriate use of the lanes – high charges to those using these lanes for long distances.

Dedicated Long Distance Freight Lanes

- More information about these lanes can be found in 'Freight – A Discussion Paper' which has been produced as part of this series.



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Multi-Modal Transport Centres (MMTCs)

The primary purposes of the MMTCs will be to:

- Allow long distance vehicles to be fed onto the AH in a controlled manner
- Provide an opportunity for travellers to change modes in a secure environment without inconvenience or delay (seamless journey)

Facilities at MMTCs could include:

- Refueling and storage for those vehicles waiting their allotted space on the AH
- Automated checks on the suitability of vehicles using the AH lanes – will a vehicle be able to complete the programmed journey?
- Sleeping, eating and washroom areas for drivers
- No waiting, low walking parking where a driver can leave their vehicle adjacent to the platform to board a waiting train/coach. Their vehicle is then automatically moved to a secure storage stacking system. On returning the driver calls the facility on the approach to the MMTC and their vehicle is waiting for them adjacent to the platform when they arrive. A similar system could be employed for hire vehicles.
- Unified systems for obtaining information and booking journeys to provide a single (through) ticket

They would be located:

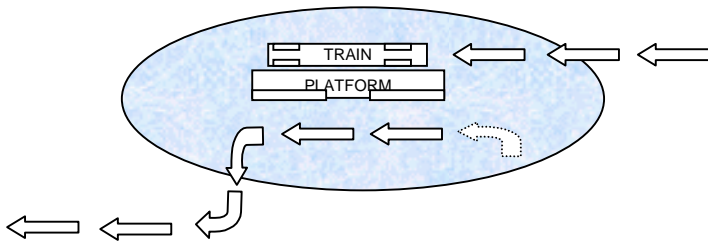
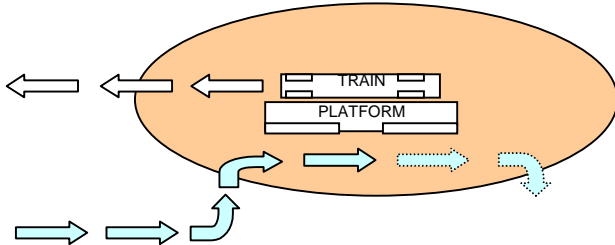
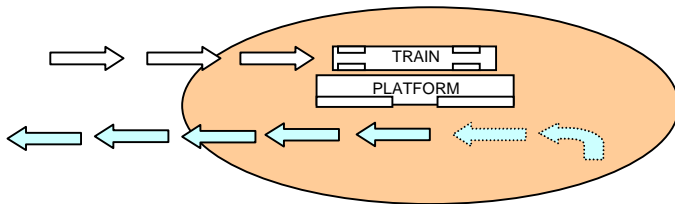
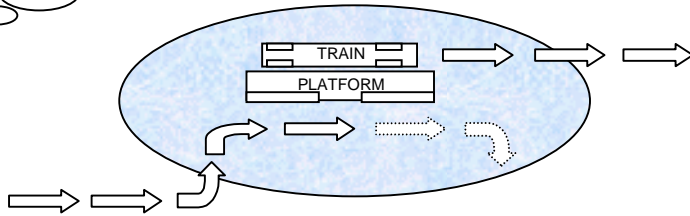
- Adjacent, or close to, the strategic road network and rail, port, air and inland water based transport terminals and convenient to major centres of economic activity and population
- Adjacent to the proposed freight villages to permit sharing of facilities and infrastructure
- In areas which already act as regional hubs where a number of transport modes already coincide

Access to MMTC could be:

- Via dedicated slips to and from the AH for inter-urban trips
- Via local principal roads for access to and from the local region
- By links with all locally available modes of transport

EXAMPLE OF AN INTER-URBAN JOURNEY MADE USING A MULTI MODAL TRANSPORT

1. Traveller consults multi-media information systems at home –
mode
time
cost?
2. Confirms journey using an interoperable smart card – reserves space and programmes smart card



16. Total costs stored on the smart card for the journey (including parking, train fare, hire and fuel) are debited from the Travellers account.

3. Traveller drives in their private vehicle, under their control, on local network to the nearest MMTC, leaves the car in a "receiving dock" adjacent to the platform and boards the waiting train via a smart card reader.

4. Private car is moved automatically by the control system to a secure stack and store facility in the MMTC.

5. Train transports Traveller to MMTC nearest destination faster, more comfortably and at a lower cost than the same journey by car.

6. Control system acknowledges train-approaching MMTC and that the Traveller will need a short term hire car.

7. A short term hire car is automatically brought out of the stack and store facility and left in the "receiving dock" adjacent to the platform as the train arrives.

8. Traveller exits train and leaves to collect the hire car which is activated by the smart card.

9. Traveller proceeds to destination in hire car under his or her own control on the local network.

10. Traveller returns to an MMTC under their own control in the short term hire car along the local network, leaves the car in the "receiving dock" adjacent to the platform and boards the waiting train via a smart card reader.

11. Hire car is moved automatically back into the servicing facility by the control system.

12. Train travels to original MMTC.

13. Control system acknowledges train approaching MMTC and automatically retrieves the Travellers private car from the stack and store facility leaving it in the "receiving area" adjacent to the platform.

14. The Traveller exits the train and leaves the platform via a smart card reader to collect their waiting car .

15. Traveller drives home under his or her own control on the local road network.

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Infrastructure

A minimalist approach will be assumed to reduce the impact of the strategic road network on its surrounding environment through:

- Improved in-car information and roadside infrastructure - reduced need for gantries, traffic signs and VMS, overhead lighting systems and need for safety fences
- Use of latest materials technology - to create more aesthetic, less obtrusive, structures capable of crossing the carriageway in a single span
- Green/living bridges and the use of cut-and-cover to minimise visual intrusion and severance
- Self-maintaining carriageways – such as self-cleaning systems for road surfaces but with sustainable water run-off which can be controlled.

Vehicles

Vehicles using the AH Lanes in 2030 would have:

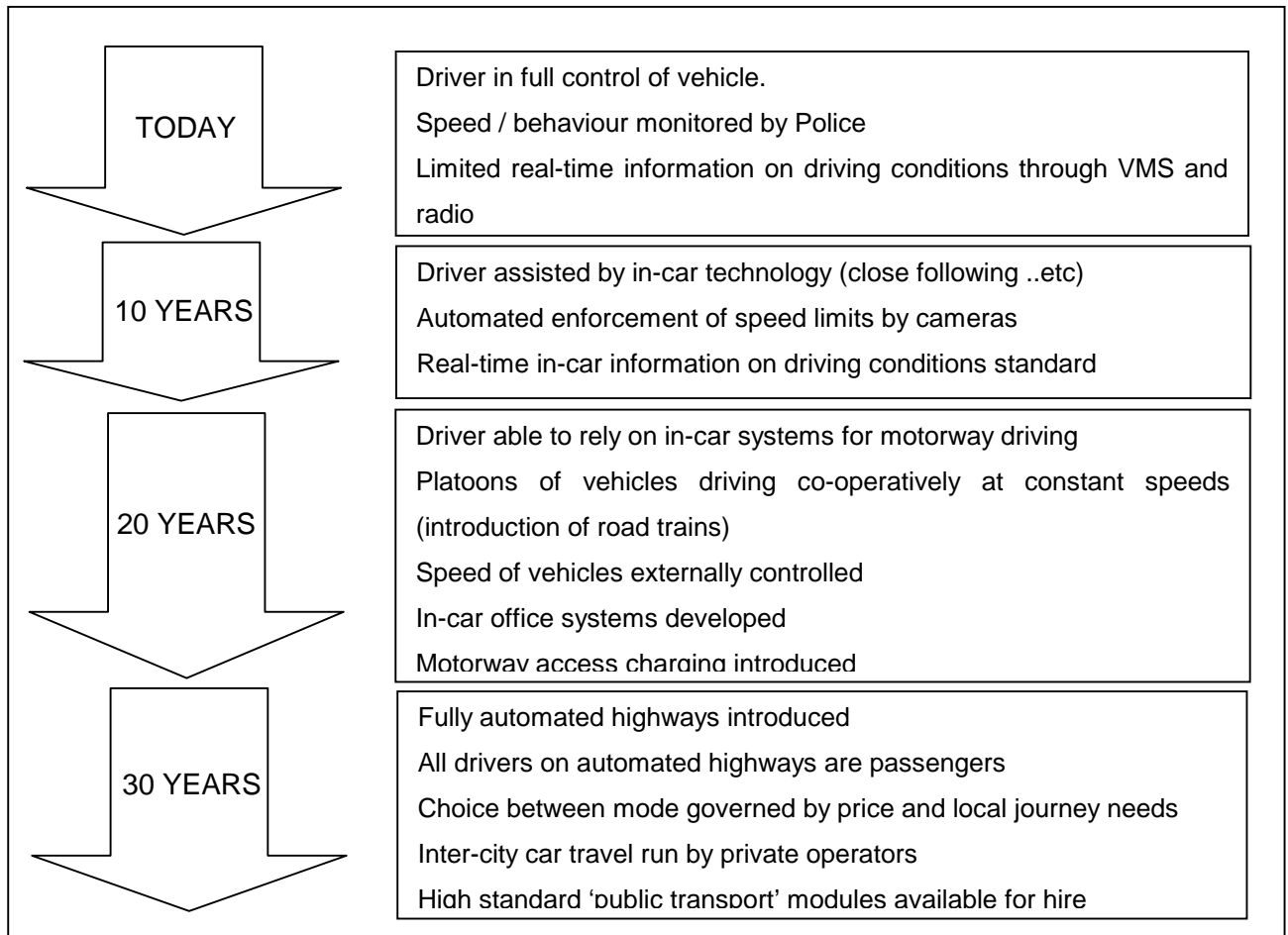
- GIS mapping/navigation systems and GPS positioning equipment
- The capability to transfer data between vehicles to warn those following about conditions ahead
- Continual monitoring systems – to permit infrastructure control
- Continuous engine monitoring systems - to highlight problems before they occur (controlled breakdown)
- Alternative fuel sources - eg fuel cells or hybrid electrical/fossil.

Informed Traveller

Improved integration between modes of transport, and advancing technology, will lead to:

- Use of interoperable smart cards as a method of payment (single payment mechanism)
- Greater availability of information through multi-media personal communicators (the electronic purse) including video and picture/audio facilities. Existing mediums such as mobile phones, personal organisers, internet, cable TV, information kiosks, radio and onboard TV services on trains and other modes will continue to be enhanced

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NEXT STEPS

Discuss vision with:

- DETR interest: vehicles, tolling ..etc
- Vehicle manufacturers and developers of technology
- EU and other road agencies
- Operators of other transport systems (rail, water, buses, water ...etc)
- Academia and think tanks

Develop programme of supporting research to:

- Develop a prediction of vehicle ownership and movement patterns in 2030
- Establish the current state of the art in international thinking
- Develop AH and DLDFL control and infrastructure technology

A list of supporting research projects that could be started immediately are listed in Annex B.

NOTE:

This Vision for the strategic network was initially developed at a two day workshop organised by HA TSS and held in Mid-Wales on 21-23 February 1999. Those who attended the '2030 Vision Workshop' are listed in Annex C.

The Vision for Integrated Transport Corridors was then refined during a one day workshop in March which was organised and attended by HA TSS at Tollgate House, Bristol.

A third, one day workshop organised by HA TSS for younger engineers and held at Raven Ait in Surbiton on 8 April 1999. Those who attended the 'Blue Sky Day' are listed in Annex D.

Annex A – Policy Linkages

Linkages between the New Deals promoted by the DETR publication “A New Deal for Transport: Better for Everyone” and proposals described in the discussion paper

“A New Deal for the Motorist through: - “

- Improved management of the trunk road network to reduce delays
- Investment focussed on improving the reliability of journeys
- Better maintained roads - increased resources both locally and nationally
- More help for the motorist if their car breaks down on a motorway
- Improved road safety and safer cars
- Quality information for the driver - before and during their journey
- More secure car parks
- More fuel-efficient cars
- Less congestion on our roads and less pollution in our cars

A New Deal for the Public Transport passenger through: -

- More and better buses and train, with staff trained in customer care
- Better information before and when travelling, including a national public transport information system by the year 2000
- Better interchanges and better connections
- Enhanced networks with simplified fares and better marketing, including more through ticketing and travel cards
- More reliable buses through priority measures and reduced congestion
- Easy access public transport - helping disabled and elderly people and making it easier for everyone to use

Annex B – Early Start Projects

Total Monitoring of the Trunk Road Network – the development of an economic system to provide total day and night, all weather surveillance and operation of the operational network expanding on the existing simulation models. **Purpose:** to facilitate the introduction of automated highways testing the 'floating space' concept. Such projects should be coupled with other schemes to develop the technology required to control vehicles by the infrastructure which are not dealt with here. **Time-scale:** within 10 years

Charging and Access Control – Existing research to be extended with tests being undertaken and pilot schemes implemented in order to provide a means of 'paper-free' charging. This may be undertaken through a local authority Local Transport Plan proposal, following the publication of 'Breaking the Logjam'. **Purpose:** to assess the demand management and behavioural patterns which are likely to be demonstrated once tolling is implemented. **Time-scale:** within 10 years

The 'Automated Highway/Motorway Fit Vehicle' – introduction of the concept of vehicles which meet standard statutory specifications for equipment and maintenance in order to gain access to the network. Vehicle / Road Communications need to be developed to monitor vehicles in motion determining their 'fitness for use'. A user survey of value added service (eg vehicle location/security) should also be undertaken. **Purpose:** to facilitate the integration of the vehicles with the infrastructure and control systems, to eliminate breakdowns and vehicles which are unable to maintain ambient speeds. **Timescale:** within 10 years

Multi-modal Transport Centre – Promote the creation of such centres linking all available means of transport and, through careful monitoring of sites, improve successive developments. **Purpose:** Optimum choice for travellers permitting the use of the most appropriate mode. **Timescale:** Some examples already present further pilots within 5 years.

Traffic Information Highway – Further develop the existing travel information highway which is expanding through increased use of the world-wide web, linking with a united public transport database. **Purpose:** to permit the informed driver to be aware of the best routes available to them throughout the journey. **Timescale:** within 5 years

The Safe/Quiet Tyre - develop the ideal tyre for the 'motorway fit vehicle' which is safe from blow-out and punctures and which will minimise noise and spray. **Purpose:** to improve safety, reduce noise and spray. **Time-scale:** within 10 years

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Lighting From The Verge – develop an efficient and environmentally friendly lighting system that can be located in the verge. **Purpose:** to reduce street furniture. **Time-scale:** within 10 years.

Cellular Communications - develop cellular communications and roadside services to square the policy imperative of not using mobile phones when driving and the potential proliferation of these, particularly their use to summon help. **Purpose:** to improve safety on the highway whilst maintaining important communication links. **Time-scale:** medium term within 5 to 10 years.

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Annex C

2030 Vision Workshop Participants

The Coach House, Plas Glensevin

Sunday 21 Feb to Tuesday 23 Feb 1999

Kris Beuret	Social Research Associates
Peter Borrough	HA TSS
Ian Cameron	JMP Consultants
Richard Eastman	HA TSS
Granville Fisher	Southampton University
Mima Garland	HA TSE
Martin Hancock	Travel West midlands
Peter Hills	Newcastle University
John Miles	Ankerbold International
Barry Moore	HA TSS
Terry Sullivan	HA TSS
Chris Harle	Minerva Training – Facilitator
Simon Hubbard	WSP Transportation (Consultants) – Reporter

Annex D

'Blue Sky Day' Workshop Participants

Ravens Ait, Surbiton

Thursday 8 April 1999

Peter Borrough	HA TSS
Francis Cluett	HA PS
Nial Finegan	HA NCS NSPFD
Simon Hubbard	WSP Transportation (Consultants)
Pam Lowery	HA QS TSE
Martin McMahon	HA
Barry Moore	HA TSS
Bruce Parker	HA PS
Yogesh Patel	HA QS QP
Jonathon Pizzey	HA PS
Steve Woodward	HA QS
Mike Wilson	HA QS CE