

Campaign for Better Transport



Integrated transport
A new generation of interchanges

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Transport options in the West Midlands

Executive summary

Transport networks should be efficient, affordable, accessible and comprehensive. Good modal interchanges are central to creating such networks.

That much of the country lacks such systems is the result of disjointed and reductive transport planning and investment. Despite in-principle support and a number of small national initiatives, there has been a widespread and ongoing failure to link transport networks and modes. The resulting over-reliance on cars is engendering negative social, economic and environmental ramifications. These consequences unfairly disadvantage those who do not have a car and lead to perverse spending decisions to address the resulting congestion.

We need a better way forward. This report makes the case for a new generation of transport interchanges. Taking account of technological, administrative and social developments, it looks at both strategic and local opportunities for transport modes and services.

Planning reform

The National Planning Policy Framework should be explicit in setting out the benefits of good modal interchanges and their potential as hubs for sustainable development. There should also be detailed guidance on planning and locating of interchanges.

The National Policy Statement on National Networks should be amended to include passenger transport interchanges alongside the existing information on rail freight interchanges. The National Infrastructure Commission should undertake a comprehensive assessment of appropriate locations for major interchanges.

Funding and support

A Bus and Coach Investment Strategy is long overdue. The Government should develop a multi-year bus and coach investment strategy to sit alongside other transport investment, such as the Road Investment Strategy and rail's High Level Output Specification.

A joint Department for Transport (DfT), Department for Housing, Communities and Local Government fund should be established to support the delivery of national priority interchanges and to fund regional assessment of interchange opportunities. Cross-government working should also examine how better interchanges can contribute to policies such as the Industrial Strategy.

Infrastructure schemes funded via the Road Investment Strategy (RIS) and all future rail franchises should be required to actively deliver better modal integration.

Devolution

The creation of Combined Authorities and Sub-National Transport Bodies (SNTB) should be used to significantly expand the integration of transport planning and deliver the interchange facilities via a review of opportunities to develop rail, bus, and coach interchanges.

Goodwill toward joined-up transport provision is not enough – more and better interchanges combined with better joined-up services are required.

Introduction

An efficient transport system should be easy and affordable to use, accessible to all, and comprehensive in the destinations it serves. This requires well-planned infrastructure and services. Yet too often our transport networks fail to deliver such a network.

The reason for this is clear. Planning, operation and investment in individual transport modes is undertaken in isolation. This means much transport planning remains reductive. For example, if there is a budget for roads then the response to a congested road will be to add more road capacity. It will not generally be to identify the wider causes of the congestion nor contemplate the best transport solution to resolve it.

A principal casualty of the current approach is interchanges. By definition, interchanges require a joined-up approach to transport. Despite some recent attempts at more creative planning, opportunities to link up road and rail infrastructure and services are routinely missed and often undervalued.

Good interchanges can greatly influence the travel choices people make. Existing interchanges have developed for many reasons including facilitating easier access to networks, taking advantage of co-located transport infrastructure, making the most efficient use of available capacity and to support new retail and housing development.

Depending on their location, capacity and design, a good interchange can offer:

- Links to a wide range of destinations employing several modes
- Integrated travel information for ease of use
- Access to good quality transport services with clear routes between modes
- Local benefits such a more attractive, visited and more accessible public realm.

In addition to these benefits, there are new reasons to focus on multi-modal travel. While currently loosely defined, the concept of Mobility as a Service (MaaS) has the potential to transform travel. MaaS foresees a move away from car ownership and towards a model where people purchase a journey by whichever mode is most efficient. Thinking has so far focused on technology needed to achieve this through better journey planning and autonomous vehicles. If it is to transform how we travel for the better, however, MaaS will need to be supported by greatly improved physical connections between modes. Because national and local government, transport operators and the bodies responsible for managing our road and rail networks rarely work together, this essential element is both long overdue and requiring of urgent attention.

Good interchange facilities do exist in the UK. The most well-used of these are in major conurbations where mainline rail termini meet local transport for onward travel. Cities with light and suburban rail systems also often have interchange stations specially designed to bring services together.

While the above examples perform an important function, all too often they represent the full extent of planned support for multimodalism. In smaller cities and towns informal interchanges have evolved between rail and bus networks. The usefulness of these, however, is frequently undermined by poorly coordinated and integrated timetabling and promotion. Rural areas fare worse, often relying on sparse and slow bus networks the funding for which is under annual pressure.

Away from major cities, public transport is regularly planned as a series of independent routes, not a cohesive linked network. This approach inflicts not only planning between modes, but planning within modes. For example, rail franchises rarely consider links with services offered by other franchises.

Addressing these lost opportunities requires door to door planning of the type the Government envisaged in its 'Door to Door' strategy of 2013 (now withdrawn). More and better interchanges are a part of this along with other initiatives such as integrated fares and ticketing.



Stratford Interchange, London

Without planning and investment in better interchanges, the absence of affordable, efficient and easy to use alternatives will mean those with access to a private car continue to rely on them. Those without them will continue to be doubly disadvantaged by the negative social and environmental impacts of our over-reliance on private cars, and the inefficient planning and spending decisions that attempt to accommodate them.

Development and investment in existing infrastructure is rarely planned in ways that promote efficient use of networks overall. The absence of integrated planning and facilities causes congestion and leads to perverse public spending decisions. It is the travelling public who pay the price for this in wasted time, long or difficult journeys, with some even prevented from travelling at all.

So, there is a clear and pressing need for better integration of our transport systems. If our networks are to become more efficient and easier to access, we need to move beyond a small number of showcase examples and develop many more interchange points. Some of these will be strategic pieces of infrastructure, bringing together major roads and rail lines. Others will be simpler, offering local interchanges designed to meet urban, suburban and rural needs.

This research highlights why and where better interchanges are needed. It considers the benefits of specific locations and looks at the role different organisations and policy initiatives should play in bringing more such developments about.

Context

The UK lacks a proactive and strategic approach to transport integration. Despite in-principle support and much lip service, there are often siloed structures in coach, bus and rail industries, a lack of clear guidance from national government and a shortage of skills and resources locally.

National policy has been complicit in this arrangement. There has been a long-term presumption in favour of cars in both planning and taxation policy. A flirtation with a more cohesive national policy in the late 1990s and early 2000s soon lost momentum and was formally ended with the abolition of the Commission for Integrated Transport in 2010.

Subsequently, there have been only three DfT initiatives of note. The Local Sustainable Transport Fund operated from 2011-15 and supported a large number of successful local initiatives albeit offset by cuts in budgets to support buses. The Door to Door Transport Strategy of 2013 (now withdrawn) encouraged better passenger information and ticketing together with improved physical connections and infrastructure, but arguably always lacked resources and ministerial support. Latterly, the Road Investment Strategy of 2015 includes a small amount of funding designed for modal integration on the Strategic Road Network.

There are examples of good practice. Geographic areas which have the most integrated approach to transport management – typified as members of the Urban Transport Group – now have well-established networks of interchanges. But, overall, progress has been uneven and slow. Bus and coach networks lend themselves to integration, but there are practical problems with severance, road congestion, signage and infrastructure. There are now 19 railway stations formally monikered as ‘parkway’s, but many hundreds more offer large amounts of space for car parking. Around 50 towns and cities in England operate bus-based park and ride

operations. While effective at facilitating access to public transport, the contribution to sustainability that such operations make is hampered by the continued reliance on private car that they engender and their limited impact on overall road mileage.

We can do better. New technological, administrative and social developments offer a great opportunity to encourage new interchanges:

- New approaches to investment – For example, the DfT is examining whether in principle its objectives for the Strategic Road Network can be best met through investment in rail freight. It will be possible to deploy similar arguments for passenger journeys
- Technological progress – Concepts like MaaS and associated progress with real-time information, smart ticketing and ride-hailing operations increasingly allow travellers to follow flexible itineraries, making swapping between modes and routes much easier and more commonplace
- Societal change – Connected with the above, other social changes such as falling car ownership in urban areas and among young people, is making a flexible approach to travel modes the norm
- Devolution – The establishment of new combined authorities and Sub-National Transport Bodies allows a more integrated approach to transport and land use planning to be taken in some places.

Drawing on the above developments, this research report makes the case for new interchange transport infrastructure to:

- Encourage multimodal journeys
- Improve accessibility and reduce reliance on the private car by making alternatives quicker and easier for all or part of a journey
- Identify potential sources of support and funding for new interchanges and promote proposals.

Example:

Rail-based park and ride interchanges

In recent years, a number of smaller interchanges based around new railway stations have been built. These have the potential to be multimodal interchanges but in practice are arguably primarily car/rail interchanges. Of the 26 new stations added to the rail network since 2012, nine have over 100 car parking spaces, with five having over 200 spaces.

Oxford Parkway Station is the largest example. It has nearly 1,500 parking spaces including the adjacent park and ride site. In addition to copious space for cars, support is also made to facilitate other modes. Rail tickets can be used on buses serving the city centre, and some buses can also carry bicycles. Cambridge North station has 450 car parking spaces along with room for 1,000 bicycles.

It is also connected to the Cambridgeshire Guided Busway. Other stations such as Edinburgh Gateway have been conceived primarily as interchanges with no car parking but links rail and tram services instead.

The location and design of Oxford Parkway and Cambridge North means they can come with a significant time penalty for public transport users. At Oxford, existing buses on the A40 and A44 bound for the city centre can only serve the parkway by imposing a delay upon city centre passengers, who are likely to be the bulk. The location of Cambridge North is a significant walk from employment areas while a nearby residential area with poor public transport provision has no easy link to the station.



Transport options at Cambridge North railway station

Planning and interchanges

An integrated transport network with reliable and well-positioned interchange points requires clear long-term policy supported by meaningful planning attached to investment decisions. This section identifies how key policies and strategies support integrated transport and interchanges.

National Planning Policy Framework (NPPF)

Surprisingly little guidance is available on planning for and locating interchanges. The NPPF is not explicit in its support for interchanges to support passenger transport (although mention is given to strategic rail freight interchanges). It does, however, contain implicit support through guidance which should require local authorities to look favourably on potential interchanges when developing local plans. For example:

30. Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.
31. Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development, including large scale facilities such as rail freight interchanges, roadside facilities for motorists or transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas.
34. Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.
41. Local planning authorities should identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice.¹



Hull Paragon interchange

Rail

Network Rail's current upgrade plan includes only two projects which explicitly aim to improve modal interchange (Edinburgh Gateway and the South Wales Metro project). Other projects in the plan such as the Crossrail projects and East West Rail also offer opportunities for improved modal interchange.

The policy of support for interchange at individual stations is relatively clear. The DfT's categorisation of railway stations identifies six main types of station. For each, it stipulates expected standards across access, information, facilities and environment, with locally specific initiatives subsequently identified through station travel plans.

Highways England

Highways England (HE) strategy documents do refer to support for better modal interchange involving the SRN. The main objectives of the Road Investment Strategy (RIS)² include, for example, joining our communities and linking effectively to each other:

'The SRN is a key part of connectivity, linking people, places, and different transport modes. This is particularly true outside of the big cities, where the range of transport options may be more constrained.'

What facilities should railway stations have?³

Category	Number (2011)	Description	Trips per annum	Interchange facilities
A	28	National hub	Over 2 million	<ul style="list-style-type: none"> ● Full access to all trains & facilities and Assisted Travel buggy ● Comprehensive signing from main road plus cycle/pedestrian routes ● Station Travel Plan ● Cycle Hub with combined storage for up to 5% of passengers ● Parking & Premium Parking for up to 15% of passengers outside London ● Plus Bus through ticketing ● Bus/tram interchange ● Bus information displayed in or near station entrance ● Well-signed taxi rank outside station with Accessible taxis
B	67	Regional interchange	Over 2 million	<ul style="list-style-type: none"> ● Full access from entrance to all platforms, including lifts ● Bus / tram interchange in or near forecourt ● Cycle Hub or secure store with combined storage for 5% passengers ● Comprehensive signing from main road plus cycle/pedestrian routes ● Station Travel Plan ● Parking & Premium Parking for up to 15% of joining passengers ● Plus Bus Through ticketing promoted ● Bus Information displayed in or near station entrance ● Well-signed taxi rank outside station with Accessible taxis
C	248	Important feeder	0.5 to 2 million	<ul style="list-style-type: none"> ● Station Travel Plan ● Cycle Parking Space for up to 5% of joining passengers ● Premium Parking as well as parking for up to 15% of joining passengers ● Plus Bus through ticketing promoted to local public transport ● Access for All Step-free access ● Comprehensive signing from main road plus cycle/pedestrian routes ● Well-signed rank outside station ● Bus information displayed in or near station entrance ● Local road map & useful information (e.g. bus/taxi phone numbers)
D	298	Medium staffed	0.25 to 0.5 million	<ul style="list-style-type: none"> ● Well-signed taxi rank outside station if possible ● Street direction signs from main road and pedestrian/cyclist routes ● Cycle Parking Space for up to 5% of joining passengers ● Car parking for up to 15% of joining passengers ● Bus information displayed in or near station entrance
E	679	Small staffed	Under 0.25 million	<ul style="list-style-type: none"> ● Cycle Parking Space for up to 5% of joining passengers ● Car Parking Space for up to 15% of joining passengers ● Bus information displayed in or near station entrance ● If no taxi rank, phone number prominently displayed ● Local road map & useful information (e.g. bus/taxi phone numbers)
F	1,200	Small unstaffed	Under 0.25 million	<ul style="list-style-type: none"> ● Minimum 4 cycle racks ● Small car park ● Local road map & useful information (e.g. bus/taxi phone numbers)

The RIS designated funds also feature a Cycling, Safety and Integration Fund. This has objectives of:

“Modal Integration – to fund better links with local networks, e.g. Park and Rides, Station access.”

£45 million of the funding specifically for integration and is expected to be spent on trial projects that can inform the future RIS.

HE's Delivery Plan for 2015-20⁴ Promises £100 million to provide 'an Accessible and Integrated Network' to

“Ensure we integrate with other networks including local roads, existing and emerging rail links, ports and airports.”

For modal integration, there are no targets associated with this objective and activities listed in the delivery plan are limited to the following:

- We will support the delivery of Park and Ride facilities to better link the strategic road network with local public transport
- Existing and emerging rail links – M42 junction 6, first High Speed 2 station outside of London”.

Other national strategies

Several other strategic Government documents mention the importance and potential of interchanges without giving particular guidance on how more and better interchanges can be provided. For example, the Cycling and Walking Investment Strategy (CWIS) requires that “Ensuring a seamless transition from public transport to and from walking and cycling routes and networks is key to increasing the number of walking and cycling stages to bus stops and other transport interchanges.”⁵

DfT guidance on the Bus Services Act namechecks the importance of good interchanges to ensuring public transport remains a viable and attractive transport option.⁶

Local guidance on interchanges

While most interchanges are based on individual masterplans, some transport authorities have produced guidance on interchanges. Most notably, Transport for London (TfL), offers detailed information for planning authorities on interchanges around four themes:

- **Efficiency** - operations, movement to and within the interchange, sustainability
- **Usability** - accessibility, safety, personal security, protection
- **Understanding** - legibility, permeability, wayfinding, information
- **Quality** - perception, built design, spaces, sense of place⁷

Transport for the North has also identified the need for further interchanges to be developed but has so far concentrated on the freight and logistics sectors.



Example:

Bus and coach interchanges - High Wycombe

Since 2016, coach services to High Wycombe have been greatly improved by the district council's development of a coachway interchange.

High Wycombe is located near to the M40 which carries frequent coach services between London, Oxford, Birmingham and Glasgow. Prior to the development of the £150 million coachway, however, services did not stop because of the delays caused in navigating local roads. High Wycombe now receives more than ten services a day, although there remains scope for service improvements (stops for Oxford-London/Heathrow/Gatwick coaches, for example).

The Coachway includes a heated waiting area and real-time information screens. The site also supports Park and Ride services.

Example:

Freight and logistics interchanges - Daventry

Compared with road distribution, rail freight can deliver economic, safety and environmental benefits. A single freight train can remove up to 77 HGVs journeys from congested strategic roads. To increase rail freight, more Strategic Rail Freight Interchanges (SRFIs) are needed at locations with good road and rail connections. Examples such as the Daventry interchange in Northamptonshire can remove up to 64 million lorry miles from the Strategic Road Network a year.⁸

Opened in 1997, the Daventry International Rail Freight Terminal (DIRFT) is one of the busiest interchanges in the country. Located in the so-called 'golden triangle' of midlands distribution points, it combines a rail connection to the west coast mainline with links to main roads including the M1 and A5. DIRFT's use for rail freight has seen significant growth over the last 20 years.

A 2005 expansion allowed the transfer between sea and channel tunnel born rail-freight and road transport. In 2011, a new rail tunnel was built under the A5 to improve access and plans for a further rail-connected extension were approved in 2014.

SRFIs are important strategic pieces of infrastructure. They are classified as Nationally Significant Infrastructure Projects under the Planning Act 2008 and the National Networks National Policy Statement (NPS) published in December 2014 sets out the compelling need for more SRFIs because of the limited number of suitable sites available.

Above: Birmingham tram

Case Study 1: Thurrock

Context

- Thurrock is a unitary authority in Essex with a population of 167,000. It forms part of the Thames Gateway area which is experiencing major and on-going development in housing, retail and port industries
- Rail movements north and south of the river serve a strong London commuter market, but the network is only lightly used for more local journeys
- The majority of Thurrock's population live within two miles of a fast service to London and the area is served by seven railway stations, all but one of which are on the Southend-Fenchurch Street Line. On the Kent side of the estuary, the North Kent Line commuter stations and supplemented by Ebbsfleet International on the HS1 line
- Thurrock is bisected by the M25 motorway and the A13, a major road linking Central London with east London and south Essex. The Kent side of the estuary is dominated by the M2/A2 corridor
- Uncommonly for a largely urban area, bus patronage in Thurrock has been relatively strong, increasing from 2.7 million journeys in 2004-05 to 4.6 million in 2015-16. In Kent, services include the Fastrack bus network which is being widened to support new development in the Dartford to Gravesend area.

Local plans

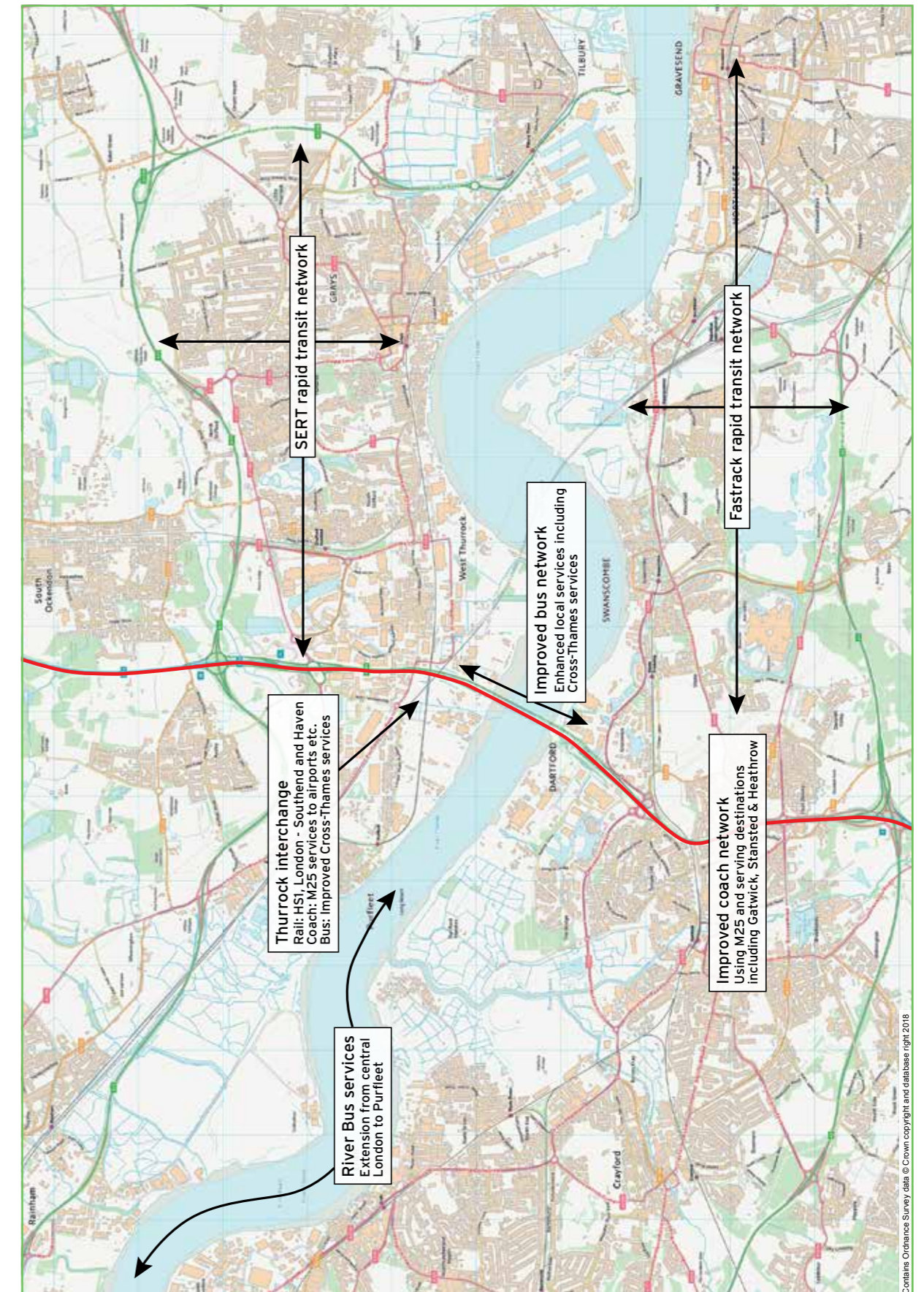
- Local authority plans strongly promote better modal integration and improvements to public transport networks. Works undertaken to date have, however, concentrated on increasing capacity on the A13 and A2 with initiatives such as the bus based SERT proposal failing to attract financial support
- Thurrock's local transport plan and emerging new local plan include priorities to "improve capacity and connections between modes of transport at key transport interchanges such as rail stations"⁹ and "create a transport system that ... is integrated to provide seamless multi-modal journeys".

Lower Thames Crossing

The current Dartford Crossing consists of two two-lane tunnels running northbound, and the QEII bridge carrying four lanes southbound. It is the only river crossing on the SRN to the east of London and carries an estimated 135,000 vehicles per day (avpd). It is not built to motorway standard, operates above capacity and a series of studies have identified it as a bottleneck on the M25.

Both Essex and Kent County Councils support plans for a new Lower Thames Crossing linking the M25 at Ockendon with the A2 at Gravesend citing Port of Dover forecasts of 40 per cent growth in freight traffic by 2030. Thurrock is opposed to the development.

A Lower Thames Crossing proposal is currently being developed by HE at a predicted cost up to £6.2 billion. This consists of a motorway standard road built across Essex and Kent linking the M25 with the A2/M2 via a tunnel from east of Tilbury to Gravesend. It was named as a priority infrastructure project in the 2011 National Infrastructure Plan, was confirmed in 2013, with a preferred route announced in April 2017. The new crossing is intended to increase cross-Thames SRN road capacity by 70 per cent.



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Shortcomings with proposal:

Freight: The Lower Thames Crossing is designed to take freight pressure off the existing M25 and allow easier access to Dover. Other options exist to this end. Freight terminals north of the Thames at London Gateway and Tilbury have spare capacity and good rail freight connections (unlike Dover). Increased rail utilisation of these ports would relieve pressure on the Dartford Crossing without requiring a new crossing.

Congestion: The principle of induced traffic suggests adding another road-based Thames crossing could encourage more traffic onto an already congested network. Elsewhere, HE appears to acknowledge the basis of this argument. In its own review of the M25 South West quadrant, HE recommended against widening, finding any new capacity would soon be taken up by increased journey numbers.

Damage to the environment: HE's own consultation document states that 'our proposed scheme would have an impact on local communities as well as cultural heritage and landscape. These include areas of greenbelt, the Kent Downs Area of Outstanding Natural Beauty and areas of ancient woodland' and 'All route options would potentially affect areas of ancient woodland and protected species such as water voles, great crested newts and birds.'

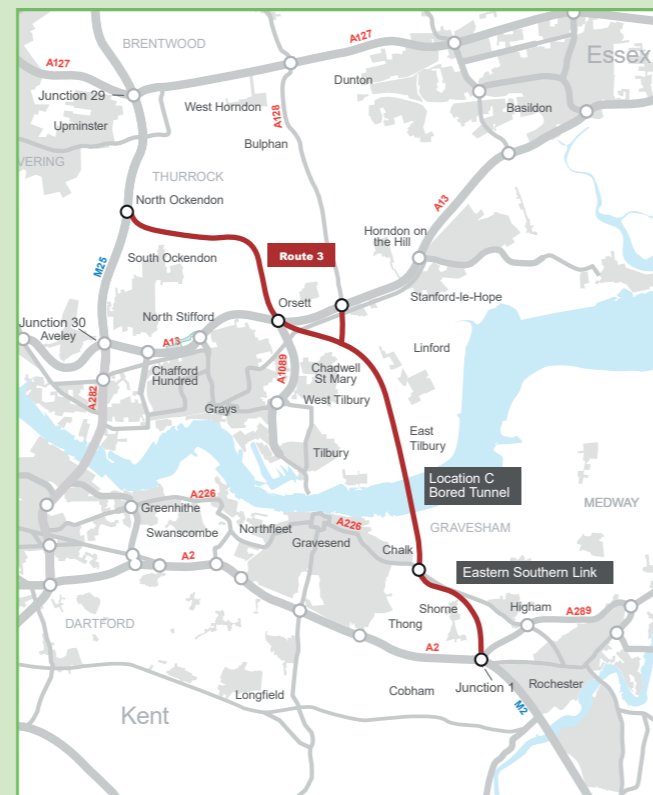
Recommended improvements

Rail facilities and services

A new Thurrock Parkway station bringing together a new station on both the HS1 and the Essex Thameside line, and a parkway on the A282. Reintroduction of passenger services on the Thames Haven Branch, improving accessibility of the London Gateway/Thames Haven port site. In the longer term, there is potential to extend this route to Canvey Island with its population of around 40,000 people.

Transformation of local bus services

Bus services operating via the Dartford Crossing are very limited. Evening and Sunday services are sparse, thus depriving Thurrock residents of easy access to a wide range of work and leisure opportunities by public transport including connections with Eurostar at Ebbsfleet. Instigation of a comprehensive bus route serving both sides of the Thames via the Dartford Crossing would overcome this and connect to other public transport networks.



Highways England's preferred route for a Lower Thames Crossing (September 2018)

South Essex Rapid Transport

Reappraisal of the South Essex Rapid Transport (SERT) proposal offering high frequency buses on dedicated lanes through congested locations and interchanges at key locations including Basildon University Hospital, Grays Town Centre, the Lakeside shopping centre (via the A13), and Purfleet.

Improved coach services

The creation of an interchange station at Thurrock Parkway would be supported by the provision of improved coach services. This could serve destinations and routes including Stansted and Gatwick airports via Thurrock, which it would join with the existing Heathrow coach services.

River Bus services

A river bus service calling at Erith, Purfleet, Greenhithe, Grays, Gravesend and Tilbury, incorporating the existing ferry services. This could be either a stand-alone service or an extension of existing London riverboat services or an eastward extension to current services to Woolwich, Thamesmead, Rainham Marshes and Thurrock. With the exception of Tilbury, all calling points would be walkable from rail stations.

Fares and ticketing

Consideration of incorporating the public transport offer into London's zonal system with Oystercard and Travelcard validity.

Wider area improvements

Further infrastructure and service improvements could be undertaken in the area to enhance integrated transport and offer interchanges with the Stansted and Gatwick coaches. These include:

- Improved coach access to Swanley from the A20, creating an interchange with rail services to Kent and parts of Sussex
- A new Brentwood Parkway station served by Crossrail, the Great Eastern Mainline and local buses
- Delivery of the proposed Thanet Parkway Station (planned to be built between Ramsgate and Minster)
- Extension of the Central Line to serve a reopened park and ride station on the M11 at North Weald (would require slip roads for buses and park and ride traffic from the motorway)
- Coach and local bus interchange at Clacket Lane would allow coaches to serve Oxted station via Junction 6 and an existing service station access road. This would require the link road to the A25 to be widened and a new short link to the B2024 allowing local bus access.

Freight

The current proposals for a Lower Thames Crossing are heavily predicated on a desire to expand freight access to cross-channel ferry and Eurotunnel services. The needs and potential of rail freight are largely excluded from this discussion.

The opportunity for increasing rail freight via Eurotunnel is significant. Establishing a freight route via Maidstone and Barking Riverside could provide capacity while avoiding London's main orbital corridor. Consideration should be given to establishing a committed rail freight route via a new link at Maidstone. Access to this could be supplemented by the Barking Riverside-Thamesmead Overground tunnel extension proposed by the London Mayor in 2015 and a new link at Hertford to give access to the east coast mainline via Seven Sisters.

Case study 2: The Catthorpe Interchange - M1, M6, A14 junction, East Midlands

Context

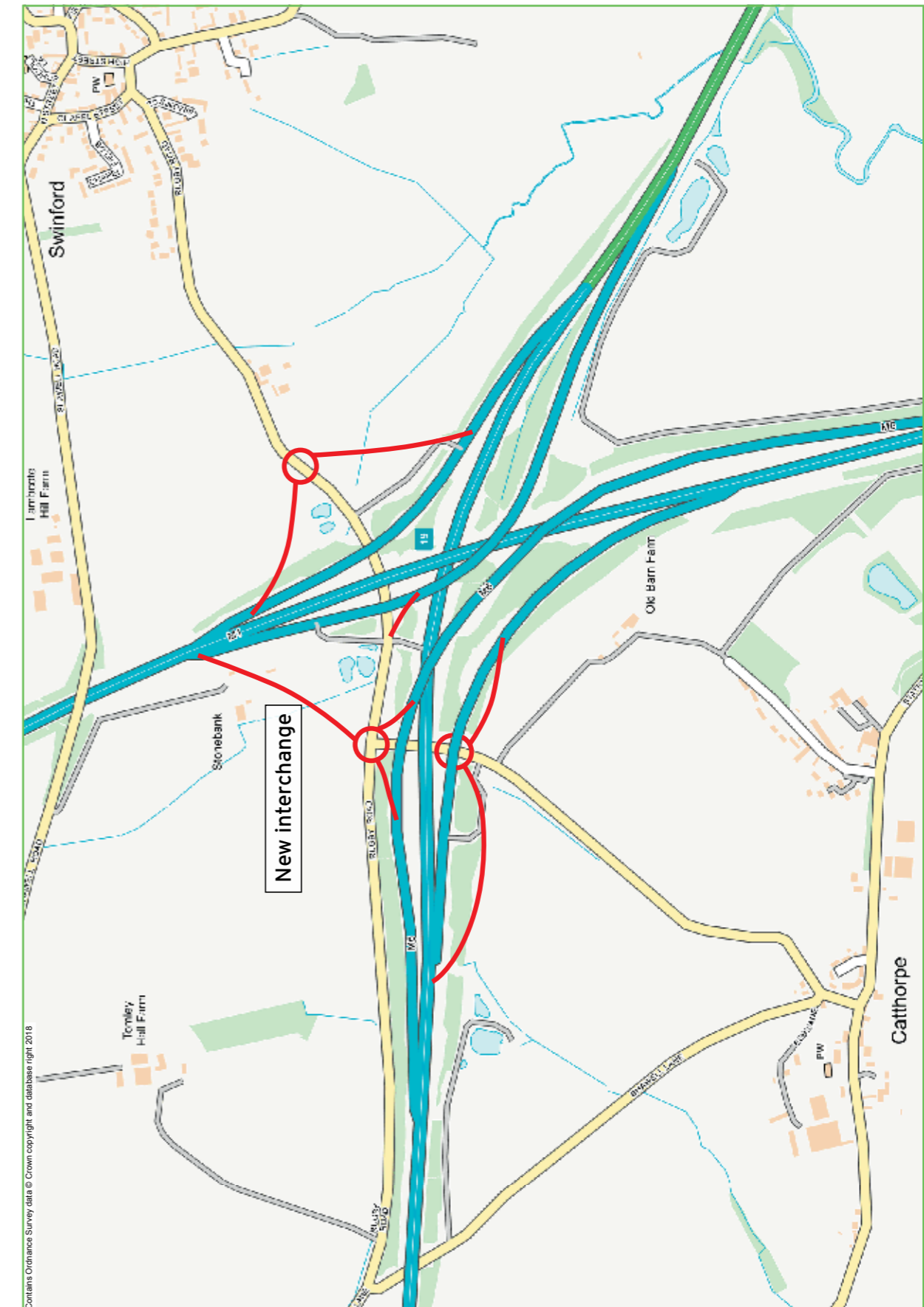
The Catthorpe Interchange is located at the junction of the M1 between Northampton and Leicester, and the A14 / M6 between Cambridge and Birmingham. It forms a strategic intersection between the North West, Greater London, Cambridge and the east coast ports.

A roundabout junction between the roads was developed in the mid-1990s when a link to the A14 was added to the pre-existing M1/M6 junction. From the early 2000s, the junction was recognised as being both congested and an accident blackspot with at least 12 people killed in crashes around the junction between 2005 and 2010. Traffic attempting to avoid the interchange caused congestion and nuisance in nearby local roads.

HE (Highways Agency at the inception of the project) undertook a £191 million project to overhaul the Catthorpe junction between 2014 and 2016. Replacing the roundabout based junction, the project created a three level intersection with connections between the three roads. This was intended to reduce journey times by resolving congestion and safety problems and overcoming conflicts between local and longer distance journey users. The interchange is now used by over 140,000 vehicles a day.

Despite the major investment, the junction project has major shortcomings:

- There are practical issues with the design of the new junction. There remains no access between the A14 and M1 south. Junctions with local roads have also been severed reducing the usefulness of the intersection (although a new bridleway was constructed between Swinford and Catthorpe to serve cyclists, horse riders and pedestrians)
- Investment has overly focused on adding road capacity to address the short-term needs and interests of private car and road freight users
- Concerns, such as north-south and east-west travel by public transport were not given due consideration in consultation or realisation of the scheme. As a result, public transport provision remains very poor, for example, the rail journey from Cambridge to Birmingham is 45 minutes slower than the same journey by private car. Only one direct coach a day follows this route, being around one and a half hours slower than by car. Similarly, there is no provision for interchange with coaches serving strategic destinations on the M1
- By failing to accommodate the strategic potential for modal shift, the Catthorpe project failed to support modal shift along the A14 corridor. It has thus contributed to the major re-routing and increasing capacity of this road at a cost of up to £1.8 billion
- The redesign of the Catthorpe junction not only failed to consider the potential for public transport, but in its execution, made it significantly more difficult to realise such improvements in the future. The former road layout would have required two new slip roads allowing coaches to join and leave from the M1 south. The redesigned formation would require the construction of an additional six slip roads to make it operational as an interchange (two each to link with the M1 south, M1 north, M6 and A14).



Recommended improvements

A public transport interchange at the Catthorpe Junction

The Catthorpe Junction is a strong strategic location for the establishment of a new public transport interchange:

- Serving coach and local bus services to Rugby, Lutterworth, Market Harborough and Daventry, an interchange would allow easier and swifter travel between a wide range of destinations across the hinterland north of London, the Midlands and parts of eastern England
- It would particularly address weaknesses in the provision of east-west public transport (see below) and improved access to north-south journeys via the M1 and connections to rail including the west coast mainline at Rugby
- Existing bus provision is limited by the fragmentation of responsibility for an area that straddles three counties (Leicestershire, Warwickshire and Northamptonshire).



Catthorpe interchange

- There would also be an expectation of local bus networks being adapted to connect to the new bus route, and connections to visitor attractions such as Grafham Water.

Express bus service Cambridge-Rugby

The A14 between Cambridge and Rugby has significant unrealised potential as a public transport corridor served by an express bus route. This would bring benefits including:

- New strategic public transport connections on both road and rail
- Improved local and regional public transport in areas where current provision is poor (including, for example, between Huntingdon and Thrapston, and Rothwell and Rugby)
- One potential express bus route would link Cambridge, Huntingdon, Kettering and Rugby, with rail services at all four locations and a number of other local interchange points. This route would be particularly attractive for journeys such as Cambridge to Birmingham, where travel times would compare favourably with existing options. The attractiveness of services would be enhanced via through joint bus and train ticketing

Other improvements

To improve the provision of multimodal transport in the area around the interchange a number of rail enhancements should be considered:

- The Bedford-Northampton rail line should be examined for reopening. The 20 mile alignment is still extant although threatened by development at Northampton. Linking these two large towns would complement the next phase of the planned East West Rail line from Bedford to Cambridge. Several studies have recommended the Bedford-Northampton reopening, including as a potential extension of Thameslink and to support the area's important and fast-growing rail freight distribution sector
- In the longer term, the practicalities of connecting other major distribution centres such as the nearby Lutterworth Magna Park to the rail network should be considered. The benefits of this would be to reduce over-reliance on roads distribution of freight and the congestion this causes.

Case study 3: Luton north

Context

- Located 30 miles north of central London, the settlements of Luton, Dunstable and Houghton Regis form a large conurbation with a combined population of 260,000
- The main transport connections are from the midland mainline, which passes through the town and has three railway stations (Luton, Luton Airport and Leagrave), and the M1 which bisects with conurbation. Other 'A' roads in the area include the A5, A6 and A505
- The local road network is congested, with 2018 research identifying the area's roads as the fourth most congested in the country. Efforts to address this have included a new bus network including an eightmile guided busway employing a disused rail line.
- Public transport travel between the area's main centres is currently difficult with the limited facility for interchange with rail, particularly at Milton Keynes a particular problem. For example, the 18 miles from Luton to Milton Keynes currently takes over an hour and half by rail and requires travel via central London. Bus journey times are quicker at 50 minutes but can be further extended at peak times due to congestion between Luton town and M1 Junction 11. Coach journeys are around 35 minutes to Milton Keynes Coachway but then require passengers to catch a further service to the town centre
- Journey times for the nine miles from Luton to Stevenage and the east coast mainline are even more stark with the new road layout at Luton Airport sometimes imposing significant delays on exiting buses routes. Coach and bus take 50-55 minutes. Rail takes considerably over an hour because of the requirement to travel by central London. Private car journeys are timed at under 30 minutes.

Existing development proposals

- Plans for a major new mixed development area to the north of Luton are being developed by local authorities
- To the immediate north of Luton, the midland mainline and the M1 run in close proximity. This provides the opportunity for an interchange between the two, offering multimodal access to local, regional and national destinations
- Luton and Dunstable's local transport plan (2011-2026)¹⁰ identifies the need to 'Improve interchange between rail, coach and bus services' as a high priority for the local area in particular to support the economy
- This potential of this location as a transport node has already been identified by Central Bedfordshire Council. In 2017, the council published a framework plan¹¹ for the north of Luton strategic allocation. This included a new transport facility combining rail and road access along with housing, commercial development, leisure facilities and a major new linking the M1 to the A6 to the east
- However, the proposal being considered is for a rail/road freight interchange only (Sundon Rail Freight Interchange) and does not include measures to improve passenger transport
- The provision of bus, coach and rail access to the new development site has a strong correlation with the objectives set out in the framework, to offer 'easy access to the towns, villages, and the countryside ... utilising existing routes and creating new ones to maximise connectivity. This will include good public transport and safe, convenient walking and cycling routes to encourage sustainable and healthy modes of travel'

Recommended improvements

Local bus improvements

- Ensure faster and more reliable peak time bus services by offering guided buses direct from Luton station to the north side of Dunstable and to a new M1 junction. This would avoid congestion both within Luton and around Junction 11 of the M1
- Improve links between Luton and Cambridge, Peterborough and intermediate stations by reinstating a stop at Hitchin station for local buses to Stevenage
- Service 88 could also usefully be diverted via Luton Airport and extended to Hitchin station.

Establish Luton North public transport and freight interchange

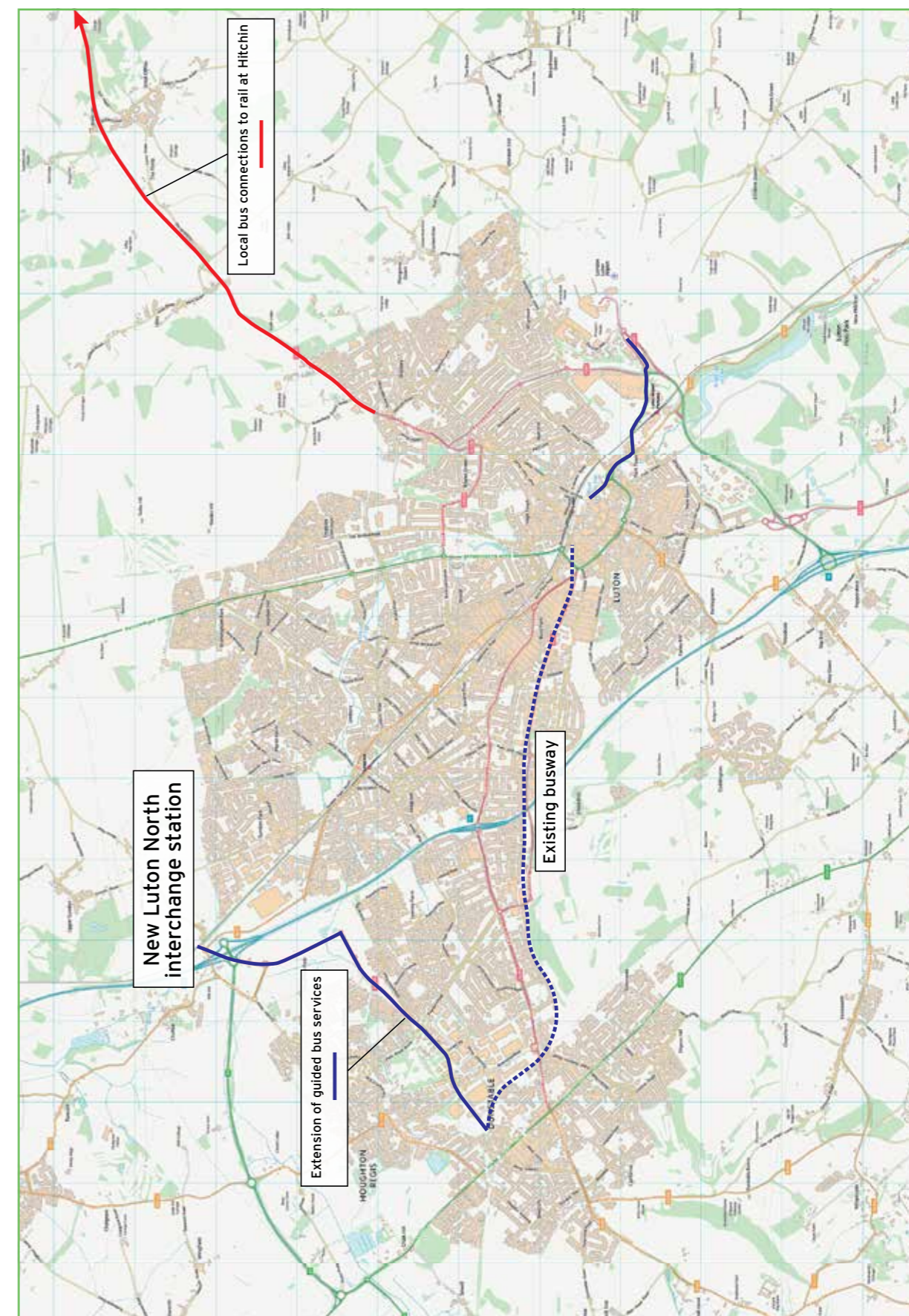
Build a new Luton North interchange station serving the midland mainline and M1 Junction 11a. This proposal should be taken forward as an expansion of plans for a rail freight facility and should include the following:

- Car parking and coach interchange, both to be accessible from the M1
- Local bus interchange supported by integrated bus/ rail timetabling. This should become a focus for local bus routes, including a new route between Dunstable and Barton le Clay
- Construction of a dedicated connecting spur linking the new station to the guided busway (if physical constraints can be overcome). This connecting spur could provide a more attractive route for Chiltern Way walkers.

Longer term

Improve local rail infrastructure by establishing a link between the midland Main Line and the Marston Vale line, allowing travel toward Milton Keynes and Oxford. This section of the Marston Vale Line is likely to require upgrading as part of the East West Rail project toward Bedford and Cambridge.

Luton - Dunstable busway



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Example:

Clock face scheduling

A clock face schedule, or Taktfahrplan, is a timetabling system that runs services at consistent intervals with the objective of making schedules simple to memorise and therefore more attractive to use. Clock face timetables can also be attractive to operators by making planning easier.

Widely used in Germany, the Netherlands and Switzerland, clock face schedules give the biggest benefits when they allow coordination across public transport modes. Generally organised around a hub and spoke system, transfer distances and waiting times between services can be minimised and journey-time based tickets employed.

In 2015, Network Rail produced its Improving Connectivity report which applied the principles of a Taktfahrplan approach to rail timetables in eastern England. It identified a core service pattern and investment priorities, but these have yet to be adopted in practice.



Other opportunities for improved connectivity between rail and road

Willesden Junction

Increasing the interchange role of Willesden Junction could create a new cross-London route. This would be created by replacing some current services from Willesden Junction to Euston and Victoria, rerouting Overground services to cover Heathrow Connect and running Crossrail fast to Heathrow then to Staines and beyond. This proposal would have the additional benefit of avoiding level crossing constraints that have hampered attempts to create a Heathrow-Staines rail link.

Carnforth

Carnforth in north west England is uniquely placed to support sustainable tourism and commuting through an integrated transport offer. It is currently prevented from doing so because its mainline railway station platforms were closed as part of the Beeching cuts.

Carnforth is situated less than ten miles from two National Parks and two further Areas of Outstanding Natural Beauty. It is also located on the A6 and close to the M6 motorway. The town has a well-served railway station with regional and local services from Manchester on the Furness Line and services on the Leeds to Morecambe Line.

It is also located on the west coast mainline, but no mainline trains currently stop there because the platforms were decommissioned in the 1970s. Reopening the mainline platforms at Carnforth would support sustainable access to a major destination, particularly helping to reduce tourist road traffic in destinations including the Lake District.

Lanark Junction

A new station to the west of Carstairs where the branch from Lanark joins the mainline. Such a location would enable the station to serve trains from Lanark, Edinburgh and Carlisle in one direction and Glasgow and Stirling in the other without the need for new permanent way. This could be combined with strategic bus links to a range of destination including the west coast and its ferry links.

Saffron Walden coachway

Saffron Walden is a commuter town in Essex located 12 miles from Bishop's Stortford and 18 miles from Cambridge. Despite being close to both rail connections and the M11 it has weak multi-modal transport provision. Establishing a short coachway exit from the motorway where it crosses a local B road near Audley End station would allow drivers currently using the M11 to access local bus and park & ride facility for Saffron Walden, avoiding congested local roads. This would also give improved access to Audley End railway station and its connections to Cambridge, London Liverpool Street and Stansted Airport while also giving access to a wider range of destinations via the national coach network.

Farnborough / Frimley Green

Three rail lines intersect around Farnborough in Surrey, but interchanges between the services are currently poor. Constructing a new station where the Ascot-Ash Vale line crosses the South West mainline would rationalise the situation, and provide a strategic interchange making services on all three lines more accessible. Reading to Guildford trains would be diverted to the new station, Frimley Green and Farnborough Main stations would remain open while Farnborough North and North Camp stations are closed, leaving Ash Vale station as a key interchange.

East West rail

Measures are needed to ensure the advantages of the new East-West rail line from Oxford to Cambridge are realised even before it is complete. When the new line reaches Bedford, a dedicated express bus link to Cambridge should be established:

- Starting from the existing or a new railway station at Bedford railway via the A421 bypass
- Calling at St. Neots station where the usefulness of the interchange should be greatly enhanced by selected east coast mainline rail services and a link with existing and future suburban services (St. Neots already has four platforms, making such a role potentially feasible)
- Subsequently, the bus route should call at a Cambourne park and ride site (near an eventual east-west rail station when the line to Cambridge is planned and constructed), and Cambridge city centre and station.

South Hylton Parkway

This proposal would establish an interchange at South Hylton on Wearside linking existing express bus services between Middlesbrough and Newcastle, local buses and the South Hylton Tyne & Wear Metro terminus. Currently, the South Hylton branch of the Metro stops half a mile from an expressway section of the A19 without a junction. The proposed reopening of the Leamside Line nearby would further enhance the connectivity this site offers.

Newark Interchange

Consider a new avoiding line east of Newark which would cross the Nottingham-Lincoln line at a new interchange station. The existing east coast mainline could close north of the Nottingham-Lincoln line to where the avoiding line would regain the current route, thereby saving the cost of converting several level crossings. Some east coast mainline trains would continue to serve Newark Northgate, then turning onto the Lincoln route before using a new junction to get onto the avoiding line. All trains except fast east coast mainline services would stop at the new station. A new Trent crossing would be needed, and would provide an opportunity to add a walking and cycling crossing.

Example:

Public transport on the Strategic Road Network

A key element in better integrating transport is to ensure the interests of bus and coach users are represented in decisions concerning the Strategic Road Network (SRN). The causes of unreliable and unattractive bus and coach services include:

- Severance where bus and coach routes cross the SRN. Junction design is crucial in resolving these problems
- Poor or confused signage directing car users to public transport such as Park & Ride
- Congestion, particularly on the SRN in urban areas
- Lack of planning or information around diversionary routes, which can badly affect local bus services
- Unattractive and unsafe bus stops on trunk roads



Newport South

A new Newport South station should be considered at the junction of the Ebbw Valley railway and the South Wales mainline. This would allow passengers for Newport and eastwards to avoid travel via Cardiff. The new station could also be served by bus links, replacing the current demand response routes and giving services appropriate for an area with close proximity to major population centres.

Pilning interchange

There are projections for significant housing and employment growth in the area around Pilning and Severn Beach to the north west of Bristol. To improve local and regional connectivity a new interchange should be considered connecting the South Wales mainline near the junction of the M4 and M49. This should include a new railway station for Pilning (the existing station is some distance from the village and receives only a Parliamentary service) and a stop for long-distance coaches from the nearby M4/M49 roundabout. In the long term, diverting Severn Beach trains to run alongside the A403 to the new station could also be possible.

Ruislip Gardens

A new Ruislip Gardens interchange station should be considered. This would be served by underground and Overground services as well as being a stop for a new Heathrow-Watford Rail/Air Link bus.

Conclusions and recommendations

Overview

England, Scotland and Wales have little in the way of integrated transport. A central reason for this is that it is no one's job to join modes up. Rail's priorities are set by franchise holders, the DfT's Rail Executive and by Network Rail. Road priorities are set by HE and local authorities. There is a wholesale lack of government strategy or policy to support coaches or long-distance bus services. Local bus priorities are set by operators and local authorities. Coach priorities are set by operators. Walking and cycling are overseen by local authorities. Not only is there no national oversight transport investment to encourage modal integration, but there are few regional and local venues in which such discussions can be had. Without clear and consistent systems to promote, encourage or support modal integration, the warm words of planning guidance are seldom reflected in national investments or local planning.

In only a few places do planning and investment decisions that actively promote transport integration take place. These are predominantly London and the major conurbations of the north of England and the Midlands (former Passenger Transport Executive areas). Other places with the potential to develop such integration are the areas covered by established or shadow Sub-National Transport Bodies (STNBs, for example Transport for the North), and locations like Cambridgeshire or Cornwall which have devolved structures able to plan and deliver transport infrastructure over relatively wide geographical areas. Some, like Cornwall, are starting to use these powers creatively with an emphasis on interchanges.

Goodwill toward joined-up transport provision is not enough – more and better interchanges combined with better joined-up services are required. To make interchanges more central to the transport system will require better promotion of their benefits and specific initiatives to plan and deliver them at national, regional and local level. The tools needed to do this are set out in the next section.

Planning reform

National Planning Policy Framework (NPPF)

It is important for the Government to clarify that better integrated public transport is a defined policy objective. Government should supplement the NPPF, ensuring it contains more detailed guidance on planning and locating interchanges. The NPPF should be more explicit in setting out the benefits of good modal interchanges. For example, guidance should be clear that transport interchanges can:

- Bring improved modal choice and range of destinations
- Contribute to reduced use of private cars, thus addressing issues including road congestion, air quality and carbon emissions
- Be employed in circumstances from cities to small towns and rural environments.

Case study:

Cornwall's devolution deal

Integration of public transport across the county is one of the prime beneficiaries of Cornwall's devolution agreement. The deal, agreed with central Government in 2015, gives the county greater ability to control its transport services and is worth £126 million.

Improvements underway include:

- Better integration of bus and rail services, with the main rail network becoming a series of hubs for onward travel by bus
- Development of contactless multimodal ticketing across rail, bus and ferry services
- A third more rail services stopping at key stations
- A smartphone journey planner giving details of journey options, timetables and other travel information
- A £7.4 million investment in new buses by operator, First.

Interchanges can both help tackle the transport impacts of development and act as hubs round which development can take place, reducing local transport and environmental impacts of new housing, for example. The efficacy of interchanges should be reflected in the planning policy guidance that accompanies the NPPF. Sections on preparing local plans, transport assessment and transport evidence base should both offer specific guidance on interchanges and their potential in delivering more sustainable development.

National Policy Statement (NPS)

The strategic importance of major interchanges needs to be reflected in relevant the NPS. The NPS on National Networks should be amended to include passenger transport interchanges. The existing NPS on National Networks already includes rail freight interchanges because of their strategic importance. This should be expanded to cover strategic passenger interchanges to:

- Maximise the effective use of existing transport infrastructure particularly on busy travel corridors around large urban areas
- Facilitate increased transport choice for the travelling public including more door to door journeys involving more than one mode of transport.

National Infrastructure Commission (NIC)

A comprehensive assessment of appropriate locations for major interchanges is need. The NIC should be charged with delivering such research, identifying locations where interchange between rail, coach, bus and private transport will deliver the largest time savings to passengers and make sustainable journeys more attractive. This should consider both existing travel patterns, environmental, social and economic policy objectives, and concepts such as MaaS.

NIC's study into future passenger interchanges needs should have the following focus:

- Identifying locations for potential new interchanges between road and rail where the strategic networks coincide
- Assessing the location and modal provision of existing interchanges with a view to targeted investment to improve performance
- Interrogating how technological change can facilitate improved door to door journeys and the interchange opportunities and needs this creates
- Setting out how road and rail interchanges can be included as part of future National Infrastructure Assessments.

Case study:

Greater Anglia franchise - integration working group

The East Anglia franchise was awarded to Abellio in 2016. Improved modal integration was identified as one of seven overarching priorities for the franchise along with objectives such as local regeneration and investment in and around stations.

To help meet this objective, a transport integration forum was established in 2017. This brings together the train operator with local bus companies, adjoining franchise holders and local authorities to discuss integration of timetables across modes.

Greater Anglia has also appointed an Integrated Transport Manager. The role covers station cycle parking, improved connections between trains and buses, joint ticketing, improved information and signage, and marketing and promotion.

Funding and support

Bus and Coach Investment Strategy

The strategic role of coach services is potentially comparable to that of the rail network, connecting large settlements and busy routes where there is insufficient rail provision. Yet coaches are rarely viewed in this way and receive none of the national profile and support of other modes. This is a huge missed opportunity which Government should rectify at the earliest opportunity by developing a multi-year bus and coach investment strategy to sit alongside the RIS programme for roads and the High Level Output Specification to rail. For interchanges, the strategy should guide infrastructure investment to:

- Support the development of new interchanges (national, regional and local)
- Road layout initiatives to address severance and improve journey times and reliability
- Tackle unattractive and unsafe bus stops on trunk roads.

These objectives should be shared with HE and the RIS process where appropriate (see below).

Multi agency working

Integrated transport requires more joint working at national level. Following research from the NIC, as called for above, a joint working group involving the Ministry of Housing, Communities and Local Government, DfT, HE, Network Rail and local and regional bodies where appropriate should be established with the aim of bringing more interchanges to fruition. The group should also identify where better interchanges can better support Government objectives, such as those emerging from the industrial strategy.

In concert with more joint working, there is a strong case for establishing a joint DfT, Department for Housing, Communities and Local Government fund to support the delivery of national priority interchanges and to fund regional assessment of interchange opportunities. In the first instance funding should

be of a single tranche with the potential to establish a rolling programme if successful (see regional opportunities, below). The establishment of a coach and bus investment strategy is also long overdue and would provide additional support for establishment and improving interchanges.

Road Investment Strategy (RIS)

Through the RIS, HE has a responsibility to improve the operation SRN for all road users. This is taking the form of an Accessibility Strategy¹² and £250 million designated fund for Cycling, Safety and Integration. Of this, £45 million is specifically for trials and pilots that support integration. This approach is beginning to stimulate broadened thinking within HE. It is important that momentum and financial support is maintained into the second iteration of the RIS.

Transport integration and competition policy

The perception of a clash between public transport and integration and competition law needs to be addressed by government. While recognising the need to ensure value for passengers, the Competition and Markets Authority's 2016 inquiry into bus and rail services in the north of England failed to recognise that the two modes are complementary. The interpretation of competition law should be clarified to ensure complementary bus and rail services are recognised as being part of a single public transport offer and are not penalised as anti-competitive or duplicative.

Devolution

Many of the best examples of existing interchanges can be found in former Passenger Transport Executive areas. Key reasons for this are the opportunities to integrate bus, train and other transport and planning that devolution allowed. The creation of Combined Authorities and Sub-National Transport Bodies (SNTB) offers the opportunity to significantly expand both the integration of transport planning and deliver the interchange facilities to enable its wider adoption.

As part of their strategic planning, new devolved bodies should carry out a review of opportunities develop interchanges combining rail, bus, and coach services. The focus of such reviews should be four-fold:

- Updating existing interchange facilities
- Examining opportunities for new interchanges to support existing development, travel patterns and trip generators
- Creating new interchanges as part of new commercial and residential development
- Piloting new types of interchange, such as rural transport hubs and travel corridor based networks of interchanges

Guidance to the rail industry

Rail franchising

Under the DfT's franchise guide, all franchises should increase the long-term value of the railway by means including supporting modal integration. In reality, such integration is often patchy.

Future rail franchise agreements must be more proactive in promoting integration. This should include:

- Establishment of transport integration forums, bringing together the train and bus operators, local authorities and other partners including major trip generators such as hospitals
- The establishment and refreshment of station travel plans to oversee cycle parking, improved connections with buses, joint ticketing and promotion.

DfT guidance on interchanges at rail stations

The DfT's guidance on interchanges at rail stations is currently overly focused on the physical aspects of interchange and needs to be broadened. Less tangible factors also need to be considered in the planning and operation of interchanges. For example:

- Is the interchange the right one for the intended market? Can people travelling to or from a given destination make an interchange at the station that is likely to be most convenient? For example, despite being less than eightmiles from St Neots station in Cambridgeshire, the growing new town of Cambourne has no regular bus service to the station

Case study:

Competition law and interchanges

Joining up bus and train services makes them easier to use and more attractive for passengers. However, the Competition and Markets Authority (CMA) has on occasion considered whether such arrangements can be anti-competitive.

In 2016, the CMA examined some bus and rail services in northern England, focusing on areas where both services were run by a single operator. The CMA investigation contended passengers' best interests are served by trains and buses competing for passengers' patronage.

In practice, the CMA inquiry discovered little which could be considered anti-competitive. Rail and bus operations generally serve separate markets. Rail journeys tend to be longer distance than bus trips, something reflected in numbers of stops and average speeds. The main area of competition in local transport is arguably not between bus and train, but public transport and private cars. By choosing to examine the case, the CMA suggested a lack of understanding of this point within the regulatory system which needs to be addressed.

- Do buses run at the times when they are needed by interchange passengers? For example, are people using off peak tickets having the time they can spend in their destination curtailed by the absence of buses connecting with trains as part of their return journey? Is weekend travel hampered by a lack of Saturday or Sunday services?
- What provision is made for delays? Are there standby and mitigation arrangements for when a train or bus is running significantly late?

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The Foundation for Integrated Transport was formed in 2014 to make transport better for people and the environment. We envision a world with a human right to get around without reliance on cars, where people can travel with minimum impact on others and the environment, where barriers to transport justice are removed, and where trains and buses are integrated, and safe and attractive routes are provided for walking and cycling. We fund projects that will help to make this vision a reality.

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Campaign for Better Transport's vision is a country where communities have affordable transport that improves quality of life and protects the environment. Achieving our vision requires substantial changes to UK transport policy which we aim to achieve by providing well-researched, practical solutions that gain support from both decision-makers and the public.

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