# THE UK PUBLIC TRANSPORT INDUSTRY AND

# PROVISION OF MULTI-MODAL TRAVELLER INFORMATION

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## 1.  INTRODUCTION

In the last five years transport policy in the UK has seen significant developments with progression from a Green Paper (seeking views on Government thinking) in 1996 (DOT, 1996) to a White Paper (setting out Government policy) in 1998 (the first for some twenty years) (DETR, 1998). Policy objectives are now to achieve an integrated and sustainable transport system across the country. The role of public transport is considered key to such objectives.  The White Paper sets out aspirations for significantly raising the quality of services, and increasing investment, to encourage travellers to transfer from car to bus and rail, and thus to reduce congestion and pollution from excessive use of motor vehicles. Provision for the necessary measures and funding were established in the Transport Act 2000, various policy guidance notes on both transport and spatial planning (including the Guidance on Full Local Transport Plans (DETR, 2000a)) and in the ten year £180bn investment plan 'Transport 2010' (DETR, 2000b).

This paper offers a review of the UK public transport industry and information systems developments. It provides a thorough account of the UK situation and in this regard is deliberately UK specific.  The UK has gone further than any other European country in transferring its public transport services into private management operating under market forces (Netherlands Ministry of Transport, 2000). However, addressing market needs forms

an essential component of success for public transport in all countries, even those where, as in parts of the European Union for example, public authority direction remains strong. So the authors believe that the key issues and lessons conveyed within the paper will in many instances be of relevance and value in addressing public transport information issues in other countries.

Improvements to public transport operations alone will not necessarily persuade people to change mode. Intending travellers need to be informed of what is available. Traditionally, public transport companies issued information on times and fares of their services, primarily through timetables and fares tables; these were generally complemented with marketing initiatives, including special offers. Provision of this core information remains fundamental at least as a foundation to gaining – and keeping – travellers. However, simply providing the information will not of itself suffice to persuade habitual car users that they should consider public transport as an alternative: in many cases they will not even think of accessing information sources to see what options exist. To attract their interest, it is essential that the extent and scope of information provision should be substantially widened so that they become aware of the opportunity: an approach identified in the White Paper as a priority for short term action.

Traveller information serves a number of purposes (Le Squeren, 1991) (Anderson, 1993) but notably it has two important functions to perform. It can minimise the inconvenience of using public transport by making it easier to plan and execute a journey. In many instances a public transport journey involves a number of journey stages and the use of different modes or services. Information can assist in diminishing the sense that such a journey is disjointed and inconvenient and render it more comparable with the seamless experience of a journey by car. Information can also be used as a means to promote public transport as a viable alternative, at least for some journeys, to the car. To do so travellers need

to be confronted with a comparison of travel alternatives' details for journeys they undertake. This requires, ultimately, the provision of integrated information services that are truly multi-modal including information on public transport alternatives alongside comparable information for use of the car.

The increase in the capabilities and use of telecommunications technology in recent years has been dramatic. The emergence of the Internet as a mainstream communications medium has opened up a multitude of data and information exchange opportunities. For example, the recent auctioning off of five network licences for third-generation mobile phones in the UK, which raised a total of £22.5billion for the Government, offers a stark illustration of the scale of the telecommunications industry and the anticipated growth in information exchange. Such developments present substantial opportunities to deliver more effective traveller information systems with the aim in particular of encouraging greater use of public transport. The public transport industry in the UK, with the support and encouragement of Government, is seizing such opportunities. Various suitable systems are being developed, with a number already in use. Such systems are addressing the integration of information across public transport operators and public transport modes. The Government's ten year spending plan for transport 'Transport 2010' has signalled a continuation and extension of such developments with a wish to see systems that not only address integration of information within public transport but between public transport and highway (car) information.

However, progress is not straightforward. The re-organisation of public transport administration (through deregulation and privatisation) in the Transport Act 1985 and Railways Act 1993 created a complex industry structure, with competing operators having varying aims, responsibilities and relationships. Service provision is now mostly in the hands of a few major groups, who work together through industry associations, but the public

transport industry can still appear complex. Extra complexity has been added by the restructuring of local authorities over the last fifteen years, the changed objectives of the Highways Agency (an Executive Agency of the Department of the Environment, Transport and the Regions (DETR) responsible for the management of motorway and trunk roads) and the creation of new regional bodies in England and devolved administrations in Scotland and Wales. Those involved in assessing the prospect of multi-modal information systems that combine highway-related information with public transport information therefore need to acquire a greater understanding of organisational, operational, functional and regulatory issues across modes if their recommendations are to be widely acceptable to the main industry stakeholders.

This paper provides an outline of the current form of the public transport industry (with a focus on bus and rail services) looking at the complex responsibilities and relationships which this entails. The authors then proceed to address the main national initiatives for integrated information provision. Finally they set out issues facing decision makers and providers in the light of public needs and consumer understanding. The authors conclude by setting current progress in context and looking forward to potential longer term opportunities for multi-modal information provision.

The paper is based on research into traveller information systems and the provision of integrated multi-modal information services carried out for the Highways Agency by Southampton University's Transportation Research Group. Material within the paper stems from widespread consultation with stakeholders in public transport, including operators, public authorities and end-users. Extensive use has also been made of organisations' web resources to assist in the compilation of factual material, together with reference to some current industry journals.

## 2.  THE UK PUBLIC TRANSPORT INDUSTRY

Effective development of public transport information systems requires involvement of the many organisations who form part of the UK public transport industry.  Most of these have a direct or indirect interest in information systems either in terms of systems to manage service operations or systems to inform customers.  The following paragraphs look in turn at the recent history, present constitution and administrative regimes for the bus and rail industries in Great Britain (Northern Ireland has a significantly different structure), and the public authorities and other bodies who play an important role.  Changes set out in the Transport Act 2000 are referred to as appropriate.

### 2.1      Bus Services

For bus services, the Transport Act 1985 established a structure outside London which had two main features: removal of regulatory controls over routes, timetables and fares (deregulation) and sale of publicly owned companies into private ownership, in small units (privatisation).  Initially competition was widespread, and often fierce, and passenger levels continued to fall strongly rather than increase, as had been intended (see Figure 1).  However, over time the level of direct competition fell, and operating companies merged into a few major groups.  These groups also dominate provision of services in London under the tendering system run by Transport for London (formerly London Transport).  Since the mid 1990s operators have increasingly co-operated with local authorities, especially through Quality Partnerships (discussed later).

The bus operating groups have expanded into other public transport areas, most notably national rail and light rail franchises.  Some have developed interests overseas, while some groups based in mainland Europe have moved into British public transport management.  This grouping has considerable implications, especially because of the groups'

(i) multi-modal interests and (ii) scale of business, encouraging rather wider assessment of opportunities. However, they remain driven by the need to demonstrate returns on investment. The national trade association for the UK bus, coach, light rail and metro operators is the Confederation of Passenger Transport UK (CPT). The CPT acts as the voice of the local passenger transport industry, and forms an important consultative body on legislative, regulatory and public affairs matters.

Privatisation of bus and local transit companies is becoming more widespread across the world. However, the British system contrasts with that in other European union countries, where regional and local public transport companies remain primarily responsible for routes, fares and information, and city or district networks are franchised by them to operators on long-term contracts. In both mainland Europe and North America, large city public transport undertakings are often owned by the city council.

## 2.2 Rail Services

The present structure of the railway industry was created through the Railways Act 1993, with modifications introduced within the Transport Act 2000. The 1993 Act created a new administrative regime, directed by the Office of the Rail Regulator (with responsibilities including consumer protection and promotion of passengers' interests) and the Office of Passenger Rail Franchising (OPRAF); the latter has now been subsumed within the new Strategic Rail Authority. The assets and activities of the publicly owned British Rail were split up between about one hundred infrastructure, operating, engineering and management companies, and these were sold into private ownership. Passenger rail services were grouped into 25 franchises, let by OPRAF for periods from 7 to 15 years (depending on the extent to which they included significant investment). For further details concerning the privatisation

process, including economic impacts and a view on the restructured railway see White (1998), OECD (1998) and Welsby and Nichols (1999).

The passenger rail industry currently has the following main component parts:

- *Railtrack* owns and runs the British national railway infrastructure, under terms set by its licence as network manager. Its income is derived mostly from payments for use of its track by operating companies (primarily for passenger services), and it is responsible for maintaining the network and developing it.

- The 25 *Train Operating Companies* (TOCs) provide passenger train services under franchise. They receive an annual grant from OPRAF, set by the terms of their franchise agreement, usually declining over the period of the franchise. TOCs pay Railtrack for use of the infrastructure (track access) and also hire their trains from the ROSCOs (see below). All TOCs are associated with transport groups having other interests, mostly the national passenger transport groups built up through merger of bus companies.

- The three major *Rolling Stock Companies* (ROSCOs), all associated with major banks, provide passenger rolling stock to the TOCs and other operators under lease agreements.

In April 1994 the TOCs set up the Association of Train Operating Companies (ATOC) to form the trade association of the passenger rail industry. ATOC's main role is to represent the TOCs when they wish; provide membership services; and co-ordinate joint activities: especially national ticketing and fares schemes and the national rail telephone enquiry service (NRES – see later).

Elsewhere in western Europe, the railway infrastructure is usually owned and managed by a state agency, strongly funded by government (usually established on a very similar basis to state highway and waterway agencies); this offers a stronger focus for government direction of national common activities, including a cohesive railway

information system. In contrast, railways in both North America and New Zealand are private companies owning their own infrastructure.

In Great Britain the Strategic Rail Authority (SRA) was formed in July 1999, in 'shadow' form, following the Transport White Paper's proposals to establish it to provide a focus for strategic planning. It was intended that the SRA would have powers to influence the behaviour of key industry players, especially through encouraging investment. Formal establishment of the SRA, and its powers and duties took place through the Transport Act 2000. The SRA's responsibilities include the functions of OPRAF, covering the franchising of passenger train services, with emphasis on protecting passengers' interests, fresh investment in the railway and quality of service. Currently the SRA is engaged in replacing these franchises, with the aim of introducing longer franchisees to gain commitments to major new investment which will increase capacity and improve the overall service to the customer. In the seven metropolitan areas Passenger Transport Authorities (PTAs) specify the minimum level of passenger rail service, administer subsidy and are co-signatories to the relevant franchise agreements. Local transport authorities (LTAs) outside the main conurbations have limited powers to provide support and funding for railway passenger services.

Figure 2 shows the improving fortunes of the passenger rail industry whose future growth is limited by capacity constraints on the network. Substantial investment in improvements to rail infrastructure and capacity is promised as part of the 10 year spending plan for transport.

Despite their generally common ownership, bus and rail companies still appear to have widely differing cultures. In part this reflects their different backgrounds and also their widely different clienteles – the lower socio-economic strata for bus, the higher for rail, with the average rail fare being many times that of the average bus fare. Government also continues to treat them differently: their administration remains under different bodies, and

even different directorates within the DETR. The Transport Act 2000 does nothing to remove these differences: two separate Parts set out new and still separate administrative regimes. These differences continue to influence the approach to systems development taken by bus and rail companies, and by the Association of Train Operating Companies (ATOC) and the Confederation of Passenger Transport (CPT). This cultural divide between rail and bus management has a long history, being evident in the 1930s; during the 1950s and 1960s it prevented the intended co-ordination under the British Transport Commission being achieved to any useful extent (Hibbs, 2000).

## 2.3 Public Authorities

Since bus services outside Greater London are provided on primarily commercial principles, and rail services are also operated commercially within the overall franchise agreement, these services do not necessarily meet the wider environmental, economic and social needs of the community as a whole, and powers exist for local authorities to support bus and rail services in various ways. The powers and duties differ for the major conurbations outside London which have Passenger Transport Authorities (PTAs) and for other local authorities with transport responsibilities (Local Transport Authorities - LTAs) - County Councils in England and non-Metropolitan Unitary Authorities in England, Wales and Scotland.

The PTAs' policies are implemented by their professional management teams, the Passenger Transport Executives (PTEs). They organise the provision of subsidised bus services to fill gaps in commercial services, administer concessionary fare schemes and reach agreement on the provision of local rail services, and invest in infrastructure, especially interchanges; effectively they provide the services and facilities which the market does not provide in large conurbations. Their duties also include provision of information, ticketing

and passenger facilities. They are required to develop a public transport strategy for the conurbation as a basis for this.

LTAs have broadly similar responsibilities for public transport to the PTAs, including contracting for bus services to fill gaps in commercial services, administration of concessionary fares schemes, provision of infrastructure including interchanges, and provision of passenger information. Rail services are supported by some non-Metropolitan authorities (they do not have the same powers as PTAs). LTAs also coordinate the provision of schools and social services transport. Most of them cover significant rural areas.

The Transport Act 1985 empowered PTAs and LTAs to provide contract services only to complement commercial services. They are not, therefore, able to provide comprehensive network support. Matters have been improved by the (usually informal) Quality Partnership arrangements, which allow bus companies and PTAs / LTAs to work together within a common purpose (DETR, 1999). Most often this involves the bus company providing new buses on key routes and undertaking to maintain service quality, while the local authority provides infrastructure; sometimes it covers joint support of enhanced information. There remain doubts about how far these can achieve significant results, and so the Transport Act 2000 has introduced powers to (i) put Quality Partnerships on a more formal basis and (ii) bring in Quality Contracts where LAs can establish that lack of co-operation by bus companies is preventing achievement of the objectives set out in their Local Transport Plan (see below).

Until 1999, PTAs / LTAs obtained funding for transport expenditure from Government through the submission of an annual Transport Policies and Programmes (TPP) document, against which Government allocated them grants and approved borrowing authority. Now they must (under a duty set out in the Transport Act 2000) submit a Local Transport Plan (LTP), setting out a comprehensive review of issues and a five year transport

strategy for their area, covering public transport and roads, and including provision of facilities.  Provisions in the Transport Act 2000 place a duty on PTAs / LTAs to ensure provision of appropriate bus information for users and potential users: either in partnership with operators or by themselves with powers to recover costs from operators.

In western Europe local authorities generally have wide powers over a range of activities and high levels of funding to support this. In France for example the various levels in the hierarchy (regions, departments, municipalities) often work closely together over transport plans and projects, their arrangements underpinned by formal contracts with the national government over funding and by constitutional support (Harman, 1995).

The consumer interests of rail passengers in Great Britain are looked after by the national Rail Passengers' Council (RPC) and its eight constituent regional Rail Passengers' Committees.  In and around London, the London Transport Users Committee (LTUC) represents the interests of rail users and other public transport travellers.  These bodies meet in public and their members represent a wide cross-section of rail users.  The SRA is now responsible for the RPC under the provisions of the Transport Act 2000.  There is no statutory public consumer representation for bus passengers, other than local authorities, the LTUC in London and the (voluntary) National Federation of Bus Users.


## 3.  HIGHWAY INFORMATION SYSTEMS

The emphasis in this paper is on developments in public transport information provision. However, this should not detract from parallel activities that continue in the development of highway information systems. Indeed, in looking to a future integration of highway and public transport information systems, both fields of development are of importance. Therefore, prior to addressing developments in public transport information systems two major UK initiatives in highway information systems developments are summarised.

In March 2001 the Highways Agency awarded a ten-year public/private partnership contract for its £160M national Traffic Control Centre' (TCC) project. This will enhance its ability to provide better information to drivers and co-ordinate traffic flows over the whole of England's core road network, based on  real time information on traffic conditions throughout this network, including alternative routes. The TCC Company will provide a traffic control centre, network monitoring and a driver information system, as well as strategic traffic management and information on the performance on the network. Additional monitoring will come from the installation of more CCTV cameras, a network of road sensors and traffic reports from information providers. TCC will make information available via a computerised 'Travel Information Highway' (TIH).

The TIH is the system which provides the primary means for the TCC to communicate with other operators and service providers. TIH is being developed by the Highways Agency as a data interchange system for travel data from a range of sources (Hobbs et al, 1999).  The TIH is a network which resides on the Internet and provides a common interface between data users or Value Added Service Providers (VASPS) and owners of travel data. In effect it enables heterogeneous systems to communicate and exchange data. The TIH seeks to provide a marketplace for exchange of travel data. It will: operate across jurisdictional boundaries; respect data ownership; and support existing driver information services as well as seeking to stimulate a healthy commercial, competitive market in new traveller information services.

## 4.  PUBLIC TRANSPORT INFORMATION SYSTEMS

At present there is considerable activity associated with the development of (improved) public transport information systems.  Some developments are to assist the efficient and

effective operation of services; others are centred on the delivery of improved information to the customer. Because many organisations are involved in the passenger transport industry, the complexity of information flows has increased, with a multitude of different (sometimes competing) systems serving different tasks, dealing with different data formats from different sources. The difficulties in obtaining, managing and interpreting data from a dispersed number of sources is a much more formidable challenge than the telecommunications systems used as delivery mechanisms. The latter are not unique to transport and in many cases off-the-shelf IT solutions (such as those to set up a telephone call-centre operation) are already available.

A large number of bespoke information systems exist or are under development within the public transport industry. The following paragraphs concentrate on key national information systems initiatives as an indication of the progress being made in integrated multi operator / multi-modal information systems' development.

## 4.1 National Rail Enquiry Service

Public transport users are concerned with getting from their origin to their destination as conveniently as possible. Convenience includes the acquisition of travel information for planning a journey. To expect travellers to negotiate an industry of multiple players and associated information sources would amount to huge inconvenience to the customer. Early in the railway privatisation era, it was appreciated that passengers needed to have a cohesive, comprehensive and independent contact point for travel information and that it was in the joint interest of the Train Operating Companies (TOCs) to develop this, acting together through the aegis of the Association of Train Operating Companies (ATOC). This led to the development of the National Railway Enquiry Service (NRES) - a single point of contact telephone information service involving a network of call centres. NRES provides timetable

and fares information. Not without its problems initially, this has come to prove an accepted contact point for many rail travellers and has generated extra business for the TOCs. The service was launched in 1997. In 1999 it handled some 60 million calls compared to 52 million in 1998 and 37 million in 1997. During the four days of the September 2000 fuel crisis in the UK NRES handled one million calls a day (ATOC, 2000).

4.2 Rail Journey Information Service

Alongside NRES, the individual TOCs have been developing their own information systems at different rates. The Rail Journey Information Service (RJIS) project seeks to take forward all TOCs together, with a development that has a primary aim of improving 'the booking office experience' for staff and customers.

To provide a customer with a ticket for the cheapest fare between an origin and a destination station requires access to information on timetables, fares, routing, reservations and quotas. Prior to privatisation a ticket was valid on any reasonable route since all ticket sales revenue eventually made its way to British Rail. In the privatised industry different TOCs operate on different routes. Passengers do not purchase a ticket specific to a particular TOC, and therefore a mechanism is required to ensure that ticket sales revenue can be fairly distributed between the TOCs. This is based on the routing guide which also determines for which routes a particular ticket is valid. The RJIS project is concerned, in essence, with marshalling a diversity of separate and bespoke databases and systems required in a booking office such that they can be used in an integrated way via a single point of enquiry.

Development of RJIS is being carried out by Rail Settlement Plan Ltd (RSP), a wholly owned subsidiary of ATOC responsible for management of fares and ticket sales and distribution of ticket sales income to the TOCs. RJIS is a 10-year Private Finance Initiative type project (PFI is a mechanism whereby private interests provide capital funding in

exchange for a share in the operation which will provide repayment and a return over a set period, thus enabling the public authority to secure more investment from its own capital resources; now more often termed Public Private Partnership - PPP). The service is comprised of three technical elements:

- *The Data Factory* loads and checks data from a number of sources including: timetables (rail and other); product information (fares restrictions, selling rules etc.); routing guide data and rules; and station data. Collection and checking of this static data has been a major difficulty for the RJIS Project to overcome.

- *The Integration Application* is the facility for querying data in the data factory.

- *The Presentation Application* delivers a graphical user interface that is used to send queries to, and present results from, the Integration Application. Figure 3 shows a screenshot of the presentation application which illustrates the complexity of data and rules that must be managed by the back-office systems. Phase 1 of the RJIS Project saw the Presentation Application introduced into booking offices in July 2000.

The RJIS Data Factory has parallels with the Travel Information Highway (TIH). Both RJIS and TIH seek to provide a common interface between data providers/sources and data users or Value Added Service Providers (VASPs). This offers the potential for producing a truly multi-modal system. However, no consideration appears to have been given so far to extending RJIS to address integration between highway information and rail information systems' databases. Indeed at present RJIS will not even extend beyond the rail industry to include other public transport modes. The sheer size of the elements involved forms a major barrier: for example, the number of rail journeys made in the UK on a daily basis is equivalent to the total global airline traffic. Introducing extra information from other modes into RJIS would vastly increase database sizes and risk slowing down transactions.

## 4.3 PTI2000

In its Transport White Paper the UK Government pledged that there would be a national public transport information system by 2000. This was intended to integrate separate information systems across public transport modes and 'local' and 'national' stages of journeys by providing a service with a single point of access for all multi-modal public transport enquiries. The initial aim was to provide a telephone enquiry service emulating the approach of the National Rail Enquiry Service (NRES) but with an expectation that a public access Internet service would closely follow.

The PTI (Public Transport Information) 2000 Project was established as a means to achieve delivery of the envisaged service. There is no legislative obligation for information providers to co-operate in the initiative, although there has been clear guidance from Government to local authorities to consider the importance of information provision in their bids for capital funds. The project has been managed by a Director based at the Confederation of Passenger Transport (CPT). The following paragraphs briefly outline the main elements of the project. The service itself is now operational under the name of Traveline.

England has been divided into eight regions which, together with Transport for London, Wales and Scotland, are responsible for the delivery of Traveline. Each region has adopted differences in approach, particularly in terms of the number of call-centres being used to cover a region. The aim has been to provide, through one telephone call on a single national number, timetable information from timing point to timing point (selected stops on bus and light rail services) anywhere in Great Britain for bus, coach, tram, underground, train, ferry and metro. To do this, each call-centre should have a database that includes all the information applicable to either its area or the region, depending on the methodology chosen by the region; preferably with data from adjacent areas. In addition, each call-centre

should carry national information for coaches, trains and ferries. Each call-centre receives the calls from its area on the national number and answers timetable queries on journeys within, to and from the area. If journey information local to a remote destination is not available at the particular call-centre, the call may either be diverted or the enquiry clerk will obtain the information from that remote location.

It is estimated that 5% or less of the calls received by call-centres will be 'local-trunk-local'. Most enquiries will refer to local public transport journeys. So the branding as a national service is potentially misleading. The strength of Traveline is in its provision of access to all available information concerning local public transport services for the whole of Great Britain from a single telephone number.

Internet delivery of journey planning information should be considerably cheaper than servicing the same data and journey planning systems with call-centres. This technology can also deliver the facility to call-centre staff, reducing or eliminating the need for mid-call transfer to another call-centre. This requires links between different databases covering all stages of one journey to be made available through a single journey planner. To achieve this a project called JourneyWeb (Slevin, 1997) (Fingerle and Lock, 1999) was established and funded, before the launch of Traveline. At the heart of JourneyWeb is the development of a communications protocol, a collection of standard methods for exchanging electronic data between heterogeneous systems. For JourneyWeb to achieve complete national coverage, all the relevant authorities responsible for individual web-based journey planners need to join the JourneyWeb 'club' and adopt the agreed protocols. JourneyWeb is still under development, although working demonstrations have been successful. JourneyWeb is likely to be incorporated into Traveline as a back office support and the intention is also that public Internet access to national public transport information should be available in due course (http://www.traveline.org.uk).

There are about 50,000 settlements in Great Britain; names of localities sometimes referring to more than one community. Few enquiry staff will know all the localities with their area / region, let alone identifying all those in other regions enough to know to which call-centre to transfer the call for local service information at the destination. For this reason, a comprehensive national gazetteer was deemed essential for Traveline as well as for JourneyWeb. Development of this is well in hand.

Traveline also has to incorporate the principles of Part III of the Disability Discrimination Act 1995, that disabled people should not be discriminated against by service providers. Transport providers are not wholly exempt. From 1 October 1999 service providers have been required to make reasonable adjustments for disabled people, such as providing extra help or making changes to the way they provide their services. Traveline provides a textphone service with its own number to address this.

Clearly, adequate supply and management of funding has been crucial to the scale and quality of development needed for Traveline to achieve results. To manage central costs, the Confederation of Passenger Transport (CPT) set up INTRASOL – a wholly owned limited liability company. Most regions have been setting up joint venture companies and the future of INTRASOL is under discussion: it might become owned by the regional companies. The Train Operating Companies (TOCs) are already paying over £35M annually for the National Rail Enquiry Service (NRES) and some have been reluctant to contribute additionally to the costs of Traveline. However, the "Instructions and Guidance to the Franchising Director" (http://www.sra.gov.uk) requires the Strategic Rail Authority (SRA) to identify in any renegotiations: 'How effectively integrated transport measures both within the rail network and between rail and other transport modes can be achieved, including integrated public transport information systems.'; proposed investment in multi-modal information could form a component in the award of franchises.

The TransXChange project (http://www.transxchange.detr.gov.uk) aims to establish protocols and system for exchanging information on bus timetables between operators, Traffic Commissioners and local authorities by electronic means. TransXChange is a standard for data records, aimed at facilitating electronic bus registration and providing a data interchange format for use by Traveline.  Development of the protocol and systems clearly offers major potential for integrated public transport information within the context of the Transport Direct approach as described below.

### 4.4 Transport Direct

This project being led by the DETR signals the nature of future developments in the UK beyond Traveline.  It was first announced by the Deputy Prime Minister in December 1999 and is outlined in 'Transport 2010'.  Government considers that a major contribution to delivering a higher quality, better-used public transport system will come from innovative developments in the provision of integrated transport information and retailing. Working closely with transport operators, local authorities and technology providers, these developments will be brought together as 'Transport Direct', a project to provide a comprehensive national service for the travelling public. Transport Direct aims to help people to plan their journeys, and to compare routes and prices. By 2003 it is expected to include:

- real-time (actual rather than timetabled) train operating information

- real-time information on many local bus services

- multi-modal travel information on the Internet, covering journeys by road and public transport modes at a single point of contact

- booking of long-distance multi-modal journeys on the Internet

- development of Internet-based maps.

## 5. STAKEHOLDER ISSUES TO CONSIDER

Good progress is being made in developing both bespoke systems and the national multi modal systems and UK transport professionals remain keen to exploit the potential of traveller information to influence travel behaviour. However, for exploitation to be successful requires an understanding of more than simply the technological opportunities and policy frameworks. For information systems to be effective (as opposed to only technologically advanced (Adler and Blue, 1998)) there are a number of factors to consider including awareness of information availability and the inclination and opportunity to access information alongside the provision of information items that are relevant to travellers' requirements (Lyons, 2000). There is a need to consider the role of information in the context of an integrated transport system within which factors concerning the underlying quality of service also have a significant bearing on travel behaviour and mode choice. The following paragraphs reflect on consideration of such issues in consultation with stakeholders in traveller information. Specifically, consultation took the form of one-to-one interviews with information service providers followed by a Government-hosted workshop attended by key representatives of the public transport industry. In addition focus groups were held involving members of the travelling public.

### 5.1 The End-Users' Perspective

In spite of the increasing availability of information services it is unclear the extent to which travellers will make use of them particularly in reviewing their choice of mode which is a principal intention from a policy perspective. People undertaking journeys rarely look for information. A lot of journeys are undertaken regularly and people often use the same mode for particular trip purposes without reflecting on it. Only if they face a disruption (e.g. their

car not being available) do they consider an alternative. Even then they are more likely to decide on a main mode (e.g. train) without seeking in-depth information on alternatives or on other aspects of the journey.

When travelling by car people consider that they are in control of their journey. In fact they may not always have a good judgement of the cost and time involved, especially for travel outside their normal routes, but this seems not to be perceived. Motoring atlases and more local maps enable them to navigate journeys which they have not done before, although they may have difficulty finding the destination on unfamiliar local roads. In contrast public transport is seen as difficult, because information has to be sought from unfamiliar or uncertain sources: especially when a journey using more than one mode or link is involved. People tend to know that they have a local bus route but have difficulty in finding out and using bus routes at the other end of their journey. Often this dissuades them from using public transport throughout.

Information concerning travel interchanges is critical since fear over interchange forms a key barrier to travel by public transport. Good information on its own is not enough. The public transport system itself must be reliable, offered at a suitable cost, and able to maximise convenient through travel opportunities. However, the deregulated regime created since the mid 1980's has led to increased fragmentation of the system. For example, easy links between bus and train are often lacking at stations, and in some cases buses do not even serve stations: recasting local bus networks to overcome this would usually be expensive and disruptive. Interchanges themselves need to provide excellent facilities, including information, but at present often fail to do so.

Travellers need information en route as well as in advance of trips being made. For car trips on the highway this is not generally a major issue, as the driver is or feels in control. For public transport journeys travellers can feel less secure, not in control; especially for

those travelling by an unfamiliar route or for regular travellers whose journey is seriously disrupted. Travellers need thorough information en route, and especially at interchanges. In the case of disruptions, this needs to provide thorough, unambiguous guidance on how passengers can continue their journey.

Part of people's uncertainty (sometimes fear) over public transport reflects their lack of trust in much of the information available. Practical aspects influence this – especially when the trip is delayed and unpleasant and the facilities are poor. But the lack of trust also reflects the fragmented nature of the public transport industry, with competition between companies emphasised by different colour vehicles and separate advertising. London Transport (now Transport for London) does have a strong image as a reliable provider of information, perhaps because it is a traditional, publicly owned body managing an apparently single network. The National Rail Enquiry Service (NRES) has also built up a reputation as a sound single source for all rail information. Both bodies are able to offer impartial and comprehensive advice, which is perhaps the key to being trusted. Trustworthiness need not mean complete accuracy in information provision. Journey estimates provided to members of motoring organisations are rarely accurate in the face of unpredictable traffic conditions but members recognise the inherent uncertainties in the transport system and generally respect the limitations of the information provided.

Travellers are principally concerned with their own particular journey(s). Therefore, targeting information provision so far as possible is essential. This should include information on travel options: e.g. faster and more expensive against cheaper and slower. For longer distance journeys this is possible through a travel agent, but for the myriad of local journeys people make more regularly this becomes more difficult. Transport for London has moved from a London-wide bus map to localised maps and information supply, and this approach has also been followed by many other authorities and companies. However the user

has to be encouraged to pick up and use the information. In part this can be arranged through addressing the needs of particular groups in society. Meeting the needs of mobility handicapped people is required by the Disability Discrimination Act. Elderly people have different assumptions about information sources and for many the web is unavailable. Teenagers are developing their independence but most have no car, and they need to be informed and encouraged about using public transport.

Targeting people when they make major lifestyle changes (change jobs or residence, experience key family change) is also valuable, because it is then that they change regular journeys. Without appropriate information they may well assume continuation of the existing means of travel, especially use of the car. If the information is brought to their attention, this gives them the opportunity to reconsider their regular travel. Suppliers of public transport information need to target bodies which influence people at this stage: local authority offices, companies moving staff, etc.

Very often people do not know what they want. Major retailers make a point of trying to tell them through advertising (lifestyle marketing), aiming to provide a message about products that is clear and cohesive. In contrast, information about public transport comes from a variety of sources. Individual providers promote their own services clearly, but this rarely reduces the image of a difficult-to-use system overall. Public transport providers need to carry out effective market research on the needs for services and facilities before promoting them: too often this does not happen, so that intending travellers do not use the service or even find out about it. This market research might also focus on employers and services providers (commercial and public), to identify the opportunities for developing public transport to meet the needs of their employees and clients.

People must be made aware of information availability. Good promotion of key access points is valuable. Many, but not all, people have no problem in finding and using, for

example, the NRES telephone line. Placing key numbers in relevant directories may contribute to this awareness. Information access on the web is also valuable, as it offers a service which people can choose to use: though it should be recalled that not everyone has access to the web and that there are often questions over how up-to-date information is.

## 5.2 The providers' perspective

For organisations with a shared role in providing information on public transport (and with a potential future role in contributing to integrated public transport and highway information systems) the crucial factor in terms of ongoing progress remains their widely varied and sometimes conflicting objectives. Most public transport and related services are provided by commercial bodies, for whom the bottom line return on investment is the key objective for all actions: usually this means increased travel on rail or bus services. Public transport providers consider it important to market their services, but give priority to promotional activities which are known to generate business. Providing information, and investing in systems to provide it more thoroughly, often fails this test, because it is difficult to assess what the impact on business is; and sometimes there is no discernible financial impact. Passenger Transport Authorities (PTAs) and Local Transport Authorities (LTAs) are charged broadly with changing travel patterns to generate a better environment and more efficiency in their area. For them, modal shift to public transport is good if accompanied by less car traffic but not if it merely leads to increased total travel. Government has the wider objective of changing national travel behaviour to achieve more sustainable quality of life for everyone, including reduced pollution and more efficient use of resources, including all transport systems. Government sets public policy directions and regulations, and the Transport Act 2000 and revisions to guidance documents all aim to change the approach of both public and

private bodies to provision and promotion of transport services on all modes. The overall picture includes walking and cycling, and air travel.

No single organisation consolidates or disseminates information on trunk corridors across all modes/operators. These corridors are usually the subject of competition between main carriers, often supported by competing promotions. Given the importance of the trunk routes in longer distance travel by public transport, as an alternative to car use, there is a strong argument for co-ordinating information relating to such services. The same situation would apply locally between competing bus companies (and local rail) were it not for the co-ordinating role of local authorities. In the present regime, however, it is not in any one operator's interests to publicise others' services along with their own unless guaranteed matching provision by local competitors.

This emphasises the need for a co-ordinating agency for all public transport information: most probably public authorities, given the wider public purpose for disseminating such cohesive information and the local co-ordinating role they have played for many years. At the same time, the importance of an operator's own role in supplying data means that initiatives can only be taken forward in partnership. At a national level Traveline has succeeded in this approach, and its launch demonstrates the value that has been achieved by all stakeholders. Experience suggests that no commercial provider would be interested in taking on this role at present, given that much of the activity focuses on local travel information with little opportunity to build commercially viable services.

Most data for public transport information comes from transport operators. A lot is compiled or generated as part of their operational activities: indeed, it is important that the same data is used for both, to ensure that the passengers' information soundly reflects what is actually happening on services. To date most of the work of compiling these various data sets into a cohesive information system has been done by PTAs and LTAs, who need

consolidated data to provide a total picture in order to take decisions on where they should arrange provision of additional services, in line with their statutory duties; the same authorities have then used such data to provide comprehensive local timetables. However, it is important that control of the data sets should remain with the originating companies, who alone can ensure that it is accurate and up-to-date. This cannot be done with paper based information, suggesting that electronically-based supply and dissemination of information is far better able to meet the objectives of both soundness and comprehensiveness.

Rail and air operators hold (and exchange) their data mostly through IT based systems. Bus operators have had a greater tendency to provide data using paper based systems: they have been working towards IT based systems within Traveline. To present a sound and cohesive multi modal information service, it is essential that the many different systems are linked through a common access means. This could be a common Internet portal. The Highways Agency's Travel Information Highway (TIH) is based on such common access.

Common referencing for all nodes is also needed to ensure multi modal travel links between different services. The national public transport gazetteer now being completed could be linked into road based systems by adding grid references. Some aspects remain to be developed: especially a common naming basis for bus stops and the production of maps. The gazetteer offers the opportunity to form the basis for a fully personalised travel service across all modes.

The development of multi modal public transport information involves substantial investment: especially to bring together and disseminate the information. For airline and most rail passenger companies, spending money on information provision generates revenue and is thus worthwhile. But there are doubts over how far a much increased level of information provision extending to full multi-modal services would bring revenue gains to

local public transport companies, who in any case operate on a relatively low capital basis. Travellers are generally not willing to pay for information; especially where it relates to local travel for which fares are relatively low. Local public transport companies will nevertheless be obligated to invest in information provision with the introduction in the Transport Act 2000 of a duty on PTAs/LTAs to (i) require operators to provide such information or (ii) provide it themselves and recoup the costs through charging operators. Taking a longer term view, it also seems likely that, as transport information becomes more widely available and expected, no company will be able to continue operating a viable and competitive business without contributing to it.

Commercial dissemination of multi modal information may also come about through Value Added Service Providers (VASPs). However, to achieve the generally agreed goal of more efficient transport behaviour through better informed travellers, the added value exploitation of transport information must be unbiased, up-to-date and accurate at all times. Quality standards have to be established and controlled for all players.


## 6. CONCLUSIONS – HOW FAR AND HOW FAST?

Provision of high quality traveller information for public transport is undoubtedly crucial for the UK Government's transport policies, whose broad principles are widely shared. However, concerns over information provision are not new: they have existed among public transport professionals and users' groups for many years. The more laisser-faire approach of the 1980s, that led to the Transport Act 1985 and the Railways Act 1993, constrained further development: putting significant resources into this field was not seen as relevant to Government or the newly privatised operators. The issue of co-ordinated information has re-emerged in the 1990s, as short term commercialism has weakened. The current enthusiasm for using IT systems reflects both the massive growth in IT use and provision and also the

apparent ease of linking data sets without requiring debates over ownership of particular sets, investment in common systems or standards for such information.  These issues are perhaps at the heart of the current debate over integrated systems development both within and beyond public transport.

Integration of public transport within a clearly established national framework remains the norm in countries such as Germany and the Netherlands. In Great Britain the public transport industry is complex, especially following the privatisation of operating companies and changes in public authority roles over the last fifteen years.  This has brought fragmentation of responsibilities among transport operating groups and many other organisations with different roles, including operators' trade groups, public authorities and customer groups. The British public transport industry as a whole continues to face a monumental task to achieve effective management of its numerous existing data sources, rule bases and enquiry systems, with varying standards.  Attention has focussed on means of standardising data exchange interfaces to enable transfer of information between heterogeneous systems. Information brokers such as the Rail Journey Information Service (RJIS) and systems such as JourneyWeb should play an important part in reducing the complexity of information accessibility and improving consistency and reliability.

Despite a high level of activity within the industry in developing information systems, it may not be keeping pace with client expectations, because of the scale of datasets and networks involved, limitations in compatibility, and complexity of the work to develop a comprehensive system.  To the customer, what might appear to be (and what should be) a straightforward request for the cheapest journey from an origin to a destination is in fact a highly complex task to deal with for the back office systems. Yet, unless the industry can meet such requests easily, it remains questionable whether it will gain substantial numbers of

new clients or play its expected role in the Government's widely supported aims of significantly changing travel patterns.

Projects like RJIS and Traveline are perhaps the best examples of the industry's attempts to address the bigger picture of information provision across operators, modes or regions. Nevertheless much activity remains insular in its approach as operators or modes attempt to get their own houses in order. RJIS, ambitious though it is, is solely concerned with passenger rail information. Traveline is multi-modal and yet the service it is initially delivering provides only timetable information and integration of existing systems rather than developing automated systems. Operators are primarily concerned with their core business – and hence with information systems that provide effective support to their services - as this is essential to their remaining in existence.

Current policy guidance and various provisions of the Transport Act 2000 aim to improve the quality of mode-specific information provision. There is some focus on progression of multi-modal information within public transport but so far little if any detailed focus on full multi-modal information that integrates highway and traffic information with public transport information. The Transport Direct initiative aims to change this. However, at present it appears that the Government's policy aims for information systems developments exceed the motivation of private sector operators who are necessarily constrained by the need to maintain their profit margins. The industry is concerned with its own internal organisation of information, and there remain doubts over returns on the investment that is required for multi-modal systems. Progress can only be made through effective partnership between all providers, as Government itself has stressed. Good examples exist for partnership in transport provision, such as the Santa Monica Freeway Corridor Demonstration Project in California (Nuttall, 1997). However, public authorities are not always likely to co-operate willingly unless circumstances require them to, even in well-integrated countries such as the

Netherlands (Witbreuk, 2000). Government guidance on this, supported by adequate core funding, may prove essential to establish an effective national system.

Initial soundings concerning the prospect of integrated information involving highway and traffic information have drawn some reservations. The benefits to local bus operators of integrated information could be marginal given the limited use their services make of trunk roads which would be covered by highway information associated with the Highways Agency. For longer distance journeys by rail, in principle the Memoranda of Understanding which Railtrack and the SRA have with the Highways Agency should set a favourable environment for pursuing opportunities for integrated information systems. In practice capacity constraints on passenger rail, the relief of which may require very heavy investment (possibly forthcoming with increased expenditure identified in 'Transport 2010'), may dominate rail companies' concerns, to the extent that they may inhibit enthusiasm for information systems if these were to increase passenger numbers significantly. There is also recognition that multi-modal information might on occasion serve to disadvantage public transport rather than benefit it; for example, real-time information on station car parking availability might reinforce the knowledge that car parks are usually full to capacity and thereby set rail travel in a bad light.

However, the prospects for integrated information systems in the longer term remain potentially favourable. Indeed, they open up valuable opportunities for real integration of transport systems through the Highways Agency and public transport partners working together. The public transport industry has not yet afforded itself the opportunity of fully considering the issues, barriers and opportunities to integration beyond its own systems. In particular, the SRA conditions for new franchises might incorporate principles and standards on passenger information linked to car traveller systems.

Other systems which might be taken forward include the national gazetteer for public transport data integration, which might be adopted by highway information systems and journey planners to give a common origin and destination referencing system with which to deliver comparable information across modes. The similarities between the Rail Journey Information Service (RJIS) and the Travel Information Highway (TIH) also suggest that communication and information exchange between public transport and private transport databases might be achievable through well directed cooperation between these two systems to provide combined accessibility to information and data. All this holds the promise of attracting a number of Value Added Service Providers (VASPs), which might then take a lead in delivering multi-modal information services to end users founded on different business cases than would be possible for either the Highways Agency, transport operators or public authorities individually.

As indicated in the Introduction, this paper is specifically focussed on the UK scene, and the approaches outlined above reflect needs, issues and opportunities in the specific structures of UK transport provision and markets, especially for public transport. However, provision of effective traveller information forms an essential component of success in transport development throughout the world, regardless of their regulatory and management structures.

Whatever the processes are that open up this very considerable potential for producing truly multi-modal information that will serve the interests of all travellers, it needs to be taken forward in partnership, so that all parties work closely together. Ultimately this partnership can only be enabled and led by Government.

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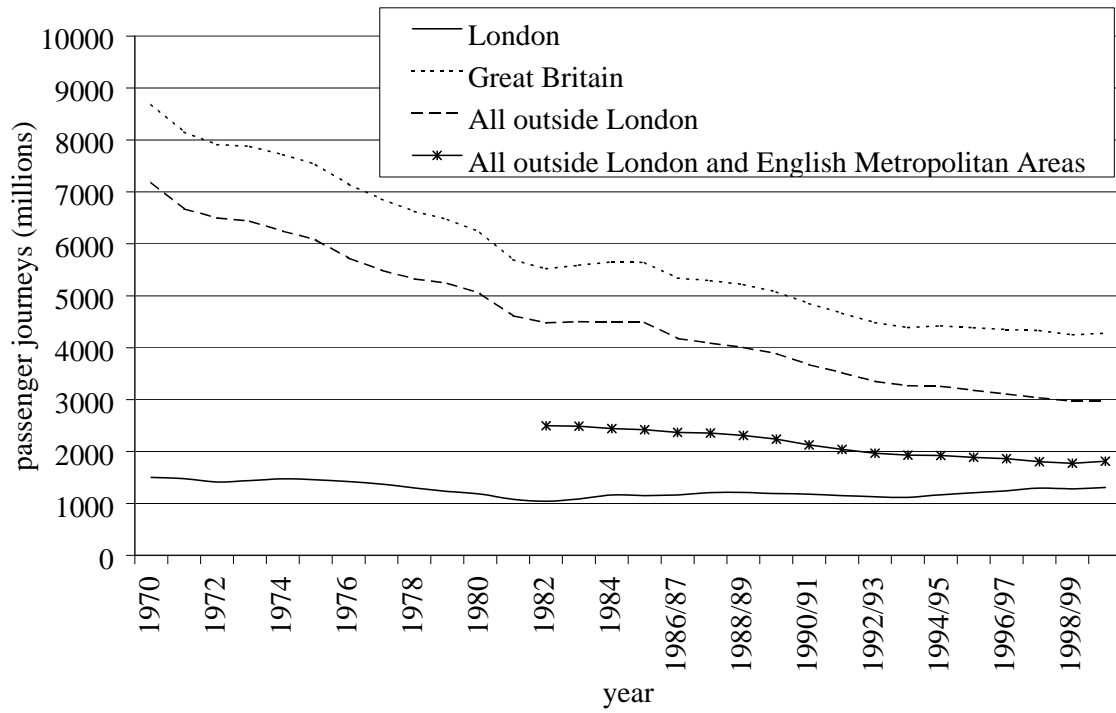
Figure 1. Local Bus and Traditional Tram Services' Passenger Journeys By Area (DETR, 2000c)
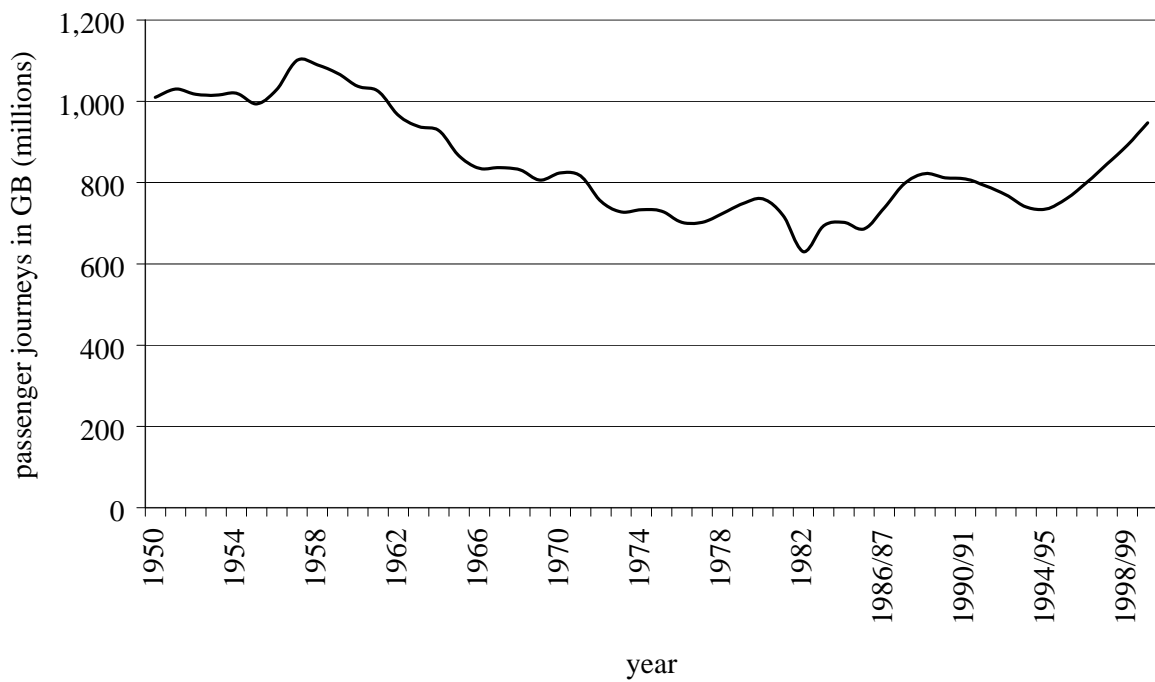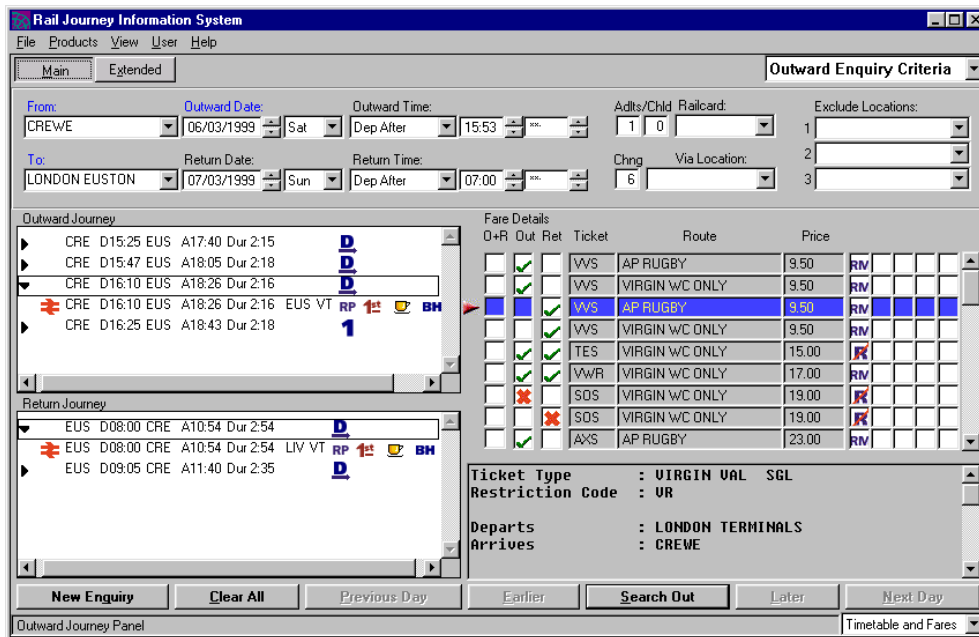


Figure 2. Passenger Journeys on the National Rail Network (DETR, 2000c)

Figure 3. RJIS Presentation Application