

6 INTERCONNECTIVITY OF RAIL AT LEEDS RAILWAY STATION

6.1 THE KEY ISSUES ADDRESSED BY THIS CASE STUDY

The rail reforms of the past 15 years have, throughout Europe, dismantled barriers to new entry into local, regional and national rail markets in order to promote competition and a more vibrant rail industry. Implementation of the reforms has taken different forms in different Member States, but in most cases there are now more – sometimes considerably more – actors involved in the planning, development and operation of rail services than ever before. This process, sometimes referred to as the disintegration of the industry, presents both opportunities, in terms of competitiveness and innovation, and challenges, particularly in relation to the maintenance of an interconnected network of rail services for passengers.

The key issues addressed by this case study are concerned with how this more competitive, more complex multiple-actor railway regime deals with interconnectivity, particularly in relation to ensuring that the short legs of journeys are well-connected with the longer legs (in keeping with the overall theme of INTERCONNECT). Thus, we focus on local access and, to a lesser extent, egress journeys that link to and form part of long distance rail journeys.

The area is interesting for a number of reasons. Firstly, access and egress can be significant, potentially amounting to close to half of the overall journey time for a long distance rail journey, and investment to cut access and egress time might be much more advantageous – in cost-benefit terms – than investment to shave a few minutes from the long leg. Furthermore, analysing this issue allows us to look at the influence of ownership, organisational and planning regimes on this question of interconnectivity. In Britain, a number of former bus operators have entered the privatised rail market and there are some attempts to bring public transport planning within integrated authorities – Transport For London (TfL) and the emerging Integrated Transport Authorities (ITAs). But there is a question as to whether these organisations think and operate in an integrated way, or whether they revert to modal safe havens.

6.2 GENERAL DESCRIPTION OF THE CASE STUDY

6.2.1 Overview

The much-increased presence of multiple agents involved in service-delivery puts strains on the required inter-actions and contractual relations between agents that pose a range of potential problems for interconnected, integrated travel opportunities on rail. For example, if the agents are not required to co-ordinate their actions then the outcome may be a somewhat disconnected service for the passenger, where as if they are required to undertake such co-ordination the costs, e.g. transactions costs, may be significant and potentially outweigh the potential benefits of the reforms in the first place.

Strategic planning processes vary across different countries and have, in some countries, varied over the period since reforms commenced. Particular inconsistencies have arisen regarding regulatory practices and the role of central and local government. Investment mechanisms over the period of the reforms have come in for particular criticism. For instance, investment in the early years of the reforms in Britain, when rail infrastructure was under the ownership of a purely private company (Railtrack PLC), was criticised for being overly short-sighted. There are real capacity problems – bottlenecks – at particular points on the rail network at particular times. In some cases this is damaging, or threatening to damage, rail's competitive position and its potential to provide interconnected travel opportunities.

Preservation of the network benefits associated with integrated ticketing, pricing and information provision has been of major concern amidst the rail reforms. Different approaches to securing these such benefits have been adopted in different places, and there is some evidence to show that passengers have been dissatisfied with these aspects of service delivery in recent years.

We analyse the issues by providing a brief review of key literature on the topic and elaborating a case study focusing on Leeds, drawing on data from the National Rail Passenger Survey and from a Station Travel Plan exercise.

Ortuzar and Willumsen (2001) highlight five key characteristics of the transport facility that impact upon the modal choice decision:

1. Time;
2. Cost;
3. Reliability;
4. Convenience; and
5. Comfort.

Whilst time and cost have tended to dominate research, perhaps because of their quantitative nature, several studies have actually found convenience to be the most important factor. Convenience has been to account for convenience within analysis and modelling via its generic incorporation in the mode specific constant or associating it with the interchange penalty. However, these are relatively blunt instruments, holding for an entire mode or for a wide range of journeys and circumstances, rather than representing the range of types of trip engaged in and the potential variation in level of convenience. There has, though, been some recent work attempting to differentiate between different types of interchange such as cross platform, changing platforms, etc. (Wardman and Shires, 2001).

It is highlighted by Brons et al (2009) that the propensity to travel by rail is a function of three principal factors:

1. the rail service offered;
2. the access to it;
3. the characteristics of the population served.

This case study focuses in particular on the second of these factors. In many parts of the rail network improving and expanding access services to the railway station can be a cost-effective substitute for improving and expanding the services provided on the rail network. Indeed, in his influential study into the UK transport system, Rod Eddington argued that, "in broad terms, the UK's transport networks provide the right connections, in the right places and that, consequently, central to our transport policy should be a focus on the performance of existing networks" (Eddington, 2006). The focus here is on enhancing the performance of existing networks by exploring the potential for increased interconnectivity and enhanced access to strategic rail nodes.

Wardman and Tyler (2000) suggest that the generalised cost of access to rail travel can be influenced by:

1. provision of new stations or improved levels of service at more accessible existing stations;
2. reductions in journey time and costs involved in accessing station by existing modes or through new links;
3. greater integration between modes, i.e. through improved car parking availability, improved cycle facilities, co-ordinated bus links and better information.

Brons et al (2009) identify a similar set of three principal means of improving access/egress to rail services:

1. wider geographical coverage of access services;
2. lower travel times to the railway station; and
3. better quality of service on travel to and from the station and at the interchange point between the modes used to get to/from the station and the rail mode.

Other factors identified include points of severance, such as the need to cross busy roads, use over-bridges or subways or otherwise convoluted routes in to or through the railway station.

Previous research to examine the significance of rail access and egress has employed principal component analysis and derived importance techniques to assess the relative importance of accessibility in determining the overall satisfaction with the rail journey, as well as regression analysis to explain the balance between characteristics of the service, the access to it and the population served in determining the propensity to use rail. It has been found that connections between rail and other public transport (bus/tram/metro) are the most important accessibility feature, followed by car park capacity and bicycle parking. Furthermore, access to the station is found to be more important for infrequent rail users, so access improvements might reasonably offer a sound means of increasing usage amongst this group.

Existing modal splits for access to rail stations vary considerably between different types of station with central, parkway, commuter and rural stations all displaying different trends. For the UK as a whole, estimates vary as follows

- Walk - 45%
- Car - 19-30%
- Local bus – 11-17%
- Underground - 11%

More detailed data analysis by Givoni and Rietveld (2010), using data for the Netherlands, finds that cycling, public transport and walking are the main modes used in the Netherlands to get to or from the railway station, together they account for about 85% of the trips at the home end. The specifics of their estimates of access mode shares are set out in Table 6-1 .

Table 6-1 Mode choice on the access journey to the home end station and the egress journey from the activity end station (%)

	Access at the home end station		Egress at the activity end station	
	Distance to station			
	< 3 km	> 3 km		
Bicycle	38.3	46.3	22.8	9.5
Bus/Tram/Metro	26.7	16.4	50.0	34.6
(Only) walking	20.1	27.0	4.6	47.2
Car (driver)	7.2	4.1	13.6	0.9
Car (passenger)	6.6	5.1	8.1	4.6
Taxi	0.2			0.9
Motorcycle	0.1			0.1
Train-taxi	0.1			0.0
Other	0.7			2.2
Total	100	98.9	99.1	100
Valid answers	1,203			1,196

(source: Givoni and Rietveld, forthcoming)

Note: based on a survey carried out between 26 and 30 September, 2005 (Monday to Friday).

In interpreting their results, Givoni and Rietveld caution that, given these modal shares, there is a risk that improving bus services to stations will most probably have a stronger effect on cycling as an access mode than on driving a car.

Although past work has placed values upon associated aspects such as access/egress and waiting time, they have not generally been considered in terms of the physical provision of specific facilities and means of access/egress. The provision of improved levels of service in terms of railway station

facilities and environment is a difficult concept to capture in terms of its impact upon the utility of a traveller's time. But there is an acknowledgement of the need for future research into these less time-orientated issues, e.g. by Wardman and Tyler (2000). Most studies do not consider egress effects, stating this as a future research need. Three further specific needs for further research are identified in the literature:

1. the role of car parks at railway stations (and their quality and pricing) in determining car use.
2. how bicycle parking facilities, guarded and unguarded, influence the use of bicycle prior to and/or following a rail journey.
3. the substitution between the supply of rail services and access services to rail stations, and potential consequences for the development of the rail network.

When it is the aim to increase rail use investments should actually be directed towards areas where the level of service (in terms of the rail service and the access to it) is already relatively high and to the most populated areas or urban centres, and this leads us to our choice of Leeds as a case study to investigate. Leeds has excellent north-south road and rail links in the form of the M1, A1 and the East Coast Main Line (ECML), and east-west links in the form of the M62 (Liverpool-Hull), M621 and Trans-Pennine rail services (Liverpool-Manchester-Leeds-York-Newcastle). Furthermore, Leeds Bradford International Airport (LBIA), the principal airport in Yorkshire and the Humber, has direct daily flights to the key international hubs of London Gatwick and Amsterdam, and Manchester International airport is a little over an hour away by rail or road.

6.2.2 Train Services at Leeds Railway Station

Leeds is connected to the rest of Britain by an extensive network of rail routes and services, including the flagship East Coast Main Line (ECML) route. ECML is electrified and runs from London to Scotland via York, with a spur to Leeds. Journey times from Leeds to London are between 120-150 minutes, and Leeds to London is the biggest long distance rail market in the UK - passenger numbers having risen by 30% over the past decade.

In common with virtually all passenger rail services in Britain, all services operating through Leeds are franchised. The services of five franchisees serve Leeds station:

- East Coast;
- Cross-Country;
- Trans-Pennine;
- Northern; and
- East Midlands Trains.

The **East Coast** franchise operates services along the length of the ECML. In November 2009 the East Coast franchise reverted from private ownership, with National Express, back in to public ownership – the only franchise to experience this.

The **Cross Country** franchise provides a cross-country service, providing direct access to the following stations: Glasgow, Edinburgh, Newcastle, Durham, Darlington, York, Wakefield, Sheffield, Derby, Tamworth, Birmingham, Cheltenham Spa, Gloucester, Bristol, Taunton, Exeter, Plymouth, Oxford, Reading, Southampton and Bournemouth. In November 2007, the Cross Country rail franchise was awarded to Arriva Trains operating the service under a new CrossCountry Trains brand and livery. The franchise runs from November 2007 to March 2016.

The **Transpennine** franchise provides east-west services and services to the north-east of England. Major locations served by the Transpennine Express from Leeds include Newcastle, Middlesbrough, Scarborough, York, Hull, Huddersfield, Manchester, Manchester airport, Warrington and Liverpool. It is operated by FirstGroup plc and Keolis. New 'Desiro' class trains, with more powerful acceleration for tackling the gradients over the Pennines, replaced the entire existing fleet in 2006. In June 2008 Network Rail announced a planned £25m upgrade to the Leeds-Manchester line to improve journey times.

Local services are operated by **Northern** (a joint partnership between Serco Group plc and Ned Railways). In fact, Leeds station is at the heart of the local Metrotrain network, which radiates from Leeds across West Yorkshire covering 67 stations (14 of which are in the Leeds local authority boundary). The local rail network has a Metrocard zonal tariff, as well as standard ticketing, plus a variety of concessions and passes. Peak travel into Leeds has more than doubled over the last ten years.

6.2.3 Stakeholders Involved

Leeds station is operated by Network Rail, Britain's national infrastructure manager. Network Rail is a not for dividend, company limited by guarantee (CLG), owned by members comprising industry stakeholder organisations (including government and representatives of the public). With 17 platforms, Leeds station is the biggest station in England outside of London. Furthermore, with over 900 trains per day and over 22m passengers entering and exiting the station in 2008/09, it is one of the four busiest stations in the UK outside of London (AEAT, 2009). There is a strong emphasis on commuting and business-related travel, with approximately 18,000 arrivals at Leeds station in the morning peak - in total, rail journeys account for 15% of all morning peak travel into Leeds City Centre (Leeds City Council, 2009).

Leeds also has relatively well-developed networks of bus services, the majority of which are operated by either First Bus or Arriva (organisations who are, as noted above, also involved in two of the four rail franchises serving Leeds). There are approximately 90m bus trips a year in Leeds).

Leeds was an early-adopter of guided bus routes which allow buses to travel along specially converted central reservations to help reduce and avoid traffic congestion. There are 3.5km of bus guideway in Leeds. There are 21.4km of bus lane across Leeds with a further 5.6km expected to be completed during 2009. Leeds was also innovative when it introduced a High Occupancy Vehicle (HOV) or '2 Plus' Lane in 1999 on the A647 Stanningley Road and Stanningley By-Pass. It is available to buses, coaches, other vehicles carrying 2 or more people, and to motorcycles and pedal cycles. It is estimated that the scheme has resulted in a reduction in inbound journey times for buses and other high occupancy vehicles of 4 minutes in the morning peak, and an increase in bus patronage and average car occupancy. The East Leeds Link Road, which opened in February 2009, has peak period tidal HOV lanes, and a further HOV lane is being built along Roundhay Road, replacing the existing bus lane and improving the traffic flow into the centre of Leeds from the north east of the city.

Since 2006 there has been a Leeds Free City Bus (see further details below) and in August 2007 First Bus launched a showcase initiative known as FTR buses. Billed as being 'the Future of Travel', this showcase route has a priority traffic signal system to maintain punctuality, a dedicated lane to avoid congestion, raised kerbs at stops for easy access, and on board Customer Service Hosts on hand to assist and sell tickets.

Leeds city bus station is situated adjacent to the city centre (on New York Street) and the city's National Express coach terminal adjoins it. This has 10 stands and a waiting area. The passenger concourse area for the coach terminal is fully integrated with the bus station. National Express Coaches have around 100 departures a day from Leeds, serving more than 1,200 destinations.

Leeds City council is the city's local authority, responsible for the local road network and for transport more generally. West Yorkshire Integrated Transport Authority, via its executive arm Metro (West Yorkshire Passenger Transport Executive), has specific responsibilities for public transport in Leeds and the four neighbouring local authorities which, together, comprise West Yorkshire. There has also been a regional development agency – Yorkshire Forward – which has taken on a regional transport role, though the future of this organisation is currently in doubt. Most recently, a Leeds City Region initiative has been established, comprising partners from 11 local authorities: Barnsley, Bradford, Calderdale, Craven, Harrogate, Kirklees, Leeds, North Yorkshire County Council, Selby, Wakefield and York.

The Department for Transport, at the national level, also influences transport in Leeds, mainly as a function of three of its roles:

- The provider of funding for local transport, via the Local Transport Plan process;
 - the rail franchising authority, with responsibility for shaping and letting most of the passenger rail franchises;
 - National policy-setting, with overall responsibility for determining national transport strategy.
- Hence, the key stakeholders involved would comprise the rail infrastructure manager, the various train operating companies, planning and funding agencies (including government and regulatory agencies) and passenger groups.

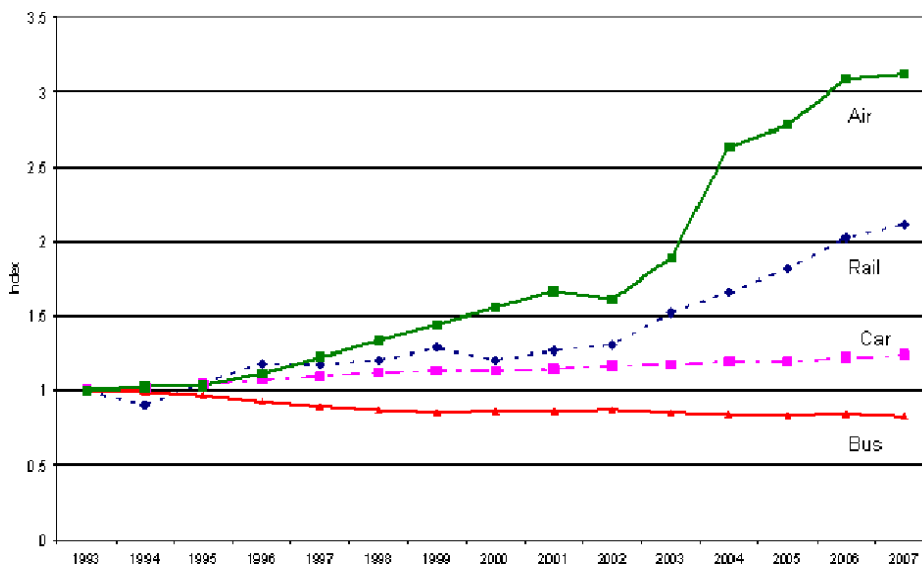
6.2.4 Current Access Modes

Around 34% of households in Leeds lack access to a car (2001 Census), thus public transport, walking and cycling play a vital role in meeting travel needs in the city. To give an impression of travel patterns, modal split figures for people crossing the Leeds central cordon inbound during the morning peak are as follows:

- car (57.0%);
- bus (23.2%);
- train (15.1%);
- walk (3.1%);
- cycle (0.9%);
- Powered Two Wheelers (PTW) (0.5%).

(source: Leeds City Council, 2009)

Furthermore, Figure 6-1 shows a longer term trend in travel patterns.



(source: MetroFacts, DfT, LBIA, Road Traffic Statistics for Local Authorities (DfT))

Figure 6-1 Relative comparison of modes

Note: Information presented for journeys in West Yorkshire rather than City Region as data on bus and rail patronage not available at the City Region level. Data has been re-based to 1993 levels, and presented as an index.

As part of the Station Travel Plan Pilot Programme, surveys were undertaken to estimate access modes shares for a range of participating stations, including Leeds. Table 6-2 here is taken from that survey. It can be seen that the share of walk journeys is extremely high, probably influenced by high numbers of commuters and shoppers returning to the station to make their journey home after a day in

the city centre. Figures are presented further below which examine access mode shares specifically for rail journeys of more than 100km and these are very different.

Table 6-2 Access mode shares for stations participating in the Station Travel Plan Pilot Programme

Station	Walk	Cycle	Car- drive alone	Park & ride	Carshare	Drop off	Train	Taxi	Motorbike	Bus/ Coach / Tram	Other	Total other	Total car	Total
Accrington	56.8%	0.0%	9.5%	0.0%	0.0%	13.7%	1.1%	4.2%	0.0%	14.7%	0.0%	4.2%	23.2%	100.0%
Ashford	21.3%	2.8%	15.3%	0.0%	8.3%	18.5%	19.0%	7.4%	0.0%	6.9%	0.5%	16.2%	33.8%	100.0%
BristolParkway	14.2%	2.4%	19.0%	0.0%	3.8%	20.9%	16.6%	10.0%	0.0%	12.8%	0.5%	14.2%	39.8%	100.0%
ChandlersFord	48.8%	9.8%	14.6%	0.0%	3.7%	18.3%	0.0%	0.0%	0.0%	3.7%	1.2%	4.9%	32.9%	100.0%
Chapelton	48.7%	0.0%	1.3%	0.0%	0.0%	18.4%	0.0%	0.0%	0.0%	31.6%	0.0%	0.0%	19.7%	100.0%
Colchester	35.0%	2.1%	9.6%	0.7%	3.1%	17.4%	7.3%	4.5%	0.5%	19.7%	0.2%	8.9%	27.0%	100.0%
Darlington	20.1%	0.0%	7.4%	0.0%	4.4%	31.9%	11.8%	10.9%	0.0%	13.1%	0.4%	15.7%	39.3%	100.0%
Derby	21.1%	2.5%	9.0%	0.0%	2.0%	25.1%	11.1%	14.1%	0.0%	15.1%	0.0%	16.1%	34.2%	100.0%
Digbyand Sowton	78.8%	2.5%	15.0%	0.0%	2.5%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	3.8%	15.0%	100.0%
Durham	20.3%	0.4%	12.0%	0.7%	0.4%	40.2%	1.1%	9.1%	0.0%	15.6%	0.4%	10.5%	52.2%	100.0%
Eastleigh	66.3%	4.1%	2.5%	0.8%	1.6%	9.1%	9.1%	0.4%	0.0%	5.8%	0.4%	3.3%	11.5%	100.0%
Hatfield	26.1%	2.7%	13.3%	0.0%	3.4%	15.5%	0.4%	8.0%	0.0%	30.3%	0.4%	11.7%	28.8%	100.0%
HazelGrove43.6%		0.6%	34.3%	0.0%	1.7%	14.5%	1.2%	2.3%	0.0%	1.7%	0.0%	4.1%	48.8%	100.0%
Hebden Bridge	59.3%	0.0%	8.3%	0.0%	0.0%	11.7%	9.7%	2.1%	0.0%	9.0%	0.0%	2.1%	20.0%	100.0%
KingsNorton	51.8%	0.0%	11.8%	0.0%	10.0%	7.6%	0.6%	0.0%	0.0%	18.2%	0.0%	10.0%	19.4%	100.0%
Leamington Spa	48.9%	0.9%	4.9%	0.0%	0.4%	20.0%	2.7%	7.1%	0.0%	14.7%	0.4%	8.0%	24.9%	100.0%
Leighton Buzzard	44.2%	2.8%	13.7%	0.0%	1.2%	26.9%	0.0%	8.4%	0.8%	1.6%	0.4%	10.8%	40.6%	100.0%
Loughborough	31.8%	3.4%	4.9%	0.0%	1.5%	20.6%	2.6%	5.6%	0.0%	29.2%	0.4%	7.5%	25.5%	100.0%
Middlesbrough	34.8%	2.4%	2.8%	0.0%	0.0%	16.8%	15.2%	12.0%	0.0%	15.6%	0.4%	12.4%	19.6%	100.0%
Miton Keynes Ctl	20.1%	3.3%	8.0%	0.0%	2.2%	26.1%	0.5%	14.0%	0.0%	25.8%	0.0%	16.2%	34.1%	100.0%
Romsey	48.4%	11.5%	8.3%	0.0%	1.3%	16.6%	8.3%	1.3%	0.0%	3.2%	1.3%	3.8%	24.8%	100.0%
Shotton	47.3%	1.8%	3.6%	0.0%	5.5%	18.2%	9.1%	1.8%	0.0%	12.7%	0.0%	7.3%	21.8%	100.0%
Southend Central	75.4%	2.3%	1.6%	0.0%	0.8%	3.9%	5.9%	2.3%	0.0%	7.4%	0.4%	3.5%	5.5%	100.0%
SouthendVictoria	72.9%	0.9%	0.9%	0.0%	0.9%	10.3%	2.2%	2.9%	0.0%	8.7%	0.2%	4.0%	11.2%	100.0%
StAlbansCity	35.2%	3.4%	16.4%	0.0%	4.7%	16.1%	8.4%	4.4%	0.0%	11.1%	0.3%	9.4%	32.6%	100.0%
StAlbansAbbey	57.1%	8.3%	1.2%	1.2%	1.2%	14.3%	2.4%	6.0%	0.0%	8.3%	0.0%	8.3%	15.5%	100.0%
StDenys	73.8%	5.0%	2.5%	0.0%	0.0%	5.0%	10.0%	1.3%	0.0%	2.5%	0.0%	1.3%	7.5%	100.0%
Stoke-on-Trent	14.7%	0.8%	7.6%	0.0%	0.4%	29.0%	8.0%	13.9%	0.0%	25.6%	0.0%	14.3%	36.6%	100.0%
Thornaby	42.5%	4.0%	6.3%	0.6%	1.7%	19.5%	7.5%	8.0%	0.0%	9.8%	0.0%	10.3%	25.9%	100.0%
Truro	37.7%	0.9%	6.3%	0.0%	7.6%	22.0%	3.1%	5.4%	0.0%	16.6%	0.4%	13.5%	28.3%	100.0%
Leeds ²	82.9%	0.7%	1.0%	0.0%	0.0%	1.2%	0.1%	1.4%	0.0%	12.7%	0.0%	1.4%	2.2%	100.0%
Median	44.2	2.4%	8.0%	0.0%	1.6%	17.4%	3.1%	4.5%	0.0%	12.7%	0.2%			
Min %	14.2	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Max %	82.9	11.5%	34.3%	1.2%	10.0%	40.2%	19.0%	14.1%	0.8%	31.6%	1.3%			
Mean %	44.5	2.7%	8.8%	0.1%	2.4%	17.1%	5.6%	5.5%	0.0%	13.0%	0.3%			

1 car then dedicated park and ride bus

²Data for Leeds station is taken from an origin and destination surveys conducted on behalf of Leeds City Council in October 2008.

6.3 SOLUTIONS ALREADY IN PLACE

6.3.1 Overview

Leeds City Station has undergone some substantial changes over the past decade aimed at enhancing its capacity and accessibility. The principal enhancements were packaged together as the Leeds First project, with then a follow-on initiative to establish an adjoining Bus Interchange. In addition to this, recognition of the expansion of the city centre and the growing distances being traversed between the station, the main bus and coach station, the hospitals and the Universities, led to the introduction of the Leeds Free City Bus. Further details of these three developments are given below.

6.3.2 Refurbishment Programme

A major station refurbishment programme – branded 'Leeds First' - was initiated in 1999 and completed in 2002. £ 245m was invested in a range of enhancements, comprising:

- the construction of additional approach tracks at the western end of the station to separate trains travelling to or from different destinations and prevent them from having to cross each other's routes;
- the construction of new platforms on the south side and reopening of the then-disused parcels depot to passengers on the north side, expanding the station from 12 to 17 platforms;
- The replacement of the majority of the track, points and signals;
- the replacement of the 1967 metal canopy with a new glass roof, considerably increasing the amount of daylight on the platforms;
- Provision of a new footbridge to replace the previous underpass;
- Provision of a new multi-storey car park;

Opening of a new station entrance, refurbishing the North Concourse and expanding retail facilities.

Problems addressed

The station's capacity was, by the 1990s, exceeded on a daily basis, with regular delays to train arrivals and departures – particularly at the west end of the station. For passengers, the 1967 (when the station was last refurbished) design was deemed inadequate. For example, entry to the station was via only one entrance point, and this was seen as no longer being adequate for the volume of passengers and status of the station, whilst transfer between platforms was via an underpass or goods lift, again not seen as appropriate or sufficiently accessible.

Performance against main toolkit criteria

Cost

At almost £ 250M, the refurbishment had major cost implications. It has not been possible, however, to disaggregate this figure to estimate the cost of particular items in the programme.

Technical feasibility

The programme of enhancements was technically challenging, and involved much disruption during the construction phase of work. A temporary station just south of the main station was constructed for the duration of the programme, in an attempt to alleviate disruption and enable quicker progress than would otherwise have been possible.

Financial and organisational/legal feasibility

Whilst the cost was significant, the work was undertaken at a point in time when the infrastructure manager – Railtrack PLC – was in an expansionist phase and so keen to invest and be seen to be

doing so. However, toward the end of the project Railtrack went into administration, leading to some uncertainty about the completion of the programme of work.

Acceptance by users

The disruption for passengers during the construction phase posed some acceptance difficulties, but once complete the enhancements have almost universally been welcomed by station users, evidenced in the continued rapid growth in usage in the years since 2002. Table 6-3 illustrates the substantial expansion in station usage over the period, with numbers entering and exiting the station almost doubling between 2002/03 and 2008/09.

Table 6-3 Leeds station usage

Period	Rank	Entries (full)	Entries (reduced)	Entries (season)	Total Entries	Exits (full)	Exits (reduced)	Exits (season)	Total Exits	Total Entries and Exits	Interchanges
2002/03	18				5.655				5.631	11.286	
2004/05	15	2.660	3.900	0.805	7.365	2.729	3.834	0.805	7.369	14.734	1.528
2005/06	13	2.877	4.161	0.976	8.014	2.928	4.141	0.976	8.045	16.060	1.599
2006/07*	13	3.171	4.254	1.246	8.671	3.238	4.203	1.246	8.686	17.357	2.836
2007/08	14	3.238	4.369	1.433	9.040	3.359	4.290	1.433	9.082	18.122	1.655
2008/09	11	3.112	4.834	3.265	11.211	3.112	4.834	3.265	11.211	22.422	1.920

Note: Numbers are expressed in millions of people.

Impact on users' door to door travel time

Opening two new points of access to the station for passengers will have reduced access and egress times for passengers and installation of lifts and escalators will have reduced walk times within the station. Furthermore, the enhancements to alleviate train congestion at the west end of the station has reduced train delays significantly. However, no formal quantification of these improvements has been estimated, and improvements as a proportion of overall journey times for long distance journeys are likely to be relatively small.

Initial impact on comfort or convenience

Comfort and convenience will have been improved via the availability of modernised waiting and concourse areas, with the new retail and refreshments outlets. Comfort and convenience will also have been positively impacted via the provision of lifts and escalators. However, the expanded station does now mean that passengers are faced with some rather long walks from one side of the station to the other.

Personal security

Personal security will have been positively impacted via the enhanced lighting throughout the station and the more visible presence of the British Transport Police with their office on the northern concourse.

Region's prestige

Having a large, modern and well-designed station does make an impact on the regional prestige of Leeds, firmly establishing its place at the heart of the Yorkshire rail network and presenting a modern face to the external visitor.

Access for people with physical disabilities

The station upgrade included several aspects designed to enhance access for disabled people, and Leeds is now designated as a fully accessible station. In particular, provision of passenger lifts has represented a step change in accessibility for disabled rail-users, though there is still the difficulty of traversing the gap between platform and train for the purposes of boarding and alighting.

Transferability of findings

All of the aspects of the 'Leeds First' programme are, in principle, transferable to other busy city stations.

6.3.3 New Bus Interchange

A bus interchange adjoining the train station, with five stands, was opened in 2004. This facility is currently used by over 7,000 passengers per day.

Problems addressed

The city's principal bus station (see above) is situated at the east end of the city centre, approximately half a mile from the train station. As a consequence, many local bus services do not use the station and instead use a range of bus stops and smaller bus points throughout different parts of the city centre. Hence, direct bus access to and from the station was seen as extremely poor.

Performance against main toolkit criteria

Technical feasibility

Provision of the new Bus Interchange involved re-routing bus services along New Station Street, part of which is a bridge that required strengthening work so that it could accommodate the vehicle weight associated with the re-routed bus services.

Organisational/legal feasibility

Construction of the Interchange, which also involved displacement of the station's major taxi rank, and re-routing of the bus services involved close liaison between Network Rail, Leeds City Council, the two bus operators, the Passenger Transport Executive and the licensed taxi operators.

Impact on users' door to door travel time

For those people able to use the bus services that use the Interchange – essentially, those using the east-west aligned bus services, amounting to some 7000 passengers per day, journey times will have been positively impacted as they are able to alight and board their bus immediately outside the station. No quantification of this time-saving has been estimated though, and for those not using these bus services journey times are unchanged.

Initial impact on comfort or convenience

Comfort and convenience will also have been positively impacted for those users affected, as they now have an easy and very short walk into the station, with no need to cross any roads or negotiate any obstacles.

Users' safety

Some concerns were initially expressed about users safety, given the substantially increased traffic volumes along New Station Street associated with the Bus Interchange. This was particularly the case given that the taxi rank was, as part of the construction of the Bus Interchange, displaced such that those wishing to take a taxi would need to cross New Station Street. Consequently, a dedicated pedestrian crossing was installed.

Access for people on low incomes

Provision of the Interchange will have had some positive impact for people on lower incomes as the easier access by bus is likely to have shifted some relatively expensive journeys by taxi to relatively inexpensive journeys by bus, particularly given that the buses serving the Interchange also serve some of the lower income areas of the city.

Transferability of findings

In some respects, the Interchange responds to a particular problem faced in Leeds, and it is only a partial response as many local bus services still do not serve the facility. However, the principal of sighting bus interchange points adjacent to the train station is transferable.

6.3.4 Leeds Free City Bus

The Leeds Free City Bus began operating in January 2006 connecting the rail station with main areas of the city centre including Leeds General Infirmary, Leeds Dental Hospital, Leeds Metropolitan University, the main shopping area and the bus and coach stations. It operates at five minute intervals between the hours of 06:30 and 19:00 from Monday to Saturday. The service has, on average, carried approximately 1.5 million passengers a year since it was introduced.

Problems addressed

Leeds station is situated at the southern side of the city centre, whilst a number of visitor and employment sites are located up the hill to the north of the city centre and the main bus station is located to the east. In addition, the road configuration immediately outside the station is busy and relatively complicated, involving multiple pedestrian crossings. This makes for some relatively long, relatively off-putting walks for those wishing to use the train station.

Performance against main toolkit criteria

Acceptance by users and other aspects of political acceptability

It is reported by Metro, the sponsor of the service, that:

“Passengers have told us that thanks to the frequent, reliable, free links provided by the free bus services, they are choosing to use public transport rather than their cars, which means the services are helping to reduce congestion in our towns and cities.” (Metro, 2009).

Furthermore, in 2009 the then Minister for Transport, Lord Adonis, named Leeds free city bus among “models of good practice for emulation nationwide”.

Transferability of findings

The free city centre bus concept does seem to be highly transferable, and has been transferred as evidenced by its introduction in several towns and cities. For example, Metro – the sponsor of the Leeds service, have subsequently introduced similar services in three of its other regional centres – Bradford, Huddersfield and Wakefield.

6.4 SOLUTIONS ALREADY ENVISAGED

6.4.1 Overview

As at time of writing, a number of further initiatives are at various stages of planning and preparation. The Leeds Station Travel Plan has been piloted and is now being rolled out, incorporating a variety of sub-solutions. There are also three major projects, two of which are at an advanced stage of planning with funding bids submitted (New Southern Entrance and new Generation Transport (trolley bus system), and a third in an earlier stage of planning. There are also plans for the roll out of a Yorkshire-wide smart-card ticketing initiative. Further details of these are given below.

6.4.2 Station Travel Plan

This actually incorporates a number of sub-solutions, some of which are implemented and some of which are still being developed for implementation. Sub-solutions include:

- Legible Leeds project - Free walkit maps now available at the station with accompanying publicity campaign;
- Potential to expand the project to bus stops being explored;
- Travel Information point - installed by National Express in the station;
- Agreement by Network rail to improve signage on the station;
- Installation by Network Rail of additional cycle racks on platform;
- Cycle Point - due to open in 2010 (see below);
- Approval being sought by Network Rail for an electric car recharging bay;
- Agreement by Network Rail to car Share Parking Bays in the new car park/deck scheme.

6.4.3 Leeds Rail Station – New Southern Entrance

The Department for Transport has recently granted £ 10M for a new southern entrance to Leeds rail station.

Problems addressed

The new entrance will significantly improve pedestrian journey times for station users who currently live or work in, or travel to the regeneration areas in the south of the city centre such as the Holbeck Village development.

6.4.4 Yorcard

This is a smart card-based method of ticketing which enables many transactions to be automated and speeded up. It is based around a plastic card in which a computer chip is embedded. This chip holds ticketing data varying from basic concessionary passes through to period tickets. Eventually Yorcard will also hold credits that enable passengers to pay for tickets from pre-paid accounts. The Yorcard has been piloted in South Yorkshire and the results of this are currently being evaluated. A joint venture between South Yorkshire Passenger Transport Executive and Metro (West Yorkshire Passenger Transport Executive).

6.4.5 Cyclepoint

A new two-storey cycle facility, located opposite the New Station Street exit, is scheduled to open in September 2010. Currently opened on a trial basis, it is designed to encourage visitors and commuters into Leeds to continue their journey from the station by bicycle. Based on the Dutch cyclepoint concept, it will be the first cycle retail and rental facility of its kind in the UK.

6.4.6 Trolley Bus City Centre Loop

Following up on the City's rejected plans to construct a light rail system, plans were announced in 2009 to develop a trolley bus system, referred to as 'New Generation Transport (NGT)'. As was the case with the planned light rail system, the plan involves three lines routed into the city centre, with park and ride sites on the edge of the city and a city centre loop connecting the three lines in the centre. This city centre loop would pass very close to Leeds train station, so would hence provide a significant enhancement to public transport access to the station.

6.4.7 Leeds City Region TramTrain

Plans are at an early stage of development for a possible TramTrain network for the Leeds city region. This would be achieved through the conversion of existing heavy rail routes and construction of some on-street alignments. The Leeds-Harrogate-York line, running from Leeds station to the north, has been indicated as the route for initial conversion to TramTrain. This would include a new link to Leeds Bradford airport and on-street running in Leeds and York city centres.

6.5 PROBLEMS STILL TO BE SOLVED

Most of the attention within Leeds on transport, amongst the local authority, the Integrated Transport Authority and the Leeds City Region partners, focuses on Leeds as a commuter and shopping destination. This is not so much the focus of INTERCONNECT, as it is anticipated that commuting and shopping trips to Leeds will generally not be of a long distance character. Whilst commuting and shopping are certainly important, it seems that focusing all attention on these aspects risks neglecting the needs and concerns surrounding long distance trips, which potentially has significant consequences for Leeds, in particular remembering that Leeds to London is said to be the largest long distance rail market in the UK.

In the 2009 ‘Transport For Leeds’ consultation exercise (SDG, 2009), the greatest transport problem in Leeds was identified as being traffic congestion, followed by the cost of bus fares and late or cancelled buses.

Table 6-4 Reported transport problems in Leeds

Problem	% of all respondents reporting problem
Traffic congestion	56%
Late or cancelled buses	36%
Cost of bus fares	34%
Bus journey times	29%
Crowding on buses	27%
Frequency of buses	27%
Crowding on trains	26%
Cost of parking	24%
Traffic pollution	19%
Availability of parking	18%
Cost of rail fares	18%
Cyclist safety	17%
Quality of buses	16%
Late or cancelled trains	16%
Pedestrian safety	13%
Frequency of trains	11%
Personal safety on buses	10%
Quality of trains	9%
Accessibility of buses	6%
Personal safety on trains/at stations	5%
Accessibility of trains/stations	5%

Turning to consider long distance trips specifically, our analysis of National Travel Survey (NTS) data highlights some interesting findings. Table 6-5 shows figures at a regional level, probably the lowest level of disaggregation it makes sense to examine NTS data at for this purpose (given the number of long distance trips in the sample). Leeds is within the Yorkshire and the Humber region and, for our purposes here, we assume that it is the dominant station within the region.

Table 6-5 Access mode for long distance rail journeys in selected British regions

Region	Walk	Cycle	Private motor vehicle	Bus	Rail	Taxi /minicab	Sample size
Yorkshire and the Humber	12		49	12	4	23	215
London	10	1	3	8	66	12	1004
North West and Merseyside	8		45	11	11	25	204
South-East	11		52	12	15	8	496

Other than in London, it can be seen that car dominates, as one might expect. Together with taxi/minicab, private motor transport accounts for 60-72% of access trips outside of London. In London, the share of rail as an access mode is quite remarkable, much of it probably being accounted for by London Underground. Also remarkable about London is that private motor vehicle and taxi/minicab, again taken together, account for only 15% of access trips. For private car, the split between parking a car & receiving a lift would be interesting.

Walking is higher than might have been expected, suggesting living close to a railway station may be particularly important in choosing it as a main mode. Cycling is clearly not performing well, though maybe it is the least feasible of all access modes for long distance trips, as it presents most difficulties in relation to carrying luggage & for overnight stays. It also seems that bus, which we might hypothesize has the most potential to be a reasonable substitute for car / taxi/minicab, is largely failing to achieve that – both in London where bus services are widely recognised as being of a higher standard, and in the regions. There might also be an interesting issue for rail in the regions too, but this may be constrained by lack of opportunities?

Understanding the reasons why access to long distance rail by bus is persistently relatively low would be extremely interesting. It might also be very fruitful to explore the possible lessons that might be learned from London in relation to rail share, bearing in mind the usual caveat that London is generally different to everywhere else in the UK. In any event, there would seem to be ample opportunity to increase bus, rail and perhaps cycle interconnectivity with rail.

6.6 POTENTIAL SOLUTIONS

A wide range of transport improvements were requested as part of the 2009 ‘Transport For Leeds’ consultation exercise (SDG, 2009). Table 6-6 shows the range of possible solutions suggested. The most popular suggestions were:

- more reliable and frequent public transport;
- cheaper fares;
- reduced road congestion;
- reduced crowding on public transport; and
- more Park & Ride sites.

Table 6-6 'Other' transport improvements

Travel to Leeds by car	Travel to Leeds by bus	Travel to Leeds by train
<ul style="list-style-type: none"> • Segregated public transport • Improved connections/ more integrated • Transport • Tram system • More car parking at stations 	<ul style="list-style-type: none"> • Segregated public transport/bus lanes • Improved connections/more integrated transport • Tram system • Another service provider • Traffic restrictions • Improved bus driver behaviour • Road user charging • Later running bus services • Parking restrictions • Better facilities for cyclists • Free bus fares • Dedicated buses for students 	<ul style="list-style-type: none"> • Tram system • Road user charging • Later train services • Improved connections/ more integrated transport

Again, the dominant focus of many of these is on the commuting and shopping oriented trips, not necessarily the longer distance trips. Nevertheless, most of these would also have the impact of improving rail interconnectivity. Further specific solutions to enhance connections in and around Leeds train station would be to substantially improve pedestrian access and to increase the proportion of bus services that stop adjacent to the station, either via their use of the bus Interchange or via additional adjoining bus points.

6.7 SUMMARY OF CONCLUSIONS

Leeds railway station is one of Britain's most significant railway stations and the past decade has seen a number of enhancements designed to, or having the effect of, enhancing interconnectivity via the improvement of access and egress. This has coincided with substantial growth in passenger numbers using the station; almost 100% growth in numbers of passengers entering and exiting the station between 2002/03 and 2008/09. Whilst it must be the case that the enhancements have contributed to the growth in passenger numbers, there is a lack of clear-cut evidence on how and by how much the enhancements have impacted on passenger usage.

A number of further enhancements are at various stages of planning and implementation, some major – such as the trolley bus proposals – and some more minor – such as the Cycle Point. The collection of access improvements taking place under the auspices of the Station Travel Plan is of particular interest. It is hoped that some greater attention will be placed upon assessing the impact of these as they come into effect.

It is interesting to note that the dominating focus of attention from the Leeds-based stakeholders is upon Leeds as a local and regional centre for commuting and shopping, and so most of the proposals currently on the table seek to enhance connections in this context. In contrast, there is very little attention given to Leeds as an origin or destination of long distance trips – an aspect made all the more surprising by the fact that Leeds to London is widely acknowledged as being the largest long distance travel market in the UK.

Whilst there have been improvements, access and egress problems continue to exist, with many bus services not properly linking up with the station and pedestrian facilities in the immediate vicinity of the station continuing to be particular issues.

In considering the scope for major modal shift, however, it is interesting to reflect on findings from the recent Independent Transport Commission study of long distance travel in Britain (ITC, 2010). They state that:

“The dominance of the car for journeys over 50 miles reflects the geographic dispersal of many households. It reflects too the limited extent and accessibility of the railway network. Cars have the additional advantages of being able to reach remote rural and coastal destinations, carry children’s and sporting equipment, and provide mobility at destinations” (ITC, 2010).

The broader context for this research is whether or not competition promotes interconnectivity or detracts from it. One side of the argument would run that competition allows market operators to respond to consumer demand and preferences, and if interconnectivity is important – like we think it is – then those operators who offer this will do well over those which don’t. The counter-argument, however, would run that we know that market failure exists in network goods such as transport, and it is network benefits – such as interconnectivity – that markets fail to properly take account of; hence there is a need to allow, encourage or force market operators to co-operate with one another. In the end, we come back to a question of whether, or perhaps how well, the market can deliver integrated transport. In practice, experience is mixed:

- Buses - little co-operation taking place in the market and many apparent failings;
- Rail – a lot of co-operation, but most of it enforced from above (with relatively little evidence to demonstrate whether co-operation is beneficial and, assuming that it is, whether the law is needed to ensure this).