

Comparison of International Rail Fares and Ticketing

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Contents

1	Introduction	1.1
1.1	Background to Study	1.1
1.2	Objectives	1.1
1.3	Methodology	1.1
1.4	Structure of Report	1.3
2	Background to Fares and Ticketing in Each of the Countries	2.1
2.1	Introduction	2.1
2.2	Overview of Countries	2.1
2.3	Status of Fares and Ticketing	2.3
2.4	Summary	2.6
3	Fares and Ticketing in Cities	3.1
3.1	Introduction	3.1
3.2	Summary of Fares in Cities	3.2
3.3	Cities in France	3.9
3.4	Cities in Germany	3.10
3.5	Cities in Italy	3.11
3.6	Cities in Spain	3.11
3.7	Cities in the Netherlands	3.12
3.8	Cities in Sweden	3.13
3.9	Cities in Norway	3.14
3.10	Cities in Japan	3.15
3.11	Cities in USA	3.16
3.12	Cities in Canada	3.17
3.13	Conclusions for Cities	3.17
4	National Network Fares	4.1
4.1	Introduction	4.1
4.2	Fares Structure	4.1
4.3	Summary of Tickets Available	4.6
4.4	Fares Levels	4.7
4.5	Availability of Tickets	4.12
4.6	Discount and Loyalty Schemes	4.14
4.7	Yield Management	4.16
4.8	Conclusions	4.16
5	Ticketing	5.1
5.1	Introduction	5.1
5.2	Purchasing Channels	5.1
5.3	New Technology for Tickets	5.3

Contents

5.4 Conclusions	5.5
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Tables

Table 1.1 Interviewees	1.2
Table 2.1 Vehicle ownership and Rail usage per country per capita	2.2
Table 3.1 Currency Exchange Rates	3.2
Table 3.2 Summary Table	3.3
Table 3.3 Ticketing Summary	3.5
Table 4.1 Peak versus Off Peak Fares	4.3
Table 4.2 Advance Purchase and Seat Reservations by Country	4.4
Table 4.3 Summary of Tickets Available by Country	4.6
Table 4.4 Summary of Fares from Desk Research	4.8
Table 5.1 Summary of Current Ticket Purchasing Channels by Country	5.2

Figures

Figure 2.1 GDP per Capita (US\$) and Population per Country	2.1
Figure 3.1 Peak Daily Average Fare in Central Zone (Single Fare, £'s)	3.4
Figure 4.1 Comparison of First and Standard Class Fares	4.9
Figure 4.2 Range of Standard Class Fares Available (£'s) for Intercity Journeys Considered	4.10
Figure 4.3 Range of Standard Class Fares Available (£'s) for Regional Journeys Considered	4.10

Appendices

- A Interview Responses
- B Routes Analysed in Desk Research

Summary

Objectives of Study

A government review of fares and ticketing is currently being undertaken which will address the scope for improved demand management, as well as wider issues associated with fares. The purpose of this study is to provide an understanding of the fares and ticketing structures in a number of rail markets to inform debate about the evolution of fares and ticketing in Great Britain, including understanding the drivers behind the different approaches and the extent to which demand management is used.

Methodology

The study was undertaken using a mixture of interviews with fare and ticketing experts in each of the rail markets considered, supplemented with desk research focussing on attempting to purchase tickets on-line. Ten rail markets were considered: France, Germany, Italy, Spain, The Netherlands, Sweden, Norway, Japan, North East corridor USA and South East corridor Canada; interviews were achieved with each of these apart from Italy and Canada, plus with two independent observers.

International Context

Of the countries considered in this study, the UK has the third highest rail use per capita and the fourth highest passenger kms travelled, with Japan having a very high rail use per capita, and the USA and Canada a very low rail use per capita.

Most of the countries considered originally had state owned railways which have since been privatised. Subsidies are provided and guidance on fare levels is generally set by the government.

Fares and Ticketing in Cities

City travel and long distance and regional travel by rail have very different characteristics, and so it is useful to consider fares and ticketing in cities separately to the fares and ticketing on the national network.

A review of the fares and ticketing policy in major cities in the ten markets considered in the study showed that most cities have a zonal based fare system, although a few use distance-based fares. Most cities use some form of smart ticketing, although a variety of single tickets, travel cards and other tickets are also available.

National Network Fares

For national rail travel, market segmentation is used by some countries to help in setting fares, generally targeting business and leisure travellers. In some markets reduced fares are available for off-peak travel, but in others such as the United States, the fares are based purely on demand, and so there will be lower fares where there is less demand regardless of the time of day.

Cheaper advance purchase fares for long distance travel, especially high speed, are used in many of the rail markets considered. In some markets this is accompanied by compulsory seat reservations to avoid over-booking on trains. The range of standard class fares available for specific routes in the UK (i.e. from the cheapest advance purchase ticket compared to an Anytime ticket) is at the top of the

Summary

range of fares available in France, Germany, Italy, Sweden, Norway, the US and Canada, although not exceptional. The Netherlands and Japan do not vary their fares.

The length of time in advance you can purchase your ticket varies by country, with around three months being standard in European countries, but 10 or 11 months being used in the US and Canada. Generally, you are able to exchange your ticket or obtain a refund if required, although in some countries a transaction fee is charged. Some countries allow purchase of advance fares almost up to the time of departure, while others close at 14 days in advance of travel.

Railcard and social discount schemes are available in many of the countries; some of these are state imposed rather than a revenue generating mechanism.

National Network Ticketing

All countries have ticket purchasing channels on the internet, at the station desk and station ticket machines. Some countries also use additional purchasing channels such as telesales, travel agents, other types of shops and on board trains. For tickets purchased on the internet, some countries allow "print at home" with the ticket including a bar code, or ID being required when you show your ticket.

Mobile ticketing has been introduced in Spain, Norway, France and Japan (for some services) and is in the process of being introduced in the US. Germany and some Asian countries are also experimenting with the use of mobile phones.

Smart cards are not so useful for long distance journeys, due to the amount of money you need to put on your card. However, the Netherlands, whose small size makes smart cards a feasible payment option is in the process of implementing a nationwide smart card option and smartcards are also in use in Japan.

In summary, many countries are moving towards electronic payment in order to reduce ticket office costs and reduce the opportunities for fraud. There was no indication that electronic payment had been introduced for demand management purposes or more flexible ticket prices, although The Netherlands are considering introducing an evening peak period once smart ticketing has been introduced.

1 Introduction

1.1 Background to Study

- 1.1.1 The McNulty review of rail value for money¹ concluded that there should be greater use of demand management, and that a review of fares policy should examine how fares structures can aid the management of peak demand.
- 1.1.2 Following the McNulty review, a government review of fares and ticketing is currently being undertaken which will address the scope for improved demand management as well as wider issues associated with fares. It was felt that an informed view on the approaches adopted by railways in other markets would be beneficial to this government review.

1.2 Objectives

- 1.2.1 The overall objective of this study is to understand better the fares and ticketing structures in a number of rail markets in order to inform debate about the evolution of fares and ticketing in Great Britain. Within this broad framework, there was a desire to address the following issues:
 - An understanding of the governmental/regulatory policy, commercial strategy, passenger culture and other drivers behind the differing approaches to fares strategy adopted by other railways; and
 - An understanding of the policies adopted by the railways concerned with regard to demand management and in particular the extent to which railways are 'turn up and go' and/or based on proactive approaches to demand management such as advance purchase fares and compulsorily reservable train services.

1.3 Methodology

- 1.3.1 The study was undertaken through a mixture of interviews with fare and ticketing experts in the rail markets considered, along with desk research focusing on attempting to purchase a ticket on-line.
- 1.3.2 The rail markets that were considered in the study were:
 - France
 - Germany
 - Italy
 - Spain
 - The Netherlands
 - Sweden
 - Norway
 - Japan
 - North East corridor USA
 - South East corridor Canada
- 1.3.3 For the interviews, a topic guide was developed which included questions about ticketing and fares in each of the rail markets. Interviews were undertaken by telephone and lasted

¹ "Realising the Potential of GB Rail: Report of the Rail Value for Money Study", May 2011

between 30 to 60 minutes. These interviews were undertaken in March and April 2012. The people who were interviewed are provided in Table 1.1. It was not possible to undertake an interview with a participant in Italy or Canada within the timeframe of the study.

Table 1.1 Interviewees

Country	Interviewee	Position, Company
France	Georges Meurisse	SNCF
Germany	Birgit Bohle	CEO of DB Sales, DB
Spain	Juan Matias Archilla Pintidura	RENFE International Project Director
The Netherlands	Dirk van Vliet	'Business to Business', NS (Dutch Railways)
Sweden	Jan Svensson	Senior Advisor, International Sales and Marketing, SJ
	Eric Tallroth	Manager, Revenue Management Department, SJ
Norway	Ken Woodward	Pricing Manager, NSB
Japan	Tasuku Takahama ²	East Japan Railway Company
USA	Matt Hardison	Chief, Sales Distribution & Customer Service, Amtrak

- 1.3.4 In addition, rail experts Mark Smith (Seat61.com) and Mark Elliott (Accenture) were interviewed to provide an overview of ticketing and fares in different markets. Mark Smith worked at the DfT regulating fares and ticketing and has developed the Seat61.com website which provides ticketing information for different countries using websites, buying tickets, trade agent online information and feedback from visitors to the website. Mark Elliott is responsible for Accenture's work in Public Transport within the UK, and has spent 8 years working globally for city authorities.
- 1.3.5 Passenger Focus and ATOC thank the interviewees for their input to this study.
- 1.3.6 The desk research undertaken was designed to get a "passenger-eye view" of ticket availability, prices and conditions for each rail administration. This was carried out through emulating the on-line purchase of tickets for a number of journeys within each country.

² Coordinated a written response to questions

looking at inter-urban, regional and urban journeys. The ticket prices for journeys up to three months in advance and at different times of day were obtained, in order to get a feel for the variability of ticket prices.

- 1.3.7 The findings from the interviews and the desk research are combined within the remainder of this report.

1.4 Structure of Report

- 1.4.1 The following chapter provides background information on each of the countries considered. The remaining three chapters provide the findings on fares and ticketing methods for the urban and national markets considered:

- Chapter 3 Fares and Ticketing in Cities;
- Chapter 4 National Network Fares; and
- Chapter 5 Ticketing.

- 1.4.2 The responses from the interviews are set out in Appendix A and the routes considered in the desk research are given in Appendix B.

2 Background to Fares and Ticketing in Each of the Countries

2.1 Introduction

- 2.1.1 The countries that were identified for this study have rail networks that in some aspects are similar to the rail network in the UK, in particular having multi-modal public transport services in cities and inter-urban long distance rail services. It was also thought that the countries considered in the study might have utilised or be considering new technology or demand management methods that might be of interest to the UK.
- 2.1.2 This chapter provides contextual information about the countries considered in the study, along with a summary of the current status of fares and ticketing within these countries. It begins by providing an overview of population and transport statistics across the countries.

2.2 Overview of Countries

- 2.2.1 Figure 2.1 shows the relationship between population and GDP for the countries considered in this study, using UN statistics. The bars represent the GDP per capita, with the line representing the population of each country. Norway has by far the highest GDP per capita³ among the countries considered in this study, as well as the smallest population⁴. It is followed by Sweden and the Netherlands. At the other end of the scale, Spain has the lowest GDP per capita and the 7th highest population. The UK has a relatively low GDP/capita, but a similar population to Germany, France and Italy.

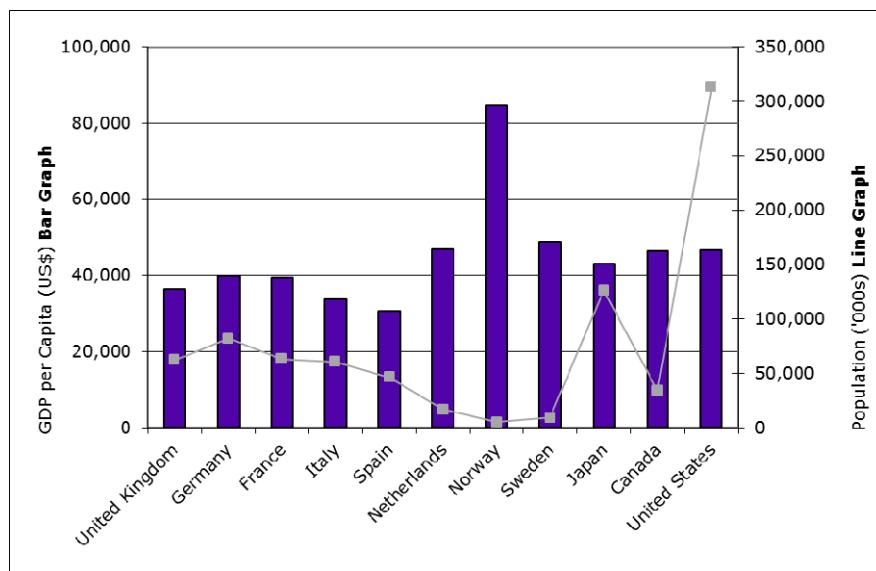


Figure 2.1 GDP per Capita (US\$) and Population per Country

³ Source: UN statistics -

http://unstats.un.org/unsd/demographic/products/socind/Tables_Excel/table5a_Dec%202011.xls

⁴ Source: UN statistics -

http://unstats.un.org/unsd/demographic/products/socind/Tables_Excel/table1a_Dec%202011.xls

- 2.2.2 The International Union of Railways (UIC) collates railway statistics from several countries across the world. The latest data available is from 2010⁵. Statistics on passenger numbers in combination with population can provide a measure of rail usage per capita. As shown in Table 2.1, Japan is the country with by far the greatest rail trips per head with just under 70 rail trips per person per year, followed by Germany and the UK with 23.7 and 21.7 trips per person per year respectively. The United States and Canada at the other end of the spectrum have just 0.1 and 0.3 rail trips per person. The rail kilometres per head shows a similar pattern, with Japan, France, Germany and The Netherlands having greater rail kilometres per head than the UK. As there was low national usage for the United States and Canada, the study focused its research on the North East corridor of North America, where rail usage is greater.
- 2.2.3 Another statistic of interest that can give a measure of mode of travel is car ownership. According to World Bank data⁶ the United States have the highest number (809) of motor vehicles per 1000 people (includes car, buses and freight vehicles but exclude 2-wheelers). Italy also has high vehicle ownership at 673 per 1000 people. The Netherlands, Sweden and the United Kingdom are the countries with the lowest vehicle ownership. In general, for countries where there is higher vehicle ownership, there is lower rail use per person, although this relationship does not hold for every country.

Table 2.1 Vehicle ownership and Rail usage per country per capita

	Vehicle					
	Population (millions) 2011	Ownership (per 1000 people) 2008	Passengers Carried (millions) 2010	Passenger Kms (millions) 2010	Rail Trips/ head	Rail Kms/ head
Japan	126	593	8,841	244,235	69.9	1,938
Germany	82	554	1,950	78,582	23.7	958
UK	62	526	1,352	55,020	21.7	887
Netherlands	17	515	324	15,400	19.4	906
France	63	598	1,139	86,853	18.0	1,379
Spain	46	606	546	22,016	11.8	479
Italy	61	673	674	44,535	11.1	730
Norway	5	575	50	2,674	10.2	535
Sweden	9	521	38	6,774	4.0	753
Canada	34	605	9	2,875	0.3	85
USA	313	809	27	9,518	0.1	30

⁵ Source: UIC statistics - <http://www.uic.org/spip.php?article1347>

⁶ Source: World Bank databank - <http://data.worldbank.org/indicator/IS.VEH.NVEH.P3/countries?display=default>

2.3 Status of Fares and Ticketing

- 2.3.1 This section considers each of the countries in turn to describe the background of their fares and ticketing regime. This information was attained through the interviews detailed in Table 1.1, and so a description is not provided for those countries where an interview has not been undertaken.

France

- 2.3.2 In France, before 1981, rail fares were based on the number of kilometres travelled. High speed trains were introduced in 1981 (Paris – Lyon), and as a result, train fare policy became more sophisticated. Train ticket prices are now more segmented and adapted to people and their consumption habits. The number of train tariffs is growing with yield management used for all long distance tariffs in order to optimise profits.
- 2.3.3 When calculating prices, SNCF is subjected to two types of constraints: government regulation and the current monopoly. The government has to agree prices with SNCF, with the highest SNCF price fixed by the French government. This constraint is quite important as it means that SNCF cannot have a “maximise profit” strategy. Social discounts are provided to the military and senior citizens, and if SNCF loses money because of these social prices, the government reimburses SNCF.
- 2.3.4 In the future (2014 for regional trains, TER, and 2016-17 for high speed trains, TGV), rail competition will be introduced in France (i.e. SNCF will no longer have a monopoly on the rail market), and SNCF will have the right to fix its prices without any government regulations. The pricing structure is likely to become more complicated, as prices will take into account the habits of the passenger (e.g. how many times a passenger used a specific train). In a given train, nearly every passenger will probably pay a different price.

Germany

- 2.3.5 In Germany, long distance rail operations are self-financing by fare alone and no state subsidies are received. However, regional rail operations are carried out through tenders with revenues obtained from fares and state subsidies.
- 2.3.6 There are three different pricing structures in place:
- Long distance tariffs are set by long distance operators. There is an administrative procedure to be followed and they need to be officially approved;
 - Regional tariffs are set and regulated by DB Regio (railway transport company). Regional tariffs using a distance based fare. These tariffs also apply to other railway companies; ; and
 - Verbund tariffs are for regions (“Verbünde”). Verbunds are transport associations with their own fare (which takes precedence over the regional tariffs).

Spain

- 2.3.7 Before high speed rail was introduced in Spain the fare was directly related to the length of journey in kms, and first class ticket prices were 50% higher than standard class ticket prices.

2 Background to Fares and Ticketing in Each of the Countries

- 2.3.8 When high speed rail was introduced in Spain 20 years ago, the fare regime "Precio de Mercado" ("Market Price") was introduced which took into account competition with air and coach. In 1992, yield management was introduced along with a dynamic fare policy on the inter-urban and regional rail markets. For the urban network, the fare policy changed from a price per km to a zonal system where the passenger's fare depended on the number of zones he/she crossed on their journey.
- 2.3.9 There are now two fare systems operating in Spain:
- "Precio comunicado" ("Communicated price") – the Spanish transport authority fixes the fares. On occasions where RENFE lose money as the government set the fare, the government reimburses RENFE the balance. This fare system is applied in Commuter, Regional and Regional High Speed services.
 - "Precio libre" ("Free price") – the price per km decreases in line with the number of kilometres travelled. This fare system is applied in High Speed and Long Distance services.
- 2.3.10 The fare prices increase according to the consumer price index, and there are currently no plans to change the way fares are calculated in Spain.

The Netherlands

- 2.3.11 In The Netherlands, previously Nederlandse Spoorwegen (NS), or Dutch Railways, was owned by the Government, where the government had a firm role in deciding the prices of the tickets. Now NS is an organisation that can decide its own prices, but there are some restrictions, as in the UK.
- 2.3.12 The government gives concessions. Some ticket prices can only rise a certain percentage per year, including basic tickets for single trips. NS can freely decide the price of off-peak tickets.
- 2.3.13 The current fares structure is likely to stay the same for the foreseeable future. In the past there was only one railway organisation with one tariff structure that was the same for everyone, but now there is more than one railway organisation. A smart card with electronic ticketing has recently been introduced, OV-chipkaart, to the Netherlands and every company has their own ways of setting fares.

Sweden

- 2.3.14 In Sweden, for long distance rail there is no regulation and the major national passenger train operator in Sweden, SJ, can set any price for their tickets. SJ are government owned, so in theory, the government could intervene, but they have not done so.
- 2.3.15 For regional rail, there is more variation with a franchise process in place. Urban and regional rail travel is managed by a mixture of SJ and private train companies, with subsidies given to train operative companies (TOCs). Pricing agreements are set between the TOCs and regional traffic authorities, but the TOCs can change prices in order to obtain a profit.
- 2.3.16 Privatisation started in Sweden some time ago, particularly on the regional and local service, with a big shift in the rail market taking place ten years ago when the southern region was won in a tender by the Danish state railway company. The full market opening only

happened at the end of last year and there is now full competition, in theory at least. Franchise lengths are generally around five years long.

- 2.3.17 However, in Sweden, private operators are required to have their own rolling stock, and so it is difficult for private operators to join the market. During the interview, Eric Tallroth thought that it could take at least 20 years to get a fully open market on the long distance routes.

Norway

- 2.3.18 In Norway, Norwegian State Railways, NSB, receive subsidies from the government. There is only one line in Norway which is franchised and the remaining lines are run solely by NSB.
- 2.3.19 NSB can increase fares yearly based on rate of inflation plus 1%. If this maximum was applied, fares would become much higher than the rate of inflation over time. NSB can freely set the fares below these reference fares; in fact, in the current economic climate NSB needs to reduce their fares. NSB has introduced advance fares called 'mini fares'. These can be freely set and NSB can introduce new levels of mini fares, as long as they are below the reference fares level.
- 2.3.20 NSB are also regulated by the government on social discounts including a discount for pensioners, student discount and a military discount. During the interview, Ken Woodward suggested that the senior discount may not be offered if it were not mandated (historically senior citizens were relatively poor, but this is not the case now).

Japan

- 2.3.21 In Japan, JR East (one of the major train operating companies in Japan), sets a fare rate per kilometre, with the rates gradually decreasing depending on the distance of the journey. The fare rates per kilometre are different between metropolitan railways, middle and long-distance railways, and regional local railway lines. Additional charges are made for express trains, first class cars and sleeping-car berths.
- 2.3.22 Since the amendment of the Railway Business Act in March 2000, there has been an approval requirement system for the upper limits of basic fares and Shinkansen express charges and a prior notification requirement system for setting and changing fares within the range of those upper limits. For other fares (express charges, berth charges, first class supplements, etc.), a prior notification system applies.

United States North East

- 2.3.23 Intercity passenger rail in the United States was operated by private rail companies until the 1970's when losses became commercially unsustainable. The federal government took over these passenger operations beginning in 1971 and turned them over to Amtrak. Freight operations – and track ownership outside of the northeast corridor (Washington, DC – New York – Boston) – nonetheless remained with the private operators. Today, Amtrak manages the intercity passenger business across the United States and operates in what is largely a deregulated pricing environment. Its primary track ownership is limited to the northeast corridor, and it leases access from private operators elsewhere. The government's aim is that Amtrak require the least subsidy possible. Amtrak's parallel goal is therefore to generate the

most revenue per seat mile possible. U.S. "commuter" (urban) rail operations, which are operated separately by state and local governments, are not explored in this study.

- 2.3.24 Amtrak operates corridor services in the northeast, Midwest, and west, as well as long distance, overnight services across the country. The northeastern intercity passenger rail market is relatively unique in that it has been operated with different corridor services targeting each of the leisure and business travel markets since the 1960's. Since assuming responsibility in 1971 for these services, Amtrak has continued to grow and refine this. In the northeastern United States, Amtrak offers two primary intercity rail products: Northeast Regional (65% leisure and 35% business / intercity commuters) and Acela (80% business travel, 20% leisure). Acela services are high speed and use separate rolling stock.
- 2.3.25 Amtrak has operated reserved and revenue managed services in various parts of the country for decades. In late 2005/early 2006, Amtrak changed the northeast sector from an unreserved to a reserved operating environment, with reserved meaning that the number of people that can buy tickets per train is limited to seating capacity available on the train, i.e., there is open seating, but a limited number of people can book travel on a given departure. This is the centre-piece of Amtrak's strategy to optimize the use and revenues from its services, in part, for example, encouraging a shift of demand from peak to off-peak trains and improving load factors and yields, generally. Previously, Amtrak had used pricing fixed by time of day and day of week (that is, peak, shoulder peak and off-peak pricing) in the northeast.
- 2.3.26 The Amtrak revenue management system uses a combination of capacity, inventory settings, and fares designed to generate the most revenue possible for each departure. This is a dynamic system, so a ticket for a certain train on a certain day will become more expensive as more people buy that same ticket.

2.4 Summary

- 2.4.1 In summary, of the railway markets considered, most of them were initially state owned but have become, or are in the process of becoming privatised. The government generally has some control over fare levels and provides subsidies to the train operators.

3 Fares and Ticketing in Cities

3.1 Introduction

- 3.1.1 This chapter presents the findings of the desk research on fares and ticketing in cities. One or two cities within each of the countries were considered for analysis. The fares for each city were determined using rail operators' websites. A single fare within each city is listed and other fares, including weekly, monthly and annual tickets are also detailed. In addition to this, information regarding concessions and other tickets available are included. This chapter also includes information from our interviews where they provided details about rail fares and ticketing in the cities being considered.
- 3.1.2 This chapter begins with a summary across the cities, before considering each city in more detail in turn. The cities considered are as follows:
- Paris and Toulouse (France);
 - Berlin and Munich (Germany);
 - Rome and Milan (Italy);
 - Madrid and Barcelona (Spain);
 - Amsterdam and Rotterdam (The Netherlands);
 - Stockholm and Gothenburg (Sweden);
 - Oslo (Norway);
 - Tokyo and Osaka (Japan);
 - New York City (USA); and
 - Montreal (Canada).
- 3.1.3 The currency exchange rates used throughout this chapter are summarised in Table 3.1.

Table 3.1 Currency Exchange Rates

City	Currency	Exchange to GB£
Paris, Toulouse	Euro	1.18446
Berlin, Munich	Euro	1.18446
Rome, Milan	Euro	1.18446
Madrid, Barcelona	Euro	1.18446
Amsterdam, Rotterdam	Euro	1.18446
Stockholm, Gothenburg	Swedish Krona	10.4685
Oslo	Norwegian Krone	8.85134
Tokyo, Osaka	Japanese Yen	128.366
New York	US Dollar	1.59516
Montreal	Canadian Dollar	1.5795

3.2 Summary of Fares in Cities

- 3.2.1 A summary of the fares information is provided in Table 3.2, more detailed information is provided in Table 3.3.
- 3.2.2 Single tickets are available in all of the cities considered. Most cities have a zonal based fare system, although some use distance-based fares. Most cities do not differentiate between peak and off-peak fares. Most cities have introduced some form of smart ticketing, although a variety of travel cards and other tickets are also available. Smart cards and other ticketing information for regional and long distance travel is discussed further in Chapter 5 of this report.

Table 3.2 Summary Table

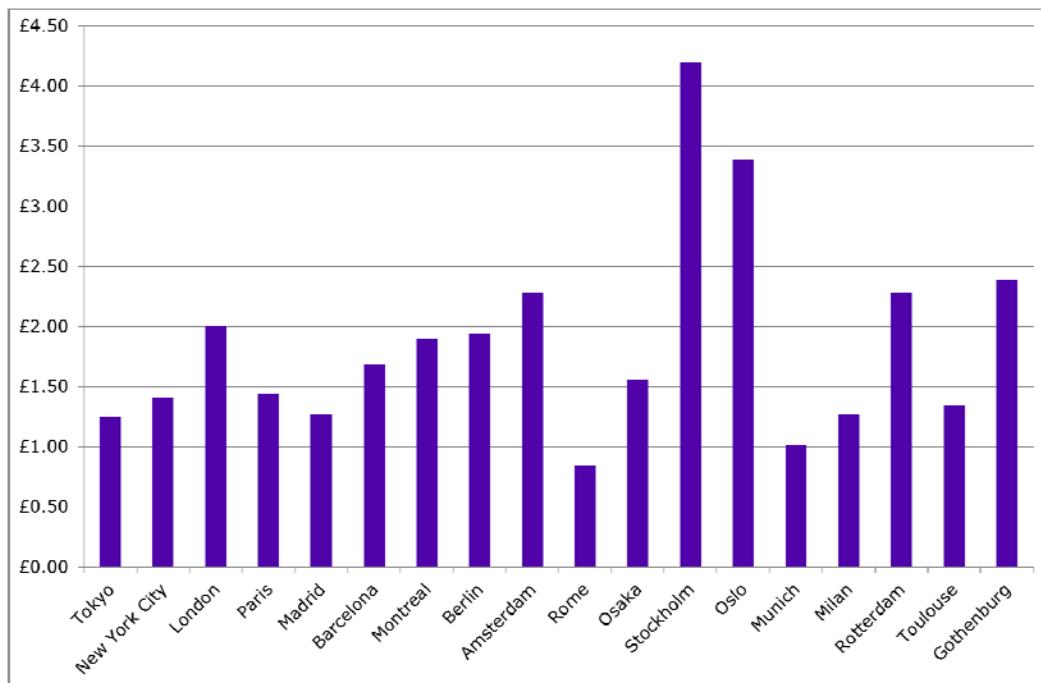
Cities	Single Ticket Price in Central Zone (£)	Smart Cards	All Tickets Multi-modal	Zone System
Paris	1.44	✓	✓	✓
Toulouse	1.35	✓		Single Zone
Berlin	1.94	X	✓	✓
Munich	1.01	✓	✓	✓
Rome	0.84	✓		Single Zone
Milan	1.27	✓	✓	✓
Madrid	1.27	✓	✓	✓
Barcelona	1.69	✓	✓	✓
Amsterdam	2.28	✓	✓	Distance-based with minimum fare
Rotterdam	2.28	✓	✓	Distance-based with minimum fare
Stockholm	4.20	✓	✓	✓
Gothenburg	2.39	X		✓
Oslo	3.39	✓	✓	✓
Tokyo	1.25 ⁷	✓		Distance-based
Osaka	1.56	✓		Distance-based
New York City	1.41	✓		✓
Montreal	1.90	✓	✓	✓

3.2.3 The minimum fare in the Dutch cities effectively means that the central area of the city acts as a single zone.

⁷ Single ticket in central zone for Tokyo Metro is £1.25, for JR East for 1-3km zone is £1.01 and for JR West for 1-3km zone is £0.94.

- 3.2.4 The single fare for each city, shown in Table 3.2, is graphed below, in order of city population. These fares are compared to London's equivalent single fare using Oyster.
- 3.2.5 The peak single fare in London for Zone 1, using an Oyster smart card is **£2.00**, with a daily price cap of £8.40 (a non-Oyster single fare in London for Zone 1 is £4.30, but this is used by a minority of passengers). A peak single fare for travel between Zone 1 and Zone 3 is £3.10 and is £8.20 for travel between Zone 1 and 9 and Watford Junction. Travelcards are also available for daily, 7-day, monthly and annual travel. A monthly ticket for Zone 1 is £112.20.

Figure 3.1 Peak Daily Average Fare in Central Zone (Single Fare, £'s)



- 3.2.6 The London Oyster fare of £2.00 is in line with the average fare of £1.86. The highest fares are in Stockholm at £4.20 and Oslo at £3.39. Both of these cities have high levels of GDP per capita, in particular Norway (See Figure 2.1). Considering the size of the cities, the single urban fares in Tokyo, New York, Paris and Madrid are relatively low. The single urban fare in Rome is the lowest considered (£0.84).

Table 3.3 Ticketing Summary

City	Geographic basis	Single Ticket	Travel Card	Other Tickets	Smart Cards	Concessions
Paris	Based on 8 zones	"t+" ticket Multi-transfer ticket – valid 90 mins Unlimited transfers using same mode	Carte Orange – weekly/monthly Weekly reset every Monday	Paris Visite – 1, 2,3 and 5 days – zone system 10 "t+" tickets	Navigo smart card – daily/ weekly/ monthly/annual – zone system Weekly reset every Monday	Families, military
Toulouse	Single zone	Integrated	Pastel - 10 journeys, weekly, monthly and annual tickets	Daily, 2 journey, 10 journey, 2 day, groups		
Berlin	Based on 3 zones	Integrated Valid for 2 hours one-way		Daily, weekly, monthly, annual, four trip, short trip, extension, group, tickets for bicycles		
Munich	Based on 16 circles	Integrated		Single, day, week, short trip, group, CityTour, Airport-City-Day	GeldKarte IsarCard	Student, child
Rome	Single zone	Integrated for the Bus and metro system – valid for 75 mins	Weekly, monthly, annual	Single, daily, tourist	Metrebus	

City	Geographic basis	Single Ticket	Travel Card	Other Tickets	Smart Cards	Concessions
Milan	Based on 4 zones (8 including half zones)	Integrated 90 minutes travel	Urban travel card, extra urban travel card, cumulative travel card	Single, weekly, 10 trips, two day ticket, 2X6 pass (two 90 minutes a day for 6 days of the same week), evening ticket, extra-urban tickets, cumulative tickets and luggage ticket	Itinero	Student travel card and senior citizen travel card
Madrid	Based on 6 zones	Integrated and non-integrated	Sube-T Monthly Youths, large groups	Single, 10 journey, combined single, Airport, Transport Season tickets and Tourist Season, monthly, university quarterly		Senior citizens, people with disabilities, children under 12, large families, students and young people. Free for children under 6
Barcelona	Based on 6 zones	TMB integrated and non-integrated	2 day, 5 day - you can use four different modes of transport and make three changes within an area and period of time established for the number of zones for which the travel card is valid	daily, 10 journeys, monthly and quarterly tickets	Bitllet Senzill	Pensioners passes, single parent and large families and companions travel card
Amsterdam	Distanced based	Integrated	OV-chipkaart - personal card, an anonymous card or a disposable card 24-, 48-, 72-, 96-, 120-, 144- and 168- hour Or pay as you go system, charged at €0.142 p/km + base € 0.83			Children, 65+, group travel, disabled people, students, tourists, etc.

City	Geographic basis	Single Ticket	Travel Card	Other Tickets
Rotterdam	Distanced based	Integrated	OV-chipkaart - personal card, an anonymous card or a disposable card 24-, 48-, 72-, 96-, 120-, 144- and 168- hour Or pay as you go system, charged at €0.142 p/km + base € 0.83	Children, 65+, group travel, disabled people, students, tourists, etc.
Stockholm	Based on 3 zones	Integrated Zone tickets available, valid during one hour after the start of the trip. 2-6 tickets are required per trip depending on the length	Specified period of time, from 24 hours up to a year – not affected by zone system 16 single tickets, weekly, season and annual	SL Access daily, weekly, season and annual Reduced price is for persons under the age of 20 or over the age of 65
Gothenburg	Based on zones	Integrated (Bus, Tram, Ferry)	Single, 3 day, 30 day, 5 trip	Västrafik
Oslo	Based on 5 zones	Integrated Valid for one hour of free travel in the zone the ticket is valid for	24-hour, 7-day, 30-day and 365-day	Flexus Pay-as-you-go
Tokyo	Distanced based	Non-integrated	1, 3 and 6 month passes 11 single, 2 day, transfer tickets, day passes 1, 3, 6 months	Suica commuter pass and PASMO
Osaka	Distanced based	Non-integrated	Day passes – unlimited and integrated Tourist passes	Icoca commuter pass for 1,3,6 months, Surutto, Kansai, PiTaPa (postpaid)

3 Fares and Ticketing in Cities

City	Geographic basis	Single Ticket	Travel Card	Other Tickets	City	Geographic basis
New York City	Commuter fares based on zones system Subway – set fare	Non-integrated	Metrocard – 7 day, 30 day, automatic top-up	10-trip	Smartlink	
Montreal	Based on 8 zones	Integrated		Groups, unlimited evening fares, one-day, 2 trip, 10-trips	Opus	

3.2.7 The remainder of this chapter considers each of the cities in turn in more detail.

3.3 Cities in France

Paris

- 3.3.1 The RER (Réseau Express Régional) is a rapid transit system in France serving Paris and its suburbs. The Paris RER consists of five express commuter trains (A to E) that travel within Paris and the greater Paris region (in contrast to the metro, which stops just outside the city limits). The RER covers 6 zones within the Paris region, and if you travel further than your ticket or pass allows for, you can be fined.
- 3.3.2 A **Navigo** pass, an RFID-based contactless smart card, is also available for daily, weekly, monthly and annual tickets and prices vary per zone. The card itself costs €5 (£4.22). The weekly tickets for travel between zones start at €19.15 (£16.17) for travel between Zone 1 and 2, increasing to €33.90 (£28.62) for travel between Zone 1 and 5.
- 3.3.3 The Paris Visite travel card is available for one, two, three or five days, for either zones 1–3 covering the centre of Paris, or zones 1–5 covering the whole of the network. Prices range from €9.30 (£7.85) to €51.20 (£43.22) depending on zone coverage and duration (1 to 5 days). The weekly card always runs from Monday to Monday (and is reset every Monday), irrespective of when it was purchased, whereas the Paris Visite card is valid for the number of days purchased.
- 3.3.4 The Paris Métro is the rapid transit metro system in Paris, France. The network's fourteen lines are mostly underground. The standard ticket is the "t+" ticket. It is valid for a multi-transfer journey within one and a half hours from the first validation. It can be used on the whole Métro network, on buses, trams and in zone 1 of the RER. The ticket allows unlimited transfers using the same mode of transport (i.e. Métro to Métro, bus to bus and tram to tram), between bus and tram, and between metro and RER zone 1. When transferring between the Metro and the RER, it is necessary to retain one's ticket. The RER requires a valid ticket for entry and exit, even if it is only a transfer. The "t+" ticket costs **€1.70** (£1.44) or €12.50 (£10.55) in tens (a carnet).
- 3.3.5 There are two railcards available in Paris:
- "Enfants et Familles Nombreuses" (Children and families with 3 children or more) where children under 4 years old can travel for free on the Ile-de-France transport network, and children between 4 and 10 pay 50% of the ticket price. People who have the "carte famille nombreuse" delivered by SNCF can have 50% discount.
 - French military personnel can have up to 75% discounts when they use the "Transilien SNCF" (extended Paris region) lines, except in zone 1.

Toulouse

- 3.3.6 The Métro de Toulouse serves the city of Toulouse and some of the surrounding area. There are two underground metro lines - A and B. Line C and D are suburban rail lines running to the west of the city and to Muret respectively. Line T1 (old line E) is a tramway to Blagnac's suburbs.

3 Fares and Ticketing in Cities

- 3.3.7 There are two sets of fares, with and without the '**Pastel**' card. The Pastel card is a personal electronic travel card available to all. Without Pastel one journey is **€1.60** (£1.35) and two journeys is **€2.90** (£2.45). A daily ticket is **€5.50** (£4.64). 10 journey, evening, two day and groups tickets are also available.
- 3.3.8 Fares using Pastel include 10 journeys, weekly, monthly and annual tickets for **€12.90** (£10.89), **€13.30** (£11.23), **€43.80** (£37.98) and **€438.00** (£369.79) respectively. It is possible to purchase your annual ticket for **€36.50** (£30.82) a month.

3.4 Cities in Germany

Berlin

- 3.4.1 Berlin has an integrated public transport system known as the VBB. It includes an interconnected three-zone system (ABC) which only requires one ticket, allowing you to change from bus to underground (U-Bahn) to surface rail (S-Bahn), regional trains and tram with one ticket.
- 3.4.2 A number of tickets are available including single and daily tickets. A single ticket is valid for two hours, but return / round trips are not permitted. Fares for single tickets are per zone and reduced fares are available for children. An adult single ticket is **€2.30** (£1.94) (Zone AB), **€2.70** (£2.28) (Zone BC) and **€3.00** (£2.53) (Zone ABC). Daily tickets for the same zones are **€6.30** (£5.32), **€6.60** (£5.57) and **€6.80** (£5.74) respectively.
- 3.4.3 There are also weekly, monthly and annual tickets available. The weekly tickets start at **€27.20** (£22.96) for Berlin AB increasing to **€33.50** (£28.28) for Berlin ABC. A weekly ticket for the whole VBB area costs **€60.00** (£50.66). Other fares include four trip tickets, short trip tickets, extension tickets, group tickets, tickets for bicycles, etc.

Munich

- 3.4.4 Munich's public transportation system consists of the Tram (streetcar), buses, S-Bahn (suburban trains), regional trains and U-Bahn (underground trains). As in Berlin, there is a one ticket system, called MVV, in which you can use all elements of the public transport with the same ticket. You can get individual, group, day and week tickets.
- 3.4.5 A single trip in a single zone such as the city centre costs **€2.50** (£2.11) and increases to **€10** (£8.44) for four zones or more. The fares are discounted if a **GeldKarte** is used, for example the single zone fare is **€2.40** (£2.03). GeldKarte is a German chip-based electronic purse system. A short trip ticket is available for **€1.20** (£1.01) which allows travel for up to one hour.
- 3.4.6 The Stripe Ticket is valid for several trips by one or more individuals in the destination direction. You are allowed to change and interrupt your trip. Return and round trips are not permitted. For a single zone the fare is **€2.40** (£2.03). A day ticket is available for **€5.40** (£4.56) for the inner district, increasing to **€10.80** (£9.12) for the entire network. A group ("Partner") day ticket is also available for **€19.60** (£16.55), allowing up to 5 adults to travel together on all lines of the MVV system. Other fares are available including student, child, CityTour card, Airport-City-Day-Card, etc.

3 Fares and Ticketing in Cities

- 3.4.7 In Munich there are 16 circles and weekly and monthly tickets to travel between each. The weekly fares using an **IsarCard** are €12.30 (£10.38) for up to 2 circles, increasing to €50.30 (£42.47) for 16 circles.

3.5 Cities in Italy

Rome

- 3.5.1 The Rome Metro is currently two metro lines, the A line and the B line. Rome's local transport provider, ATAC, also operates several other rail services: the Roma-Lido line, the Roma-Giardinetti line, and the Roma-Nord line. The first of these, the Rome-Lido railway line, which connects Rome to the sea at Ostia, is effectively part of the metro network. The Roma-Giardinetti line, although officially designated as a railway, is a narrow gauge tram line, while the Roma-Nord line is a suburban railway.
- 3.5.2 In Rome there are six tickets available, including a single ticket for **€1.00** (£0.84) and a daily ticket for €4.00 (£3.38). A tourist ticket is also available which allows travel for three days travel for €11 (£9.29). The weekly, monthly and annual tickets using **Metrebus** smart card cost €16 (£13.51), €30 (£25.33) and €230 (£194.18) respectively.

Milan

- 3.5.3 Milan's public transport network includes the Metro, the Suburban Railway, tram and bus network. The Milan Metro, running mainly underground, serves Milan and other surrounding cities, and the network consists of three lines. The Suburban Railway Service (Linee S) consists of 10 lines connecting Milan to the greater metropolitan area.
- 3.5.4 There are four zones (eight including half zones) in Milan and it is possible to purchase single or weekly tickets for travel within these zones. An urban single journey ticket costs **€1.50** (£1.27), and is valid for buses, trams, suburban and metro lines inside the Milan municipality (urban fare limit). This is valid for 90 minutes travel in one direction. The standard single fare increases to €4.10 (£3.46) for 4 and ½ zones.
- 3.5.5 It is possible to buy urban single tickets in bundles of 10, which cost €13.80 (£11.65) for a standard urban ticket. Other tickets include one day ticket, two day ticket, 2X6 pass (two 90 minutes a day for 6 days of the same week), evening ticket, extra-urban tickets, cumulative tickets and luggage ticket.
- 3.5.6 Travel cards are available including an urban travel card, extra urban travel card, cumulative travel card, student travel card and senior citizen travel card. The travel cards are charged onto an electronic card called **Itinero**. A weekly, monthly and annual urban travel card costs €11.30 (£9.54), €30 (£25.33) and €300 (£253.28) respectively.

3.6 Cities in Spain

Madrid

- 3.6.1 The RENFE Suburban Train System in the Madrid Region consists of 12 basic lines. The Madrid Metro system also has 12 lines.

3 Fares and Ticketing in Cities

- 3.6.2 For travel within Metro Madrid (underground network within the municipality of Madrid) a single ticket costs **€1.50** (£1.27). Single tickets for travel within Metro Sur, Metro Norte, Metro Este, TFM and Metro Ligero Oeste also cost €1.50 (£1.27). A 10 journey ticket for each of these areas is €9.30 (£7.85). A combined single ticket, allowing for travel across the whole Metro network costs €2.50 (£2.11). An equivalent 10 journeys ticket is €15 (£12.66). Tickets for travel to the Airport, Transport Season tickets and Tourist Season tickets are also available.
- 3.6.3 There are also monthly travel cards, **Sube-T** smart card, for travel in Madrid for adults, youths, senior citizens, large groups, people with disabilities, students and university workers. A monthly adult fare for Zone A travel is €47.60 (£40.19), increasing to €114.80 (£96.92) for travel up to Zone E2.
- 3.6.4 RENFE suburban fares range from **€1.35** (£1.14) for a single ticket for one/two zones to €6.20 (£5.23) for travel across the full suburban network. RENFE also offer 10-journey tickets, monthly and university quarterly tickets.

Barcelona

- 3.6.5 Rodalies Barcelona is the commuter rail service that serves Barcelona and its metropolitan area as well as other parts of the province. Rodalies Barcelona is made up of 13 lines, six of which are operated by the Spanish company RENFE and seven by Generalitat-owned FGC. The whole network—and fare system—is further divided into six concentric areas, with Estació de Sants as its centre. Rodalies trains are fare-integrated with the Barcelona Metro network and a few other means of transport in the city, sharing stations and also running mostly underground in Barcelona and its adjacent municipalities. Barcelona Metro system consists of 11 lines.
- 3.6.6 A Transports Metropolitans de Barcelona (TMB) ticket valid for one metro journey costs **€2.00** (£1.69). This is an individual non-integrated ticket. A two day travel card is €12.80 (£10.81) and a five day travel card is €28.00 (£23.64). Integrated fares are also available, where you can use different modes of transport (metro, urban, metropolitan and interurban buses, tram, Ferrocarrils de la Generalitat de Catalunya trains and Rodalies de Catalunya trains) on a single travel card, **Bitllet Senzill** smart card. Under this system you can use four different modes of transport and make three changes within an area and period of time established for the number of zones for which the travel card is valid.
- 3.6.7 Barcelona has six zones, with daily, 10 journeys, monthly and quarterly tickets for each. The daily ticket for Zone 1 is €6.95 (£5.87). This increases to €19.60 (£16.55) for six zones. A 10 journey ticket for Zone 1 costs €9.25 (£7.81). There are also a number of discounted travel passes including pensioners passes, single parent and large families and companions travel cards.

3.7 Cities in the Netherlands

Amsterdam

- 3.7.1 The Amsterdam Metro is a mixed rapid transit and light rail system in Amsterdam, and its surrounding municipalities. The network is owned by the city of Amsterdam and operated by

the Gemeentelijk Vervoerbedrijf, the company that also operates trams, ferries and local buses. There are four lines in the metro system.

- 3.7.2 The **OV-chipkaart**, a contactless smart card, is the only accepted ticket in the Amsterdam Metro. This smart card is used throughout the Netherlands and not just the cities of Amsterdam and Rotterdam. There are 24-, 48-, 72-, 96-, 120-, 144- and 168- hour OV-chipcards, which allow for unlimited travel on all trams, buses, metros and night buses for the duration of the card. It is possible to purchase a personal card, an anonymous card or a disposable card. A one hour fare is **€2.70** (£2.28) and a one day fare is €7.50 (£6.33).
- 3.7.3 There is also a pay as you go system, when using the personal card or anonymous cards which is charged at € 0.142 p (£0.12)/km + base € 0.83 (£0.70). Travel cards are also available for children, 65+, group travel, disabled people, students, tourists, etc. An example one-way fare in Amsterdam between Amsterdam Centraal and Amsterdam Science Park is €3.60 (£3.04) (1st class) and €2.10 (£1.77) (2nd class). The return fares are twice the single fare for both.

Rotterdam

- 3.7.4 The Rotterdam Metro is a rapid transit system operated in Rotterdam and surrounding municipalities by RET. There are five Metro lines, Lines A to E and eight tramlines.
- 3.7.5 The **OV-chipkaart** is also required to use public transport in Rotterdam. The same fares are available in Rotterdam as in Amsterdam, including the pay as you go system. A one hour fare is **€2.70** (£2.28) and a one day fare is €7.50 (£6.33). An example one-way fare in Rotterdam between Rotterdam Centraal and Rotterdam Noord is also €3.60 (£3.04) (1st class) and €2.10 (£1.77) (2nd class). As in Amsterdam, the return fares are twice the single fares for both.

3.8 Cities in Sweden

Stockholm

- 3.8.1 Storstockholms Lokaltrafik, commonly referred to as SL, is the organisation running all of the land based public transport systems in Stockholm County. Public transport in Stockholm includes metro, regional/suburban rail, light rail and tram. The Stockholm Metro consists of three groups of lines, which are each referred to as a singular line. There are three suburban rail systems, with eight lines.
- 3.8.2 The Metro is broken into three zones, A, B and C. Zone A is in the middle containing the entire Metro system, covering Stockholm City Centre and the innermost of the suburbs. Zone B covers a band outside Zone A, containing many of the outer suburbs. Zone C includes the outermost parts of Stockholm County.
- 3.8.3 There is a travel card available which is valid for a specified period of time, from 24 hours up to a year depending on the card. The travel cards are generally not affected by the zone system. There are also zone tickets available, valid for one hour after the start of the trip. Two to six tickets are required per trip depending on the length of journey. With the zone tickets, if you change to another SL public transport mode you may do so with the same

3 Fares and Ticketing in Cities

ticket, as long as the next part of the trip begins within an hour from the time that is stamped on the ticket.

- 3.8.4 There are a variety of tickets available in Stockholm, with a full and reduced price for each. The reduced price is for persons under the age of 20 or over the age of 65. The zone tickets are available as a cash ticket, pre-paid ticket, text message ticket or vending machine ticket.
- 3.8.5 A single cash ticket is **22 SEK** (£2.10) per unit. Travel within Zone A requires two units and therefore the price of a single ticket within Zone A is 44 SEK (£4.20). The equivalent pre-paid ticket is 18 SEK (£1.72) per unit. A book of 16 single pre-paid units costs 180 SEK (£17.19). Text message and vending machine tickets for 1 / 2 / 3 zones cost 36 / 54 / 69 SEK (£3.44/5.16/6.59).
- 3.8.6 Other fares include daily, weekly, season and annual tickets using a **SL Access** smart card. A one day fare is 115 SEK (£10.99) and a seven day fare is 300 SEK (£28.66). An annual card from January to December cost 7160 SEK (£783.96).

Gothenburg

- 3.8.7 Public transportation within Gothenburg (and the west of Sweden) is operated by Västtrafik and consists of trams, buses and ferries. The network consists of 12 tram lines.
- 3.8.8 A single journey ticket is **25 SEK** (£2.39) and 22 SEK (£2.10) using mobile ticketing. 1, 3 or 30 day tickets are available for purchase for 65 SEK (£6.21), 130 SEK (£12.42) and 435 SEK (£41.55). A blue card called the Västrafik card is charged with ticket information. You can also get a five trips card, valid for exactly five trips for 87 SEK (£8.31). Using a pre-paid ticket, if you travel within one zone a fixed price of 16.50 SEK (£1.58) is deducted from your card.

3.9 Cities in Norway

Oslo

- 3.9.1 Oslo's metro systems is known as the Tunnelbane or T-bane. The network consists of six lines that all run through the city centre. Local trains cover certain areas of the city, and run out to the neighbouring municipalities and towns. The local train network spans across the city limits to neighbouring cities and towns.
- 3.9.2 There is cooperation within the Oslo metropolitan area between NSB and the local transportation company Ruter to give the customer opportunity to travel on all means of transportation within the Oslo metropolitan area. The cooperation is within prices (fares), ticket types, market information and timetables. Tickets for travel within the Oslo metropolitan area can be purchased from both NSB's and Ruter's sales channels and are valid on the trains of both companies. Ticket revenues are divided annually between NSB and Ruter based on number of passengers, ticket type and travel patterns. Ruter is responsible for price (ticket) levels and fare structure within the Oslo metropolitan area. Ruter uses a zone-based model with price levels lower than the price for an equivalent distance on NSB. NSB is compensated for the fare difference.

- 3.9.3 All public transport in Oslo is run on the same fare scheme, and the same tickets are valid for all modes of transport. A single ticket for Zone 1 costs **30NOK** (£3.39) when bought in advance from a kiosk or a ticket machine, and 50NOK (£5.65) when bought from a bus or tram driver. After being stamped or activated (validated), the single ticket is valid for one hour of free travel in the zone the ticket is valid for. Oslo has four other zones and the single adult fares for each are:
- Zone 2: 50 NOK (£5.65);
 - Zone 3: 70 NOK (£7.91);
 - Zone 4: 90 NOK (£10.17);
 - Zone 5: 110 NOK (£12.43).
- 3.9.4 You can also buy pay-as-you-go-credit, and pay 27NOK (£3.05) for a smart ticket, **Flexus**, for one zone. There are also period tickets available; 24-hour ticket (75NOK/£8.47), 7-day ticket (220NOK/£24.85), 30-day ticket (620NOK/£70.05, 380NOK/£42.93 with valid student ID) and 365-day ticket (6200NOK/£700.46) (all prices are for one zone).

3.10 Cities in Japan

Tokyo

- 3.10.1 Tokyo is covered by a dense network of train, subway and bus lines, which are operated by 15 different companies (two metro and 13 private railways).
- 3.10.2 The city's 13 subway lines are operated by two companies and run largely inside the Yamanote circle and the areas around Ginza and Shitamachi. Most of the many suburban train lines commence at one of the six major stations of the JR Yamanote Line (Tokyo, Ueno, Ikebukuro, Shinjuku, Shibuya and Shinagawa).
- 3.10.3 Metro fares depend on the distance travelled. For example, an adult fare of **160 yen** (£1.25) is charged for travel between one and six kilometres. This increases to 300 yen (£2.34) for distances between 28 and 40 kilometres. Coupon tickets include packs of 11 ordinary tickets for 1600 yen (£12.47). Off-peak and holiday coupon tickets are also available. Passes include one, three and six month passes for commuters and students. Transfer tickets offer you a special deduction on the regular passenger fare when transferring between some different operators and the Metro also has a special reduced fare.
- 3.10.4 **Suica** and **PASMO** are smart cards that can be used interchangeably on most trains and buses in Greater Tokyo, including JR trains, subways and other non-JR trains.
- 3.10.5 A whole variety of day passes are available for the Tokyo area. However they are not always cheaper than purchasing single tickets or prepaid cards. The Tokyo Free Kippu card is 1580 yen (£12.31), allowing for unlimited use of all subway lines (Toei and Tokyo Metro) and JR trains in the central Tokyo area on one calendar day. Many other passes are available, the cheapest being the Tokyo Metro Open Ticket (1-day: 600 or 710 yen (£4.67/5.53); 2-day: 980 yen (£7.63)) offering unlimited use of the nine Tokyo Metro subway lines, but not the four Toei subway lines and JR trains.

Osaka

- 3.10.6 The city of Osaka is served by over seven different railway and subway companies. Osaka has eight subway lines.
- 3.10.7 Osaka Municipal Subway charges fares for adult passengers based on distance travelled. For section 1, between 1km and 3km, the adult single fare is **200 yen** (£1.56). For section 5, between 20 and 25km, the adult single fare is 360 yen (£2.80).
- 3.10.8 The following one day passes are available for the Osaka area:
- Osaka Unlimited Pass (2000 yen/£15.58) provides unlimited use of subways, city buses and Hankyu, Hanshin, Nankai, Keihan and Kintetsu Railways within Osaka City on one calendar day.
 - Osaka One-Day Pass (800 yen/£6.23 on weekdays, 600 yen/£4.67 on weekends and public holidays) allows unlimited use of subways, city buses and the New Tram (but excluding the OTS Line) on one calendar day.
- 3.10.9 Smart cards include **Icoca** (from 1000 yen/£7.79), **Surutto Kansai** Card (1000/£7.79, 2000/£15.58, 3000/£23.37 and 5000 yen/£38.95) and **PiTaPa** Card (postpaid card).
- 3.10.10 There are tickets which provide unlimited travel on trains and buses in Osaka City and neighbouring areas. There is the Osaka Unlimited Pass One-Day Pass which costs 2,000 Yen (£15.58) and the Osaka Unlimited Pass Two-Day Pass which costs 2,700 Yen (£21.03) and is available for overseas visitors only. Both passes are available for adults only.

3.11 Cities in USA

New York City

- 3.11.1 The Metropolitan Transportation Authority (MTA) operates most of New York City's transit systems.
- MTA New York City Transit provides an extensive fixed-fare subway throughout the five boroughs of New York City. The subway system is one of the largest in the world.
 - MTA Metro-North Railroad provides commuter services from The Bronx, Westchester County, Putnam County, Dutchess County and southern Connecticut into Grand Central Terminal.
 - MTA Long Island Rail Road provides extensive commuter services to most of Long Island, with destinations in Queens, Nassau, and Suffolk Counties via two trunk lines and six subsidiary branches.
 - The Port Authority of New York and New Jersey operates three rail systems connecting Manhattan to New Jersey, AirTrain JFK and AirTrain Newark.
 - New Jersey Transit (NJ Transit) provides extensive commuter rail service from northern and central New Jersey to Hoboken Terminal in New Jersey and Pennsylvania Station in Manhattan.

3 Fares and Ticketing in Cities

- 3.11.2 The fare for a subway journey is **\$2.25** (£1.41). The MetroCard is the current payment method for New York City subways and buses, on which the customer electronically loads fares. With a MetroCard ticket you can pay per ride, purchase an unlimited card (7-day card for \$29/£18.18, 30-day card for \$104/£65.20, etc) or automatic top up (using EasyPay). A smart card, **SmartLink** is available.
- 3.11.3 Long Island Railroad Commuter rail fares are based on a zonal system. For Zone 1, a peak one-way trip is \$7.25 (£4.54) and an off-peak one-way fare is \$5 (£3.13). Monthly, weekly and 10-trip tickets are all available for each zone. The one-way fares increase to \$25 (£15.67) and \$18.25 (£11.44) for Zone 14.
- 3.11.4 Metro North Railroad fares within New York range from \$2.75 (£1.72) to \$11.50 (£7.21) for single fares. Metro North Railroad one-way peak fares to Harlem range from \$6.75 (£4.23) to \$28 (£17.55). Fares sold on board are more expensive.

3.12 Cities in Canada

Montreal

- 3.12.1 The Agence Métropolitaine de Transport (AMT) is the umbrella organisation that plans, integrates, and coordinates public transportation services across Canada's Greater Montreal Region. It was created in 1996, replacing the Société de Transport de la Communauté Urbaine de Montréal's (STCUM's) commuter rail service. The AMT operates Montreal's commuter rail and express bus services.
- 3.12.2 Montreal has five commuter rail lines, and one under construction. There are also four Metro lines. The Société de transport de Montréal (STM) operates both the Metro and the bus services in Montreal, and thus transfers between bus and Metro are free. Fare payment is via a barrier system, including magnetic tickets and passes, as well as a RFID card. The STM introduced the contactless smart card called **OPUS** as a means of fare payment in 2008.
- 3.12.3 The greater Montreal area is divided into eight fare zones. Starting from downtown Montreal, they stretch outwards in all directions. The first three zones are within the cities of Montreal, Laval and Longueuil only. Zones 4 to 8 are circular around the centre of Montreal. Regular, student and reduced fares are available for each of these zones. A single regular fare is **\$3.00** (£1.90), and for two trips this increases to \$5.50 (£3.48). A one-day card is available for \$8 (£5.06). The monthly fares range from \$84.50 (£53.50) for Zone 1 to \$232 (£146.88) for Zone 8. Other fares include group fares, unlimited evening tickets and 10-trips.

3.13 Conclusions for Cities

- 3.13.1 Although all cities use a zonal pricing system; some have a single zone, others a system based generally on concentric rings.
- 3.13.2 Approximately 60% of cities considered only sell multi-modal tickets, the remaining 40% have the option of rail-only tickets.

3 Fares and Ticketing in Cities

- 3.13.3 Almost all cities use some form of smart ticketing, although in some cases this is only for season tickets. All expect smart ticketing to take a larger role, with The Netherlands having a plan to phase out all other tickets.
- 3.13.4 Several cities charge more for using paper products, with London having a large price differential, although only a minority of passengers pay the higher fare. Apart from paper tickets in London, the Scandinavian cities have the highest fares (with their high national GDP). London with Oyster is towards the top of the range of other cities.
- 3.13.5 Few cities have differential peak and off-peak fares, and none have three-tier pricing.

4 National Network Fares

4.1 Introduction

- 4.1.1 This chapter considers fares in the different countries focussing on long distance and regional travel. It begins by looking at the fare structure, and then fare levels, availability of tickets and then railcards and other discount schemes.
- 4.1.2 The information provided in this chapter is gathered through the interviews detailed in Table 1.1 and web based desk research, including browsing operators' websites.

4.2 Fares Structure

Market Segmentation

- 4.2.1 It is important to distinguish between long distance, regional and urban travel. Within an urban setting it is likely that most rail customers are commuters, travelling to work Monday to Friday. For longer distances, most customers are either business people travelling inter-urban distances or leisure/tourist passengers. More detailed market share information is not readily available for the markets considered.
- 4.2.2 In France and Spain there is currently a high use of market segmentation. There are different passenger groups (young people, families, workers, retired people etc.) and within a group there are different levels of price. The price depends on:
 - The passenger group;
 - How far in advance you buy your ticket;
 - Your destination;
 - Route of train; and
 - Type of train e.g. high speed trains or regional services.
- 4.2.3 While most countries recognise that there are different markets using the rail services, this is generally reflected in advance purchase tickets targeted at the leisure market e.g. France, Germany, Sweden, Norway and the USA. Some other examples of the use of market segmentation in other countries are as follows:
 - In France, peak and off-peak walk-up fares are used, in part for demand management but in part for higher prices for business travellers;
 - In Sweden, discounts on fares are available for large organisations, young people and students, and families;
 - In the Netherlands, NS has two parts to its business: "business to business" which considers commuters and business trips, and "business to commuter" which considers off-peak trips, mostly leisure traffic; and
 - In the USA, North East Regional tickets are primarily targeted towards leisure travellers and price sensitive business travellers, with Acela tickets, the higher speed product, targeted towards business travellers.

Peak Hours and Busy Periods

- 4.2.4 The busy periods of a service generally depend on its main purpose, e.g. commuting, business or leisure. For most urban and inter-urban services the peaks are in weekday mornings and evenings, i.e. before and after the standard working day. For longer distance services the peaks are mostly Friday evening and Sunday evening, i.e. those travelling away for the weekend. Where "peak" and "off-peak" fares are in operation, these may not coincide with the busiest travel periods, for example, peak ticket fares in the UK are applied on weekday mornings (and in some cases weekday evenings), but for long distance travel, there is greatest demand on some routes at the weekend. This section considers both peak demand (busy periods) and peak fares in the different rail markets.
- 4.2.5 For example, in the cities in the Netherlands (which has no considerable long distance) there are two peaks, between 07:00-09:00 and 16:00-18:00. Along the North East Corridor (USA), Sunday afternoons, Monday mornings, Thursday afternoon and almost all day Friday are peaks, reflecting the long distance nature of rail services in this region. However, in Spain there is generally one peak in the morning (07:00 – 09:00) and two peaks in the afternoon (14:30 – 16:00 and 19:00 – 20:30), with the main peak being in the morning. A siesta culture exists in Spain, where many workers take a long lunch break, perhaps going home during the day, thus explaining the double afternoon peak.
- 4.2.6 In Sweden, there are high passenger flows into Stockholm on a Monday morning and out of Stockholm at the end of the week with Friday evening and Sunday afternoon/evening also having high flows into and out of cities. For commuting flows, peaks are into the city in the morning, and out of the city in the evening.
- 4.2.7 In Norway, the peaks vary. For long haul, there are seasonal factors, with higher demand in the summer holiday period. For short regional trips, many of the passengers are commuters and therefore there is a higher demand Monday to Friday around the working day.
- 4.2.8 In Japan, the busy periods are 06:00 – 09:00 and 17:00 – 20:00 during the weekdays, and after 20:00 at weekends.
- 4.2.9 Many companies use pricing concepts to increase loading on off-peak trains where they might have cheaper tickets to encourage off-peak travel. Some companies also have subscriptions to encourage customer loyalty to the company. The table below details the time of day fare differentiation for walk-up fares used in each country.

Table 4.1 Peak versus Off Peak Fares

Country	Peak V Off-Peak Fares
France	Cheaper off-peak fares are available.
Germany	For regional travel there are elements of off-peak pricing with cheaper tickets for some weekend and regional fares and reduced family and small group tickets (up to five people) in the weekday off-peak period (09:00 – 03:00 the next day).
Spain	For public services, there are no differences between a peak and off-peak period. For commercial services, there are more discounts during the off-peak period.
The Netherlands	There are two fares, peak and off-peak. Currently off-peak operates after 09:00, but with the introduction of smart cards planned in the next two years, there will be the option for off-peak fares to be excluded in the evening peak as well.
Sweden	Demand management is carried out on a per train basis using pricing strategy, so fares increase when there is more demand for a train, regardless of whether the train is travelling in the peak.
Norway	The standard fare is the same regardless of whether you are a commuter passenger travelling in the peak or leisure passenger travelling off-peak. However, NSB are considering having concessions which would encourage off-peak travel.
Japan	There is no differentiation in fare price by time of day.
United States – North East	Demand management is carried out on a per train basis using pricing strategy, so fares increase when there is more demand for a train, regardless of whether the train is travelling in the peak.

Advance Purchase

- 4.2.10 Most countries with sizable rail networks have cheaper advance purchase to some degree as a form of yield management. The system used in the USA and Spain is totally dynamic, whereas others are simpler. Sweden has had a dynamic system since 2005, and passenger volumes have increased significantly since this time. For some countries, this is supplemented by seat bookings so that trains are not overbooked. The table below includes a description of advance purchase fares available, and whether seat reservations are available and/or required. Some countries only sell as many tickets for a specific train as there are seats (Spain for high speed, regional high speed, long distance and regional trains, Sweden for long distance trains, some Japan express trains, and US North East trains), but the remaining markets do allow more passengers to purchase tickets than there are seats on the train, hence there is the possibility of standing passengers. In the case of French TGV services, the principle is that all seats are reserved; however, in the case of a train being

full, you are allowed to purchase a ticket to travel on the train knowing that you will probably have to stand (or sit in one of the few tip-up seats), unless someone does not use their reserved seat.

Table 4.2 Advance Purchase and Seat Reservations by Country

Country	Advance Purchase Discounts	Seat Reservations
France	The price depends on how far in advance you buy your ticket. Generally, the earlier you book your ticket, the cheaper the ticket. 9% of travellers book their tickets more than two months before travel, 14% between 1 and 2 months before travel, 28% between 10 days and 1 month before travel, and 50% between 0 and 10 days before travel. It is also possible for passengers to pay a sum of money to SNCF to allow fixed prices on services, independent of how early your ticket is booked.	For TGV you are generally required to have a seat reservation although there are exceptions – you can book on a full train knowing you may have either to stand or use a tip up seat. For TER (regional services), seat reservation is not required.
Germany	For long distance travel, there is a minimum fare of €29, then steps of €5 as demand for a service increases and as the departure date approaches to encourage people to purchase their tickets in advance.	Seat reservations are not compulsory.
Spain	There are commercial discounts for tickets booked in advance, of up to 70% discount depending on available seats and number of days in advance ticket is booked in order to stimulate the demand (yield management). The number of discounted tickets available changes depending on day of week (but price does not) e.g. more discounted seats available in business class during holidays.	Seat reservations are compulsory on high speed, regional high speed, long distance and regional trains.
The Netherlands	No discount for tickets bought in advance.	No seat reservations available, only for international travel
Sweden	Fares are fully flexible with prices increasing as demand for a service increases. This price system allows fares to be lowered in order to stimulate demand and make every train full as far as possible.	On the faster trains, you have to buy a seat to travel. On other long distance trains, you do not have to buy a seat, but the tickets sold per train are limited by the number of seats available.

Norway	<p>Mini fares are a demand driven concept. The seats are allocated based on peak/ off-peak. For example, on the long haul routes, they would be higher demand Friday to Sunday, and therefore fewer mini fares. And they would have a lower demand on Tuesday, Wednesday and therefore more mini fares. They dynamically change the allocation of mini fares. This is the only area that currently is dynamic.</p> <p>There are a series of pricing points 199, 299, 399 and 499 NOK. An amount of each are allocated to each train. Based on demand, the amount of each level will be changed up to departure.</p>	<p>Seat reservations are available for long distance regional trains, but not for local/ short distance regional trains.</p> <p>You are able to book a ticket on short distance regional trains but you do not get a seat. On local services there is no limit to the number of people using the trains, with people able to stand in the corridors.</p>
Japan	No discount for tickets bought in advance.	Some express trains are all reserved, but some have non-reserved seats. Sleeping-car trains are all reserved. Other trains have only non-reserved seats.
United States – North East	Advance purchase is available 335 days before departure. With dynamic pricing, the fares go up as more tickets are purchased closer to departure. There are five 'buckets' on coaches for long distance. For example, Amtrak might decide the best way to sell tickets is to put an equal number of seats in each, with the first 20% selling at the lowest price, then the price increasing to the next lowest price. Demand is projected for each train, and an inventory is allocated to that train. If sales are not materialising as forecast on a particular train, then tickets will stay at the lowest price.	No seat reservations are available, but tickets will not be sold if the train is already full.

- 4.2.11 In Britain, the full fare is relatively expensive but there are normally discount fares on offer with the use of Railcards and advance purchase tickets, with only a minority of travellers paying the full fare for long distance travel.
- 4.2.12 In the airline industry, the fares shown when purchasing a ticket are generally the cheapest fares available, whereas in the British rail industry, all relevant fares are generally provided. Mark Smith (of Seat61.com) suggested that "*we should try to distance ourselves from the idea that the 'normal' fare is the full fare when very few people actually pay the full fare, and 'discounted' fares are the normal fares that people expect to find*".

4.2.13 The views of Mark Smith on fares and yield management are provided in Appendix A.

Fares Structure Summary

- 4.2.14 In summary, there is a pattern of cheap advance purchase fares being used as a form of demand management to reflect the price-sensitive leisure market and to maximise the use of off-peak services. In addition, tickets for faster trains are often more expensive to maximise revenue from the time-sensitive business travellers.
- 4.2.15 The magnitude of demand management measures vary by country, with the USA and Sweden having a fully dynamic system and only selling as many tickets as there are seats on each train. This would not be compatible with the "Anytime" fare that is currently available in the UK.

4.3 Summary of Tickets Available

- 4.3.1 Table 4.3 summarises the tickets available in each of the countries. All countries studied offer first class tickets. In the USA, along the North East Corridor, first class is offered on Acela services, which have their own rolling stock. Walk on fares are available in all countries, however these fares are generally considerably more expensive.

Table 4.3 Summary of Tickets Available by Country

Country	Advance Discount Fares available	Advance Discount Fares with/ without restrictions	Walk-on Available	Discounted Off-Peak Walk up Fares
France	✓	Non-refundable, non-transferable	✓	Yes
Germany	✓	Charge to exchange/ return	✓	No
Italy	✓	Limited changes/ refunds	✓	No
Spain	✓	Limited changes/ refunds	✓	No
The Netherlands	X	No advance discount fares	✓	No
Sweden	✓	Different fares offered: non-rebookable, rebookable, refundable – in order of price	✓ but will be a lot more expensive	No
Norway	✓	Non-refundable, non-transferable	✓ for standard, you can also purchase on train	No

Country	Advance Discount Fares available	Advance Discount Fares with/ without restrictions	Walk-on Available	Discounted Off-Peak Walk up Fares
Japan	X	No advance discount fares	✓	No
USA – North East	✓	Exchangeable, non-refundable	✓ (as long as there is a seat available)	Yes – based on demand rather than set peak/off-peak times
Canada – South East	✓	Most refundable and exchangeable for free Cheapest fare non-refundable/exchangeable	✓	No

- 4.3.2 Cheaper advance tickets are available in each of the countries apart from The Netherlands and Japan, but generally these tickets come with restrictions on changing trains or cancelling the ticket. Some countries offer a reduced off-peak walk up price, although for others, the fare changes due to demand rather than time-of-day. First class is available in all markets, with the US having specific first class trains.

4.4 Fares Levels

- 4.4.1 Desk research was carried out to obtain the range of fares for specific journeys booked a day, week, month, two months and three months in advance, for different times across the day. Up to three intercity journeys and two regional journeys were chosen within each country.
- 4.4.2 Table 4.4 summarises whether the fares changed if purchased in advance, by journey time or for different times of day for each of the countries, as well as providing the length of time in advance you can purchase a ticket. For most countries, the price of the ticket changes over time, but The Netherlands and Japan have a fixed fare. The length of time that you can purchase a ticket in advance varies considerably between countries, from around 3 months in most of the European countries, to 11 or 12 months in the US and Canada. During the interview with Ken Woodward (of NSB), it was noted that having a longer period in which to purchase a ticket allows greater competition with the airline industry, where you can often purchase up to a year in advance. However, allowing rail tickets to be sold this early in the UK may cause issues with planning for service changes or engineering works.
- 4.4.3 Some of the routes considered had variable journey times, but the fare increased as journey time decreased in only some of the rail markets, notably in France where the TGV was more expensive but significantly quicker than the TER. For standard non-flexible tickets for journeys with the same travel time, fares were generally the same at different times of day, with the UK, France and the US being the only exceptions.

Table 4.4 Summary of Fares from Desk Research

Country	Discounts Available if Ticket purchased in Advance	Length of time in advance you can buy ticket	Expensive Fare for shorter journeys (Intercity only)
UK	Yes for long distance services	83 days	No
France	Yes	3 months on average, but varies by route	Yes
Germany	Yes for Long Distance services	3 months	Yes
Italy	Yes	75 days	Yes
Spain	Yes for High Speed and Long Distance services No for Regional High Speed and Regional services	It varies between 90 to 180 days 60 days	Yes
The Netherlands	No	260 days	No
Sweden	Yes	90 days	Yes
Norway	Yes	90 days	No
Japan	No	1 month	No
United States – North East	Yes	3551 days	No
Canada	Yes	11 months	No

4.4.4 Figure 4.1 shows the average walk-on / fully flexible standard class fare and first class fare. As, the routes that have been considered have not been selected to be comparable in length, the fares have been divided by an estimate of the rail distance to give units of pence /

kilometre⁸. For most countries, the first class fare is less than 10 pence/km more expensive than the standard class fare. However, the UK is substantially greater at 26 pence/km. It is also clear from the figure, that the UK has one of the more expensive fully flexible standard class fares.



Figure 4.1 Comparison of First and Standard Class Fares

- 4.4.5 When booking a ticket for a specific train service, for some rail markets, The Netherlands and Japan, there was no choice between the standard class fares available. However, for most markets, Germany, Italy, Spain, Sweden and Canada, there were several tickets available for the same train when purchasing in advance with different restrictions on transferring or cancelling the ticket. In addition, most rail markets have a range of standard class fares available for the same origin-destination depending on which service during the day was used and how far in advance the ticket is purchased.
- 4.4.6 Figure 4.2 shows the average range of fares within each country for the Intercity journeys considered, and Figure 4.3 shows the average range of fares within each country for the regional journeys considered. Again, the fares have been divided by an estimate of the rail distance to give units of pence / kilometre.

⁸ Crow fly distances were multiplied by 1.3 for the intercity journeys and 1.2 for the regional journeys, as these were the average ratios of the UK crow-fly to rail distances for the journeys considered.

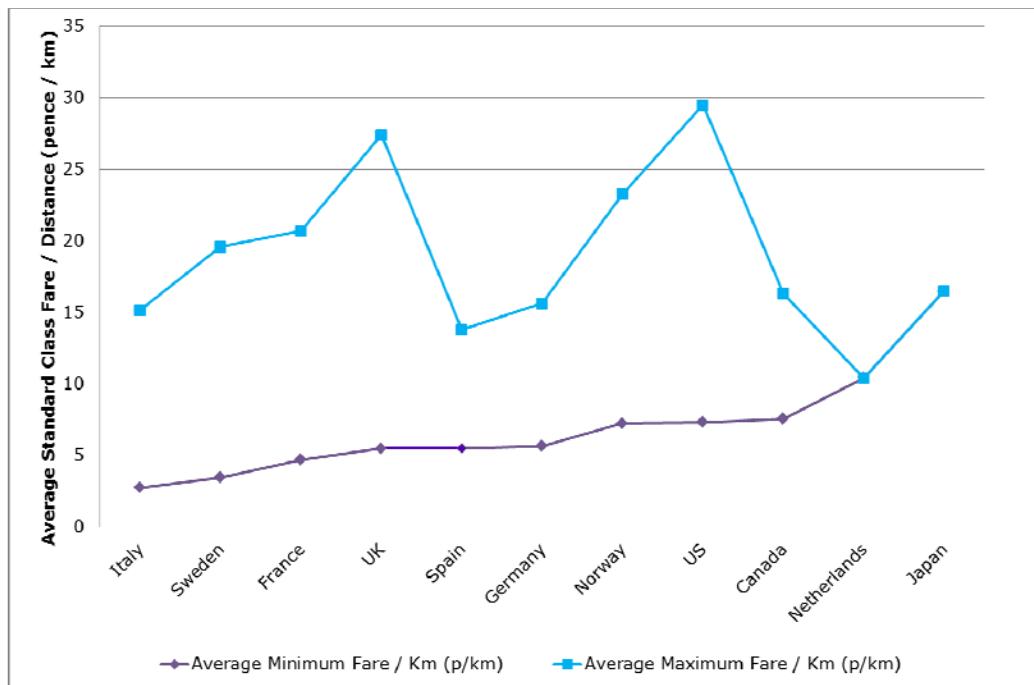


Figure 4.2 Range of Standard Class Fares Available (£'s) for Intercity Journeys Considered

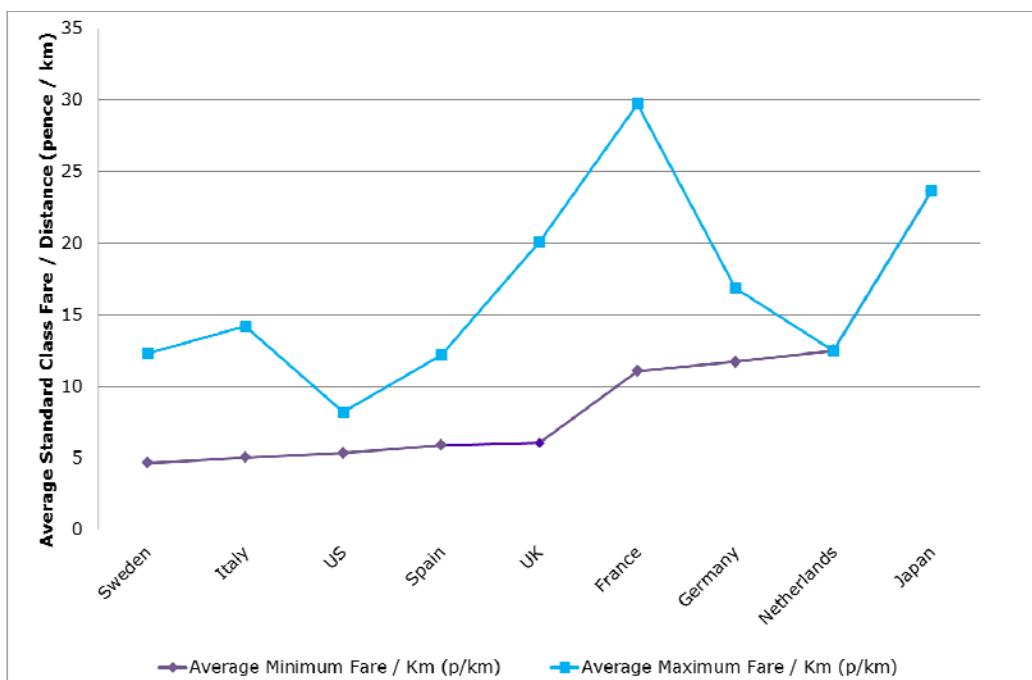


Figure 4.3 Range of Standard Class Fares Available (£'s) for Regional Journeys Considered⁹

- 4.4.7 For The Netherlands and Japan there is no variation in the standard class fares available, and the average fare per kilometre for these two countries is higher than the minimum fare per kilometre for each of the other countries considered, although lower than the maximum fare per kilometre for some of the countries. For other countries, there are a wide range of standard class fares available depending on how far in advance the ticket is booked or what

⁹ Note that the analysis was not carried out for regional journeys in Norway and Canada

particular service is used for each route. The intercity fares generally have a wider range of fares per kilometre than the regional fares. The UK has a relatively low minimum fare per kilometre compared to the other countries, but has one of the highest maximum fares per kilometre, with the US having the highest fare per kilometre for Intercity journeys, and France for regional journeys for the journeys considered in this analysis.

- 4.4.8 Table 4.5 shows the average ratio of maximum standard class fare to minimum standard class fare. The ratio of maximum fare to minimum fare available for the UK journeys is the second highest for intercity journeys and the highest for regional journeys. France, Italy and Sweden also have high ratios, indicating a wide range of fares are available for the same journey depending on when the ticket is purchased and ticket restrictions.

Table 4.5 Average of Maximum Standard Class Fare Divided by Minimum Standard Class Fare for each Country¹⁰

Country	Intercity Average Ratio	Regional Average Ratio
Canada	2.2	
Spain	2.5	2.1
Germany	3.1	1.6
Norway	3.5	
US	4.1	1.5
France	4.6	2.8
Italy	5.9	2.8
UK	6.1	3.5
Sweden	6.2	2.7

- 4.4.9 As part of the interviews, Mark Smith was asked about the ease of understanding for customers for the different fare systems (see Appendix A for further details). He indicated that there was a trade-off between a sophisticated pricing system that generates the greatest amount of revenue, and a system that is fair and easy to understand for customers. This view is illustrated in the fare comparison analysis, with The Netherlands having one of the simplest systems to understand with constant fares for each journey, but as there are no discounts for advance purchase or off-peak travel, The Netherlands has a relatively expensive average fare per kilometre. Conversely, those countries which operate a complicated fare structure, with many fares available for a specific train depending on when the ticket was purchased, have a cheaper average fare per kilometre available for passengers booking early in advance of travel.

¹⁰ Note that The Netherlands and Japan are not included in this table as only one standard class fare is available.

- 4.4.10 In summary, the fare analysis has shown that the range of tickets and fares available in the UK is in line, although having one of the larger ranges of fares, with the other markets considered.

4.5 Availability of Tickets

Availability of Walk Up Tickets before Departure and On-train

- 4.5.1 Some countries allow the purchase of tickets on-train, others do not. Some countries charge extra to purchase on trains:

- In France, it is possible to buy a ticket on board a train, but it will be considerably more expensive.
- In Germany, walk-up fares can be purchased on-board long distance trains but there is a surcharge. For most regional and suburban trains, tickets have to be purchased before boarding the train.
- In Sweden, you can buy a ticket on-board the train, but this will be the full price ticket as well as an on-board sales charge.
- In the Netherlands, it is possible to buy a ticket on train.
- In Spain, there is access control for high speed, regional high speed and long distance trains. It is possible to buy tickets on regional and commuter trains from stations without a ticket office; otherwise, there is a surcharge.

Advance Purchase Fares

- 4.5.2 Similarly, countries treat the advance purchase of tickets before departure differently:

- In France, it is possible to buy your ticket around 3 months in advance, but this varies by route. Groups are able to purchase their tickets 120 days in advance. The 'prems' fare is only available at least 14 days before departure.
- In Germany, long distance fares can be bought three months in advance of the day of travel and are available up to three days before the day of travel for long distance journeys.
- In Spain, reservations are open 90 days before day of travel, and end 10 minutes before departure of the train.
- In the Netherlands there are no discounts for advance purchase.
- In Sweden, cheaper tickets are available 90 days before the day of travel and generally up to the time of departure (the exception being the regional area around Stockholm).
- In Norway, the ordinary fare can be purchased on the same day of travel. However the mini fares have a minimum one day advance purchase window. NSB are considering taking away the advance purchase on the higher mini fares because if you buy a ticket on the day of travel and only the ordinary fare is available, in many occasions this is actually higher than an air fare for the same journey. Norway has a 90 day ticket release system.

- In Japan, there are no discounts for advance purchase.
- In the USA, reservations are open 355 days before day of travel until time of the train departure, so long as there is a ticket remaining on that train.
- In Canada, advance purchase tickets are available from 11 months to up to the day before travel.

Scope to Change Train/ Cancel Ticket

- 4.5.3 Differences in the scope to change tickets or cancel tickets before departure are as follow:
- In France, there are no changes or refunds with the 'prems' fare (which is only available up to 14 days in advance).
 - In Germany, it is possible to change your ticket before the time of travel, but there is a surcharge of €15 and you will have to pay the difference in price. Cancellation of the ticket without surcharge is possible before the first day of validity or under the Passenger Rights Regulation (PRR).
 - In Spain, if you want to change ticket for a more expensive train then you are charged the difference in fare. Fares are checked before boarding trains so it is difficult to get on the wrong train. However, if you are on the wrong train, then if it is believed that you are intentionally travelling with a cheaper ticket, you have to pay a fine.
 - In Italy, the 'mini' was available up to June 2012, which was changeable up to a day in advance to a later train but not an earlier one. This has recently been replaced with Super-Economy fares (no refunds, no changes) and Economy fares (no refunds, may be changed before departure of original train).
 - In the Netherlands, it is possible to change your ticket or obtain a full refund if the ticket is purchased more than a day in advance of travel.
 - In Sweden, there are three types of tickets available (in ascending order of price): non-refundable, non-rebookable ticket; rebookable ticket (based on the cheaper fare but with an add-on for being able to rebook); and fully refundable, rebookable ticket.
 - In Norway, the standard fares are fully flexible so you can change them and/or get a refund. The mini fare is non-refundable and you cannot change them.
 - In the USA almost all fares are fully exchangeable, although if the new ticket is more expensive, the passenger will have to pay the difference. There is a refund penalty that applies. There are some tickets that are non-refundable, but they will still be exchangeable for the value of the ticket. With connecting trains, you are allowed to get on the next available train if the first train is delayed at no extra charge.
- 4.5.4 In the interview with Mark Smith, he mentioned that in Europe, all tickets are issued subject to the International Convention for the Transportation of Passengers (CIV). This should mean that if you miss a train because the previous train was late, you are entitled to continue your journey at no additional cost irrespective of the operator involved. However, due to changes in the way that people purchase tickets, with rail legs for the same journey often bought separately in order to get the best price, it is ambiguous whether CIV still applies. Mark believes that CIV protection should be updated to be made more relevant to current ticket purchasing methods.

Ease of Booking Journeys for Long Distance Journeys in Different Countries

- 4.5.5 During the interview with Mark Smith, booking rail tickets for travel across different countries was discussed. Previously, with TCV tickets (Tarif Commun pour Voyageurs - Common Fare for Passengers), every national operator gave every other national operator a list of distances between stations and a tariff per km rate every year so that it was easy to see how much the journey would be in each country. Now most operators have their own yield managed fares that are only accessible from its own booking system. There are limited links between each country's system, and it is not always possible to purchase the cheap advance fare tickets through a single website. In addition, there are now competing operators on the same route within a country and so you may need to check the fares of all operators that offer the same journey.

Availability of Tickets Summary

- 4.5.6 In summary, tickets are generally available about three months in advance of travel in Europe, but around ten months in the USA. Tickets can normally be purchased on the day of travel, and in many countries on board the train, although this will be more expensive. The ability to change train in some countries depends on the type of tickets purchased, although in others, such as Germany, a surcharge is applied; this is similar to the British situation.

4.6 Discount and Loyalty Schemes

- 4.6.1 Many of the markets offer Railcards or other discount schemes, either to increase revenue from specific groups of people, or as social schemes. A summary of Railcards offered in each country is given in Table 4.6.

Table 4.6 Railcards and Discount Schemes Available by Country

Country	Discount Schemes
France	For the inter-urban and classic networks, discount cards are available for young people between 12 and 25, senior citizens, for people between 26 and 59, children under 12, families with 1 or 2 children under 18 and families with 3 more children under 18. A new fidelity programme is being launched for children under 12 (carte de reduction Enfant+), young people between 12 and 25, people between 26 and 59 (Escapades) and for people older than 60.
Germany	There is a whole family of discount schemes which are commercial. For example, the BahnCard 50 costs €240 for second class and gives 50% off rail travel (although is not valid with Saver fares). Children, students under 27 and senior citizens over 60 pay half price for their BahnCard 50. Similarly, the BahnCard 25 costs €59 for standard class, and gives a 25% reduction off full fare tickets and saver tickets for a year.
Spain	Social discounts (old people, young people, families with more than 3 children) – value of discounts depend on day of travel (Mon-Thurs vs Fri-Sun)

	Commercial discounts (groups over 3, return, in advance, free under 4 years old, large companies, hotel + train or car+ train) are available.
The Netherlands	There are special tariffs for children under 12 accompanied by an adult (after 09:00 and all day Saturdays and Sundays). There is a discount card for people aged 60 or over which provides seven free tickets for use throughout the year, along with the normal 40% discount (after 09:00 and all day Saturdays and Sundays). Other discounts include a travelling together reduction – travel card for four people with a 40% discount (after 09:00 and all day Saturdays and Sundays). Additional discounts are available to the employer in the order of 2-5% if employees buy their tickets through their employer (annually or monthly). There is a different pricing system for students, with the student ticket paid for by the government (smart cards active for five years unless you fail exams).
Sweden	For regional markets, there are monthly cards, 10 ticket cards and six-monthly cards. For long distance, the main product is an annual card differentiated by first or second class.
Norway	NSB have 30 day tickets, 7 day tickets, 30 day tickets for students and annual tickets. They also have an old customer card concept which has not been marketed in the past 10 years and most customers are not aware of it. You pay a fixed fee subscription and then obtain a 30% discount of all ordinary fare travel. The volume of customers using this has decreased. They have recently decided to reduce this discount to 20%, but you will still pay the same fee. This concept will probably be phased out.
Japan	Commercial discount tickets are available for families and senior citizens. These vary by railway company.
United States – North East	Student and OAP discounts are available with ID for leisure services all day, although this may change to off-peak only in the next few years. Veteran (military) discounts are also available up to the day before departure.

4.6.2 In some countries, loyalty schemes are available which encourage loyalty to the railways in that country. Examples of these include:

- The Netherlands has a number of subscriptions which give a 20-40% discount on rail fares, off-peak only;
- Amtrak have a points scheme similar to a frequent flyers points system;
- The 'Grand Voyageur' programme is the SNCF loyalty scheme for business travellers, with loyalty points available to be collected and traded in for tickets or other gifts;
- Germany has a national railcard you can buy which gives a 25% - 50% discount on the regular fare, and can be used in both the peak and off-peak; and
- France also has a card you can buy which gives you a 50% discount on rail fares.

- Spain has a loyalty card linked to a credit card that has already gained more than a million subscriptions. You can obtain free tickets or other services from associated companies depending on its use.
- 4.6.3 Ken Woodward mentioned during his interview that airlines within Norway offer loyalty points to customers on routes within Norway, and that this needs to be considered by NSB because of the direct competition with airlines on longer distance routes.
- 4.6.4 The UK provides discounts to regular users of specific types through the use of Railcards to encourage travel; these have some restrictions in place at peak times. The groups of people eligible for these Railcards, aged 16-25, groups travelling with children, and over 60's, are similar to the types of discounts available in other markets.
- 4.6.5 The UK does not offer a loyalty scheme comparable to those in France or Germany which is available to everyone. Previous research¹¹ indicated that such a scheme would not generate sufficient additional demand to offset the reduction in revenue that would be obtained from passengers who would use the scheme but would have travelled at the full fare without the scheme.

4.7 Yield Management

- 4.7.1 Amtrak are looking at implementing a new forecasting system in the next few years that delivers information on how to optimise revenue. Their view is that there appears to be no good rail management solutions for forecasting, due to the number of combinations of origin-destination trips compared to air. Amtrak have been working with vendors to find a system that provides a balance between model specifications and reliable results, as well as giving sufficient information to manage departures. Initially, this system would be used to help Amtrak change their fares, and in the longer term, encourage more people to move to the shoulder peak and bring in more revenue per available seat mile.
- 4.7.2 Spain has implemented yield management for high speed services and it is being assessed as to whether to roll it out to regional high speed, long distance and regional trains.

4.8 Conclusions

- 4.8.1 Most countries use some form of market segmentation in setting fares, generally targeting business and leisure travellers. In some markets reduced fares are available for off-peak travel, but in others such as the United States, the fares are based purely on demand, and so there will be lower fares where there is less demand regardless of the time of day.
- 4.8.2 There is also a distinction between intercity and regional train services, with several countries only offering Advance (yield managed) tickets on the intercity services. Often regional services have a much simpler fares structure.

¹¹ 'Evaluating the Impacts of a National Railcard', European Transport Conference 2005, P Le Masurier, J Segal, MVA Consultancy; D Medrisch, Strategic Rail Authority

- 4.8.3 Most countries use some form of demand management in setting their advance purchase rail fares, with varying levels of sophistication. Seat reservations for all tickets appears to be a useful way to ensure trains are not overloaded, but may prevent walk-up fares being available for all services, and so would not necessarily be compatible with the "Anytime" ticket. This may also cause issues if a train is cancelled for some reason.
- 4.8.4 If the UK were to consider a fully dynamic fare system on long distance services, there would need to be a requirement to only sell as many tickets as seats available, and it would not be possible to sell fully flexible tickets without a train reservation; however, such reservations could be changed.
- 4.8.5 The range of standard class fares available for specific routes in the UK (i.e. for the cheapest advance purchase ticket compared to an Anytime ticket) is at the top end of the range of fares available in other countries that practice demand management, but not exceptional.
- 4.8.6 The length of time in advance you can purchase your ticket varies by country, with around three months being standard in European countries, but 10 or 11 months being used in the US and Canada. However, it has been noted that if you want to compete with airlines, you should be able to purchase a ticket more than three months in advance.
- 4.8.7 Discount schemes are available in most countries, although some of these are state-imposed rather than to generate revenue. Loyalty schemes have also been introduced to encourage greater rail travel; however, it is not clear that if introduced in the UK, these would generate revenue as well as travel.

5 Ticketing

5.1 Introduction

- 5.1.1 This chapter considers the available methods for purchasing a ticket in the different rail markets and how you are currently able to receive tickets. The chapter also considers new technology that has been introduced in the different markets and technology that is likely to be introduced in the future.
- 5.1.2 The information presented in this chapter has been obtained from the interviews with industry experts in the UK and the different markets, and therefore information from some countries is missing as it was not possible to interview a relevant industry expert. Full details of the interview responses are provided in Appendix A.
- 5.1.3 The information presented in this chapter focuses on regional and long distance ticketing rather than ticketing in urban areas.

5.2 Purchasing Channels

- 5.2.1 All countries considered have ticket purchasing channels on the internet, at the station ticket desk and station ticket machine. Some countries also use additional purchasing channels such as telesales, travel agents, on board trains and discounts in shops. Norway and the US (Amtrak) have also introduced ticketing on mobile phones.
- 5.2.2 In most cases, ticket prices do not change by the different purchasing channels but there are some exceptions. These exceptions are generally related to encouraging passengers to purchase their tickets through automatic channels in order to reduce the use of the more expensive manual channels. For example, in Spain and the US, there are sometimes cheaper fares that are only available online, and in Norway, a surcharge is introduced if you purchase your ticket on-board the train or for mini-fares (advance purchase only) through manual channels. In Japan, there is a special internet discount price only available on the website.
- 5.2.3 The purchasing channels by country are summarised in Table 5.1.

Table 5.1 Summary of Current Ticket Purchasing Channels by Country

Country	Station Ticket Desk	Station Ticket Machine	Internet	Telesales	Travel Agents	Other
France	✓	✓	✓			✓ – on board trains, mobile ticketing
Germany	✓	✓	✓	✓	✓	✓ – mobile, on board trains, sales outlets for monthly and annual passes
Spain	✓	✓	✓	✓	✓	✓ – mobile, on board trains
The Netherlands	✓	✓	✓			✓ – sometimes special discounts in shops
Sweden	✓ – about 25 stations have ticket desks	✓	✓	✓	✓	
Norway	✓	✓	✓	✓		✓ – mobile ticketing, on board trains
Japan	✓	✓	✓ - not regional railway	✓ - not regional railway	✓	✓ – mobile ticketing, on board trains
United States – North East	–	✓ – card only	✓	✓	✓	✓ – mobile ticketing

- 5.2.4 There are a variety of methods used in different countries for receiving tickets purchased on the internet. Some of these are similar to the UK, through post, station ticket office and printing the ticket at a station's ticket machine, but some countries have introduced print at home capability and mobile phone ticketing.
- 5.2.5 In the Netherlands, you can print your ticket at home but must show ID with your ticket on the journey, whereas in the US, a bar code is provided on print at home tickets. In Norway, for tickets purchased over the internet, the ticket can be printed at the station through entering your mobile phone number and credit card number. Mobile ticketing is also available through using an application on a smart phone; when purchased, the ticket is stored on the phone. A similar mobile ticketing application is available in France.
- 5.2.6 In Germany it is possible to print at home with bar code and supervisory audit elements or have a bar code sent to the passengers' mobile phone. Sweden also operates mobile ticketing, and some internet booked tickets in Japan can be downloaded by mobile phone.
- 5.2.7 In Spain, when you buy a ticket on the internet you can get a code, a bar code and/or a bidi code (mobile ticketing). It is possible to print the ticket at home, at the station ticket office or at station vending machine at any time, or to consider your bidi code as ticket.

5.3 New Technology for Tickets

- 5.3.1 The main technology that is being used, or is being considered for introduction in the next few years, are smart cards and mobile phones. The main reason for implementing new technology is to reduce the use of ticket offices for ticket sales, and therefore reduce costs.
- 5.3.2 During Mark Elliott's interview, he discussed the difficulties in moving away from a paper ticket base. He thought that introducing technology requires a change in culture. He also thought that technology may not be the solution for fares policy in the UK, the primary issue is getting the policy right for customers. Mark described the different issues that may influence a country to move towards electronic payment: TrenItalia are concerned with reducing fraud, and the Dutch business case for going to smart cards nationally was centred around security and putting gating on stations.
- 5.3.3 This remainder of this chapter considers the usage of Smart cards and mobile ticketing.

Smart Cards

- 5.3.4 Smart cards are most useful for short journeys as the high price of long distance travel means that loading a card with credit for "pay as you go" travel could prove difficult. As discussed in Chapter 3, many cities have introduced a smart card scheme. However the take-up at a national level is much lower.
- 5.3.5 In the Netherlands, where rail caters for mostly urban or shorter distance inter-urban travel, smart cards are a feasible ticketing option and NS is in the process of implementing a smart card system. Currently around 750,000 smart cards have been given to students. The system is due to be expanded in the next two years so that smart cards will replace tickets. Consideration is still being given as to whether a disposable smart card will be used. It is unsure whether money will be loaded onto a machine or there will be automatic top-up, but the card will operate as pay as you go, ie you would swipe the card at your origin and

destination station and the fare would be deducted from the card.

- 5.3.6 Norway are also considering introducing a smart travelcard concept for their metropolitan area.
- 5.3.7 Germany uses smart cards in regional or urban travel, but as there is no gated system, the smart cards are mostly used to replace the traditional monthly paper ticket but there is little intelligence in the card.
- 5.3.8 In Japan, more than 36 million "Suica" JR East smart cards have been issued. These are widely used for public transportation (including railways, subways and buses), but also at shops in stations and on street in most of Japan's main cities. JR East has a subsidiary credit card company, who issues their in-house credit card with the VIEW brand and co-branded cards jointly with international credit card companies VISA/Master/JCB. These credit card holders can also use it as a Suica and use an auto-charge system (when the card's balance is insufficient, a predetermined amount of money is automatically added to the card at the moment of passing through the ticket gate).
- 5.3.9 In Spain there are three types of integrated smart cards: as a transport ticket, as a means of payment and a third type that is a mixture of both. These smart cards are read at turnstiles at stations and by staff on board trains. This system is used in regions in which Renfe has arranged an agreement with local authorities and smart ticketing can be used on buses, trams, trains and other means of transport within that region. Renfe participates in 15 local and regional consortia of this kind and in all cases has developed technology and methods for adapting these tickets to local requirements.

Mobile Ticketing

- 5.3.10 The use of mobile ticketing varies widely by country.
- 5.3.11 In the United States, mobile is a fast growing sales channel with an iphone app, android app (later this year) and mobile website. All of these will support electronic ticketing, and you will be able to use your phone to show the bar code of the ticket. Sweden, Spain and Norway have also successfully implemented mobile ticketing.
- 5.3.12 In his interview, Mark Elliott discussed a philosophy called the "credential model". This is where a bank card or other secure media is used for the system to identify an individual, but no ticket is on the card. The back office knows whether you bought a ticket, or can identify where you travel and then charge you at the end of the journey. This would reduce costs as you would remove the cost of the sale of tickets, but rail operators would be deferring the collection of the fare until the journey is completed, rather than at the beginning, which is a different financial model to that generally used at the moment.
- 5.3.13 Germany are in the process of rolling out a check-in check-out system, Touch & Travel, along these principles. It is currently being tested in a small number of places, and the passenger checks in and checks out at the start and end of their journey using a mobile phone, and receives an invoice after their journey. This is a ticketless system, and the passenger is tracked on the public transport network using wi-fi to synchronise the passengers' phone. For example, if you travel on a train from Frankfurt to Berlin, then caught a bus and then another bus, the system would calculate the route and price at the end of the journey. The system is currently being rolled-out, and works on all long distance

stations and other stations in select urban areas where there has been agreement with all parties. The infrastructure used is a large IT system with relatively cheap touch points at the stations.

- 5.3.14 In Japan, JR East are considering further use of smart phones, in particular for purchasing and reserving tickets for overseas customers with smart phones for middle and long-distance railway travel.
- 5.3.15 Some other operators in Asia may also be experimenting with this to reduce their costs. During the interview, Mark Elliott said that the Asian market has a higher density of mobile users and it is easier for operators to take advantage of that.
- 5.3.16 Mark Elliott also implemented a scheme with Finnish Rail last year where you can buy your ticket on your mobile phone and you receive a token for travel.
- 5.3.17 Mark Elliott believes that over time, contactless devices will become more dominant than barcodes on smart phones, as using a mobile phone requires it to be powered.

5.4 Conclusions

- 5.4.1 Many countries are moving towards electronic ticketing in order to reduce ticket office costs and reduce the opportunities for fraud.
- 5.4.2 While smart cards are an attractive idea, they are not practical for long distance travel due to the amount of money that needs to be put on the card. However, forms of payment other than pay as you go are a possibility such as the “credential model” and may be worth further consideration.
- 5.4.3 Mobile technology has been introduced successfully in some markets, and could be considered further in the UK.
- 5.4.4 During the research, there was no indication that electronic ticketing had been introduced for demand management purposes or more flexible ticket prices, although The Netherlands are considering introducing an evening peak period once smart ticketing has been introduced.

Appendix A – Interview Responses

Fares

Country	Market Segmentation
France	<p>There is currently a high use of market segmentation. There are different passenger groups (young, families, workers, retired people, etc) and within each group there are different levels of price. The price depends on:</p> <ul style="list-style-type: none">• The passenger group;• How far in advance you buy your ticket;• Your destination;• Route of train used; and• Type of train e.g. high speed trains or regional services.
Germany	<p>At the moment there is no peak pricing on long distance rail travel. A Business Bahncard for corporations has just been introduced which is more expensive and has more features than a regular Bahncard. DB have tried to differentiate between business and leisure travel.</p>
Spain	<p>There are five main services: high speed, regional high speed, long distance, regional and commuter services. Each service has its own market segmentation with the High Speed service having yield management to stimulate the demand.</p> <p>Regional High Speed service has one main segmentation: workers.</p> <p>Long Distance and regional services. There are different passenger groups (young, families, workers, retired people, etc) and within each group there are different levels of price. The price depends on:</p> <ul style="list-style-type: none">• The passenger group;• How far in advance the ticket is purchased; and• The destination; <p>Commuter services have three main segmentations: workers, students and leisure travellers.</p>
The Netherlands	<p>NS has two parts to its business: “business to business” which considers commuters and business trips, and “business to commuter” which considers off-</p>

	peak trips, mostly leisure traffic.
Sweden	<p>SJ has closed fares and public fares, with the closed fares being for specific market segments:</p> <ul style="list-style-type: none"> • Corporations / Large organisations – negotiated, but typically a discount on public prices • Youth and student fares – 15% discount • Family offer for up to two children accompanying an adult – 15% of adult price on longer distances or free on the slow trains <p>The majority of fares are public or open fares which are dynamic depending on the day of booking and day of departure. Typically the fare increases as you get closer to the day of departure, with "late" bookers being more likely to be travelling for business reasons and having a higher willingness to pay, and "early" bookers being more likely to be a leisure travellers, having a lower willingness to pay.</p> <p>SJ have fast trains which are treated as a separate product category to the standard trains.</p>
Norway	There are discounts for students, military and senior citizens.
Japan	Commuter tickets are offered at a reduced fare to commuters and students to promote railway utilisation.
United States – North East	– North East Regional tickets are primarily targeted towards leisure travellers and price sensitive business travellers, with Acela tickets, the higher speed product, targeted towards business travellers.
Mark Smith	It is important to distinguish between long distance, regional and urban travel. In particular, there is a big difference between advance purchase relating to long distance fares and commuter fares.
Mark Elliot	Accenture have done research on customer segments in mass transit rail in urban environment research with sample of 15 cities including Sydney, Philadelphia, Toronto, Washington, Chicago, HK, Singapore, Marseille, Oslo, Helsinki and London. The biggest level of segmentation was found to be in Sydney (12 segments), Amsterdam, London, Oslo, Copenhagen (8), Manchester 4, Toronto 3. They organise customers in children <9 or children <18, students, senior citizens >60, normal people fulltime - only Sydney has this segment, disabled, family segments, groups, socially support (welfare), Marseille has a day user and single trip segments which are trips but are classified as types of person. Amsterdam has 5 other segment not falling under the list above.

Country	Demand Profile Throughout the Day
France	The demand profile through the day depends on the Origin-Destination, the direction, the day, and the period. There is therefore a high degree of segmentation in the fare policy in France.
Germany	Demand profiles vary. In some urban areas there is peak demand before 09:00 and between 16:00 and 20:00.
Spain	Generally there is one peak in demand in the morning (07:00 – 09:00) and two peaks in the afternoon (14:30 – 16:00 and 19:00 – 20:30), with the main peak being in the morning.
The Netherlands	There are two peaks in demand, between 07:00-09:00 and 16:00-18:00. This relates to the high volume of urban or inter-urban travel.
Sweden	There is strong movement towards Stockholm on Monday morning and travelling out of Stockholm at the end of the week. For commuting, the peak in demand is into the city in the morning peak and out of the city in the evening peak. Friday evening and Sunday afternoon/evening are busy into and out of cities. Stockholm dominates the flows.
Norway	For long haul journeys there are seasonal factors, with higher demand in the summer holiday periods. There are also weekday factors, with higher demand on Friday and Sunday. The lowest demand is on Tuesday and Wednesday and middle demand on other days.
	For short regional journeys, many of the passengers are commuters. There is a higher demand Monday to Friday. But for leisure passengers, there is higher demand on the weekends but total load is lower at weekends. The working day in Norway is shorter than other countries - most people work 08:30 – 15:30/16:00. Therefore the interval between the morning and evening peak is shorter than other countries. The afternoon peak in demand would be 15:30 – 17:30 with a sudden decrease in passengers after 17:30. The school peak is the same as the commuter peak.
Japan	The morning rush hour is around 06:30 to 09:00 in the morning. The return rush hour is around 17:00 to 20:00 in the evening. Trains on the weekends after 20:00 are also often crowded.
United States North East	– Sunday afternoons, Monday mornings, Thursday afternoon and almost all day Friday are demand peaks due to number of people who travel to a city and work there for a couple of days. This is because most travel is medium to long distance.

Country	Key attributes of fare
France	Generally the earlier you book your ticket, the cheaper the fare.
Germany	<p>For long distance fares there are different price categories for advance fares, with a minimum price of €29, then steps of €5, as demand for a service increases and as departure date approaches, in order to encourage growth in advance purchase fares.</p>
	<p>For regional travel, there are some special fares such as "Happy Weekend" where you can have unlimited travel on trains at the weekend, or "state" tickets which can only be used within that state. Tickets are generally bought on the day of travel at the ticket vending machine.</p>
	<p>The "Spezial" ticket is based on dynamic pricing for long distance travel, but is a flat fare for regional travel.</p>
Spain	<p>For High Speed fares, the prices depend on the demand for the train.</p>
	<p>For Long Distance fares, the prices are directly related to distance.</p>
	<p>For Regional High Speed services, the prices depend on distance and the number of journeys in a period.</p>
	<p>For Regional fares, the prices are related to distance.</p>
	<p>For Commuter fares, the price is linked to a zonal system.</p>
The Netherlands	<p>Fare prices are directly related to distance.</p>
	<p>With a subscription, it is possible to get an off-peak discount, between 20% and 40% off peak prices. Sometimes there are special offers where a day ticket can be bought for €15, where this ticket can be used across the NS network, or you can buy a special offer through a big store that you can use for three months across the whole NS network</p>
Sweden	<p>Fares are fully flexible with prices increasing as demand for a service increases. Sweden have had a dynamic system since 2005, and they have increased their volumes significantly in this time. A flexible price schedule allows SJ to lower the price in order to stimulate demand and make every train full as far as possible.</p>
Norway	<p>There are no fares that encourage spreading but it is something NSB are considering in order to increase revenue. They are considering having concessions which would encourage off-peak travel.</p>
Japan	<p>Fare rates per kilometre are set, with the rates gradually decreasing depending on distance. The fare rates per kilometre are different between metropolitan railway,</p>

middle and long-distance railway and regional local railway lines. Additional charges are made for Shinkansen and other express trains, first-class cars and sleeping-car berths.

The upper fare limit is based on the principle that fares will return a profit, so this limit is set such that it is believed the price will be in response to demand. Local railway lines have the highest fare rate, then medium- and long-distance railway lines, with urban railway fares at the lowest rate.

Additional charges for sleeper and express trains are mostly at flat rates to prioritize their use for long distance travel. Advance purchase is required for some discount excursion tickets, but there are very few of these, and they are for fixed areas or fixed routes. The Normal Price is the same whenever the ticket is purchased.

United States – Fares are for a specific train, with the price dependent on demand for that train.
North East

Country	Advance Purchase Discounts
France	The price depends on how early you buy your ticket. Generally, the earlier you book your ticket, the cheaper you pay. 9% of travellers book their tickets more than two months before travel, 14% between 1 and 2 months before travel, 28% between 10 days and 1 month before travel, and 50% between 0 and 10 days before travel. Some prices are fixed and don't depend on how early you book your ticket. It is also possible for passengers to pay a sum of money to SNCF to allow fixed prices on services, independent of how early your ticket is booked.
Germany	Dynamic pricing is used with long distance tickets bought in advance of travel.
Spain	Commercial discounts are given to tickets booked in advance, with up to a 70% discount depending on available seats and number of days in advance the ticket is booked and the demand of the train. The number of discounted tickets available changes depending on the day of week (but price does not) e.g. more discounted seats are available in business class during holidays.
The Netherlands	There is no discount for tickets bought in advance.
Sweden	Dynamic pricing is used with tickets purchased in advance generally being cheaper than tickets purchased close to the day of travel.
Norway	NSB have the full standard fares and then a series of pricing points for discounted fares. The series of pricing points are allocated to each train, depending on demand and based on demand, the allocation of each pricing level will be changed up to departure. NSB do not have a sophisticated demand forecasting tool; they use a

	primitive model that considers each departure.
Japan	<p>There is no discount measure for promoting advance purchase. Normal fare is the same whenever you purchase.</p> <p>Advance purchase is limited to discount price tickets, and those tickets have restrictions of purchasing, refunding and train changing. Each discount price has its own restrictions.</p>
United States – North East	Advance purchase is available 355 days before departure. With dynamic pricing, the fares go up as more tickets are purchased closer to departure. There are five 'buckets' on long distance trains. For example, Amtrak might decide the best way to sell tickets is to put an equal number of seats in each, with the first 20% selling at the lowest price, then the price increasing to the next lowest price. Demand is projected for each train, and an inventory is allocated to that train. If sales are not materialising as forecast on a particular train, then tickets will stay at the lowest price.
Mark Smith	<p>The full fare in the UK is relatively expensive, but there are normally many other discount fares on offer. This is compared to Switzerland where it is the same fare for peak, off-peak or in advance. In the UK, most people use the off-peak 'saver' fare and only a minority, probably around 15%, ever book the full fare. Approximately 30% book in advance in Britain and get the significantly cheaper fare.</p> <p>In the rail industry, discounted fares are accepted terminology, but in airlines, the fare is just the fare. We should try to distance ourselves from the idea that the 'normal' fare is the full fare when very few people actually pay the full fare, and 'discounted' fares are the normal fares that people expect to find. Operators should lead information with their cheapest fares and not their most expensive.</p>

Country	Demand Management by Time of Day
France	Peak fares are more expensive.
Germany	<p>For regional travel there are elements of off-peak pricing. For example, in Frankfurt, you can buy a monthly pass, annual pass, weekend tickets, and after 09:00 and before 16:00 you can take your family with you for free. Single tickets are more expensive in the morning than in the afternoon.</p> <p>There has been discussion in the "Verkehrsverbünde", who organize tariffs and sales in rural areas, about whether an e-tariff can help with demand management. The development of technology certainly helps in applying demand management, but there is an issue of whether people are willing to change their behaviour and move their time of travel due to different ticket prices. The ticketing structure should be simple or passengers will not understand all the</p>

	different tariffs available.
Spain	For public services, there are no differences between a peak and off-peak period. For commercial services, there are more discounts during the off-peak period.
The Netherlands	There are two fares, peak and off-peak. Currently off-peak operates after 09:00, but with the introduction of smart cards planned in the next two years, there will be the option for off-peak fares to be excluded in the evening peak as well.
Sweden	SJ try to absorb the main differences in demand through dynamic pricing.
Norway	Other than the mini fare, the standard fare doesn't change. The allocation of mini fares changes based on demand. Fewer mini fares, in particular the cheaper ones, are offered on peak trains.
Japan	There are no usage restrictions on normal fare tickets.
United States – North East	Demand management is carried out on a per train basis using pricing strategy so fares increase when there is more demand for a train.
Mark Smith	Most countries practice yield management, however the gradation varies and is often a lot less than it is with airlines. Spain has a three tier system and Germany and France have quite a number of steps. No country has fully gone to a budget airline model of yield management or to the extreme where all tickets are non-refundable. Many have flexible and semi-flexible tickets as well as inflexible tickets.

Country	Seat Availability
France	For TGV, you are generally required to have a seat reservation although there are exceptions – you can book on a full train, knowing that you may have either to stand or use a tip-up seat.
Germany	Seat reservations are not compulsory.
Spain	Seat reservations are compulsory on high speed, regional high speed, long distance, and regional trains.
The Netherlands	No seat reservations are available in The Netherlands, only for international transport.
Sweden	For long distance rail travel there are space restrictions. On the faster trains, you

	have to buy a specific seat therefore SJ only sell as many tickets as there are seats available. On other trains, you do not have to buy a specific seat but SJ only sell as many tickets as there are seats available. On regional travel, there are some "hop-on hop-off" travellers, and so a seat cannot be guaranteed for everyone.
Norway	Seat reservations are available for long distance regional trains but not for local or short distance regional trains. You are able to book a ticket on the short distance regional trains but you do not get a seat, although NSB are thinking about changing this. On local services there is no limit to the number of people using the trains, with people able to stand in the corridors.
Japan	Some Shinkansen and other express trains are all reserved; some have non-reserved seats. Sleeping-car trains are all reserved. Other trains have only non-reserved seats.
United States – North East	No seat reservations are available, but tickets will not be sold if the train is already full.
Mark Smith	Spain, France and Italy have compulsory reservations, which are more aligned to air fares, with the ticket always having a reservation printed on it. The ticket is in the reservation system which has implications for fraud control. For Germany, Austria, The Netherlands and Switzerland, a reservation is never needed and you can arrive and purchase a ticket, albeit at full fare but in some cases at reduced off-peak flexible fare.
Mark Elliott	Some high speed operators apply reservation only airline-style bookings e.g. Italian high speed NTV, SNCF (TGV) on long distances. UK do not do this as distances are not as long and due to combining walk-on and reservation tickets.

Country	Availability of Tickets before Departure
France	A passenger can buy their ticket three months before departure on average, but it does vary by route. Groups of people can book their ticket 120 days in advance of travel. You are able to buy a ticket on board the train, but it will be more expensive.
Germany	Long distance advance purchase fares can be bought three months in advance of travel. Advance purchase tickets are available up to three days in advance for long distance journeys. Walk-up fares can be purchased on-board trains but there is a surcharge.
Spain	For high speed, and long distance, it varies between 90 to 180 days before day of travel. For regional high speed and regional travel, tickets are available 60 days

	before day of travel. Tickets can be purchased up to 5 minutes before the train's departure.
The Netherlands	Normally people buy their ticket on the day of travel at the station, but it is possible to buy up to three months in advance through specific marketing campaigns. In the future, there will be a smart card system and so no tickets will be purchased. It is possible to buy a ticket in the station. In a couple of years there will be a ticketless smart card system.
Sweden	Tickets are released 90 days before departure. You can purchase a cheap ticket until the train leaves, except for the regional area surrounding Stockholm, where on the day of departure it is only possible to purchase full price fares. You can buy a ticket on the train, but this will be the full price ticket as well as an on-board sales fee in order to discourage on board sales. SJ are thinking of removing on-board sales altogether.
Norway	Norway has a 90 day release. NSB consider this an issue when directly competing with airlines. The ordinary fare can be purchased on the same day of travel. The mini fares have a one day advance purchase requirement. NSB are considering taking away the advance purchase on the higher mini fares to better compete with airlines.
Japan	Passengers can purchase the ticket from the same date of the previous month to the time of the train departure.
United States – North East	Reservations are open 355 days before day of travel. You are able to walk up and buy a ticket for a train so long as there is a ticket remaining on that train. It will tend to be more expensive than if the ticket had been purchased in advance.
Mark Smith	<p>In Switzerland and the Netherlands where distances are relatively small, there are no advance purchase fares and all fares are equivalent of "walk-up". Over long distances, like Germany and France, there is a difference between walk-up and advance fares, with much cheaper tickets available if you book in advance. The price range is generally less than it is in Britain, although the span is getting bigger all the time. For example, three or four years ago in Italy, there was just one fare but now with high speed trains, they've progressively increased the value of the flexible anytime fare and brought in cheaper advance purchase fares. If yield management is used, there are no peaks and every ticket is for a specific train.</p> <p>In France, 'prems' fares disappear 14 days before departure, although they are often sold out before then. There are other less than full price fares that are available in France after the 14 day period. In France, on TGVs, every ticket has a reservation and therefore it is possible to have more control over fares.</p>

Country	Scope to change train/cancel ticket
France	If you took the wrong train, you will probably have to pay for a new ticket on-board for the train you boarded (although it depends on the SNCF agent that checked your ticket).
Germany	A passenger can change ticket before the time of travel for a €15 charge and the difference in price of the ticket. For passengers on the wrong train, the passenger has to pay the difference in price and a penalty charge, which depends on the term and length of the driving route and on the original ticket. If your train has been cancelled, then another train can be used instead.
Spain	If you want to change ticket for a more expensive train than you are charged the difference in fare. Fares are checked before boarding trains so difficult to get on the wrong train, however if you are on the wrong train and it is believed that you are intentionally travelling with a cheaper ticket, you have to pay a fine. There is no charge if you want to change ticket for the same date. You can cancel your ticket for a 15% charge. However, the cheapest fares is non-refundable and cannot be changed.
The Netherlands	It is possible to change your ticket or obtain a full refund if the ticket is purchased more than a day in advance of travel.
Sweden	There are three types of ticket: <ul style="list-style-type: none"> • Non-refundable, non-rebookable ticket – this is restrictive but cheaper and 80% of customers buy this ticket; • Rebookable ticket – This is based on the cheaper fare but includes an add-on for being able to rebook. If a passenger does rebook, the passenger has to pay the difference in price between the old and the new ticket (or is refunded the difference if the new ticket is cheaper); and • Fully refundable, rebookable ticket – This is the most flexible ticket, is fixed price and more expensive. You can change to any other train.
Norway	The mini fare is non-refundable and cannot be changed. The standard fares are fully flexible and therefore you can change them or get a refund.
Japan	There is no usage restrictions on normal fare tickets.
United States – North East	Almost all fares are fully exchangeable, although if the new ticket is more expensive, the passenger will have to pay the difference. There is a 10% refund penalty that applies. There are some tickets that are non-refundable, but they will still be

exchangeable for the value of the ticket.

With connecting trains, you are allowed to get on the next available train if the first train is delayed at no extra charge.

Mark Smith In France, there are no changes or refunds with the 'prems' fare. In Germany, the spezials cannot be refunded but can sometimes be exchanged. In Italy, the 'mini' is changeable up to a day in advance to a later train but not an earlier one, so you have to know you are going to miss the train before the day of departure. However, this was replaced in June 2012 with Super-Economy fares (no refunds, no changes) and Economy fares (no refunds, may be changed before departure of original train).

All tickets in Europe are issued subject to CIV (International Convention for the Transportation of Passengers). This should mean that if you miss a train because the previous train was late, you are entitled to continue your journey at no additional cost irrespective of the operator involved. In reality, some operators will claim that CIV only applies to through tickets (which do not exist anymore), in particular when asked to pay for a hotel when the last train is missed, or all tickets must have been bought as a through journey as part of a single contract from one source, which it is not possible to do to get the best price. Mark believes that CIV protection should be updated and is important to avoid passengers transferring to airplane to avoid risks.

Interviewee	Ease of Booking Journeys for Long Distance Journeys in Different Countries
Mark Smith	<p>To book long distance journeys in different countries you need to purchase your tickets separately and investigate each operator's fares. Previously, with TCV tickets, every national operator gave every other national operator a list of distances between stations and a tariff per km rate every year so that it was easy to see how much the journey would be in each country. There were two month open tickets so if you missed a train; your ticket was valid on the next train.</p> <p>Now every operator has its own yield managed fares that are only accessible from its' own booking system. There are limited links between each country's system, and it is not always possible to purchase the cheap advance fare tickets through the Rail Europe website. In addition, there are now competing operators on the same route within a country and so you need to check the fares of all operators that offer the same journey. It is getting much more complex.</p> <p>Once you understand which website to use and you understand the difference between fares, it is fairly easy to book tickets for journeys in other countries. Normally you can collect tickets in train stations and in many cases print them out at home. For journeys that cross borders, there may be an issue with obtaining a ticket, for example, if you book from Zurich to Milan, you can buy the ticket but you can only collect the ticket in an Italian train station or get it posted to an Italian address.</p>

Country	Discount Schemes
France	For the inter-urban and classic network, discount cards include young people between 12 and 25, senior citizens, discount card for people between 26 and 59, children under 12, families with 1 or 2 children under 18 and families with 3 more children under 18. A new fidelity programme is being launched for children under 12 (carte de reduction Enfant+), young people between 12 and 25, people between 26 and 59 (Escapades) and for people older than 60.
Germany	There is a whole family of discount schemes which are commercial.
Spain	Social discounts (old people, young people, and families with more than 3 children) are available. The value of discounts depend on day of travel (Mon-Thurs vs Fri-Sun). Commercial discounts (groups over 3, return, in advance, free under 4 years old, large companies, hotel + train or car+ train) are also available.
The Netherlands	<p>Discounts include:</p> <ul style="list-style-type: none"> • Special tariffs for children under 12 accompanied by an adult (after 09:00 and all day Saturdays and Sundays); • Discount card for people aged 60 or over which provides seven free tickets for use throughout the year, along with the normal 40% discount (after 09:00 and all day Saturdays and Sundays); • Travelling together reduction – travel card for four people with a 40% discount (after 09:00 and all day Saturdays and Sundays); • Additional discounts are available to the employer in the order of 2-5% if employees buy their tickets through their employer (annually or monthly); and • There is a different pricing system for students, with the student ticket paid for by the government (smart cards active for five years unless you fail exams).
Sweden	There are a number of Railcards. For regional markets, there are monthly cards, 10 ticket cards and six month cards. On long distance, the main product is an annual card (differentiated by first or second class). Travel on all these cards is unrestricted on any SJ train, although a ticket needs to be booked. In addition, there is a Gold Card which allows first class travel with SJ and all regional operators, either by train or bus (although this has a low take-up and is expensive).

Norway	NSB have 30 day tickets, 7 day tickets, 30 day tickets for students and annual tickets. They also have a customer card concept which hasn't been marketed in the past 10 years and of which most customers are not aware. You pay a fixed fee subscription and then get a 30% discount of all ordinary fare travel. The volume of customers using this has decreased. NSB have recently decided to reduce this discount to 20%, but customers will still pay the same fee. This concept will probably be phased out.
Japan	Each railway company provides its own discount rules and tickets for elderly persons & families. There is no subsidy from the Government for these.
United States – North East	Student and OAP discounts are available with ID for leisure services all day, although this may change to off-peak only in the next few years. Veteran (military) discounts are also available up to the day before departure.
Mark Smith	Several countries including Germany and Switzerland have national railcards that anyone of any age can buy (assuming you are going to make enough journeys in the year to make it worthwhile), giving a 25% - 50% discount on the regular fare. The UK has considered this but it gives a discount to regular users and not to people in cars who we might want to try to shift mode. France has Family and Senior Railcards.

Ticketing

Country	Prices Change depending on Ticketing Method
France	You can buy your ticket on-board the train, but it is more expensive ("on-board tariff")
Germany	All DB tariffs are the same on all sales channels with the exceptions of: <ul style="list-style-type: none"> • Advance purchase tickets (surcharge for station and travel agency purchase); and • Regional flexis e.g. "Happy Weekend" (surcharge for station and travel agency purchase).
Spain	Some discounts are available on internet that aren't available elsewhere. There are no booking fees on the internet.
The Netherlands	No, only cheaper when there are marketing campaigns.
Sweden	A booking fee is applied and its value depends on where you purchase your ticket, with the internet having the lowest booking fee and the ticket office / telephone having a 12% booking fee. Travel agencies can set their own booking fee. The number of offers available by ticket vending machine is restricted, and last minute tickets cannot be purchased at the ticket office / telephone.
Norway	Mini fares bought through the manual channel have a surcharge; otherwise all fares are available through all channels. You can purchase your ticket on train but there is a surcharge to discourage this.
Japan	The ticket can be purchased at the same price at any sales channel. However, there is an internet special discount price only available on the website. It is a special campaign aimed at increasing internet sales.
United States – North East	No, although there are sometimes promotion fares that are only available online.

Country	Ways of receiving Internet Tickets
France	You can print your reservation code at home (E-billet) and also print your ticket in the station at ticket machines. When you buy your ticket on the internet, it is very useful for SNCF so that they can warn you by email or mobile phone if the departure time changes.

Germany	Print at home, station ticket office, station vending machine, post, bar code sent to mobile phone. There is a check-in check-out system, Touch & Travel (ticketless), where you touch in and out and have a receipt on your mobile and then you receive an invoice.
Spain	In Spain, when you buy a ticket on the internet you can get a code, a bar code and/or a bidi code (mobile ticketing). It is possible to print the ticket at home, at the station ticket office or at a station vending machine at any time, or to consider your bidi code as ticket.
The Netherlands	Print your ticket at home, but must show ID with your ticket on journey, or obtain ticket from ticket machine / ticket office at station.
Sweden	You can print your ticket at home, get it posted, get a barcode sent to your mobile, or collect at the ticket office.
Norway	In addition to mobile ticketing, you can pick up your ticket on board the train or at a ticket machine in the station (you enter your mobile telephone number and your credit card number).
Japan	For middle and long-distance railway, telephone touch-tone booking tickets and internet booking tickets need to be picked up at the station counter or at automatic ticketing machines. Some of the internet booking tickets can be downloaded by NFC mobile phone for use.
United States – North East	Electronic ticketing is in the process of being implemented (currently about 4% of sales), with electronic ticketing due to be deployed across the country by the end of the summer. Electronic ticketing will give the option to print at home and will provide a bar code. Paper tickets are distributed through ticket office, post and ticket machines.
Mark Elliott	Online channels generally offer postal or print at home tickets. Some use ticket on departure where you book your ticket online, name the station and print the ticket at a machine in the station. Some markets have machines that can print much wider tickets that can provide more details about your itinerary such as all the journey details if you have a multi-leg journey. Most countries have looked at mobile phones such as bar-codes on smart phones. Mark does not think that this technology will last a long time as contactless devices will become more dominant than bar-codes. Difficulties with using a mobile include that it has to be powered and you have to remember to bring it with you. A smart card is easier to carry around.

Country	Technology Being Used
France	There are smartphone applications for interurban and classic rail journeys in France. The reservation code is sent to the smartphone, and passengers show this code to the SNCF agent when their reservation is checked.
Germany	<p>There are very strong growth rates in online ticket sales each year and it is expected to be the channel with the highest revenue share in the next couple of years.</p> <p>Smart cards are used in regional or urban travel with a variety of smart cards being used e.g. discount cards or monthly cards. No standard has emerged, with many of the Systems seeming to fall behind original plans. There is no gated system, so smart cards are mostly used to replace the traditional monthly paper ticket, but there is very little intelligence in the card.</p>
Spain	<p>Smart cards are used in many Regions.</p> <p>It is possible to buy a ticket on your mobile phone; you are given a bidi code which is the real ticket.</p>
The Netherlands	Students have been given smart cards (750,000)
Sweden	SJ are encouraging mobile ticketing and at home printing. Smart cards work within a region/city but not on a national level.
Japan	More than 36 million "Suica" JR East smart cards have been issued. These are widely used for public transportation such as railways, subways, monorails and buses, also at the shops in stations and on streets of most main cities in Japan.
United States – North East	Mobile is a fast growing sales channel with an iphone app, android app (later this year) and mobile website. All of these will support electronic ticketing, and you will be able to use your phone to show the bar code of the ticket. Smart cards have not been implemented due to the high price of long distance travel.
Mark Smith	Print at home is becoming increasingly prevalent. In Germany, it is heavily used for discounted tickets but not necessarily for flexible tickets because of the fraud risk. In France there is a similar situation, with print at home being used widely for cheap tickets but not for flexible tickets, with the reference number just being quoted on board the train. In Spain, any fare on any domestic journey can be printed at home.

Mark Elliott

Most countries use ticket office, ticket machines, internet, agencies and phone. Predominantly cash or credit card is used as the payment method. Some cities have started an account based system with billing after travel. A growing number use online and some have started using mobile phones. DB are experimenting with mobile phone tickets where you touch your phone on a touch card machine and the system monitors where you are on the network and when you touch out it knows which services you used. It uses wi-fi to synchronise your phone, and works out the best price for the journey you made and then bills you afterwards. It is called "Be in – Be out". Some operators in Asia may be experimenting with this to reduce their costs.

All operators are trying to get away from ticket offices because of the cost. Mark implemented a scheme with Finnish Rail last year where you can buy you ticket on your mobile phone and you receive a token.

The Asian market has a higher density of mobile users and it is easier for operators to take advantage of that. He doesn't see any huge technology dominance or any country being too much technologically ahead of others. He is amazed at how many countries still have a paper ticket base. There is a big challenge to break out of this culture. Work carried out in Oslo showed that to break the psychological fix is a struggle, perhaps due to fear of change. Technology is about also changing culture.

No country at the moment has a completely paper-less system, but most are piloting or the most advanced have about 20%-30% of travel in some form of electronic form. It is hard to compare operators as they have different frequencies, segments, pricing and state subsidising or not. It is not easy to compare, for example, TrenItalia to DB. Trenitalia are concerned with reducing fraud or cleanliness of trains but DB has a more compliant culture although has other issues. They are all factors that can contribute to the business case to move to ticketless systems. For example, the Dutch business case for going to smart cards nationally was centred on security and putting gating on stations rather than believing everyone should have smart cards.

Country	Technology Planned in next Few Years
France	No response given

Germany	<p>Currently a new check-in check-out system, Touch & Travel, is being tested in a small number of places (e.g. Berlin and Frankfurt) where the passenger checks in and checks out at the start and end of their journey using a mobile phone, and receives an invoice after their journey. This is a ticketless system, and you are tracked on the public transport network. For example, if you travel on a train from Frankfurt to Berlin, then caught a bus and then another bus, the system would calculate the route and price at the end of the journey. The system is currently being rolled-out, and works on all long distance stations and other stations in select urban areas where there has been agreement with all parties. Mobile technology or Near field Communications Technology (NCT) can be used.</p> <p>DB are attracted to the idea that the customer does not have to be concerned about the fare as the local structures are complicated. The infrastructure is a large IT system, but the touch points at the stations are relatively cheap (below €50).</p>
Spain	<p>The following are planned in the next few years:</p> <ul style="list-style-type: none"> - Mobile ticketing is planned for regional and commuter services. - Season ticket management with over-the-air technology. - Smartphone/tablet Renfe apps (Android, iOS, RIM, Windows Phone). - New fares and prices depending on the customer choices.
The Netherlands	<p>A smart card system (OV chipkaart) is planned to be implemented in the next two years to replace tickets. Consideration is still being given as to whether a disposable smart card will be used. It is unsure whether money will be loaded onto a machine or there will be automatic top-up, but the card will operate as pay as you go, i.e. you would swipe the card at your origin and destination station and the fare would be deducted from the card. Mobile phones may be considered in the future</p>
Sweden	No further technology planned.
Norway	<p>There is a smart travelcard concept for the metropolitan area which they are considering (similar to Oyster).</p>
Japan	<p>Further utilization of Smart phones is being considered. JR East are interested in creating a reservation and purchasing system for overseas customers with Smart phones, especially for middle and long-distance railway travel.</p> <p>JR East has a 100%-owned subsidiary credit card company as a JR East in-house credit card issuer. This company also issues their in-house credit card with the VIEW brand and co-branded cards jointly with international credit card companies VISA/Master/JCB. The number of its effective members exceeds 4 million.</p> <p>These credit card holders also can use it as a Suica (Smart card of JR East) and use auto-charge system (when the card's balance is insufficient, it adds a predetermined amount of money automatically at the moment of passing through</p>

the ticket gate).

United States – Amtrak are looking at implementing a new forecasting system in the next few years that delivers information on how to optimise revenue. There appear to be no good rail management solutions for forecasting, due to the number of combinations of O-D trips compared to air. Amtrak have been working with vendors to find a system that provides a balance between model specifications to reliable results, as well as giving sufficient information to manage departures. Initially, this system would be used to help Amtrak change their fares, and in the longer term, encourage more people to move to shoulder peak and bring in more revenue per available seat mile.

Mark Smith All countries are trying different methods. If mobile ticketing were used in the UK, tickets should be sent to UK mobile phones. Print at home is the preferable option as tickets will not get lost in the post and can be printed several times. It also allows a train operator to sell a ticket for a journey where it does not have a station at both ends of the journey, for example in cross-border trips.

Mark Elliott Mark does not think technology is the solution for fares policy in the UK. Sydney struggled to introduce an electronic system, and one of the reasons was that they did not start with unifying the ticket policy between bus and rail. So technology is a secondary issue. The primary issue is getting the policy right for customers.

On other studies Accenture have carried out, they have noticed that cities move to electronic tickets because of fare review and fare policy and not technology.

One operator believes that they should not sell tickets at all. The idea of tickets date back to when public transport was manual and may be a legacy to lose. London for example is doing it.

The introduction of contactless bank cards creates an interesting philosophical question, not about the use of bank cards but the way we can use bank cards or any other secure media. Why not just use the card as a credential as an idea, no need for the ticket to be on that card. It's a credential for the system to identify you. The back office knows whether you bought a ticket or can watch where you go and then charge you at the end. If you take this model you have a complete ticketless system. This philosophy is called the "credential model". Accenture have had discussions with operators and authorities for some years on this. London is doing it. The future ticketing project is enabling them to get used to the idea of a ticketless system. It's mostly city authorities or national operators that are most attracted to this. London quoted 13%-14% of cost is the sale, which is a large amount of their revenues. Other cities Accenture work with have sales which cost them 8-9% of their revenues. Rail operators would question this a bit more as volume of travel across their networks is lower and they are more nervous about deferring the collection of the fare till the journey is completed as opposed to at the beginning. All their financial models are based on that. However, Mark thinks that it may work for some of them.

Appendix B – Routes Analysed in Desk Research

Country	Intercity Routes	Regional Routes
UK	J1: London – York J2: Glasgow – Manchester J3: Bristol - Birmingham	J1: Paignton – Taunton J2: Holyhead - Chester
France	J1: Paris – Lyon J2: Paris – Lille J3: Bordeaux - Nice	J1: Bourges – Vannes J2: Limoges - Clermont Ferrand
Germany	J1: Berlin – Hamburg J2: Berlin – Dusseldorf J3: Hamberg - Munchen	J1: Stuttgart – Nurnberg J2: Rheine - Emden
Italy	J1: Rome – Naples J2: Rome – Turin J3: Turin - Venice	J1: Modena - Rimini J2: Foggia - Bari
Spain	J1: Madrid - Barcelona J2: Madrid - Valladolid J3: Barcelona - Valencia	J1: A coruna – Leon J2: Albacete - Murcia
The Netherlands	J1: Amsterdam - Eindhoven J2: Amsterdam - The Hague J3: Groningen - Rotterdam	J1: Vlissingen - Roosendaal J2: Leeuwarden - Hengelo
Sweden	J1: Malmo - Goteborg J2: Stockholm - Goteborg J3: Stockholm - Ostersund	J1: Mora - Hallsberg J2: Boras - Kalmar
Norway	J1: Trondheim - Dombas J2: Bergen - Oslo J3: Stavanger - Oslo	
Japan	J1: Tokyo – Hachinohe J2: Tokyo – Niigata J3: Tokyo - Fukuoka	J1: Matsue – Okayama J2: Yamagata-Sendai

United States –	J1: Boston - New York	J1: Albany - Buffalo
North East	J2: Washington DC - New York	J2: Portland-Auburn - Boston
Canada	J1: Montreal - Toronto	

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