Origin – Destination Matrix 2011/12

Summary Report

Report

April 2013

CONTENTS

TABLES

APPENDICES

Executive Summary

Introduction

1. The Origin Destination Matrix (ODM) forms a vital part of the Office for Rail Regulation's (ORR) information about how passengers travel on the railways in England, Wales and Scotland. The ODM gives information for revenue and journeys, by ticket type, for each rail flow across the country, i.e. each combination of origin station, destination station and ticket route code.

2. This report is provided with the ODM file, and gives guidance on the methodology that has been followed during the process of creating the matrix for financial year 2011/12 (1st April 2011 to 31st March 2012).

3. The ODM shows the numbers of journeys made, and resulting ticket revenue and passenger miles, for each flow (pair of origin and destination stations) in Great Britain. Where tickets are offered via different routes, the data is also broken down into those routes. It is used as the source for the regional usage profiles in ORR's National Rail Trends publications. If further analysis is needed ORR may be able to respond to such requests.

4. Tickets are offered between every pair of stations in Great Britain, though not all combinations register a sale in any particular year. For each pair of stations , journeys and revenue figures are split between eight different ticket types.

5. While LENNON is the major source of data for the ODM, it is augmented by a range of additional data sources to provide a more complete representation of travel on the national rail network. Since 2008/09, this has included estimates of journeys and revenue made in major urban areas on PTE[1] sponsored tickets which were previously excluded due to issues of distributing passenger journeys to flows.

Methodological Development

6. Consistency with past datasets is important to enable comparisons to be made over time. However, stakeholders have indicated that they are keen to see improvements, even where this leads to inconsistency with historic data, provided changes are clearly explained.

7. In the 2011/12 dataset a number of changes have been made to improve the dataset:

    ❚ The growth rate applied to the "PTE infill[2]" in the ODM has been applied at a more disaggregate level;

---

[1] Passenger Transport Executives (PTEs) are local government bodies which are responsible for public transport within large urban areas. They are accountable to Integrated Transport Authorities (ITAs) which were formerly known as Passenger Transport Authorities (PTAs) prior to 2008 and the Local Government Act 2008. There are five PTEs in England, for each of the metropolitan counties (Merseyside, South Yorkshire, Tyne and Wear, West Midlands and West Yorkshire) with the former Greater Manchester Passenger Transport Executive being replaced by Transport for Greater Manchester from April 2011. In Scotland the Strathclyde Partnership for Transport is the equivalent body covering the region of Strathclyde. For convenience in this report we continue to refer to these areas as PTEs.

[2] This is the term used in this report to describe the layer representing journeys on PTE sponsored products.

❙ An improved PTE infill has been included for the West Midlands PTE area (Centro); and

❙ Journeys on a number of Ranger/Rover products, previously excluded, have been added.

steer davies gleave

1   Introduction

1.1   Steer Davies Gleave was appointed by the Office of Rail Regulation (ORR) to produce the ODM for 2011/12, continuing the historic series that dates back to 1997/98. This report accompanies the ODM for 2011/12 and provides details of the process and outputs used to produce the dataset on behalf of the ORR.

1.2   The methodology adopted by Steer Davies Gleave in the production of the ODM is consistent with that adopted by DeltaRail in the production of the ODM in previous years. As part of our work we have undertaken a Methodological Review of the data and processes used to generate the ODM as well as stakeholder input (see Methodological Review Summary) and identified a number of areas for improvement in the data set. A number of these have been implemented in the 2011/12 data set (see Chapter 4) and others will be investigated in more detail with a view to including in future versions of the ODM.

Use of statistics sourced from the ODM

1.3   When using statistics based on the ODM (e.g. station usage data also published by the ORR) it is important to be aware of:

i)   Improvements made to the dataset over time which can impact consistency between years;

ii)   Limitations of the data and specifically factors e.g. some ticket sales not being included, that may mean that demand on particular flows or stations is underestimated; and

iii)   Factors which can affect reporting of entries and exits.

Improvements to the dataset

1.4   Improvements to the dataset in 2011/12 are set out in Chapter 4. A summary of improvements made over recent years are further detailed in Appendix A. The ORR continues to work with stakeholders and its own consultants to improve the robustness of the dataset by implementing methodological changes that demonstrate value and address acknowledged issues.

Limitations of the data

1.5   In the absence of a completely gated system that allows a complete recording of flows through stations or comprehensive and robust count data, the use of ticket sales data, LENNON, as the primary source of the station usage data set as described in the following chapter is the best approach available. In particular, its national coverage makes it suitable as a basis for the production of national statistics such as those reported by the ORR. However, this data does have weaknesses when utilised for this purpose and, although some of these are catered for in the methodology, the user should be aware of these acknowledged limitations. The key limitations are outlined below. More extensive discussion of some aspects of the limitations of the dataset is included in Appendix B.

> ❚ **Non-Point to point tickets** - An overarching issue is the inherent difficulty and uncertainty associated with estimating the number of journeys associated with many rail products which do not simply represent point to point single or return journeys and furthermore the distribution of those journeys. This is a particular issue for the London Travelcard Area and PTE areas;
>
> ❚ **Concessionary travel** – Most PTEs subsidise some form of free travel for passengers over a certain age and those with disabilities. This creates a substantial additional element of demand which is very difficult to include in the ODM as information on the level and distribution of journeys associated with these free travel products is not recorded. The current approach to this in the ODM is to include this demand where data has been made available by PTEs which would generally be estimates as a result of surveys;
>
> ❚ **Non-LENNON Sales** - A significant proportion of sales is either not passed directly through LENNON (sold at non-railway sales points) or is included in LENNON in a format which requires additional processing and assumptions i.e. is not associated with a station to station flow;
>
> ❚ **Group stations** – Many products to major destinations are sold with the origin or destination as a group of stations (e.g. London Terminals, Manchester BR stations). Current industry data does not distinguish between the component stations and therefore a split between these stations has to be estimated during the production of the ODM;and
>
> ❚ **Ticketless travel** – Journeys associated with ticketless travel are not included in the datasets but as with journeys made on other products excluded from the datasets, some journeys would be observed in passenger counts. This is likely to be an issue on some flows and in some areas where ticketless travel is significant. As more stations have become gated over time and TOCs focus on revenue protection activities this is likely to be less of an issue than in the past in contributing to a shortfall in journeys. Finally, there is a strong argument that it is inappropriate to include ticketless travel in the ODM as its purpose is to record bone-fide journeys on the rail network and inclusion of ticketless travel could distort business cases for new investment where these are reliant on data from the ODM.

1.6   It is important to remember that in aggregate the underlying data, from LENNON, is a rich and comprehensive data source and, importantly, covers the entirety of Great Britain. The issue is that when using the data source to construct the ODM the data is being pushed significantly beyond what it was originally designed for which was primarily to report and allocate revenues across train operators.

2   Matrix Definition

2.1   The ODM contains revenue, journeys and passenger miles data for each flow on the network. A flow is defined as an origin station / destination station / ticket route code combination. Since this dataset is designed to show passenger journeys made, rather than "producer-attractor" figures, journeys have been split equally into the two directions of travel. The fields included in the ODM are:

TABLE 2.1   ODM FIELDS

Field	Description
Mode	This variable is used to categorize the source of the passenger journey data. Refer to the table overleaf.
Origin (NLC, name)	Based on ticket origin, assumed to be where passenger starts his/her journey.
Destination (NLC, name)	Based on ticket destination, assumed to be where passenger ends his/her journey.
District, County, Region and NUTS2 Region & Code for Origin	Origin's geographical location.
District, County, Region and NUTS2 Region & Code for Destination	Destination's geographical location.
Route Code and Description	Route code and description on ticket as recorded by LENNON.
Dist	Distance in miles between origin and destination derived from LENNON.
Revenue	Revenue for each flow split into the eight ticket types. It is also summarised into the four main categories (Full, Reduced Excluding Advance, Advance and Seasons) and a Reduced category (Reduced plus Advance) and summarised in total.
Journeys	Journeys for each flow split into the eight ticket types. It is also summarised into the four main categories (Full, Reduced Excluding Advance, Advance and Seasons) and a Reduced category (Reduced plus Advance) and summarised in total.
Passenger Miles	Miles the passengers travelled - effectively journeys multiplied by a station to station distance derived from LENNON.
Group Station (NLC, name) for Origin	If the origin is part of a Group Station, the NLC and name is provided, otherwise this field is blank.
Group Station (NLC, name) for Destination	If the destination is part of a Group Station, the NLC and name is provided, otherwise this field is blank.
Flag	Flag = 0 (no problem), 1 (flow has failed a check), or 2 (flow has failed a check and may be significant).

≡ steer davies gleave

TABLE 2.2   MODE DEFINITIONS

Mode	Description
NR Sold Non-Tcard	Sold by National Rail, point to point
TfL Sold Tcard	London Travelcards sold by Transport for London
NR Sold Tcard	London Travelcards sold by National Rail
PTE Sold	Sold by a PTE
Airline Sold	Ticket sales for routes serving Airports, where tickets do not go through LENNON
Other	A small number of Rangers and Rovers and non-LENNON season products

steer davies gleave

3 Methodological Overview

MOIRA2 Demand Matrix – Base Data

Overview

3.1 The ODM is derived primarily from the MOIRA2 Demand Matrix. The MOIRA2 demand matrix is sourced from MOIRA2 which is the rail industry's principal planning tool and includes a comprehensive representation of travel on the national rail network. The base data for the MOIRA2 demand matrix is LENNON ticket sales, with the addition of "infills" for London Travelcards, airport links and multi-modal and zonal products sponsored by Passenger Transport Executives (PTEs).

Underlying Base Data - LENNON

3.2 The underlying matrix of ticket sales and associated journeys and revenue used in MOIRA2 is derived from LENNON. It is based on an extract from LENNON, produced by Atos, of total sales revenue and journeys for the year, broken down by flow (origin and destination National Location Code (NLC)), route code and by product type (CTOT). However, as there are known omissions in this data in respect of Transport for London (TfL) and PTE sponsored tickets, and non-National Rail tickets on some airport services, there needs to be a "matrix infilling" exercise undertaken to estimate a more complete origin-destination matrix and include the associated journeys and revenue that do not appear in the underlying matrix.

3.3 There are three main cases:

I Tickets with non geographical destinations, e.g. zonal products, Rovers;

I Tickets sold at some non National Rail (RSP: Retail Settlement Plan) outlets, e.g. newsagents; and

I Tickets which do not appear in LENNON at all. This includes some Train Operating Company (TOC) tickets on airport flows, and tickets for TOCs which fall outside the Rail Settlement Plan.

3.4 Certain tickets with destination codes that are not national rail stations are included in the MOIRA2 demand matrices, being mapped to the corresponding rail station. These Rail Links usually include a third party element, such as to a bus zone, or tourist attraction. The MOIRA2 demand matrix includes the journeys and the net revenue associated with such tickets.

3.5 Data excluded from the MOIRA2 demand matrix is set out in Appendix B.

Net Revenue

3.6 The MOIRA2 demand matrix contains Net Revenue based on the "Net Revenue" field in LENNON. Travelcard revenue in MOIRA2 is Net (rather than Gross) i.e. excludes revenue paid by ATOC to TfL for travel on the London Underground and on buses. Similarly, PTE revenue is net i.e. for multi-modal tickets only revenue for travel on national rail services is included.

Ticket Type Definitions

3.7   Within the base demand matrices, journeys and revenue have been sub-divided into the following four ticket types, each of which is further split by First & Standard Class:

    i)   Full: all walk-up undiscounted single or return tickets, whether or not issued with a status discount (child, railcard etc);

    ii)   Reduced: all walk-up discounted single or return tickets, whether or not issued with a status discount (child, railcard etc);

    iii)   Advance: all advance-purchase tickets;

    iv)   Seasons: all multi-use tickets.

Infills for London Travelcards, Major Urban Areas (PTE) & Airports

3.8   Infills are included within the MOIRA2 demand matrix to add in the missing journeys and revenue identified in para 3.3 in three key areas:

❚ **Within London Travelcard area.** Whilst the underlying matrix includes an estimate of journeys made on Day Travelcards / Travelcard seasons purchased at National Rail stations, it does not include a significant number of national rail trips made using Travelcards purchased at Tube stations, travel shops and newsagents.

❚ **Within Passenger Transport Executive (PTE) areas.** The underlying matrix excludes virtually all rail trips made on PTE-sponsored tickets, which are usually zonal and often multimodal.

❚ **Trips to/from Airports.** The underlying matrix includes many trips to/from airports, but excludes all Heathrow Express journeys, and some tickets sold for Gatwick Express, Stansted Express and other airport operators.

3.9   There are also other ticket sales which are not included in the MOIRA2 demand matrix, but these are generally much less significant. It should also be noted that journeys with no associated ticket sales such as staff travel, and particularly fare evaders, are not included in the MOIRA2 demand matrix and therefore are not included in the ODM either.

3.10   The most significant "infills" are for the London Travelcard area (sales made by Transport for London (TfL)), and for PTEs, since in both cases a substantial proportion of the rail journeys made use multimodal travelcard type of tickets.

3.11   The third infill, for Airports, estimates the significant number of rail journeys on Gatwick and Stansted Express, made on tickets sold outside of the RSP system i.e. not sold by National Rail outlets. Journeys on Heathrow Express are excluded from the MOIRA2 demand matrix.

PTE Infill

3.12   The revenue and journeys associated with PTE Infill are estimated based on an uplift applied to the previous year's PTE Infill figures. The methodology used has changed slightly this year to use a more disaggregate growth rate and is detailed in the following chapter.

Joint Rail & TfL Stations

3.13   Joint stations are stations which are served by both rail services and TfL services i.e. Underground or DLR. These stations can have both a TfL and a TOC ticket office, or they may have just a TfL or just a TOC ticket office. Special treatment of the ticket sales at these stations is important to ensure a realistic estimate of passengers using rail services. Passengers travelling on Underground or DLR services should not be included. These stations are identified on the station usage dataset by the flag: London Joint Station = 'Joint TfL & TOC Station'.

3.14   Within the MOIRA2 demand matrix, an estimate of the number of travellers using rail (as opposed to other modes i.e. tube or DLR) is made. Ticket sales at the joint stations are therefore scaled down in order to provide a better estimate of actual rail journeys.

3.15   In addition, there are a number of stations that MOIRA2 treats in the same way as Joint Stations. These are identified by the flag: London Joint Station = 'MOIRA2 Joint Station', e.g. Lewisham and Greenwich. These stations are not classified by the TOCs and TfL as a 'Joint Station', but they are the same: they are served by both rail and Underground/DLR services.

4 Methodological Changes in 2011/12

Introduction

4.1 Consistency with past datasets is important to enable comparisons to be made over time. However, stakeholders have indicated that they are keen to see improvements, even where this reduces consistency with historic data, provided any changes are clearly explained.

4.2 In the 2011/12 dataset a number of changes have been made to improve the dataset and these are explained in the rest of this chapter, together with some quantification of their impact.

Improved PTE Infill growth rate

Methodology

4.3 With the initial version of MOIRA2 an improved representation of PTE demand was included in the base demand matrix based on work undertaken by Steer Davies Gleave for the year 2008/09. This included journeys from tickets sold at non-railway sales points and an estimated distribution of journeys largely based on the distribution of point to point tickets sold in PTE areas.

4.4 Subsequent versions of the MOIRA2 demand matrix have included a PTE infill but the journeys are now based directly on LENNON data and are therefore not consistent with the 2008/09 infill.

4.5 To maintain consistency with previous ORR statistics the PTE infill contained in the ODM has therefore been based on the 2008/09 MOIRA2 PTE infill grown by growth rates derived from National Rail Trends data.

4.6 Up until 2010/11 the application of growth was carried out at a highly aggregate level based on growth seen for 'franchised regional operators' as reported in National Rail Trends data. In the construction of the 2011/12 dataset a more disaggregate set of growth rates has been applied at the PTE level based on LENNON data.

Impact of change

4.7 Growth rates applied by PTE area are shown in Table 4.2. These growth rates have enabled the capture of the specific growth characteristics of the different PTEs rather than treating them as a single group as in previous years. The average growth rate of just over 6% compares well with the 7.1% National Rail Trends journey growth rate for franchised regional operators and we have not made any adjustment to the growth rates applied to reflect the National Rail Trends number.

steer davies gleave

TABLE 4.1   PTE INFILL GROWTH RATES (2011/12)

PTE	Annual Growth	
	Journeys	Revenue
West Midlands PTE	10.05%	9.77%
Greater Manchester PTE	8.35%	13.54%
Merseyside PTE	3.23%	8.42%
Tyne and Wear PTE	-1.47%	5.70%
Strathclyde Partnership for Transport	4.62%	7.85%
South Yorkshire PTE	1.44%	8.45%
West Yorkshire PTE	5.90%	8.67%
Average	**6.08%**	**9.69%**

Source: LENNON analysis

Inclusion of revised West Midlands PTE (Centro) Infill

Methodology

4.8   Steer Davies Gleave were commissioned in 2011 by the Passenger Demand Forecasting Council (PDFC) to construct a PTE infill matrix for the Centro area for the rail year 2010/11. The methodology followed that used for the construction of the original MOIRA2 infill but included use of additional data sources and specific adjustments for known issues such as directionality.

4.9   The infill represents a significant improvement on the current infill in the ODM, generally increasing passenger volumes across the area, and therefore as part of the 2011/12 update the PDFC infill was updated to 2011/12 data and included in the ODM.

Impact of change

4.10   The inclusion of the Centro infill represents a significant change for stations within the Centro area and also a number of stations not in the Centro area but where Centro tickets can be purchased for travel into the Centro area. For the majority of stations the inclusion of the infill has resulted in an increase in associated journeys although in a small number of instances there is a decrease. A comparison of the Centro infill with the 2010/11 ODM infill is included in Table 4.2. This shows that the new infill adds approximately 5 million journeys compared to what would have been derived had the previous methodology been used.

steer davies gleave

TABLE 4.2   CENTRO AREA INFILL COMPARISON

	2010/11 ODM infill	2010/11 infill grown to 2011/12 using previous methodology	2011/12 updated infill
Journeys (m)	15.5	16.6	21.3

New 'Other' infill layer

Methodology

4.11   In some non-PTE areas there are zonal products which are not currently captured within the MOIRA2 demand matrix (e.g. Rover and Ranger products). Whilst volumes of travel on these tickets are relatively small, in the area of use they can be significant. Therefore in the 2011/12 update we included journey estimates for a number of Rover and Ranger products. These were:

  ▌ St Ives Group Day Ranger
  ▌ St Ives Day Ranger
  ▌ St Ives Family Day Ranger
  ▌ Valleys Night Rider
  ▌ Cambrian Coaster Ranger

4.12   Journeys on these products have been included as an 'Other' infill in the ODM, together with journeys from some non-LENNON season ticket products previously included in the airport flow infill. Journey estimates for these products have been constructed using LENNON data and distributing journeys based on point of sale and the underlying reduced ticket travel distribution of the stations covered.

Impact of change

4.13   The total additional number of journeys arising from inclusion of travel on these tickets journeys is 380k in 2011/12.

Other methodological variations

4.14   In the 2010/11 station usage calculations the generic methodology for separating out group stations was not followed for the following BR groups due to the necessary data not being available in LENNON:

  ▌ Wigan BR
  ▌ Warrington BR
  ▌ Manchester BR

It has been possible to use the generic methodology for Manchester and Warrington in 2011/12 but still not for Wigan where we have maintained the same split of journeys between Wigan North Western and Wigan Wallgate as in 2010/11 at a flow and route code level.

steer davies gleave

APPENDIX

A

HISTORICAL METHODOLGICAL CHANGES

A1   HISTORICAL METHODOLOGICAL CHANGES

A1.1   In the five years prior to the latest dataset a number of improvements were made to the ODM and Station Usage methodology which are described in this section. In addition since 2009/10 Oyster PAYG data has been included in the ODM which represented a significant improvement to the estimates for rail travel across London.

Historical methodology changes

A1.2   Between 2006/07 and 2008/09 the accuracy and usefulness of the ODM was improved by applying new procedures on the way journeys with unknown origin and/or destination have been treated, and by including journeys that were previously excluded from the file or did not appear in the LENNON sales data. In summary, the main changes were:

I   Adding in previously missing journeys, e.g. TfL sold Travelcards, and some airport link tickets -*this is undertaken in the production of the MOIRA2 demand matrix*.

I   Rail Links such as PlusBus and Attractions. The rail element of these ticket sales is now included - *this is undertaken in the production of the MOIRA2 demand matrix*.

I   Estimating the split of records for station groups, including London BR, into the constituent individual stations. This methodology was further refined for those groups with no ticket office at one or more stations within the group - t*his processing is undertaken in the ODM*,

I   Via the integration with the process that creates the MOIRA2 Demand Matrix, PTE ticket sales are now included, in addition to TfL sold Travelcards, and some airport link tickets – *this is undertaken in the production of the MOIRA2 demand matrix*.

I   The method for estimating passenger journeys from ticket sales has changed. This is a result of using the MOIRA2 Demand Matrix as a starting point. The MOIRA2 Demand Matrix does not disaggregate single journeys, and so when estimating passenger journeys all ticket sales have been split equally into the two directions of travel. This will only have an impact on the ODM if there is more travel on single tickets away from a station compared to travel to the station, which is not likely to be material. Therefore in the Station Usage file, entries are the same as exits.

A1.3   In 2009/10 further improvements were made:

I   Adding in data for journeys undertaken by Oyster "pay-as-you-go" (PAYG) in the London area. This is undertaken within the base LENNON data, in the production of the MOIRA2 demand matrix. This applies to journeys made after 1 January 2010.

I   Refinement of the methodology used to calculate journeys undertaken using PTE tickets.

A1.4   When the 2010/11 dataset was constructed it emerged that the original 2008/9 figures which were given for one PTE, West Yorkshire, were not a complete record of all the rail journeys on multimodal tickets which should have been included in

the PTE infill. A correction was therefore made by uplifting the West Yorkshire PTE Infill, both revenue and journeys figures, by 53% on top of the generic PTE infill growth rate. Note that within West Yorkshire PTE area, the majority of rail journeys are made on rail-only tickets, i.e. not PTE Infill tickets. Thus the overall effect of this correction was relatively small.

Oyster PAYG

A1.5   Oyster 'Pay As You Go' (PAYG) was rolled out at National Rail stations in January 2010. Prior to this date Oyster PAYG was available on selected routes only and was not recorded (in LENNON) on a flow or station basis. After this date Oyster PAYG was available at *all* National Rail stations in the Travelcard Area and recorded by flow.

A1.6   The 2009/10 data contained roughly 9 months of data prior to January 2010 and 3 months of data after, while the 2010/11 data which was wholly after January 2010 when Oyster PAYG, with data capture, had been fully implemented contains a full year of data. This lead to some very large reported growth figures for some stations within the London Travelcard (/Oyster PAYG) area. The 2010/11 figures, based on recorded use of Oyster PAYG should be accurate, but the percentage growth may be over-represented since the old figures will be largely estimates made without the benefit of Oyster records.

APPENDIX

B

ODM LIMITATIONS

B1 ODM LIMITATIONS

Limitations of the LENNON data

B1.1 The LENNON database captures ticket sales for the entire national rail network from many different input machines. It is as a consequence a very large data set. With all large data sources there will always be input errors resulting in a certain amount of invalid data. Generally such errors will be small, and are more likely to occur in the journeys rather than revenue fields.

B1.2 Checks are performed on the data when the MOIRA2 demand matrix is compiled, but due to the size and complexity of the dataset it is not possible to validate each and every entry.

B1.3 There are a number of areas where we know that LENNON does not capture the data correctly, or instances where it is not possible to derive passenger journeys from ticket sales data. These areas are expanded upon below.

Known Problems of Data Capture

B1.4 The data in LENNON from which the ODM is derived is based on ticket transactions. In order for the data to be included in the ODM it must include an origin station and a destination station. However if this is not the case then the data will automatically be excluded.

B1.5 Human error at the point the ticket sale is entered into the input machines will also produce invalid data in LENNON.

Travelcards

B1.6 As Travelcards are for multi-modal travel they allow the purchaser to make journeys on the rail system and on other modes. Equally, tickets purchased elsewhere on the local transport system will be valid for rail travel. Therefore LENNON gives only a partial picture of the rail travel in conurbation areas, such as: London, Birmingham, Glasgow, Leeds, Liverpool, Manchester, Newcastle and Sheffield.

B1.7 The ODM contains reasonably robust estimates of journeys within London and other conurbation areas where travelcards are widely used. An infill for London Travelcards has been included in the ODM since 2006/07, and an infill for PTE tickets is included from 2008/09.

Return and Single Journey Tickets

B1.8 It is possible that on certain routes the cost of a return ticket could be lower than a single ticket. This leads to the cheaper return ticket being purchased even though the passenger has no intention of making the return journey by rail. This results in two journeys being recorded instead of one.

Multiple Tickets

B1.9 It is possible to buy special cheaper tickets between certain stations for example under a promotion by one of the train companies. In these cases a local ticket may be bought to gain access to a main station and a second ticket bought for the rest

of the journey. This results in two journeys being recorded in the ODM and will not accurately represent the journey undertaken.

Rail Staff Passes

B1.10   Prior to the privatisation of the rail network, British Rail employees and their families were eligible to various levels of free or reduced rate rail travel. When the various rail companies were converted to private companies, this benefit often continued.

B1.11   If you consider the network as a whole, the effect of staff passes is unlikely to be significant. However, it may be significant on certain routes, for example on routes out of Derby due to large concentration of companies in Derby relating to British Rail both pre and post privatisation.

B1.12   Ticketless Travel On every route on the network there will always be passengers who travel without purchasing a ticket. This is referred to as ticketless travel. As LENNON data is derived from ticket transactions it cannot reflect this travel.

Other Rail Systems

B1.13   There are a number of rail systems in operation in the country that are not covered by LENNON. For Heathrow Express and Eurostar revenue and journeys data were not available.

Journey Factors

B1.14   Ticket transactions are converted into an estimate of the number of journeys made by applying a series of ticket type journey factors. Single and return tickets unambiguously translate into one and two journeys respectively, for season tickets, the factors used represent a rough historic estimate as set out in Table 9-1 overleaf.

B1.15   Ticket periods of other lengths are converted to a number of journeys using a proportion of the monthly journey factor.

B1.16   Therefore the journeys data in the ODM represents an assumed number of journeys made based on the ticket type sold and the above journey factors. In particular it should be noted that the journeys data has not been cross-checked against other data sources of the actual number of journeys made on the network.

B1.17   These journey factors have been used within the LENNON system for a number of years at their current values. The source of the factors is unclear, and there is some indication that they were based on reasonable estimates of ticket use made in excess of fifteen years ago. It can therefore be argued that these journey factors do not provide an accurate estimate of the number of journeys that result on the rail system at present, or in any ODM.

APPENDIX TABLE B.1 JOURNEY FACTORS USED IN LENNON

Description	Journeys Per Issue
Single Journey Ticket	1
Return Journey Ticket	2
Return Journey 2 Persons	4
3 Day Return/ 6 Single Journeys	6
4 Day Return/ 8 Single Journeys	8
5 Day Return/ 10 Single Journeys	10
6 Day Return	12
5 Day Single	5
1.5 Journeys	1.5
Weekly Ticket	10.3
10 Day Return/ 20 Single Journeys	20
2 Weekly Ticket	22
Seasons-Variable Periods	***
Monthly Ticket	45
Not Used	0
3 Monthly Tickets	135
Not Used	0
6 Monthly Tickets	270
Summary Group Codes	***
Annual Ticket	480
8 Day Ticket	22
22 Day Ticket	44
14 Day Ticket	30
50 Journeys	50
10 Weeks	103

Data Excluded from the ODM

B1.18 Some of the LENNON data has been excluded from the MOIRA2 Demand Matrix, and subsequently from the ODM.

B1.19   All the products that were classified into the 'miscellaneous' ticket pot were excluded. These products were:

I   Car Parking
I   Railcard Sales
I   Penalty/Excess Fares
I   Seat Reservations
I   Sleeper Supplements.

B1.20   Also excluded from the analysis were all the flows that had either an Origin or Destination that did not represent a geographical location (these are mainly "I codes"), e.g.

I   Rover and Ranger Tickets (except those included in the new 'Other' Infill in 2011/12);
I   BritRail Tickets;
I   Gate passes usually used by staff;
I   Passenger Charter Discounts;
I   Headquarters Input Items, other than those which can be identified as TfL or PTE.

B1.21   Finally for flows that have either Origin or Destination a Private Settlement Code some are included and some are excluded.

I   PTE tickets and TfL sold London Travelcard records from LENNON are removed, and replaced with an estimate of all rail travel using these tickets via 'infill's to the MOIRA2 demand matrix (refer to Chapter 3).
I   PlusBus – all significant flows have been included since 2007/08, and minor flows are excluded.
I   Attractions – the rail element of the significant flows have been included since 2007/08, which include:

▪   Bluewater Shopping Centre
▪   Alton Towers
▪   Whipsnade
▪   Chatsworth House

B1.22   All other flows involving Private Settlement are excluded, e.g. Irish Stations.

Project/Proposal Name	Origin – Destination Matrix 2011/12
Document Title	Summary Report
Client Contract/Project No.	Click here to enter text.
SDG Project/Proposal No.	22513001

ISSUE HISTORY

Issue No.	Date	Details
ODM_v1.0_Final_for publication	27/03/2013	Final

REVIEW

Originator	Kevin Dadswell	
Other Contributors	Andrew Davies; Andy Dundas	
Review by:	Print	Andrew Davies
	Sign	

DISTRIBUTION

Client:	Office of Rail Regulation
Steer Davies Gleave:	