



Impact of Open Access operators on industry revenue and journeys

First Rail

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Executive Summary

Open Access operators have introduced rail services on the Great British rail network with the aim of providing competition to deliver benefits to passengers through more choice of travel options and lower fares.

This report assesses the success of Open Access operations in Great Britain regarding the number of journeys and the amount of additional revenue they have generated. This is considered in relation to the Office of Rail and Road's (ORR's) Not Primarily Abstractive (NPA) test, such that proposed new services should generate at least 30p of 'new' revenue for every £1 abstracted from existing operators (i.e. the "NPA ratio", calculated as 'generated revenue / abstracted revenue', should exceed 0.3).

Our analysis recognises that there are benefits beyond the generated revenue. This is evident when considering rail mode share. For a selection of flows with Open Access services, rail mode share averages 64%. For a selection of flows without Open Access, the average mode share is just 39%. For this reason, we also consider a journeys NPA ratio which attempts to capture the significant journeys generation from Open Access services.

Our analysis has focused on the two First Rail Open Access Operators – Lumo and Hull Trains – but also considers the impact of the Grand Central service to Sunderland, as summarised below.

Approach

In order to determine the demand and revenue generated by Open Access, we first need to estimate the amount of revenue growth that the affected flows would have earned in the absence of Open Access. A recent study for the ORR uses demand forecasting (PDFH) principles as one approach to establish a counter-factual position. While this approach has some merit, it cannot accurately isolate the impact Open Access services have on key demand drivers such as journey times, fares, economy and population. Instead, we have used similar flows, unaffected by Open Access, to produce a benchmark level of journeys and revenue, and calculated demand and revenue generation and abstraction from this. This is consistent with the alternative approach used in the ORR report.

The purpose of this analysis is not to definitively prove the levels of generation and abstraction caused by Open Access services. It merely aims to demonstrate, through use of industry average growth rates, that there are clear signs of significant generation through the introduction of competing services.

Results

Lumo (London to Edinburgh): since 2021

Lumo has helped to generate over 6 million new rail journeys since its introduction and also driven a material switch from air travel. Nearly half of all journeys on this route are now made by rail (up from one-third in 2019). This demand growth has been achieved with negligible net abstraction from other operators (primarily LNER). Figure 1 illustrates that, when compared to benchmark flows, LNER's 2023/24 journeys were above or close to where they were expected to be. Lumo's growth is therefore primarily generative and takes the overall growth rate of the Edinburgh/Newcastle to London flows far in excess of their benchmarks. Lumo has also

generated significant growth on routes outside London, with passenger demand between Stevenage and Newcastle/Edinburgh more than doubling since the service was introduced.

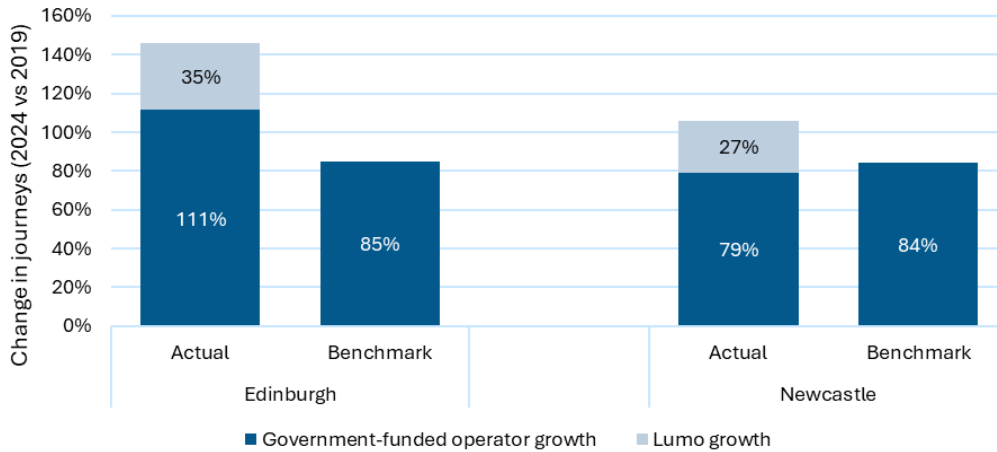


Figure 1: Change in journeys between 2018/19 and 2023/24 for London flows to Edinburgh and Newcastle, compared to highest of two benchmarks (Source: LENNON sales)

Lumo has supported a 55% growth in rail revenue between London and Edinburgh between 2018/19 and 2023/24, while other long-distance flows in Great Britain have seen revenue reduce in this time. The revenue of LNER on competing London flows has grown by more than its comparator flows, indicating that Lumo has not abstracted any revenue from LNER, and has instead helped it to grow its revenue base by increasing the overall awareness and attractiveness of rail.

Hull Trains (London to Hull): since 2000

Ten years after Hull Trains commenced operation, revenue on flows from London to Selby, Howden, Brough and Hull had increased by nearly 300% (see Table 1), generating approximately £30m in revenue for the railway in this time. For every £1 of revenue abstracted, we estimate that Hull Trains generated an additional 51p to 67p of industry revenue, approximately double the minimum level stipulated by ORR. When considering journeys, the figures are higher, with 2 to 2.5 journeys generated for every 1 abstracted. This analysis acknowledges that some of the Selby, Howden, Brough and Hull growth came at the expense of Doncaster revenue, as passengers benefitted from using their local station rather than driving to Doncaster. More recently, Hull trains has seen industry-leading growth. Since 2018/19, Hull Trains has grown its passenger journeys by 42%, 25 percentage points more than any other operator. This has been helped by investment in new rolling stock, providing much-needed additional capacity.

Revenue (£k)	1999/00	To 2009/10			To 2023/24		
		Abs	Growth	Growth (%)	Abs	Growth	Growth (%)
Hull	3,861	8,796	4,936	128%	11,689	7,828	203%
Brough	793	2,874	2,081	263%	4,037	3,244	409%
Howden	1	601	601	102135%	757	757	128683%
Selby	91	1,635	1,544	1697%	2,372	2,281	2506%
Total	4,745	13,906	9,162	193%	18,855	14,109	297%

Table 1: Revenue on flows to London from stations served directly by Hull Trains (Source: LENNON)

Grand Central (London to Sunderland): since 2007

Since the Grand Central service commenced, there has been a notable response from competing East Coast Main Line (ECML) operators. As a result, the number of weekday rail services between London and York has risen by one-third, offering more choice, and faster journey times, to passengers, as illustrated in Figure 2.

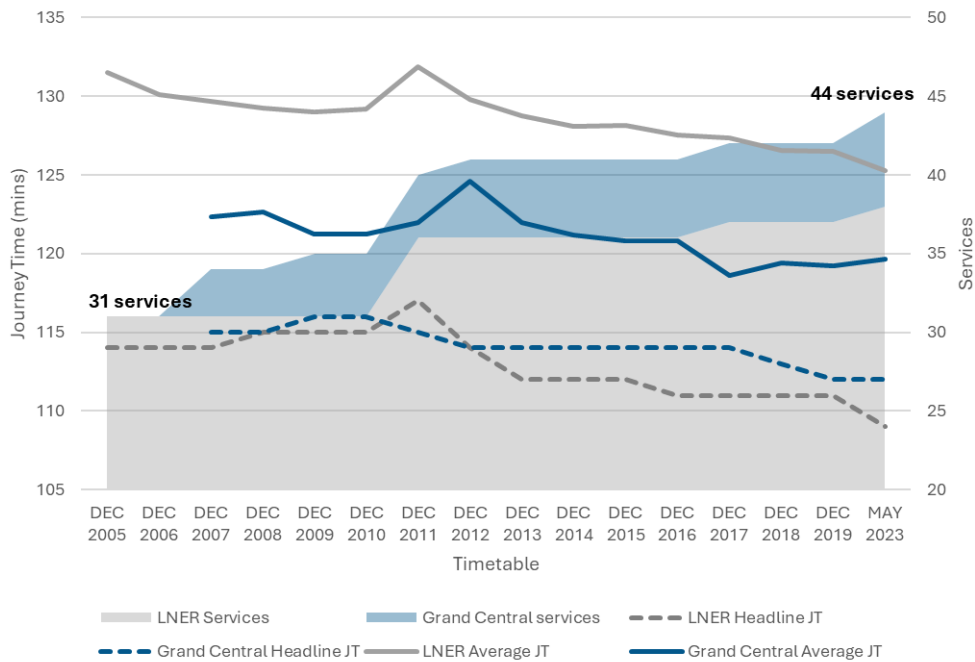


Figure 2: Historical timetable changes between York and London (Source: MOIRA)

Additionally, fare growth has been below the industry average, increasing the value for money for passengers and growing demand. As a result, the number of rail journeys made between London and York has increased much faster than on long-distance routes in Great Britain, with 92% more journeys since its introduction.



The service has opened up new direct trains to London from Sunderland, Hartlepool, Eaglescliffe and Thirsk and rail travel from these stations to London has increased five-fold since the services started.

NPA ratio for each route

Table 2 summarises the inferred NPA ratios for journeys and revenue for Hull Trains and Lumo, alongside an estimate of the new journeys and revenue that have been generated by the introduction of these services. In each case, this indicates that the introduction of Open Access services has been successful in attracting new demand (and revenue) to the rail market, with the inferred NPA revenue ratios far in excess of the 0.3 threshold set by ORR. Full details of the results for each route are covered in Sections 3 and 4.

In total, the analysis indicates that First Rail’s Open Access services – across the nine years assessed and on London flows alone¹ – helped to attract over seven million journeys, and between £261m and £297m of new revenue for the Great British railway. Extrapolating across the 25 years of Hull Trains operations, this is likely to mean the true figure is in excess of £350m.

Open Access Operator flows to London	Total Journeys generated (m)	Total Revenue generated (£m)	NPA (journeys)	NPA (revenue) ²
Lumo (2022/23 to 2023/24)³	5.3 to 5.4	232 to 263	No net abstraction	No net abstraction
Hull Trains (2003/04 to 2009/10)⁴	1.8	29 to 34	1.59 to 1.75	0.51 to 0.67

Table 2: Summary of results for London flows only, detailing indicative journey/revenue generation of each operator, and corresponding NPA ratio

While the presence of any abstraction from government-funded operators may be viewed negatively, it is important to consider other benefits that Open Access services provide. Passengers can benefit from the competition provided through lower fares and faster end-to-end journey times (with subsequent Value of Time benefits). Passenger satisfaction for Open Access operators has historically been higher than most government-funded operators due to their agile approach and passenger focus⁵. The wider economic benefits, including the environmental benefits driven by mode shift, are significant, and have been covered in two reports by Arup⁶.

¹ This is based on journeys and revenue attracted across seven years for Hull Trains between 2003/04 and 2009/10 inclusive, plus two years for Lumo between 2022/23 and 2023/24 inclusive

² NPA excludes Infrastructure Cost Charge

³ Total revenue and journeys generated over first three years of operation will be higher due to exclusion of 2021/22

⁴ Total revenue and journeys generated over first ten years of operation will be higher due to exclusion of 2000/01 to 2002/03

⁵ NRPS Autumn 2019; Open Access Operators occupy the top three spots regarding overall satisfaction.

⁶ Hull Trains: The economic impacts of an Open Access operator (Arup, 2024) and Lumo: Economic impacts study (Arup, 2024)

1 Introduction

1.1 Background to Open Access

1.1.1 Open Access Operators

There are two types of rail operator running passenger services in Great Britain; those who are contracted and funded by the Government to run services (either through franchises and concessions or directly by DfT OLR Holdings Ltd (DOHL)) and those who operate through Open Access contracts. Open Access operators run independently of the Government with the aim of introducing competition to deliver benefits to passengers, with access rights granted by the Office of Rail and Road (ORR).

There are currently three Open Access Operators running passenger train services in Great Britain, all on the East Coast Main Line (ECML):

- ▶ Lumo; operating between London Kings Cross and Edinburgh (since 2021)
- ▶ Grand Central; operating between London Kings Cross and Sunderland (since 2007), and London Kings Cross and Bradford (since 2010)
- ▶ Hull Trains; operating between London Kings Cross and Hull (since 2000)



Figure 3: Map of four Open Access routes on ECML

1.1.2 Gaining access rights / assessing the benefits of Open Access

One of the core considerations for ORR when assessing Open Access applications is the balance of benefits that the proposed service can bring through opening up new direct routes and increased competition compared with the revenue impact on government-funded operators. This is examined through a 'Not Primarily Abstractive' (NPA) test. The NPA test dictates that the proposed new services should generate at least 30p of 'new' revenue for every £1 abstracted from existing operators. This ensures that the new

operation will not simply take revenue from government-funded operators, but will drive growth in rail industry revenue. The revenue NPA ratio of 0.3 has recently been reviewed by ORR⁷, and continues to be used in the updated guidance published in December 2024⁸.

It is important to note that the revenue NPA ratio considers farebox revenue generation as the only economic benefit of Open Access. As shown in Table 3, the benefits are far wider. The service offered by Open Access drives a variety of behavioural changes, each with subsequent economic benefits. Figure 4 demonstrates that by including Value of Time (VoT) and Wider Economic Benefits (WEBs) the total benefits can increase significantly. In this example, it would increase a revenue NPA ratio of 0.3 to 0.81⁹. This illustrates that only a small proportion of benefits are considered with the current method.

Note that the economic growth generated has been covered in more detail for both Hull Trains¹⁰ and Lumo¹¹ in two reports by Arup.

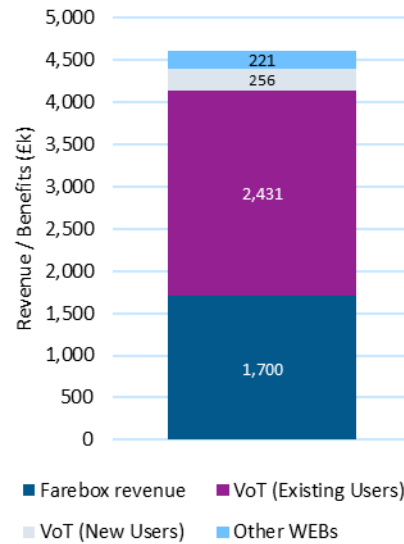


Figure 4: Comparison of farebox revenue, Value of Time and Wider Economic Benefits of Hull Trains

Open Access Offer	Passenger response	Economic Benefits
<ul style="list-style-type: none"> Faster rail journey times Direct journey opportunities Increased service frequency Fare competition Increased customer focus 	<ul style="list-style-type: none"> Existing rail passengers switch to Open Access Mode shift from car to rail Reduced railheading: passengers no longer need to drive to access direct rail services Entirely new business / leisure trips due to improved accessibility 	<ul style="list-style-type: none"> Farebox revenue generation for the rail industry Value of Time benefits for existing rail users Value of Time benefits for new rail users Decongestion of the roads, meaning reduced greenhouse gases and reduced maintenance costs Economic growth in previously underserved areas

Table 3: Passenger and economic benefits of Open Access

⁷ <https://www.orr.gov.uk/search-consultations/summary-guidance-rail-open-access-applications>

⁸ Open Access guidance: Making a track access application and ORR decision making (Office of Rail and Road, Dec 2024)

⁹ An indicative Dec 2005 timetable was assessed in MOIRA with and without the Hull Trains services to estimate the benefit. The VoT benefits were calculated within MOIRA1 and the WEBs using WebTag guidance

¹⁰ Hull Trains: The economic impacts of an Open Access operator (Arup, 2024)

¹¹ Lumo: Economic impacts study (Arup, 2024)

To help illustrate the impact of the wider benefits of Open Access, Figure 5 illustrates the mode share for rail journeys to London, showing they can vary considerably by region. Typically, rail's mode share will be higher for longer distance flows as the end-to-end journey times will be more competitive. For the longest flows (e.g. Scotland), air also has a higher mode share. What is striking about Figure 5 is the air/rail mode share for regions that have Open Access services to London (Yorkshire and the Humber for Hull Trains and Grand Central; North East and Scotland for Lumo). All three regions have a mode share in excess of 50%. The most comparable region without Open Access – the North West – has just 26% mode share. While this is not conclusive evidence that Open Access doubles the mode share of rail, it illustrates the potential to increase rail usage through abstraction from other modes. For most regions, rail is the minority mode.

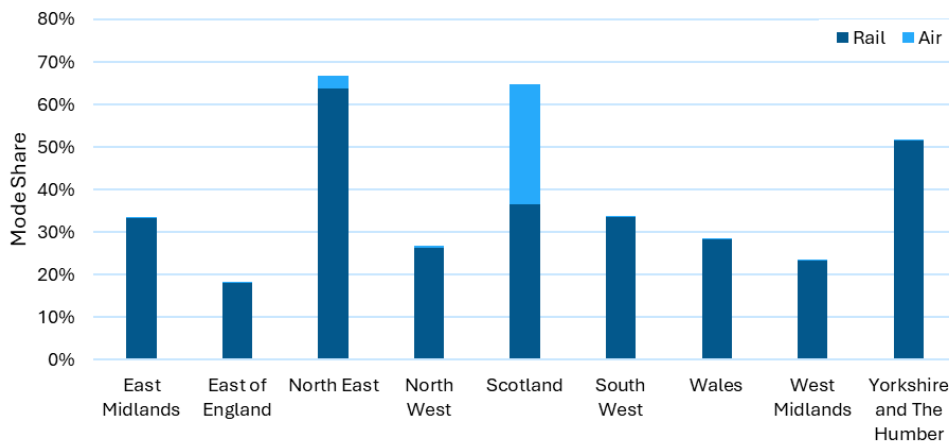


Figure 5: Mode share for regional flows to London (source: MND)

This is more evident when considering specific Local Area Districts (LADs) served by Open Access. Here we can see an average mode share of 64% for LADs served by Open Access compared to 39% for a selection of comparable LADs without Open Access.

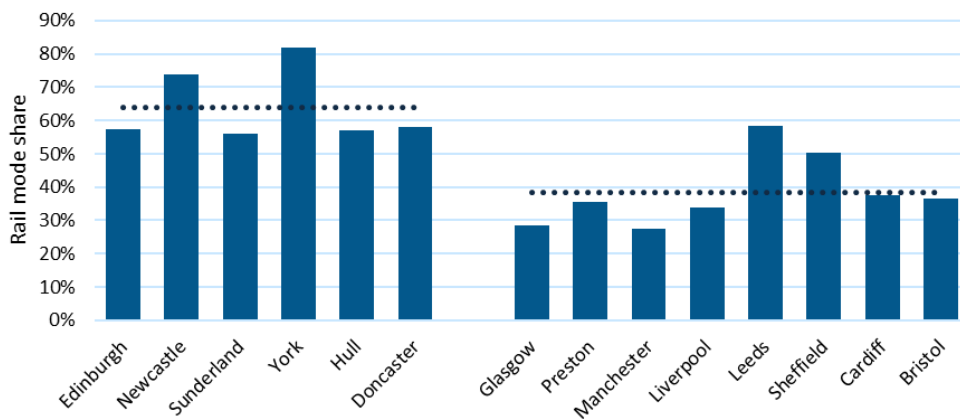


Figure 6: Mode share for Local Area Districts to London (source: MND)

1.2 Purpose of this Report

This report assesses the success of Open Access operations in Great Britain regarding the number of journeys and the amount of additional revenue they have generated. We also test the theory that Open Access operators take, or abstract, revenue that would otherwise have gone to government-funded operators. Our analysis considers ORR's NPA test, in particular whether the services met the revenue NPA ratio threshold of 0.3 (where the NPA ratio is calculated as 'generated revenue / abstracted revenue'¹²).

A rail revenue NPA ratio does not paint the full picture. As shown in Figure 5 and Figure 6, flows served by Open Access see a higher mode share, indicating significant journeys growth driven by the wider benefits of Open Access. For this reason, the report also considers the NPA ratio for journeys to give an alternative perspective on levels of generation. The NPA ratio for journeys is typically higher than that for revenue. The reasons for this are discussed in Section 1.3.6.

The analysis excludes the impact of the Infrastructure Cost Charge, which is subtracted from the level of abstraction as part of the revenue NPA ratio calculation. As a result, the presented NPA ratios are likely to be understated.

1.3 Approach

1.3.1 Benchmarking

The key challenge in assessing the level of generation and abstraction for Open Access services is estimating the level of demand and revenue the affected flows would have produced had Open Access services never been introduced. This is referred to as the benchmark, or counter-factual scenario. Once the benchmark is produced, the actual revenue/journeys for each flow can be compared to the benchmark revenue/journeys to determine the level of revenue generation. Any benchmark produced is subject to a large degree of judgement and, as such, similar studies can produce varying results, almost entirely driven by the assumptions made in producing the benchmark. There are numerous ways that a benchmark can be estimated. Each are discussed below.

Counter-factual scenarios can be produced using industry best practice modelling (typically from PDFH¹³ or WebTag), to determine how we would have expected a series of flows to grow based on changes to timetable, economy, fare, station enhancements, etc. The main challenge here is isolating the changes to include in the scenario where Open Access wasn't introduced. The introduction of Open Access typically drives growth in the economy, as has been detailed in Arup's assessments on the economic benefits of Hull Trains and Lumo. A PDFH approach would typically include economic changes in the counter-factual. If this is included, the benchmark demand and revenue are arguably higher than they should be, thus suppressing

¹² For example, if an Open Access operator earns £750k a year, of which £250k is deemed as new (or generated) revenue and £500k has been abstracted from other operators, then the NPA ratio will be 0.5 (£250k / £500k); £0.50 is generated for every £1.00 abstracted.

¹³ Passenger Demand Forecasting Handbook

the implied generation of Open Access services. Other considerations are the fare and timetable changes to include in the assessment. Government-funded operators typically adapt their fares and service levels to counter-act the impact of the competing services. This is part of the benefit that Open Access brings to passengers so should not be included in the benchmark. Isolating the counter-factual growth drivers is incredibly subjective and, for these reasons, not considered further.

An alternative approach is to choose similar flows that have not benefited from Open Access services, and use these as our benchmarks. The demand and revenue generation is then established by comparing the relative growth rates of the benchmark flows (or group of flows) and the Open Access flows. Again, this is subjective, with local economy, distance from London and levels of disruption among the factors that can distinguish flows and their respective growth rates from each other. While this process is complex, it is considered to be more robust than the modelling approach above, because the growth rates used as a comparison are factual rather than theoretical.

Finally, an industry average growth rate can be used for the benchmark. This can be calculated using data published by ORR on rail journeys by sector. The challenge from this approach is that the figures for the long-distance sector are dominated by large flows which have well-established direct services to London, so their growth rates would not be reflective of a station that had continued with a poor direct service to London (such as East Riding stations to London – now served by Hull Trains). Additionally, ORR only publishes journeys, so an average yield growth is required, and that again relies on some form of benchmarking.

The preferred approach is to choose flows, or groups of flows, as our benchmark, and compare these to the Open Access flows. The choice of benchmark flows will vary for each flow of each operator, and is thus discussed in more detail in the relevant operators' chapters.

Note that the subjective nature of any approach means a precise result will not be produced. The purpose of this analysis is not to definitively prove the levels of generation and abstraction caused by Open Access services. It merely aims to demonstrate, through use of suitable benchmarks that there are clear signs of significant revenue and journey generation through the introduction of competing services.

1.3.2 Open Access flow categories

Our analysis has considered that Open Access services typically contain two types of flow: those which go head-to-head with an existing operator – so provide direct competition – and those which provide a new or vastly improved rail journey opportunity for passengers. When reviewing the benefits of the latter, particularly in terms of abstraction, we have estimated the extent to which passengers were “rail-heading” to other stations prior to the introduction of the new service, i.e. where people were driving to a station providing a better/direct service to London than their local station. By distinguishing the two types of flows we are able to establish whether they produce different levels of generation and abstraction.

1.3.3 Open Access routes evaluated

We have structured this report to primarily focus on the First Rail Open Access operations (Hull Trains and Lumo), although we briefly consider the impact of Grand Central.

The Lumo service was introduced during the time when the rail industry – and indeed the country – was still recovering from the COVID-19 pandemic. As such, it has been challenging to disentangle the impact of the introduction of this service with the wider recovery of rail demand over the last three years. However, we are able to provide evidence of the significant growth that this service has driven in Section 3.

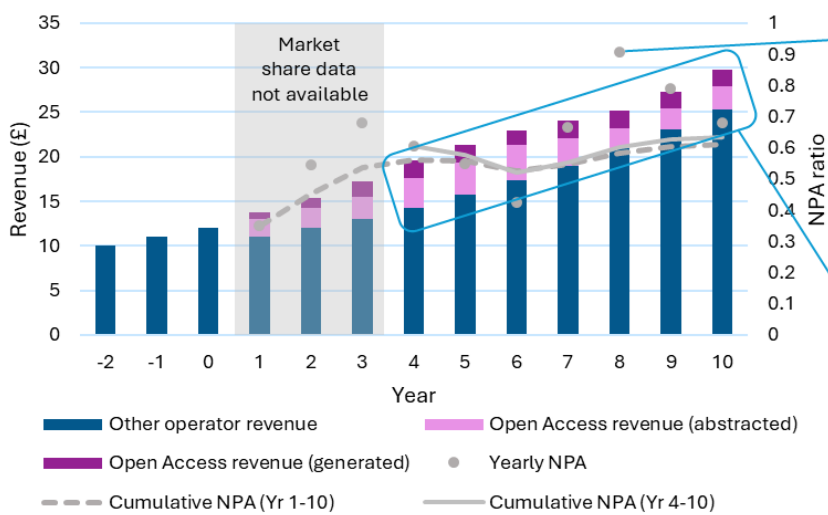
Hull Trains started operating in 2000, but ticket sales and journeys data is only available in LENNON from 2004. Therefore, we have had to rely on an alternative source of data from MOIRA to review the impact of introducing these services, as outlined in Section 4. Coupled with market share data from LENNON, this still provides sufficient evidence of demand and revenue generation when compared against benchmark flows.

The Grand Central service to Bradford has not been considered. The significant number of stations in the surrounding area from which journeys could have been abstracted makes the analysis particularly complex. However, Grand Central's service to Sunderland serves more remote stations meaning fewer stations from which revenue could have been abstracted. As such, we have briefly considered the Sunderland route in our analysis, as summarised in Section 5.

In each case, analysis predominantly focuses on stations for which Open Access operators provide direct rail services to London, since these flows represent the vast majority of revenue for the operators examined. The main exception is Lumo, where we have observed significant growth between Stevenage/Morpeth and Newcastle/Edinburgh, which is presented in Section 3.2.

1.3.4 Assessment time periods

Each of the operators assessed have limitations in terms of data availability/quality. Where possible, our assessment of demand and revenue NPA ratios is taken over 10 years. ORR typically award access for five to ten years, so this is deemed appropriate. Additionally, trying to find benchmark flows which are suitable for a period of more than 10 years is risky, and reduces the number of flows for consideration. Lumo has only been operating for 3 years, the first of which was significantly impacted by the Covid pandemic. We therefore use just two years of data to determine its NPA ratio. For Hull Trains, we do not have LENNON data for the first three years of operation, meaning market share (and hence levels of abstraction and generation) cannot be calculated. We instead use the cumulative NPA ratio for 2003/04 to 2009/10. Cumulative NPA ensures the impact of the missing years is minimised. The generation and abstraction calculated in each year from 2003/04 to 2009/10 is compared against a 1999/00 baseline, so includes the generation and abstraction from the earlier, excluded years. The concept of Cumulative NPA, and the impact of excluding three years, is explained in Figure 7.



The NPA for any given year is calculated based on the total generation and abstraction compared to the year 0 baseline. The generation and abstraction grow each year, so for example, the Year 8 figures include some generation that began in Year 1

The cumulative NPA is calculated by summing the generation and abstraction of all years. It is the net impact on the railway over this time period. In the case of Hull Trains we exclude years 1 to 3 due to lack of data.

Figure 7: Explanation of cumulative NPA

Table 4 summarises the time periods used for calculating NPA ratios.

Operator	Service introduced	First year	Last year	Reason
Lumo	October 2021	2022/23	2023/24	Covid pandemic impacts 2021/22
Hull Trains	September 2000	2003/04	2009/10	LENNON not available prior to 2003/04. 10-year impact considered

Table 4: Time period for assessment or NPA ratios

1.3.5 Presenting 'negative' NPA ratios

The calculation for revenue NPA ratio is:

$$\frac{\text{Revenue generation}}{\text{Revenue abstraction}} = \frac{\text{Actual Industry revenue} - \text{Benchmark Industry revenue}}{\text{Benchmark Industry revenue} - \text{Other Operator industry revenue}}$$

Based on this calculation, the NPA ratio can become negative in two ways, through negative abstraction or negative generation. Negative abstraction reflects a scenario where the other operator (government-funded) benefits from the exposure of Open Access services and sees its own revenue exceed expectation. Negative generation reflects a scenario where the total industry level falls below where it would expect to be had Open Access not been introduced. This can occur, at a station level, where passengers change their travel patterns due to the introduction of a more convenient local station.

This theory is illustrated in Figure 8. It shows that negative NPA ratios have little meaning, and displaying their value can be misleading.

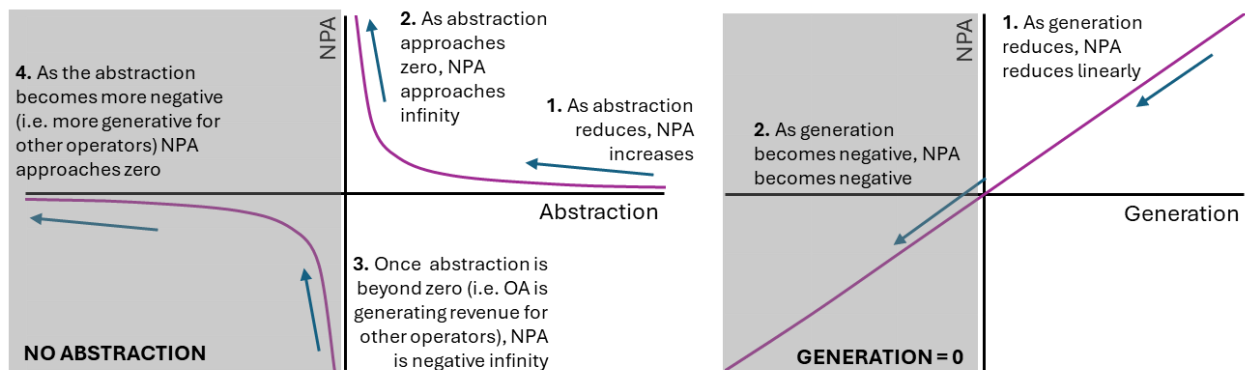


Figure 8: Illustration of the impact of reducing abstraction with fixed generation (left) and reducing generation with fixed abstraction (right)

A negative NPA ratio can, therefore, be a sign of significant generation or significant abstraction. As such, we avoid presenting results in this way. Instead:

- ▶ Any instances of negative generation will produce an NPA ratio of zero (the worst result that can be reported for any Open Access flow or operator); and
- ▶ Any instances of negative abstraction will not receive a numerical value and will instead state 'no net abstraction' (the best result that can be reported for any Open Access flow or operator).

Note that, when aggregating revenue and abstraction across multiple flows, negative values will be retained. The adjustments above only affect the way that NPA ratio results are presented.

1.3.6 Journeys NPA ratio

The NPA ratio for journeys is an important concept. Typically, when an Open Access Operator introduces a service, the fares on the served flows will become more competitive. While this is sometimes driven by Open

Access operators being aggressive with their pricing strategy, this can equally be driven by the response of the government-funded operator. The average yield growth on some London flows impacted by Grand Central and Hull Trains are shown in Figure 9. All are largely below the average industry yield growth, and most are below the 25th percentile. The result is a higher NPA ratio for journeys. A revenue NPA ratio of 0.3, could feasibly see a journeys NPA ratio of more than 1, indicating one new rail journey for every passenger abstracted. As discussed in Section 1.1.2 generation of new rail journeys leads to economic benefits from road decongestion and reduced emissions and/or brand new trips for business/leisure, which are not included in the revenue NPA ratio. The journeys NPA ratio helps to highlight these benefits.

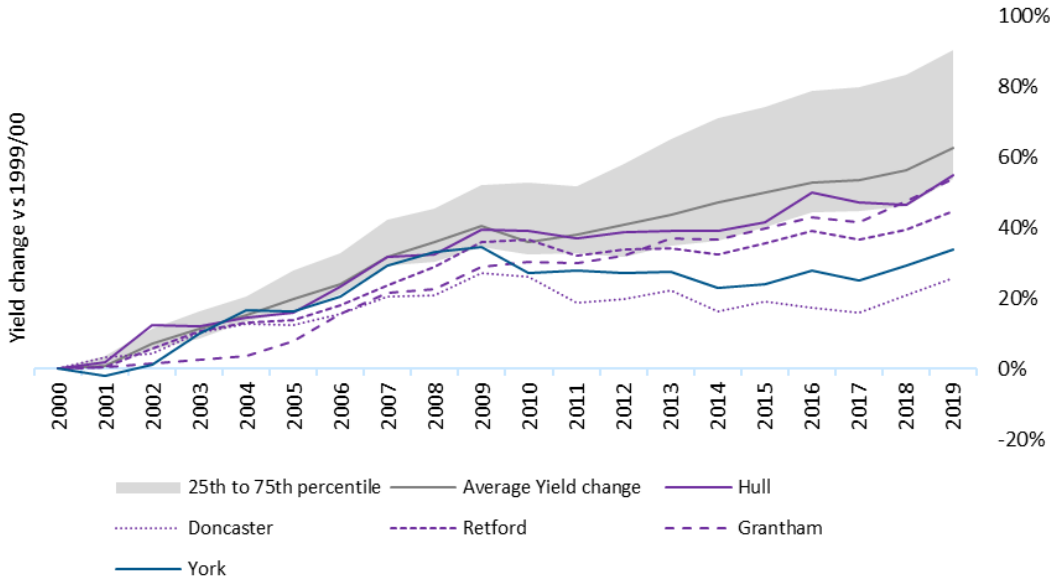


Figure 9: Change in yield for Open Access flows vs other long-distance London flows (source: MOIRA yield)

2 Summary of demand and revenue generated by Open Access

Ahead of the detailed results, Table 5 summarises the inferred NPA ratios for journeys and revenue for each of the First Rail Open Access operator routes considered. In each case, this indicates that the introduction of Open Access services has been successful in attracting new demand and revenue to the rail market. In each case, the inferred NPA revenue ratio far exceeds the 0.3 threshold set by ORR. Full details of the results for each route are covered in the following sections.

Open Access Operator flows to London	Total Journeys generated (m)	Total Revenue generated (£m)	NPA (journeys)	NPA (revenue) ¹⁴
Lumo (2022/23 to 2023/24)¹⁵	5.3 to 5.4	232 to 263	No net abstraction	No net abstraction
Hull Trains (2003/04 to 2009/10)¹⁶	1.8	29 to 34	1.59 to 1.75	0.51 to 0.67

Table 5: Summary of results for London flows only, detailing indicative journey/revenue generation of each operator, and corresponding NPA ratio

¹⁴ NPA excludes Infrastructure Cost Charge

¹⁵ Total revenue and journeys generated over first three years of operation will be higher due to exclusion of 2021/22

¹⁶ Total revenue and journeys generated over first ten years of operation will be higher due to exclusion of 2000/01 to 2002/03

3 Lumo Services

3.1 Improved service provision for passengers

Lumo services were introduced in October 2021, providing 5 trains per day between Edinburgh and London to compete directly with the air market, while also calling at Stevenage, Newcastle and Morpeth. The service offered lower fares to stimulate mode switch.

Service enhancement	How provided
Faster rail journey times	Lumo offer the fastest journey time from London to Newcastle, reducing it from 2 hours 48 minutes in 2019 to 2 hours 36 minutes in 2022
Direct journey opportunities	Stops at Stevenage, removing the need for some passengers to travel into London to access the ECML Stops at Morpeth, providing a consistent service for passengers travelling to London
Increased service frequency	5 additional services in each direction
Fare competition	Lower fares to compete with air market between Edinburgh and London

Table 6: Service enhancements provided by Lumo

3.2 Benchmarks

Due to the challenge in producing reliable benchmarks, two have been produced, as detailed in Table 7. The detail behind the choices is included in Appendix A.

	Benchmark 1	Benchmark 2
Newcastle	Leeds Durham	Manchester BR Liverpool BR Preston Bristol Temple Meads Cardiff BR
Edinburgh	Glasgow	Bristol Temple Meads Leeds Cardiff BR Manchester BR

Table 7: Flows chosen as a benchmark for Lumos two key London flows: Newcastle and Edinburgh

3.3 Growth in rail journeys

The introduction of Lumo has helped to generate over 6 million new rail journeys, helping to achieve a material switch from air travel.

Lumo has seen significant growth in journeys and revenue on all flows. Much of its success has come from mode shift, as shown in Figure 10. The market share for rail has increased notably at the expense of the air market, rising from 32% in 2019 to 46% in 2024. In comparison, the rail mode share for Glasgow to London has remained static during the same time period. This provides strong evidence of extensive rail demand generation on this route since the Lumo service was introduced.

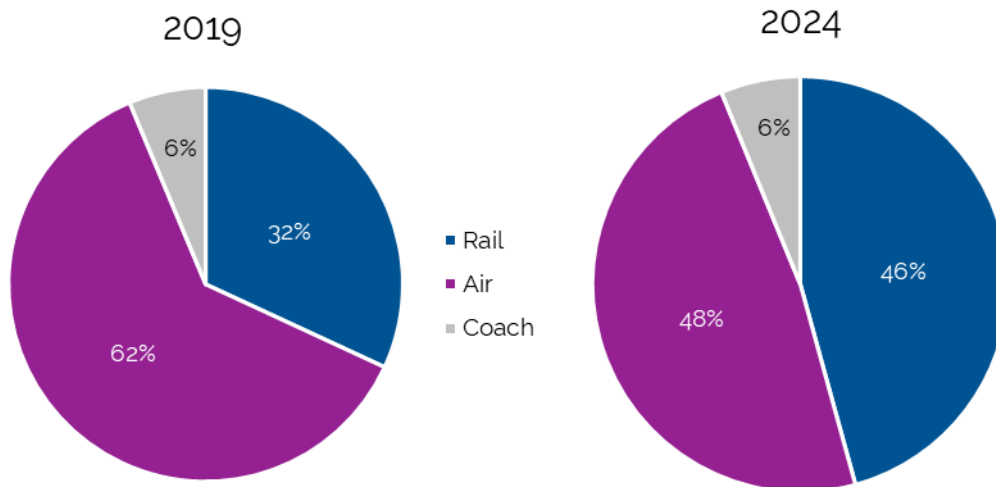


Figure 10: Proportion of journeys by mode between London and Edinburgh (source: CAA, LENNON)

Journeys between London and Edinburgh have materially increased since the introduction of Lumo in 2021, with a 46% increase in the latest rail year (2023/24) compared with 2018/19¹⁷. Growth has also been seen on the London to Newcastle route, up 6% over the same time period. These growth rates compare favourably to their respective benchmarks. If we split this growth between LNER¹⁸ and Lumo growth – as shown in Figure 11

¹⁷ The comparison is made with 2018/19 since this was the last full year prior to the Covid pandemic which materially affected rail demand from the final period of 2019/20 (March 2020). We have not shown data for the two years most affected by the pandemic in all charts in this report (2020/21 and 2021/22).

¹⁸ LNER has been the main ECML operator since Lumo began operations

– we can see how the LNER journeys growth compares to benchmark. For Edinburgh, LNER journeys growth is 11%, while its benchmark flow has seen journeys reduce by 15%. This implies that LNER has thrived since the introduction of Lumo services. For Newcastle, LNER growth is marginally below its benchmark, which indicates a degree of abstraction, but the overall growth is 22 percentage points higher, indicating significant generation of journeys.

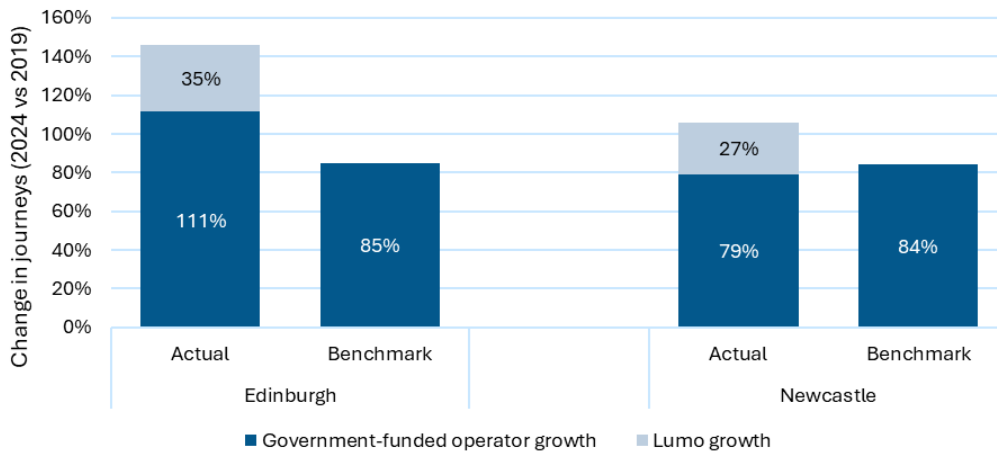


Figure 11: Change in journeys between 2018/19 and 2023/24 for London flows to Edinburgh and Newcastle, compared to highest of two benchmarks (Source: LENNON sales)

Lumo has also opened up improved journey opportunities away from London on the ECML. The introduction of calls outside major cities (e.g. Stevenage and Morpeth) has generated significant growth as passengers no longer have to travel long-distances to access direct rail services. This can be seen in Figure 12, where all non-London flows have grown by more than the industry benchmark¹⁹, with some flows growing by more than 150%. Across all five non-London flows, more than 490k new rail journeys have been generated in 2022/23 and 2023/24.

¹⁹ Based on average growth for long-distance and Open Access operators (source: ORR)

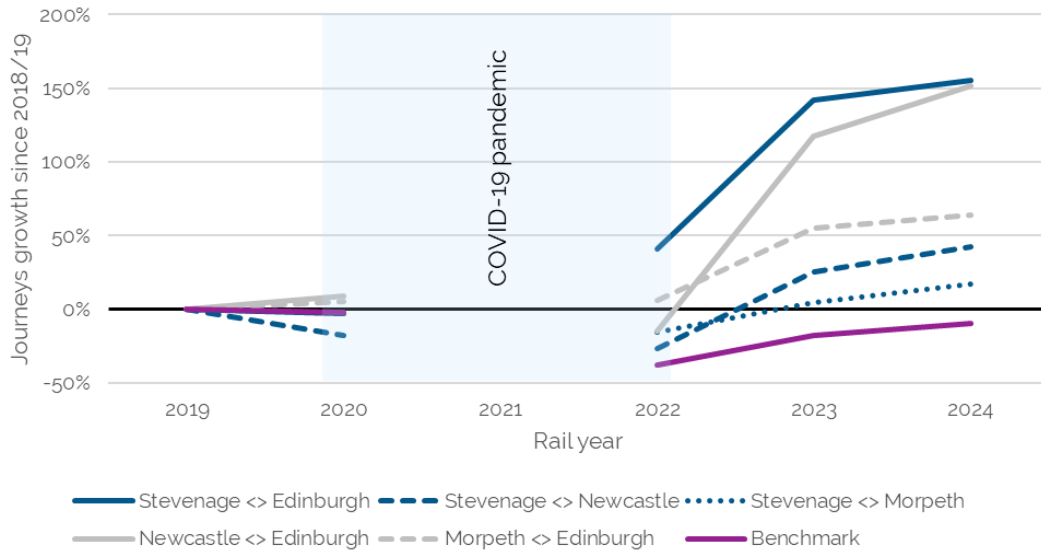


Figure 12: Growth in non-London rail journeys for directly served Lumo flows (source: LENNON)

When comparing to industry benchmarks²⁰ for all directly-served flows, over 6.2m journeys have been generated between April 2022 and March 2024, with 64% coming from Edinburgh to London, as shown in Figure 13. This figure is significantly larger than the 3.9m journeys carried by Lumo, which gives an indication of the level of journeys generation that is possible following the introduction of Open Access.

²⁰ Benchmark 1 for London flows, ORR long-distance and Open Access growth for non-London flows

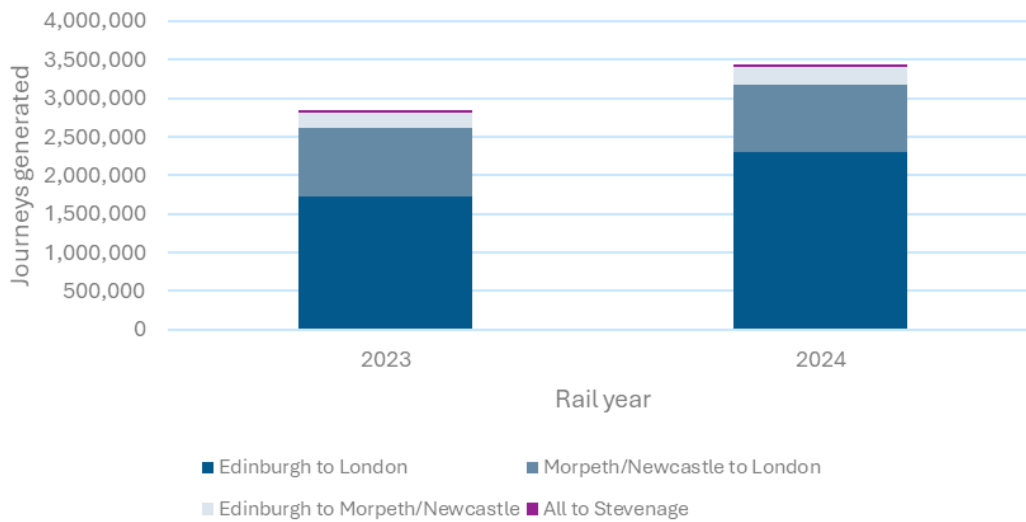


Figure 13: Journeys generated following the introduction of Lumo, calculated through comparison with the Benchmark 1 (Edinburgh and Newcastle) and Industry average (ORR) (source: LENNON)

3.4 Growth in industry revenue

Lumo has supported a 55% growth in rail revenue between London and Edinburgh between 2018/19 and 2023/24. During this time, benchmark revenue has not grown.

While journeys have demonstrably increased, revenue needs careful consideration, particularly given the lower pricing of Lumo tickets. Figure 14 shows how, despite the lower fares, the rail revenue between London and Edinburgh has materially increased since the introduction of Lumo in 2021, with a 55% increase in the latest rail year compared with 2018/19. Comparatively, Glasgow (Benchmark 1) revenue has grown by just 1% over the same period. Figure 14 shows Edinburgh and Glasgow revenue tracking closely leading up to the pandemic, then drastically diverging after. While some of the reduction in Glasgow revenue is attributed to poor performance on West Coast, there is still a clear upward trend for Other Operator revenue. This indicates that there has been no net abstraction of LNER²¹ revenue by Lumo, since its services were introduced. Instead, its emergence has supported wide rail growth on this flow.

²¹ LNER has been the main ECML operator since Lumo began operations

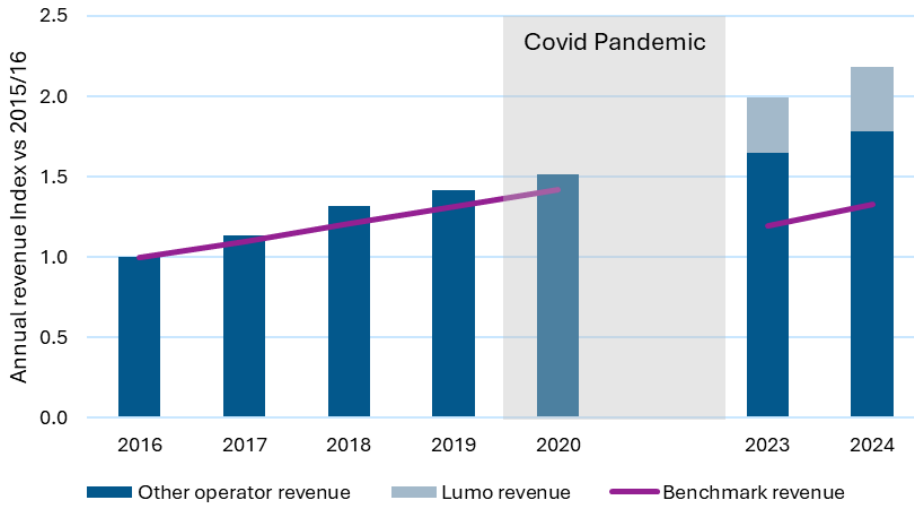


Figure 14: Growth in annual revenue between London and Edinburgh, benchmarked against Glasgow (Source: LENNON sales)

While growth rates on the London to Newcastle routes are not as high, they still compare favourably with benchmarks, as indicated in Figure 15. Once again, the benchmark of Leeds and Durham (Benchmark 1) tracks Other Operator revenue closely between 2016 and 2020. Beyond the Covid pandemic, this tracking continues, despite the growth of Lumo revenue. Based on this evidence, LNER’s revenue on the London to Newcastle flow is tracking where it would expect to be without the new Lumo services. Again, this indicates negligible levels of net revenue abstraction on this flow.

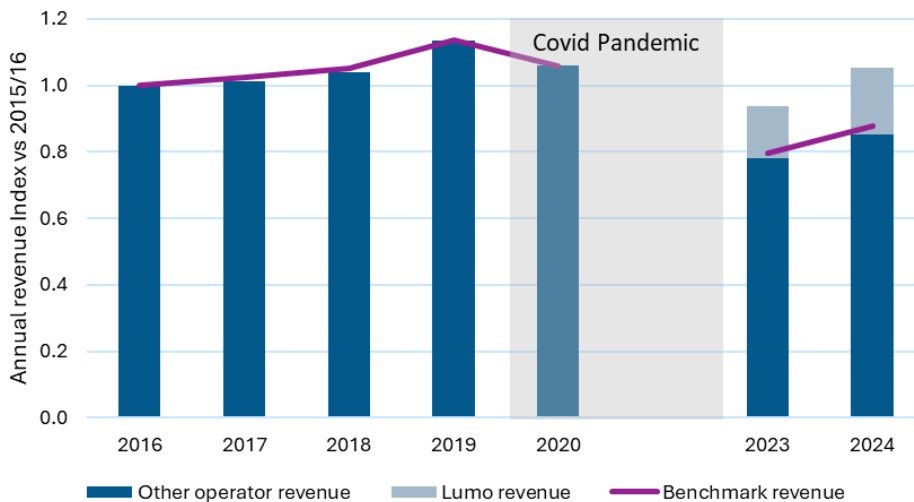


Figure 15: Growth in annual revenue between London and Newcastle, benchmarked against Leeds/Durham (Source: LENNON sales)



In total, in 2023 and 2024, Lumo has helped to generate between £230 and £260m on these two key London flows²².

3.5 NPA Test for Lumo services

The impact of Lumo services has been net generative, particularly capturing market share from airlines; there has been no net abstraction from government-funded operator revenue.

Given these services commenced operation while the industry was still recovering from the COVID-19 pandemic, it is more challenging to accurately estimate the levels of demand generation and abstraction from these services. However, the charts above present compelling evidence of strong rail demand generation, particularly through abstraction from the air market.

Due to the strong growth on the London to Edinburgh route at the expense of the air market (with rail now accounting for 46% of all journeys), our calculations conclude that Lumo hasn't materially abstracted any revenue from government-funded operators, but has been predominantly revenue generative. There is evidence of a small amount of revenue abstraction on the London to Newcastle route, this is offset by the significant generation of revenue seen by LNER. Both benchmarks conclude that there has been **no net abstraction by Lumo**.

	Total Journeys generated (m)	Total Revenue generated (£m)	NPA (journeys)	NPA (revenue) ²³
Lumo (2022/23 to 2023/24)²⁴	5.3 to 5.4	231.9 to 263.0	No net abstraction	No net abstraction
Edinburgh	3.4 to 3.6	166.6 to 223.0	No net abstraction	No net abstraction
Newcastle	1.7 to 1.9	40.0 to 65.3	7.06 to 43.32	1.23 to 8.95

Table 8: Revenue and Journeys NPA for Lumo flows between Newcastle/Edinburgh and London, based on 22/23 and 23/24 data (Source: LENNON)

²² Range based on total generation compared with Benchmark 1 and Benchmark 2

²³ NPA excludes Infrastructure Cost Charge

²⁴ Total revenue and journeys generated over first three years of operation will be higher due to exclusion of 2021/22

4 Hull Trains Services

4.1 Improved service provision for passengers

Hull Trains began operation with three services in each direction between Hull and London in September 2000. Prior to this, Hull (plus Brough and Selby) was served by just one train per day, meaning the majority of passengers from these stations were forced to interchange onto GNER²⁵ services at Doncaster. This service level increased incrementally each year, including adding a call at Howden in 2004, ending with seven services in December 2006. This is the service level that has continued through to today. Additionally, since December 2006, the journey time between Hull and London has gradually been reduced by nearly 4 minutes. Since 2017, Hull Trains has also extended some services to Cottingham and Beverley, providing these towns with direct services to London for the first time. A summary of the timetable benefits is provided in Table 9,

Service enhancement	How provided
Faster rail journey times	Passengers no longer need to interchange, or have reduced their railheading time, reducing end-to-end journey times. Journey Time between Hull and London has reduced by nearly four minutes
Direct journey opportunities	Prior to Hull Trains, one service per day meant the majority of passengers required an interchange to access London, or a long drive to Doncaster to access a direct service. Howden, Cottingham and Beverley have direct services to London for the first time.
Increased service frequency	Increased from one train per day to seven. Also created a regular hourly service from Retford and Grantham.
Fare competition	While Hull Trains do not target lower fares, the existence of competition has kept fares growth on this route below the national average.

Table 9: Service enhancements provided by Hull Trains

²⁵ The East Coast franchise operator when the Hull Trains service commenced

4.2 Benchmarks

Due to the challenge in producing reliable benchmarks, two have been produced. The detail behind the choices is included in Appendix A. Note that Brough, Howden and Selby have the same benchmark flows in both scenarios, as the local environment is the most important consideration, and the flows are small enough that they do not have a notable impact on the NPA test.

	Benchmark 1	Benchmark 2
Hull	Grimsby Lincoln	Middlesbrough
Brough	Grimsby Lincoln	Grimsby Lincoln
Howden	Grimsby Lincoln	Grimsby Lincoln
Selby	Grimsby Lincoln	Grimsby Lincoln
Doncaster	Wakefield	Warrington Wolverhampton
Retford	Lincoln Newark	Gloucester Stafford Wigan
Grantham	Nottingham	Kings Lynn Rugby Stafford Westbury Weymouth

Table 10: Flows chosen as a benchmark for Hull Trains' key London flows

4.3 Head-to-head competition: Retford and Grantham

The introduction of Hull Trains services from Retford and Grantham has generated revenue (£1.26 for every £1 abstracted) and journeys (2.81 for every one journey abstracted) for the railway.

Retford and Grantham are two of three stations, now served by Hull Trains, that had at least a two-hourly service provided by GNER prior to the introduction of Hull Trains' service. The other is Doncaster. Doncaster has not been included in this analysis as there is evidence that passengers previously railheading to

Doncaster have moved to stations such as Selby following Hull Trains' enhanced service. This is illustrated in Figure 16, which shows that, compared to Benchmark 1, Doncaster has grown at a slower rate. Benchmark 2 has a notably different profile, but reaches a similar point in 2009/10 where the benchmark growth is higher than Doncaster's overall growth. There could be other factors affecting Doncaster's below-average journeys growth, such as economic challenges, but these have not been considered in this analysis. If journeys have been reduced by other external factors, any adjustments to account for this would inflate Hull Trains' NPA ratio.

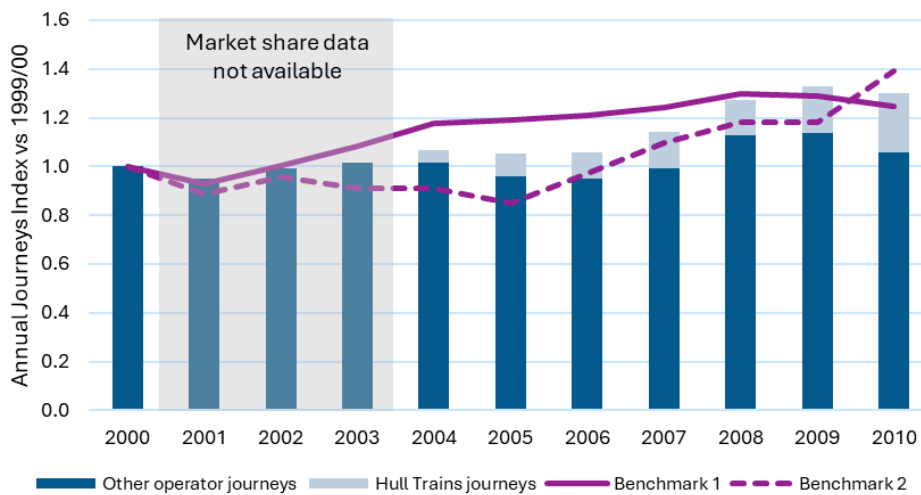


Figure 16: Growth in annual journeys between London and Doncaster, compared with two benchmark flows (Source: MOIRA journeys, LENNON market share)

Considering the same graph for Retford and Grantham combined, we can see that Retford and Grantham grow at a faster rate than their benchmarks in most years, although this gap closes with Benchmark 2 in 2009/10²⁶. The gap between the benchmark line and Other Operator journeys represents the amount of abstraction estimated. Where the benchmark line is below the Other Operator journeys, it implies that these other operators have benefited from the introduction of Hull Trains services to Retford and Grantham. Intuitively this could be explained by the high prevalence of railheading to these stations. Previously, with a two-hourly service, passengers may not have wanted to risk using Retford and Grantham knowing they may be left with a long wait in London if they miss their preferred train home. With the increased frequency provided by Hull Trains, that risk reduced, encouraging more passengers to use these stations, even if not explicitly travelling with Hull Trains. Considering the cumulative effects to 2009/10, the journeys NPA ratio for

²⁶ Note that the West Coast Very High Frequency (VHF) timetable was introduced in December 2008 and may be responsible for some of the divergence seen between benchmarks in 2009/10

these flows ranges from ‘no net abstraction’ to 2.81. So, taking the worst of these, Hull Trains generated 2.81 journeys for every passenger abstracted from the government-funded ECML operator²⁷.

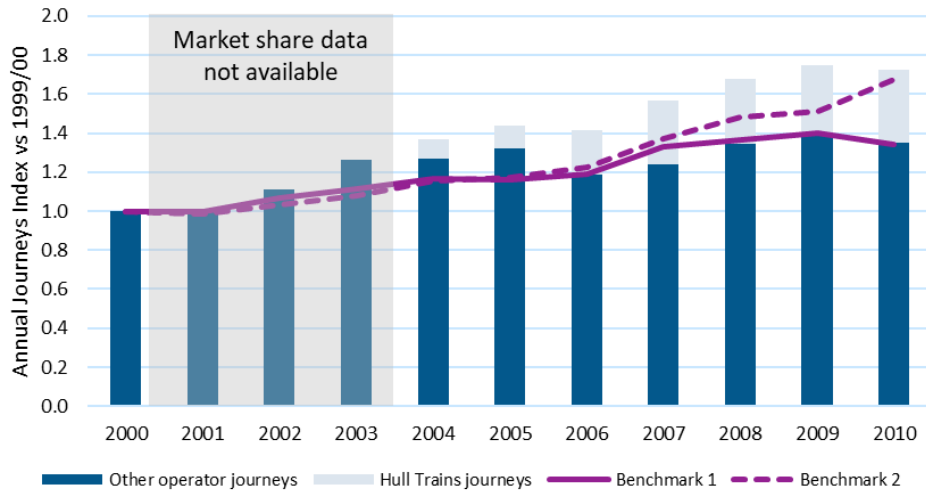


Figure 17: Growth in annual journeys between London and Retford/Grantham, compared with two benchmark flows (Source: MOIRA journeys, LENNON market share)

For flows with Open Access operators, it is almost certain that yields will lag behind national averages. Even if the Open Access operator doesn’t intend to compete directly on price – as is the case with Hull Trains – competitive responses for each operator will naturally force fares down. This is one of the key benefits of Open Access. This is demonstrated in Figure 18, which shows cumulative yield growth of Hull Trains flows lagging behind the benchmark flows.

²⁷ The ECML Operator since 2000 has been GNER (1996 – 2007), National Express East Coast (2007 - 2009) and East Coast (2009 – 2015)

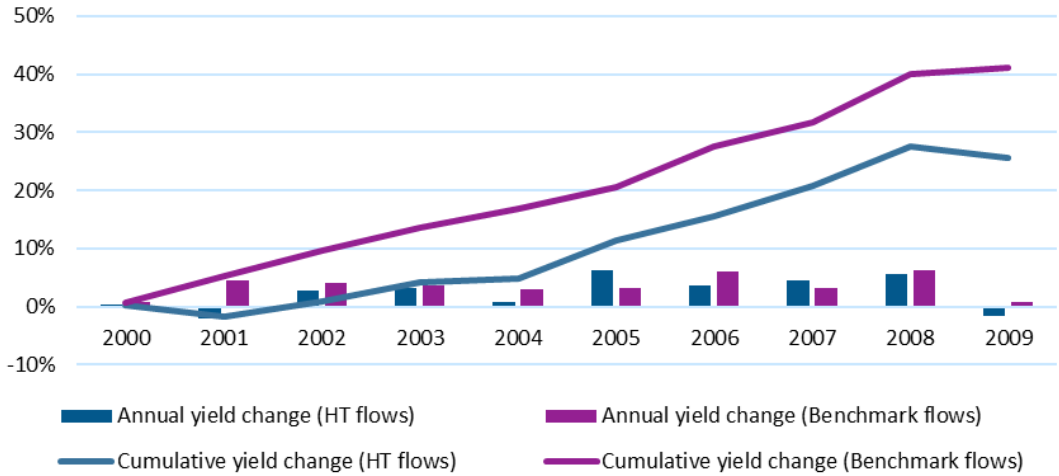


Figure 18: Comparison of yield growth for Grantham and Retford vs their Benchmark 1 flows (Source: MOIRA)

This yield differential will inevitably mean that the revenue NPA ratio is smaller than the journeys NPA ratio. This is demonstrated in Figure 19. The benchmark lines are consistently above Other Operator, implying some level of abstraction in each year, but remain below the Hull Trains revenue, indicating there is also some generation. The two benchmarks again give different results, with Benchmark 1 producing an NPA ratio of 3.38, higher than Benchmark 2 at 1.26. This still returns a range of positive NPA ratios, with at least £1.26 generated for every £1 abstracted. It highlights how important the choice of benchmark is.

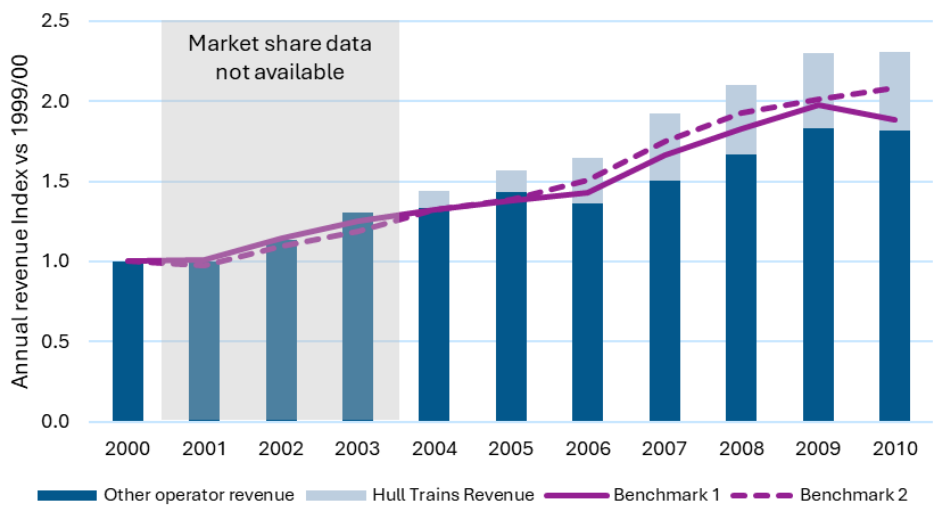


Figure 19: Growth in annual revenue between London and Retford/Grantham, compared with two benchmark flows (source: MOIRA journeys, LENNON market share)

In summary, the Hull Trains services generated significant revenue for passengers from Retford and Grantham, and even more journeys:

- ▶ £1.26 generated for every £1 abstracted; and
- ▶ 2.81 journeys generated for every journey abstracted.

4.4 New and improved direct journey opportunities: Hull, Brough, Howden and Selby

Ten years after Hull Trains commenced operation, revenue on flows from London to Selby, Brough and Hull had increased by nearly 200%, generating approximately £30m in revenue for the railway in this time.

Hull, Brough, Howden and Selby have all benefited from a substantially improved timetable following the launch of Hull Trains. From the launch of Hull Trains up to the end of 2009/10, the annual revenue on flows to London from these three stations has tripled, from £4.7m to £13.9m. By 2023/24, it has increased further to £18.9m, despite the suppression caused by the Covid pandemic.

Revenue (£k)	1999/00	To 2009/10			To 2023/24		
		Abs	Growth	Growth (%)	Abs	Growth	Growth (%)
Hull	3,861	8,796	4,936	128%	11,689	7,828	203%
Brough	793	2,874	2,081	263%	4,037	3,244	409%
Howden	1	601	601	102135%	757	757	128683%
Selby	91	1,635	1,544	1697%	2,372	2,281	2506%
Total	4,745	13,906	9,162	193%	18,855	14,109	297%

Table 11: Revenue on flows to London from stations served directly by Hull Trains (Source: LENNON)

This has generated significant revenue for the railway. Across these four flows, the Hull Trains services are estimated to have generated between £28m and £33m of additional revenue for the railway between 2003/04

and 2009/10²⁸. This results in a cumulative revenue NPA ratio for these flows of between 0.98 and 1.36. The journeys NPA ratio is significantly higher (1.45 to 1.78).

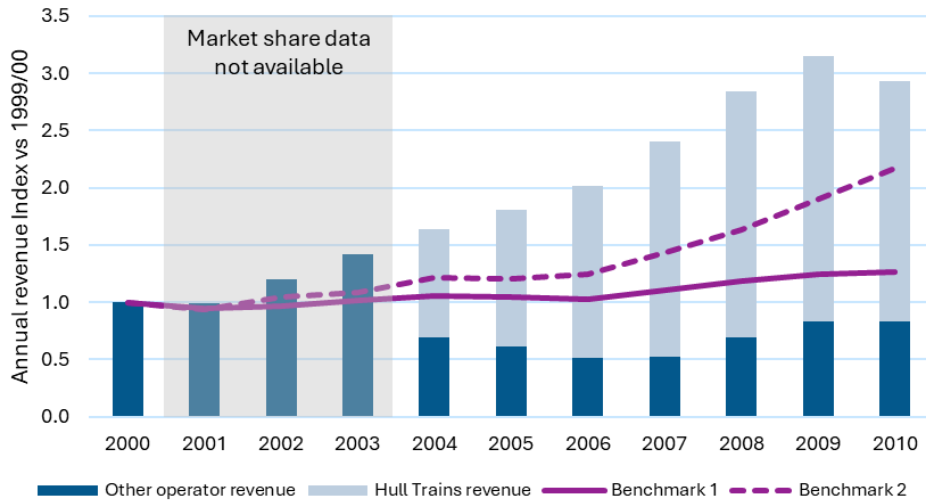


Figure 20: Growth in annual revenue between London and Hull, Brough, Howden and Selby, compared with two benchmark flows (Source: MOIRA journeys, LENNON market share)

4.5 NPA Test for Hull Trains services

For every £1 of revenue abstracted, we estimate that Hull Trains generated an additional 51p to 67p of industry revenue.

Hull Trains has three different groups of stations on its service. Stations in East Riding (Selby, Howden and Brough) and Hull have benefitted from a significantly enhanced service, and this is estimated to have generated £0.98 to £1.36 for every £1 abstracted. While this has come at the expense of revenue levels at Doncaster, some significant revenue generation for Retford and Grantham (up to £3.38 for every £1 abstracted) result in a net revenue NPA ratio of 0.51 to 0.67. As previously illustrated, journeys NPA ratios are always likely to be higher, and this is the case for Hull Trains, with 1.59 to 1.75 new rail journeys generated for

²⁸ As per Section 1.3.4, we are unable to calculate generation or abstraction figures prior to 2003/04 due to a lack of LENNON market share data. The cumulative NPA is unlikely to be significantly skewed by the missing data as every year is compared to a 1999/2000 baseline. The total generation figure is likely to be understated by £1-2m.

every journey abstracted. This has helped to generate significant economic growth for the East Riding and Hull regions.

Note that the lack of generation at Doncaster could have been caused by a number of different factors. As with any station, it could be subject to unique economic circumstances, or issues for passengers accessing services due to engineering/station works. What is unique about Doncaster is its role as a railheading station. Passengers from areas around Sheffield and Leeds can choose to drive to Doncaster to access the ECML. As such, improvements to London services – or economic conditions – from various locations in Yorkshire can have an impact on Doncaster loadings. If this is the case, the benchmark flows are unlikely to be representative and the NPA ratio unfairly suppressed. Finally, the Doncaster benchmarks are all based on the West Coast which was impacted by the Very High Frequency (VHF) timetable re-write in December 2008. While this only impacts the final year of analysis, it's another factor that could skew the Doncaster – and other Hull Trains' – flows. Any such characteristics haven't been accounted for. If Doncaster was excluded from the analysis, the revenue NPA ratio range increase to 1.03 - 1.61. This highlights how sensitive the NPA ratio can be.

	Total Journeys generated (m)	Total Revenue generated (£m)	NPA (journeys)	NPA (revenue) ²⁹
Hull Trains (2003/04 to 2009/10)³⁰	1.8	28.6 to 34.0	1.59 to 1.75	0.51 to 0.67
East Riding and Hull	1.1 to 1.2	28.4 to 33.1	1.45 to 1.78	0.98 to 1.36
Doncaster	No generation	No generation	No generation	No generation
Retford and Grantham	0.5 to 0.7	8.6 to 12.0	No net abstraction to 2.81	1.26 to 3.38

Table 12: Revenue and Journeys NPA for Hull Trains flows to London, based on data from 2003/04 to 2009/10 (Source LENNON)

4.6 Driving recent growth

Considering recent trends, Hull Trains has seen significant growth, along with other Open Access operators. Figure 21 shows that Hull trains has seen higher journeys growth than all other long-distance operators since 2018/19; Hull Trains has actually seen higher journeys growth than any other operator in this time period³¹.

²⁹ NPA excludes Infrastructure Cost Charge

³⁰ Total revenue and journeys generated over first ten years of operation will be higher due to exclusion of 2000/01 to 2002/03

³¹ Excluding Elizabeth Line which has undergone significant change in this time period



This is likely to have been helped by Hull Trains' investment in new rolling stock, and the additional capacity provided.

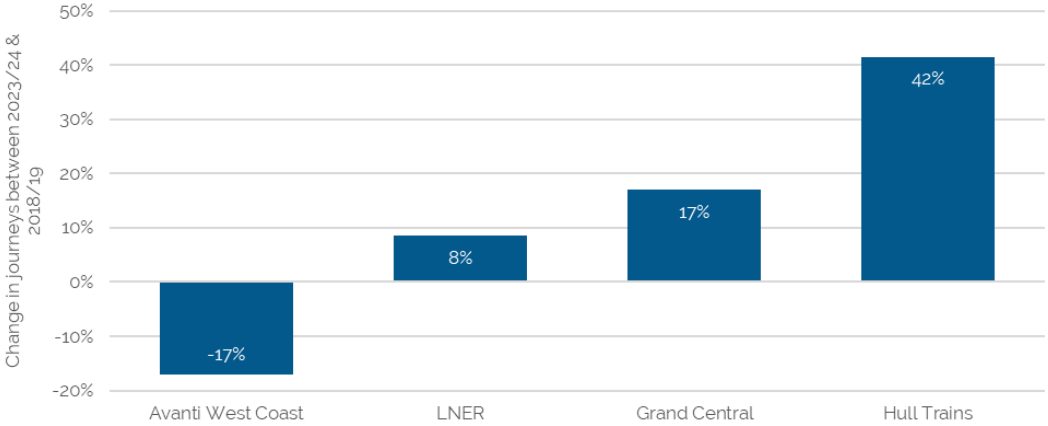


Figure 21: Journeys growth since 2018/19 for long-distance operators (Source: ORR)

5 Grand Central Services to Sunderland

5.1 Improved service provision for passengers

Since the commencement of Grand Central, weekday rail services between London and York have increased by one-third, offering more choice to passengers. Thirsk, Eaglescliffe, Hartlepool & Sunderland passengers now have direct services to London

The Grand Central service to Sunderland serves a mix of existing and new markets to and from London. It offers an enhanced direct service from York and Northallerton to London, while opening up new direct journey opportunities to London from Thirsk, Eaglescliffe, Hartlepool and Sunderland.

Grand Central began its service from London to Sunderland via York in December 2007 and has gradually increased service levels and reduced the journey times since then. During this time, the government-funded ECML operator³², has also increased the number of services and reduced journey times to York, perhaps in response to increased competition (see Figure 22). In total, York now has 44 services from London each weekday; a 33% increase from 31 in December 2006, demonstrating a notable benefit for passengers.

Service enhancement	How provided
Faster rail journey times	Passengers from Thirsk, Eaglescliffe, Hartlepool and Sunderland no longer need to interchange, or have reduced their railheading time, reducing end-to-end journey times. Journey Time between York and London has reduced by six minutes (see Figure 22)
Direct journey opportunities	Sunderland, Hartlepool, Eaglescliffe, and Thirsk have direct services to London for the first time.
Increased service frequency	Increased from no trains per day to six. 33% increase in services between York and London (see Figure 22).
Fare competition	The existence of competition has kept fares growth on this route below the national average.

Table 13: Service enhancements provided by Grand Central

³² The ECML Operator since 2007 has been National Express East Coast (2007 - 2009), East Coast (2009 – 2015), Virgin East Coast (2015 – 2018) and LNER (2018 - today)

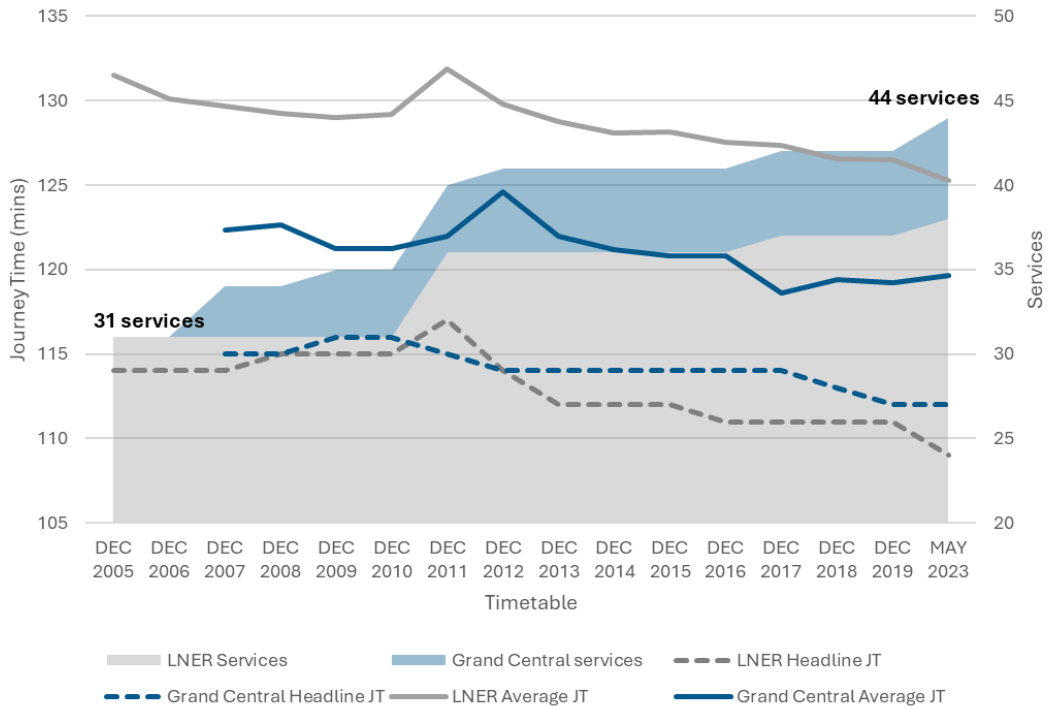


Figure 22: Historical timetable changes between York and London (Source: MOIRA)

5.2 Journeys growth

For stations with access to new direct journey opportunities, growth has been significant, with rail journeys to London growing from 78k in 2007 to 437k in 2019; growth of 556%.

Journeys (k)	2006/07	2018/19	Growth	Growth (%)
Thirsk	7	51	44	720%
Northallerton	52	132	80	256%
Eaglescliffe	1	91	90	9006%
Hartlepool	3	64	61	2142%
Sunderland	16	99	83	625%
Total	78	437	358	556%

Table 14: Journeys to London from stations served directly by Grand Central (Source: LENNON)

It would be too simplistic to suggest that all of this growth is “new” rail demand. Prior to the introduction of Grand Central services, someone living in Eaglescliffe may have either driven to Darlington to catch a train to London or bought two rail tickets: a Northern Rail ticket to Darlington and an LNER ticket to London. So, while the above journey generation contains some abstraction, it still generates an NPA ratio considerably higher than the 0.3 threshold.

As stated in Section 4.6, Grand Central has also seen significant growth in journeys in recent years. Figure 23 shows that Grand Central has seen higher journeys growth than all government-funded long-distance operators.

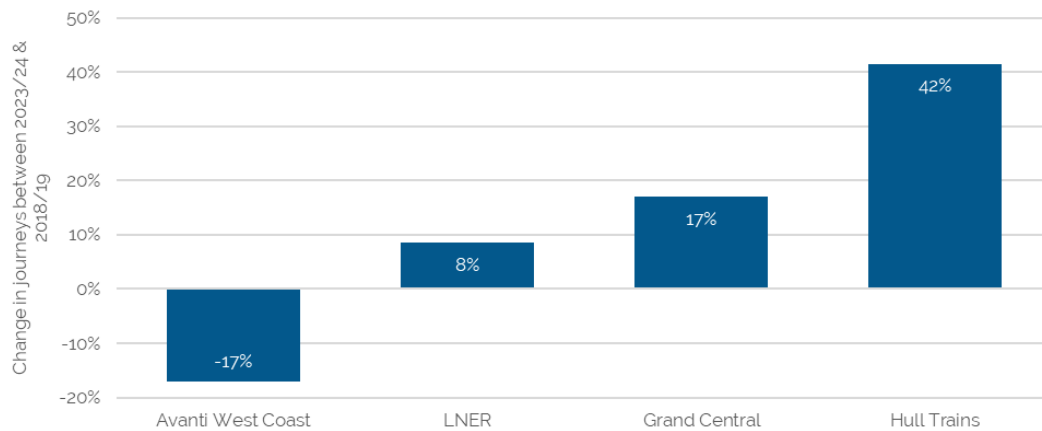


Figure 23: Journeys growth since 2018/19 for long-distance operators (Source: ORR)

6 ORR report

ORR have recently published a report, which carries out similar analyses of the generative benefits of Open Access³³, written by Systra. It generally supports the findings of this report by concluding that:

- ▶ Lumo’s NPA ratio has been above 1, and the service has been highly generative.
- ▶ Hull Trains NPA ratio is ‘above 0.3 to 0.45’, so comfortably above the 0.3 threshold.

Two approaches are used by Systra, a PDFH elasticity approach and a benchmarking approach; each is considered for a variety of timescales. The benchmarking approach is broadly the same as that used in this study, with different benchmark flows chosen. The comparable NPA ratio of the benchmarking approach for Hull Trains is 0.59³⁴, in the middle of the range reported in Section 4.5. When considering their different approaches, Systra conclude that the NPA ratio for Hull Trains is ‘above 0.3 to 0.45’, which is the result included in Table 15.

We have not attempted to replicate the PDFH approach used. Our view is that the factors used to establish the counter-factual, such as GVA, employment, performance and fare are all directly influenced by the existence of Open Access, so are not appropriate. Intuitively this would produce a lower implied NPA ratio. Note, however, that the NPA ratio calculated using the PDFH approach remains above 0.45 for Hull Trains³⁵.

Route	This study	Systra/ORR report
Lumo	No net abstraction	Above 1
Hull Trains	0.51 to 0.67	Above 0.3 to 0.45

Table 15: Comparison of revenue NPA ratios from this study, and that carried out by Systra for ORR

³³ Review of Open Access revenue generation and abstraction, Systra 2024

³⁴ 2009/10 value from Table 28 of Systra report

³⁵ A PDFH-elasticity NPA ratio was not calculated for Lumo due to the effects of the Covid pandemic

7 Conclusions and further considerations

The purpose of this analysis is not to definitively prove the levels of generation and abstraction caused by Open Access services. It merely aims to demonstrate, through use of industry average growth rates, that there are clear signs of significant generation through the introduction of competing services.

Even when considering the lower fares typically offered on Open Access services, all three routes examined have shown evidence of revenue generation well above the 0.3 threshold stipulated by ORR, as summarised in Table 16. Even those flows for which Open Access introduces direct competition with existing operators (e.g. London to Retford/Grantham) have an NPA ratio above the 0.3 threshold. It is clear from our analysis that journeys NPA is an important consideration because of the wider economic and environmental benefits that it represents. While Hull Trains generates 51-67p for every £1 abstracted, it generates 1.59-1.75 journeys for every one abstracted. This is as a result of the significant benefits provided by the improved service offer, including competitive fares and higher passenger satisfaction, leading to better value for money.

Open Access Operator flows to London	Total Journeys generated (m)	Total Revenue generated (£m)	NPA (journeys)	NPA (revenue) ³⁶
Lumo (2022/23 to 2023/24)³⁷	5.3 to 5.4	232 to 263	No net abstraction	No net abstraction
Hull Trains (2003/04 to 2009/10)³⁸	1.8	29 to 34	1.59 to 1.75	0.51 to 0.67

Table 16: Summary of results for London flows only, detailing indicative journey/revenue generation of each operator, and corresponding NPA ratio

Our analysis is based on a comparison against a counterfactual scenario based on industry average growth rates. This means the analysis considers the effect of the response from the competing operators from the introduction of Open Access services, whether through changes to fares or journey time. As such, it is a fair reflection on the overall impact on the railway.

In total, the analysis indicates that First Rail's Open Access services – across the nine years assessed and on London flows alone³⁹ – helped to attract over seven million journeys, and £261m to £297m of new revenue for the Great British railway. Extrapolating across the 25 years of Hull Trains operations, this is likely to mean the true figure is in excess of £350m.

³⁶ NPA excludes Infrastructure Cost Charge

³⁷ Total revenue and journeys generated over first three years of operation will be higher due to exclusion of 2021/22

³⁸ Total revenue and journeys generated over first ten years of operation will be higher due to exclusion of 2000/01 to 2002/03

³⁹ This is based on journeys and revenue attracted across seven years for Hull Trains between 2003/04 and 2009/10 inclusive, plus two years for Lumo between 2022/23 and 2023/24 inclusive

8 Appendix A: Selecting Benchmark Flows

This section outlines the process taken for establishing appropriate benchmark flows for each of the main Lumo and Hull Trains London flows. The choice of benchmark flows has been chosen based on distance from London, GVA, population and rail demand. This is not an exact science, but some evidence is shown below to justify the selections detailed in Table 7 and Table 10.

Throughout this appendix, there is reference to an ORR benchmark. This is produced by taking the ORR journeys for all long-distance flows, plus all Open Access operators (excluding Heathrow Express). An industry average yield is applied to this by taking the revenue and journeys for the top 92 long-distance flows from MOIRA1. As stated in Section 1.3.1, these figures are dominated by large flows which have well-established direct services to London, so their growth rates would not be reflective of a station that had continued with a poor direct service to London (such as East Riding stations to London – now served by Hull Trains). Additionally, ORR only publishes journeys, so an average yield growth is required, and that again relies on some form of benchmarking.

8.1 Lumo

To choose the benchmark flows for Lumo, we have taken consideration of a) how the key economic markers such as GVA and population have compared and b) how well the benchmark revenue growth has tracked that of the Lumo flow prior to the introduction of the service. The ability to backcast gives added confidence of the quality of the benchmark.

8.1.1 Edinburgh to London

Glasgow is the clear choice for a benchmark for Edinburgh. Figure 24 shows that, prior to 2019, Glasgow's revenue and journeys have tracked Edinburgh's closely, far better than the ORR Industry average benchmark. Figure 25 also shows GVA and Population for the Local Area Districts (LADs) have grown at similar rates.

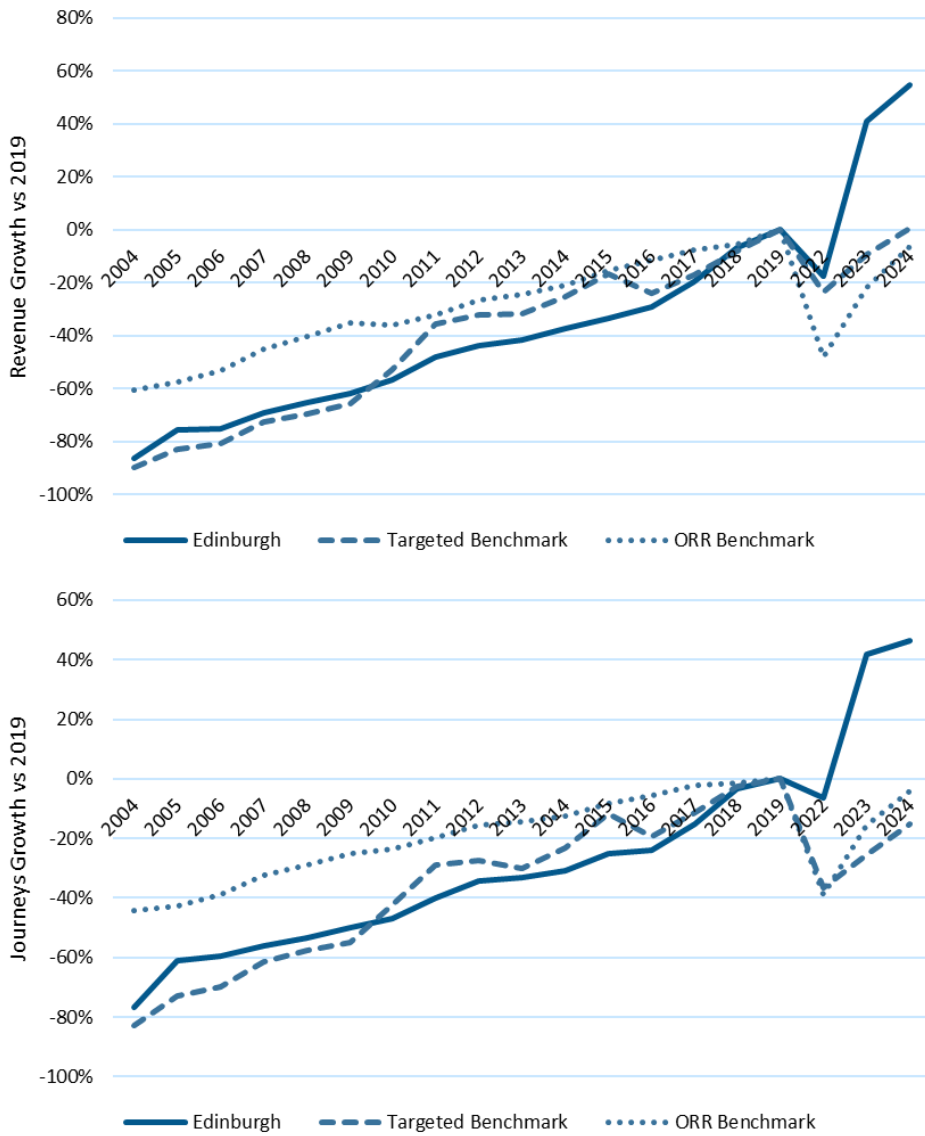


Figure 24: Benchmarking Edinburgh to London revenue (top) and journeys (bottom) with Glasgow to London (Source: LENNON)

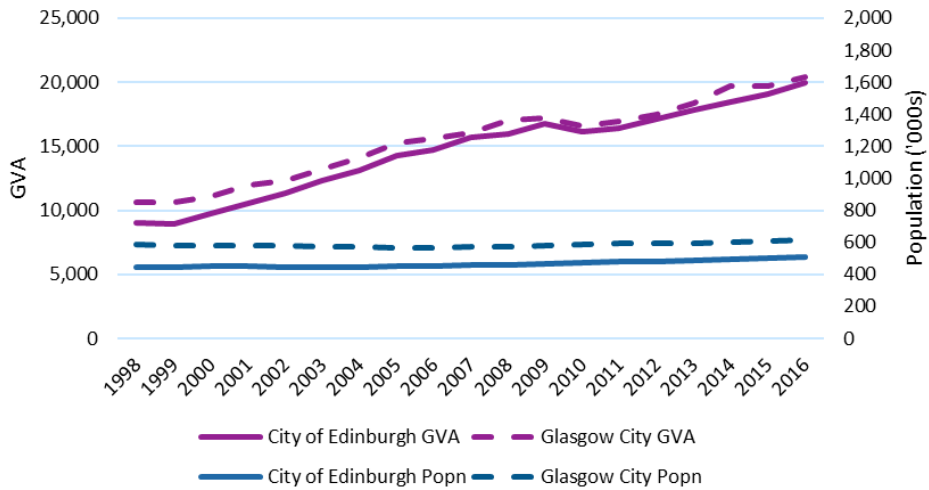


Figure 25: Benchmarking Edinburgh GVA and Population with Glasgow (Source: ONS)

Arguably, the comparison after 2019 will be skewed by the performance challenges on the West Coast Mainline (WCML). Regardless, Glasgow remains a valid comparator. To attempt to counter the effects of the WCML, we have considered a selection of other flows (Bristol Temple Meads, Leeds, Cardiff BR and Manchester) to use as a benchmark. These don't compare particularly well to Edinburgh, but track the industry average reasonably well, so will act as the second benchmark.

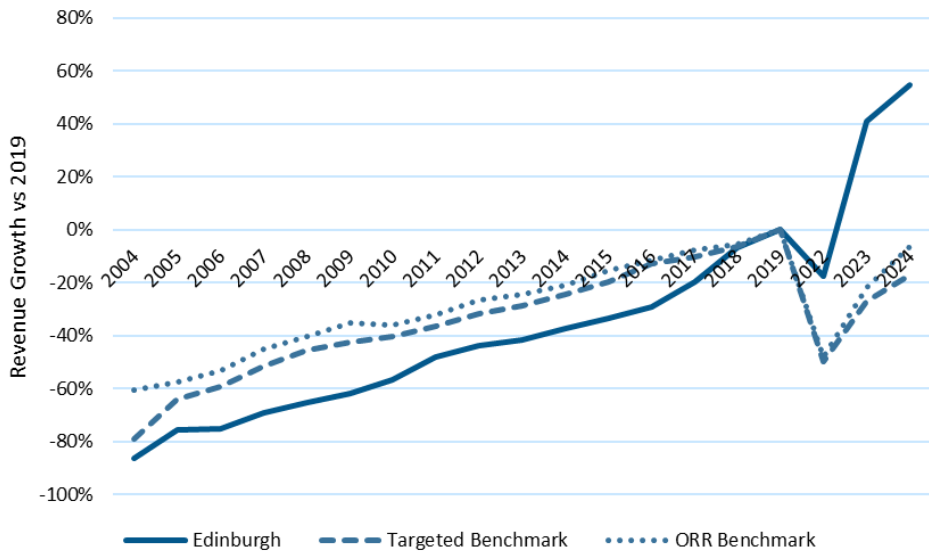


Figure 26: Comparison of Edinburgh to London revenue growth vs benchmark of Bristol, Leeds, Manchester and Cardiff (Source: LENNON)

8.1.2 Newcastle to London

Being mindful of the issues with WCML, options for benchmarking Newcastle with flows of a similar distance (and not impacted by Open Access) are limited. On ECML, Leeds and Durham are considered. Durham has not benefitted from the same service level as Newcastle but is a closer match when considering the backcast over the past 10 years. The story for population and GVA is not so clear-cut, with Newcastle-upon-Tyne having a far smaller population. It does, however, have an almost identical GVA profile to Country Durham.

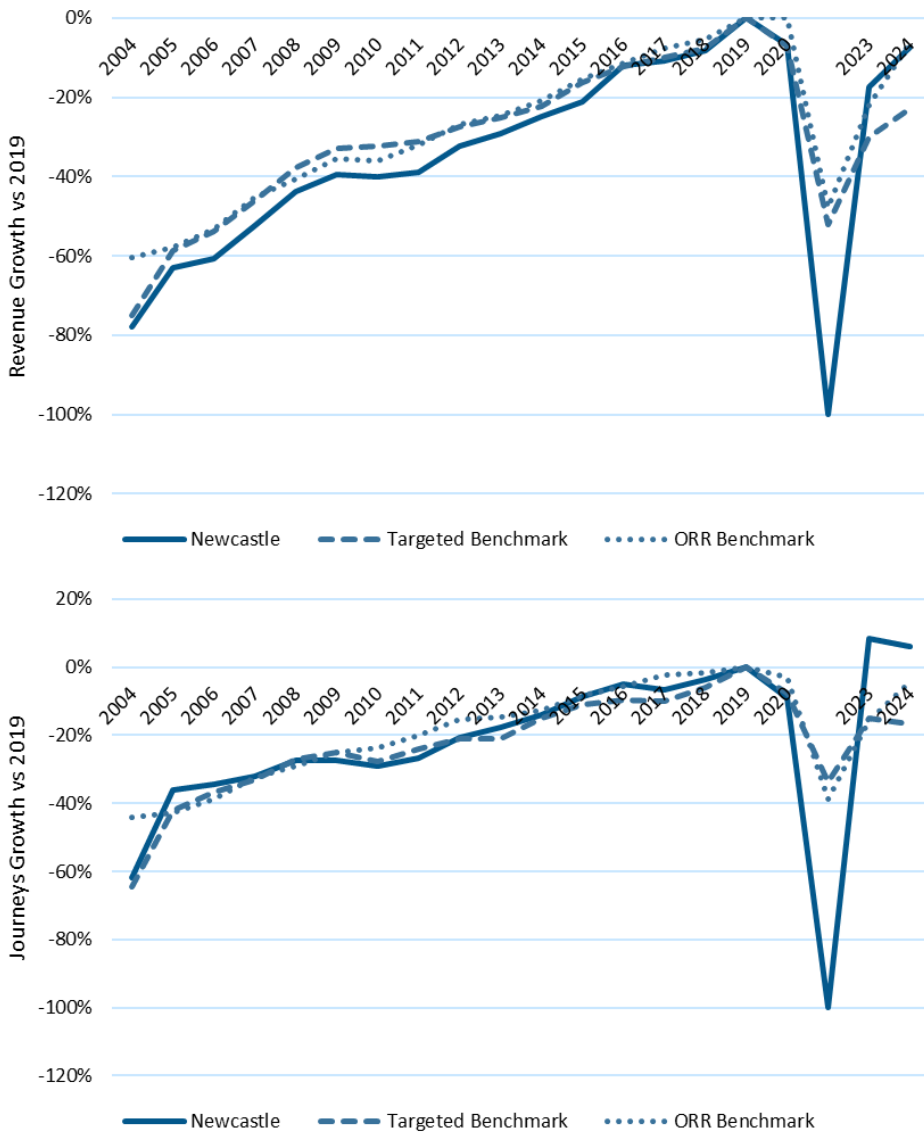


Figure 27: Benchmarking Newcastle to London revenue (top) and journeys (bottom) with Leeds and Durham to London (Source: LENNON)

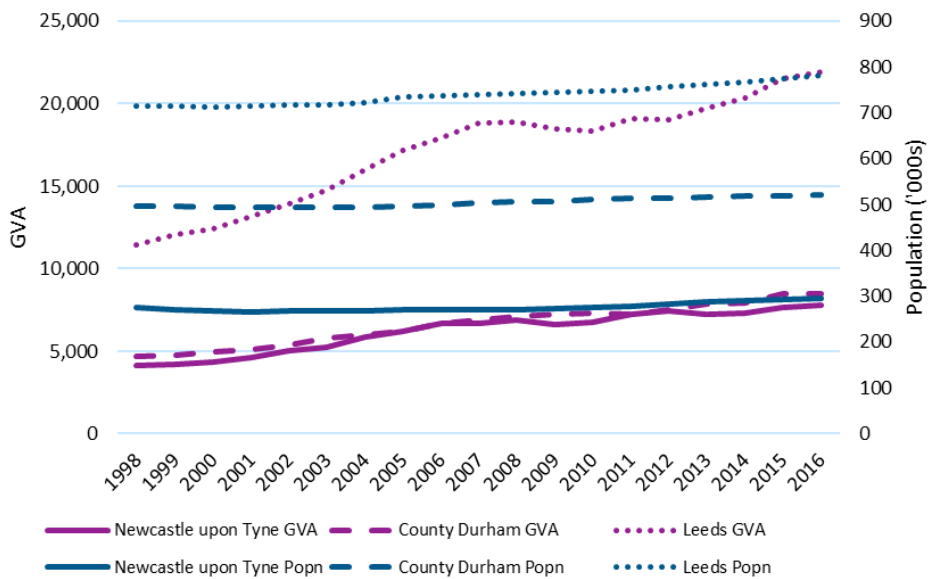


Figure 28: Benchmarking Newcastle GVA and Population with Leeds and Durham (Source: ONS)

A second benchmark is considered which looks to smooth the potential volatility of selecting one or two flows. This contains: Manchester, Liverpool, Preston, Bristol, Leeds, Nottingham and Durham. This performs better than the ORR index, as detailed below.

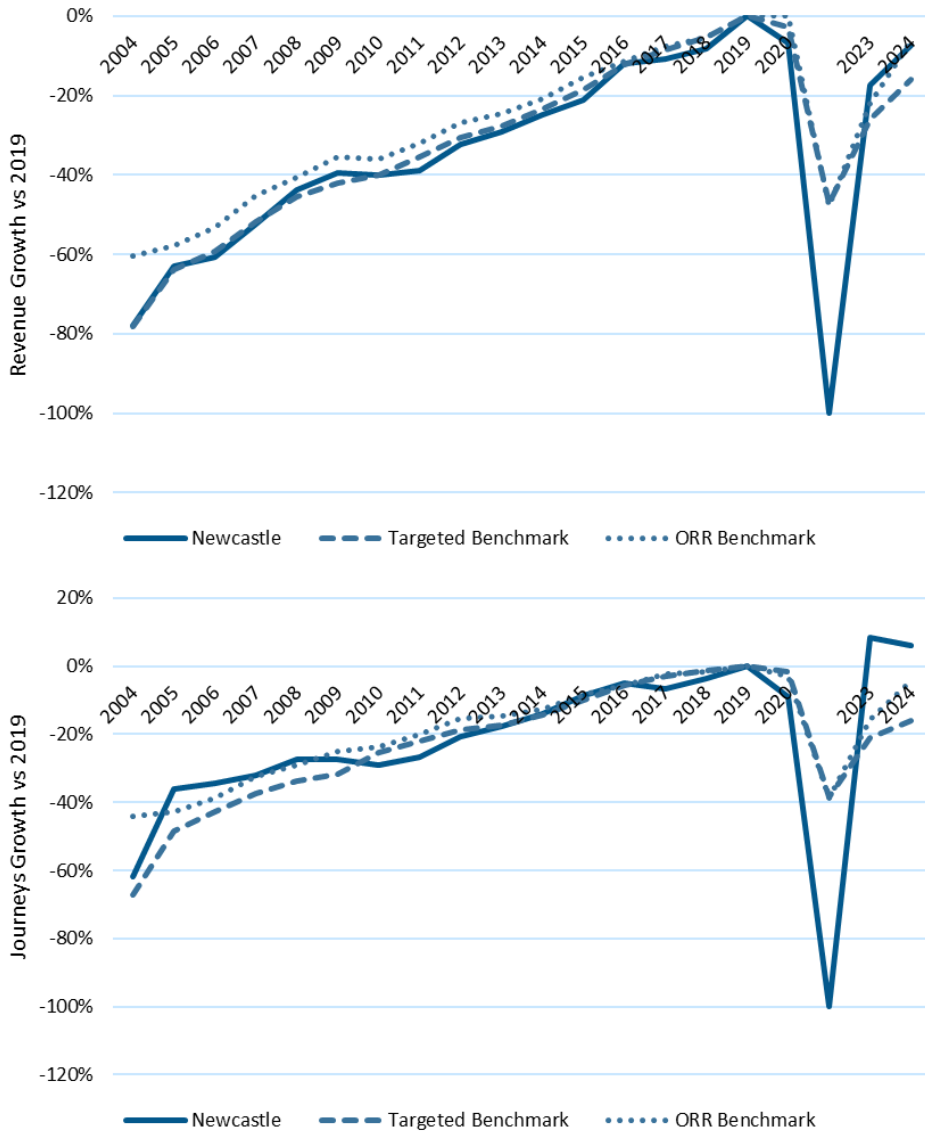


Figure 29: Benchmarking Newcastle to London revenue (top) and journeys (bottom) with Manchester BR, Liverpool BR, Preston (Lancs), Bristol Temple Meads, Leeds, Nottingham, Durham and Cardiff BR (Source: LENNON)

8.2 Hull Trains

For Hull, we don't have the benefit of performing a backcast. We can only choose flows of a comparable economic standing, locality and/or distance from London. Our aim for Hull Trains is to find one local comparator and one from a different region with similar rail and economic characteristics.

8.2.1 Hull to London

Regional

Comparing to local areas first, the areas around Lincolnshire, such as Lincoln and Grimsby have both had limited rail service to London so we would expect them to have a similar growth to Hull. While Hull has a larger population and GVA, its population growth trend has been comparable to Grimsby (North East Lincolnshire) and its GVA growth trend comparable to both. By combining Grimsby and Lincoln as one benchmark we anticipate a reasonable benchmark for Hull.

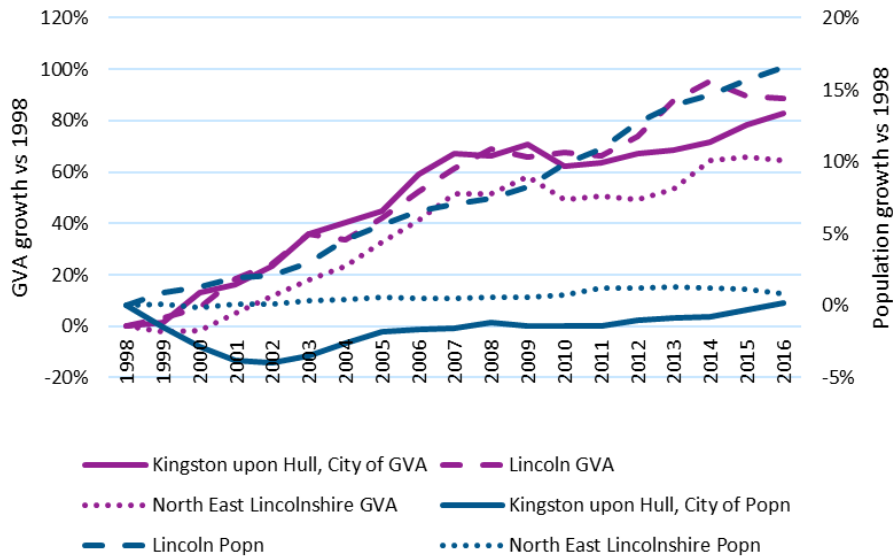


Figure 30: Benchmarking Hull GVA and Population with Grimsby (NE Lincolnshire) and Lincoln (Source: ONS)

Economic

Hull has clearly suffered from a declining population during the first years of Hull Trains. This turned in 2002. There are limited examples of locations that were experiencing a similar decline at the turn of the century and have not seen subsequent recovery. Middlesbrough is a good example that has some likeness with Hull, albeit with a smaller overall economy and population. Hull Trains saw a turnaround in population that is not replicated by Middlesbrough, but this could arguably be attributed to the new service provided by Hull Trains. On this basis, Middlesbrough is used as a second benchmark.

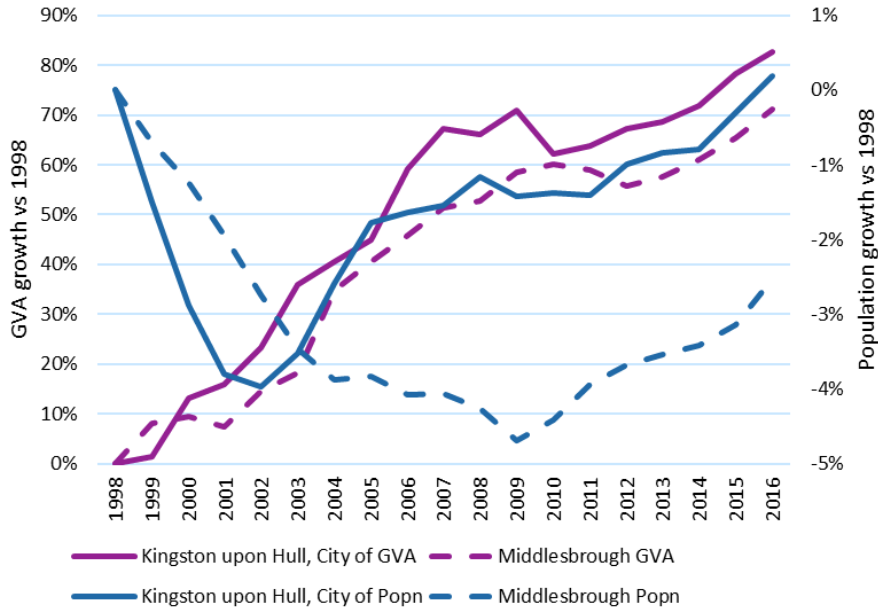


Figure 31: Benchmarking Hull GVA and Population with Middlesbrough (Source: ONS)

8.2.2 Brough, Howden and Selby to London

Stations from East Riding (Brough, Howden and Selby) have a small base revenue of approximately £850k. By 2009/10 this had grown to in excess of £5 million. While choosing an appropriate benchmark is important, it will have less impact on the overall NPA ratio. For this reason, we have only chosen a local benchmark and have used the same as Hull: Lincoln and Grimsby. The story is similar to Hull, whereby the GVA trend closely matches Grimsby and Lincoln, while population only matches one; in this instance, Lincoln.

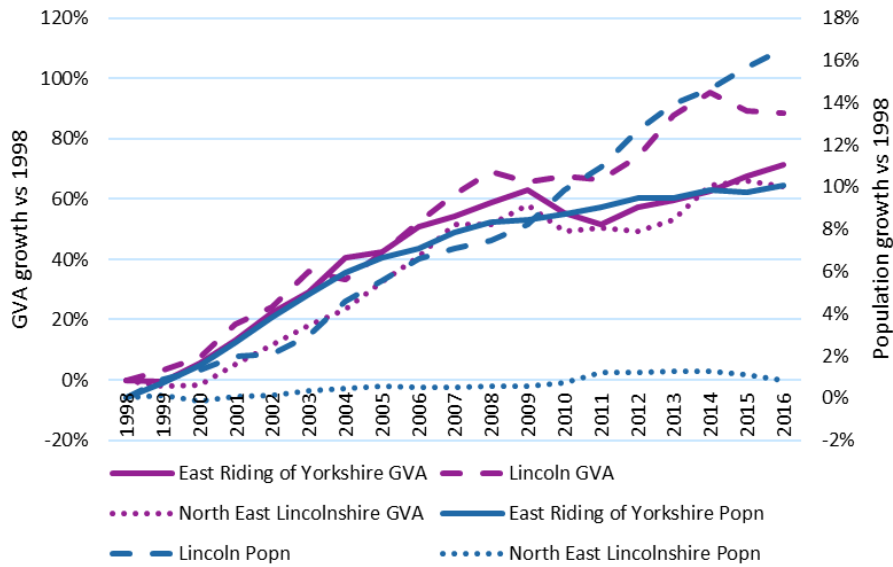


Figure 32: Benchmarking Brough, Howden and Selby (East Riding) GVA and Population with Grimsby (NE Lincolnshire) and Lincoln (Source: ONS)

8.2.3 Doncaster to London

Regional

Comparing to local areas first, Doncaster has a few locations that could be deemed comparable, including Sheffield, Wakefield and Leeds. Sheffield and Leeds are substantially bigger cities than Doncaster so have been excluded. Comparison of GVA and population to Wakefield show that both are of a similar scale and track reasonably closely. Doncaster experienced a substantial dip in GVA in 2008 and this is reflected – albeit less pronounced – for Wakefield.

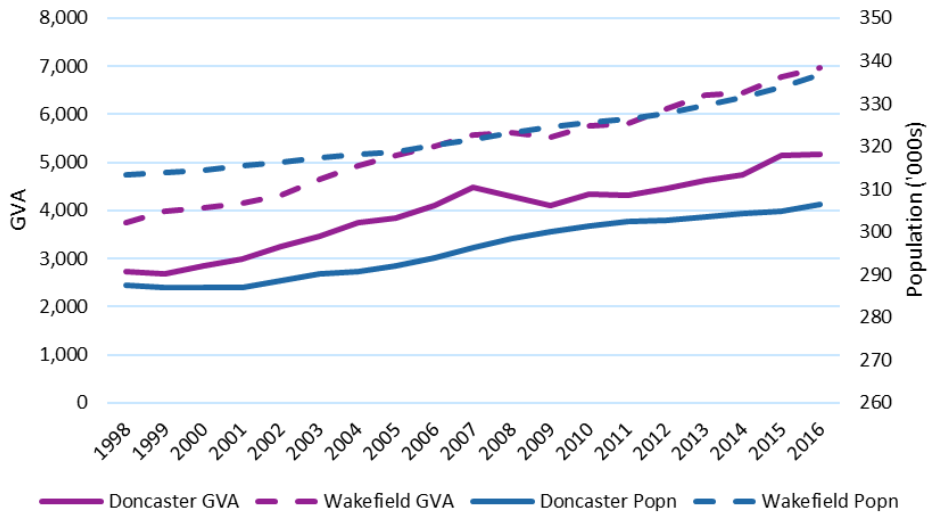


Figure 33: Benchmarking Doncaster GVA and Population with Wakefield (Source: ONS)

Economic

There are plenty of examples of well-served locations that are a similar distance from London and have similar quantity of rail journeys in 2000. Of these, those which best match Doncaster GVA and population trend are Wolverhampton and Warrington. These form our second benchmark.

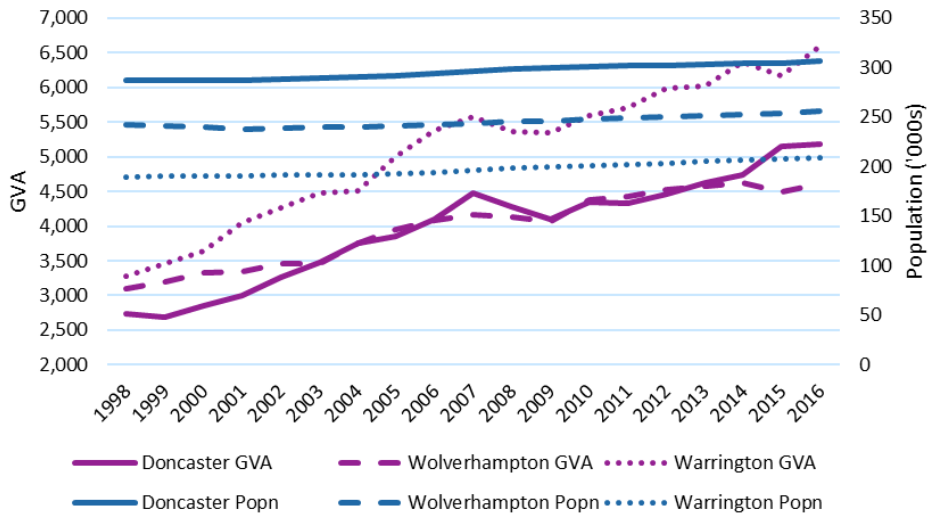


Figure 34: Benchmarking Doncaster GVA and Population with Warrington and Wolverhampton (Source: ONS)

8.2.4 Retford to London

Regional

Retford has been challenging to benchmark. The full list of stations that are within 50% of its distance from London and 50% of its journeys to London are as follows.

- Harrogate
- Bridgend
- Llanelli
- Bradford BR
- Stratford U Avon
- Lincoln Central
- Oakham
- Great Malvern
- Huddersfield
- Grimsby Town
- Bolton
- Halifax

Of these, none had a regular service to London in 2000 so aren't appropriate benchmarks. For regional locations, Lincoln is sufficiently similar that it should be considered a valid benchmark. To offset the lack of any direct rail service, Newark is added to Benchmark 1. Comparing GVA and population, both provide a close match. By combining the effects of Newark and Lincoln, it accounts for any movement of passengers between the two stations.

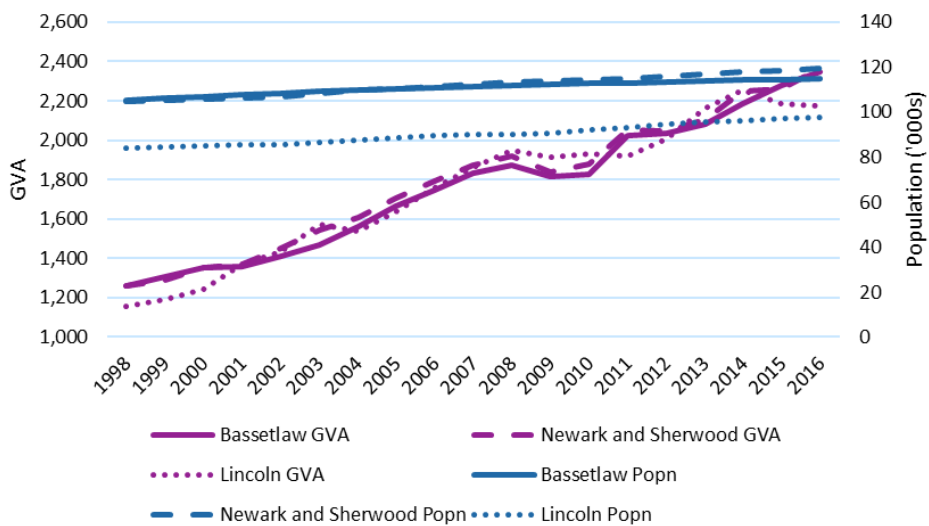


Figure 35: Benchmarking Retford (Bassetlaw) GVA and Population with Newark and Lincoln (Source: ONS)

Economic

As stated above, there are no obvious flows to use to benchmark against Retford. Instead flows with higher demand have been chosen: Wigan, Gloucester and Stafford. They have been chosen based on broadly similar GVA and population profiles to Retford. Wigan has larger absolute population and GVA, but its growth trend has been broadly similar.

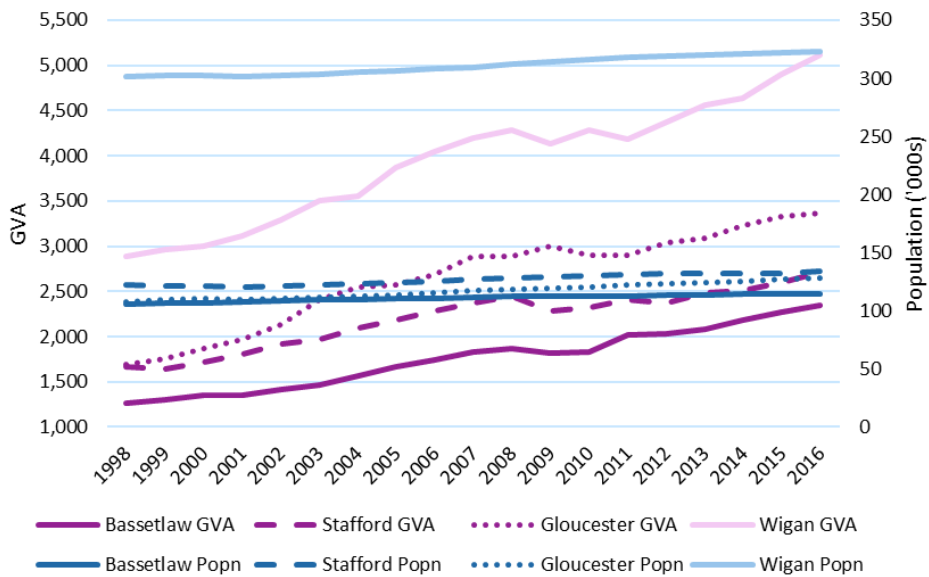


Figure 36: Benchmarking Retford (Bassetlaw) GVA and Population with Stafford, Gloucester and Wigan (Source: ONS)

8.2.5 Grantham to London

Regional

Locally, there are not many locations that have a similar service provision to Grantham. Nottingham has been chosen as the best local benchmark.

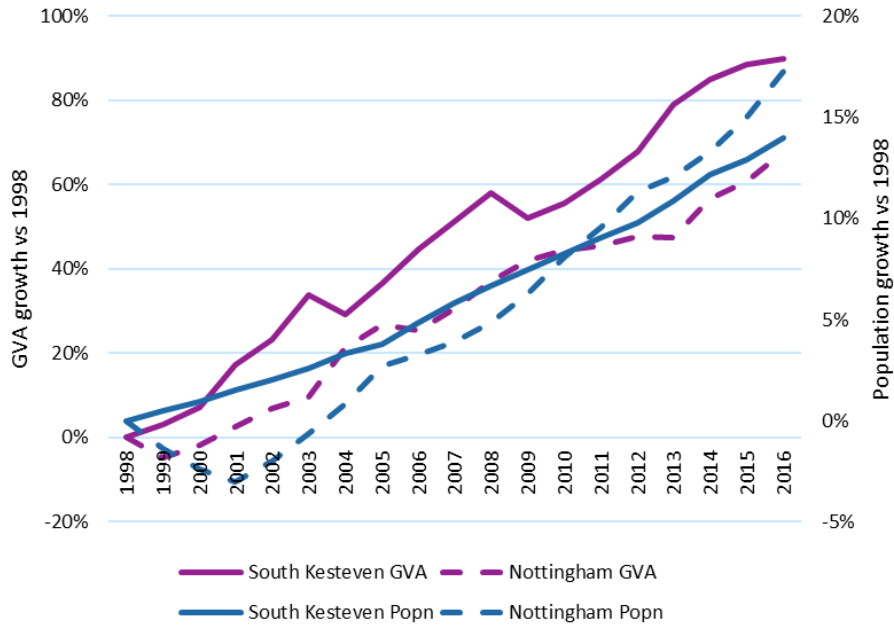


Figure 37: Benchmarking Grantham (S Kesteven) GVA and Population with Nottingham (Source: ONS)

Economic

Grantham has a large pool of comparable flows to choose from. If filtering by locations within 30% of the distance from London and 30% of the 2000 rail demand, the following locations are useful comparisons.

- Stafford
- Kings Lynn
- Westbury
- Weymouth
- Rugby

By choosing from a wider pool of locations, it lessens the effects of outliers.