

Kent ↔ Gatwick Rail Connectivity



Strategic Advice

Is there a rail case to reinstate direct rail services between Gatwick Airport, Tonbridge and beyond?





Tickets

5 Platforms 6

Definitions

Acronym	Definition
BML	Brighton Main Line
GJT	Generalised Journey Time
GTR	GoVia ThamesLink Railway
GWR	Great Western Railway
MPPA	Millions of passengers per annum
ORR	Office of Road and Rail
PDFH	Passenger Demand Forecasting Handbook
RUS	Route Utilisation Study
TPH <i>or</i> tph	Train(s) per hour

Document control

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DISCLAIMER: CHANGES TO THE BASE TIMETABLE USED IN THIS ANALYSIS

December 2023 timetable change

This analysis was completed in 2023, based on the December 2019 timetable and 2019 rail demand data, complemented with 2023 trip rates and mode shares. 2019 was used as the base year because the periods of 2020-2022 were heavily skewed by changing rail usage during and after the COVID-19 pandemic. In the December 2019 timetable (and in subsequent timetables until December 2023), GTR, the train operating company allocated three electric multiple units (EMUs) for the Redhill-Tonbridge service group. This allocation of three EMUs enabled two trains per hour (tph) to operate in each direction during the peak, and 1 tph in the off-peak.

In December 2023, to improve efficiency and reduce costs while maintaining the core connectivity benefits of the Redhill-Tonbridge service, GTR reduced the number of EMUs allocated to the service group from three to two. This means the baseline on which the rail case developed and presented in this document has changed.

The key aspects of this change are:

- Each service will spend less time stationary at Redhill and Tonbridge at peak times, making better use of the rolling stock.
- A small number of services on the line will no longer operate with focus on serving key local markets such as school traffic while balancing connectivity across the region.
- At peak times the regular clockface departure pattern has been amended, to make best use of the EMUs available.

The operating expenditure (opex) and unit savings are necessary given the budgetary pressures facing the industry.

Implications of timetable change for this Strategic Advice

This study has found that the Redhill - Tonbridge line performs a strategic connectivity function but requires high levels of subsidy due to the high operating costs and relatively low patronage and associated revenue. In other words, the costs of running the services (including staff, rolling stock, mileage) are greater than the revenue the line generates.

To improve this, either costs must go down or more people need to use the services. This study has set out a credible opportunity to generate additional demand and revenue by directly linking the service with Gatwick Airport – as well as delivering a range of strategic and economic benefits.

This analysis concluded that there is an opportunity to achieve patronage and revenue growth with a three EMU allocation to the Redhill-Tonbridge line by extending the shuttle on to Gatwick. This could be done efficiently by using time that one of the EMUs was otherwise stationary at Redhill/Tonbridge or in sidings. In this scenario, the main additional costs were limited to additional staff and running mileage. Consequently, the proposed change appeared financially positive relative to the December 2019 service pattern. However, the December 2023 reduction in allocated rolling stock on the Redhill-Tonbridge line means there is reduced flexibility to extend trains to Gatwick as suggested in this analysis, particularly in the early morning and in the morning and evening peaks. Additionally, additional mileage and staff costs are subject to high uncertainty.

Nevertheless, it is estimated that around 9 trains per day in each direction could be accommodated within the latest resource allocation, but instating these is not an immediate term priority for the industry. Direct, all-day services between Tonbridge and Gatwick would require the restoration of a third EMU and would be contingent on a viable path being found between Redhill and Gatwick, which would be challenging at peak times.

Reinstating the EMU allocation from two back to three units would also make the financial case for the services challenging. That said, this advice has focused on financial sustainability and has not quantified the full wider benefits (e.g. environmental / economic) of such a service which a full strategic outline business case could evaluate.

Progressing the services is therefore contingent on the following specific matters being assessed and resolved:

- Operational considerations (e.g. timetabling, staffing and rolling stock allocation);
- Costs (particularly for staff which could vary from the figures stated in the report); and
- Potential performance/reliability risks, particularly at/around Redhill and Gatwick on the Brighton Main Line.

However, assessment of the above is best completed by operators who have ready access to the information necessary to complete the assessment robustly and accurately.

EXECUTIVE SUMMARY

CONTEXT

Since the removal of direct passenger trains between Kent and Gatwick over a decade ago, resuming them and realising the strategic benefits they could bring has been a long-standing transport priority for many stakeholders across the region.

Since the services last operated, Gatwick Airport has grown to be a dominant hub of regional, national, and international travel demand. In 2022, as people once again took to the skies following the pandemic, Gatwick was ranked as the 35th busiest airport globally in terms of passenger volumes. 32 million people flew into or out of the Airport (this figure was over 45 million in 2019). Additionally, upwards of 10,000 people commuted to and from the airport daily (this figure was over 20,000 before the Covid-19 Pandemic).

With the Airport already planning for tens of millions more passengers and additional employment in the coming decade, as well as a potential expansion, demand from Kent (as with the rest of the region) is likely to rise.

This report responds to the stakeholder priority for the reinstatement of direct rail services and provides a detailed appraisal of options for filling this rail connectivity gap.

Currently, taking the train between Kent and Gatwick is difficult and unattractive for commuters and leisure travellers alike. Consequently, most people in Kent travel to or from Gatwick by car. Comparing Gatwick's eastern rail connectivity with similar locations to the north, south or west (for instance along the Brighton Main Line or North Downs Line) it is clear Kent's rail connections are inferior. This translates to low existing rail demand; Kent has much lower rail passenger volumes and mode shares for Gatwick trips than equivalent areas and passengers flows in Sussex.

However, addressing this gap and realising the strategic benefits of direct rail services (such as mode shift, economic connectivity, and revenue generation) is complicated by several key challenges.

KEY CHALLENGES FOR KENT-GATWICK RAIL CONNECTIVITY

- 1. Network geography and recent service investment:** Kent's primary rail lines radiate from London, and the focus of investment over past decades has been serving the established London commuter market with fast, frequent, high-capacity, and high revenue-generating connections to and from the capital. Compared to this, cross-regional connections are less time competitive with cars, generate lower rates of revenue and/or require increased subsidy, and have therefore been a lower priority from an operational perspective. This has constrained cross-regional rail growth between places like Kent and Gatwick.
- 2. Protecting main line performance and capacity:** Introducing new services onto the Brighton Main Line (BML) between Redhill and Gatwick would absorb capacity and could impact service reliability on this busy and strategically important line. The BML carries a high volume of passengers and generates significant revenue for the network. As such, adding new services from areas such as Kent with lower passenger volumes and revenue generation potential means the impact of any new services on the BML must be demonstrably minimal from a capacity/performance impact perspective. This must be fully assessed before a direct Kent-Gatwick service is introduced.
- 3. Establishing new markets:** The absence of existing rail demand and revenue for cross-regional trips such as Kent-Gatwick creates a tension in terms of rail network planning between providing sufficient capacity for existing flows and developing network coverage to serve new or latent ones. Cross-regional flows are lower than London commuter flows, contributing to a catch-22 where passengers do not take the train between Kent and Gatwick because it is inconvenient, and there is a lack of investment in services to fill this gap because the existing demand pattern is perceived to be too low to justify investment in new services.
- 4. Ensuring operational efficiency and competitive journey times:** Planning an operationally and time-efficient service between Kent-Gatwick is challenging due to trains needing to reverse at Redhill. Meanwhile, any prospective rail services must have competitive journey times with cars to attract demand whilst continuing to serve existing passengers.

THIS DOCUMENT

The aims of this document are to: respond to stakeholder's aspirations for new services; summarise the strategic drivers and benefits; and appraise the options for addressing the Kent-Gatwick rail connectivity gap at a high level.

Key stakeholders involved in the drafting of this document include Gatwick Airport Limited, Train Operating Companies (GTR, GWR and Southeastern), Local Authorities, the Department for Transport, rail user/advocacy groups and region-wide bodies such as Transport for the South East and Coast to Capital LEP.

From this engagement, it is clear that no one option will fully meet all stakeholder's needs or aspirations, and each option has its merits and drawbacks. These are assessed in detail, and the key findings summarised below.

KEY FINDINGS

1. There is a sound strategic case for extending the existing Redhill-Tonbridge shuttle to/from Gatwick once an hour, but the financial case is only marginally positive based on 2019 schedules, passenger volumes and revenue. Other options assessed (for instance half-hourly from Tonbridge or extensions to and from Maidstone or Ashford) would catalyse economic opportunities and help support mode shift ambitions for the region especially as the airport grows, but would not generate enough revenue to cover costs. It is important to note that the wider economic, social and environmental benefits of the more ambitious service proposals have not been fully quantified at this stage.
2. Extending the existing Redhill-Tonbridge shuttle to/from Gatwick would leverage the connectivity potential of the Redhill-Tonbridge railway line which is currently underutilised.
3. The analysis shows that greater investment to serve new markets catalyses more overall demand and benefits. However, in the context of the region and Gatwick's overall demand, Kent generates only modest levels of demand, creating a tension from a train capacity planning perspective on the BML.
4. More ambitious proposals that involve new infrastructure (chords, track layout reconfigurations etc.) are unlikely to be feasible unless they result in transformative (for instance over 15 minute) reductions in generalised journey times. Such a service pattern would also required detailed operational assessment.

5. Maidstone and Ashford both have a moderate rate of car trips to/from Gatwick trips, and this could grow in the future. However, the operational complexities of serving these markets and long journey times make the rail case for these locations challenging. Ashford would likely present the strongest potential market over Maidstone as it is where rail can be most competitive.
6. The suggested starting point is a more tactical proposal – extending the existing Redhill-Tonbridge shuttle to Gatwick as an hourly service that can be introduced with existing rolling stock and infrastructure.

POSITION STATEMENT

Overall, the position of Network Rail Southern Region Strategic Planning is that direct Kent-Gatwick services present an opportunity to grow a modest amount of revenue and meet widely agreed stakeholder objectives. Our analysis, based on the December 2019 timetable found that an hourly Tonbridge-Gatwick service would likely be able to:

- fit into a future timetable with minimal disruption to established services while still meeting the core needs of airport travellers/commuters for competitive journey times and direct trains;
- be implemented without new infrastructure at Redhill or elsewhere; and
- improve the efficiency of the Redhill-Tonbridge line shuttle relative to 2019 levels by increasing passenger volumes thereby enabling a reduction in the line's operating subsidy.

NEXT STEPS

A key next step is to verify that an hourly Tonbridge-Gatwick service can be delivered operationally in the latest timetable, without compromising existing services and without unduly increasing operating costs. The upfront cost/programme development details also need working through. This is best done once new Redhill-Tonbridge shuttle timetable to be introduced in December 2023 has bedded-in, and the rail industry finances and passenger demand recovery trajectory is clearer.

This analysis has shown that Tonbridge-Gatwick services have a clear strategic case and there are no infrastructure barriers to service introduction. The key next step is to confirm the availability of funding and establish a workable service pattern for the reinstatement of a prospective direct Kent-Gatwick service.

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Chapter

01



INTRODUCTION

1.1 ASSESSING KENT-GATWICK RAIL CONNECTIVITY: WHY NOW?

Direct rail links between Gatwick Airport and destinations in Kent are not a new concept, having operated nearly 20 years ago in the early 2000s. Ever since their removal, the rail industry's stakeholders in Kent have advocated for their reinstatement.

The last time Network Rail sought to assess the opportunity of running direct Kent-Gatwick services was in the 2010 Kent Route Utilisation Study (RUS). Recognising the gap in regional connectivity, Network Rail provided a feasibility assessment of several service specifications for direct services. At the time, none of the options presented a strong enough benefit cost ratio to justify taking them forward (refer to section 3.2.1). However, this analysis is now over a decade old. Since then, the rail network in Kent and Sussex, its strategic context and travel patterns have changed significantly.

Between the early 2000s until the COVID-19 pandemic, the UK rail industry and specifically Kent/Sussex commuter routes into London have seen significant growth in revenues and passenger volumes. However, the pandemic has uprooted this pattern with passenger travel patterns now indicating a systemic shift in behaviour. Tuesdays, Wednesdays, and Thursdays are now the busiest days to travel, with commuter traffic consistently reduced on Mondays and Fridays. Weekend and off-peak demand has rebounded to close to or even above pre-pandemic levels in many places. In terms of revenue, pre-COVID industry revenue patterns are disrupted, with fewer passengers purchasing season tickets, but sales of other ticket types have increased.

With such systemic shifts in demand, service patterns and revenue, now is an appropriate time to revisit Kent's underdeveloped western rail connections.

Today, along with wider industry changes such as the introduction of the 'guiding mind' of Great British Railways (GBR) bringing together 'track and train', one of the few certainties is change.

COVID-19 caused major revenue and operations shock, and subsidies have become necessary to keep the rail system going.

Now, it is critical to look to new markets to aid revenue recovery and better serve existing and new customers.

1.2 KEY REASONS FOR UNDERTAKING THIS WORK NOW:

1. **Gatwick Airport travel demand (notwithstanding the pandemic) has grown.** Since direct Kent-Gatwick services last ran from Maidstone and Tunbridge Wells in 2003 and 2008 respectively, Gatwick passenger volumes have grown by 56% to 2019, driven primarily by the emergence of budget airlines. Gatwick itself has become a major hub of demand, with the co-location benefits for businesses in the 'Gatwick Diamond' resulting in employment growth. Cumulatively, this has resulted in strong growth in demand between London and Gatwick, with Gatwick Station itself being upgraded to accommodate the demand. Looking to the future, the Airport is forecasting ongoing growth in air traffic, and at a faster pace if approval is granted for the Northern Runway Project (section 2.1).
2. **Infrastructure capacity and timetable structure has changed.** There is an opportunity to reappraise network capacity and consider the possibility of improving cross-regional connections which could drive revenue (see section 2).
3. **Stakeholder's aspiration for the service.** Stakeholders have consistently advocated for Kent-Gatwick services, making this analysis timely and salient.
4. **New data (such as mobile network data) is now available to support analysis and enables novel estimates of rail demand/mode shift potential for new rail services using new techniques (building on Moira estimates, the standard rail industry demand forecasting tool).**
5. **Transport system strategic direction and policies are shifting.** From a whole of transport system policy perspective, there is a clear direction from Government across all levels to encourage mode shift to rail, particularly for cross-regional journeys like Kent-Gatwick.
6. **Following the pandemic, greater weight is being given to the strategic benefits of interventions. Rail investment cases for proposals that will grow revenue while supporting other strategic needs (such as Kent-Gatwick) are seen as favourable.** The 2020 Green Book (used in the appraisal of transport schemes) has now been refreshed to ensure "interventions and options [...] clearly support the delivery of strategic objectives". In this case, the strategic objectives are explained in detail in Chapter Two of this report (Strategic Drivers).
7. **2010 was the last time Network Rail formally considered the Kent-Gatwick connectivity question.** Continuous Modular Strategic Plans (CMSPs) were envisaged to provide more targeted advice and take account of customer needs. CMSPs have now been replaced by more targeted pieces of advice (like this one) with the same principle in mind.

1.3 AT A GLANCE: STRATEGIC BENEFITS OF IMPROVED KENT-GATWICK CONNECTIONS



Gatwick Airport has ambitious public transport mode share aspirations for 2030s of approximately:

- 50% (staff)
- 60% (customers)

Improving Kent's rail connectivity may play a role in helping reach these goals.

Second busiest Airport in the UK

In terms of passenger volumes & aircraft movements



Precise trajectory of aviation demand uncertain but Gatwick envisage a return to 2019 demand levels in the mid-2020s.



>85% drop in passenger demand (2021 v. 2019) due to Covid, but in 2022 this rebounded to 70% of 2019 levels with month-on-month growth.

Gatwick is the 22nd busiest rail station in the UK and 53rd busiest for interchanges – connecting Kent to a rail hub.



Based on 2022-23 ORR station entries/exits data.

Opportunity to enhance cross-regional connectivity and improve Kent's access to the multimodal strategic transport hub at Gatwick.



1.4 ADVICE SCOPE

The scope of this advice is focussed on understanding and analysing the benefits and trade-offs associated with enabling direct rail services between Gatwick Airport (via Redhill on the Brighton Main Line (BML)), Tonbridge (Tonbridge-Redhill line), Maidstone West (Medway Valley Line) and Ashford (Tonbridge/South Eastern Main Line). The key reasons for restricting the scope to the locations shown on figure 1 are:

- **Tonbridge station acts as a hub for rail services in Kent.** Tonbridge station sits at the junction of three lines (the Tonbridge – Redhill line, South East Main Line and Hastings Lines) and therefore effectively forms the rail ‘gateway’ between Gatwick and Kent.
- **Assessing better east-west rail links (for instance via the North Downs Line) is a separate issue and relates to Network Rail’s forthcoming North Downs Line study.** Redhill is a constrained station for east – west train movements. Only a major upgrade at Redhill is likely to reduce generalised journey times enough to catalyse a step-change in cross-regional connectivity. Even then, Gatwick drives the greatest cross-regional demand meaning connections to/from Gatwick are more useful than between the Tonbridge-Redhill and North Downs Lines.
- **Focus analysis and improvements where the rail can provide the most connectivity benefits** for instance where travel times are within or under 90 minutes. This is window of travel time that the largest new passenger markets tend to develop.
- **No options developed for direct Sevenoaks and/or Tunbridge Wells services:** the rail network geography makes the markets at Sevenoaks and Tunbridge Wells difficult to serve e.g. due to a lack of capacity on main lines and having to reverse services. Passengers can still use Tonbridge to transfer to direct services.
- **A tactical piece of analysis.** The scope shown in figure one reduces complexity of required analysis. Increasing the advice scope beyond Tonbridge would call into question existing route operations and strategies, potentially unleashing a cascade of complexity and requiring considerable additional effort and resources. Instead, this report establishes a rail case, specifically for the least complex Kent connectivity option (Tonbridge) while still assessing the demand elasticities from larger centres like Maidstone and Ashford.
- **Stakeholder priority:** Local Authorities and Rail User group stakeholders made it clear they were interested in understanding the potential demand and mode shift opportunities of services from across Kent, including locations like Maidstone and Ashford.
- **Aerodrome chord bypassing Redhill or other/large scale infrastructure:** not considered to be practical to model or include in this advice (see section 3.1). This study builds on the findings of the Kent Rail Utilisation Study that demonstrated that the operational/demand/revenue case for direct Kent services was marginal. This Advice is not the appropriate format to assess the costs/merits of more major, transformational infrastructure proposals which may be more expensive, but leverage greater benefits. Having said this, Transport for the South East have included this project in their Strategic Investment Plan and Network Rail will support the development of a business case for this initiative.



Figure 1: Geographic scope of document analysis and rationale.

1.5 AIMS & OBJECTIVES

As part of remitting this work, several aims were identified. As an iterative piece of analysis using novel techniques to estimate new rail markets, the aims and the processes used to meet the aims changed over time in discussion with Network Rail’s Economic Analysis team. Table One below summarises the final set of aims, processes and outcomes.

Aims	Process/Outcomes
1. Describe and summarise the Kent-Gatwick rail connectivity problem/opportunity from multiple perspectives (for instance strategic transport planning, rail advocacy etc.).	<ul style="list-style-type: none"> • Synthesis of the findings from stakeholder discussion sessions held in early 2023. • Summary of the findings of relevant documents. These include Network Rail documents, local government transport strategies and Passenger Focus publications.
2. Provide a range of estimated potential passenger demand for direct Kent-Gatwick rail services across several locations and service specifications and analyse these options using outcomes-based criteria. These are explained in section 4.3.	<ul style="list-style-type: none"> • With support from Network Rail’s Economic Analysis team, Moira software was used to define ranges of potential passenger demand, revenue and operating expenditure across different service specifications serving locations in Kent shown in figure 1. • Summarise the operational and timetable opportunities and constraints between Tonbridge, Redhill and Gatwick. • Use the Great British Rail Transition Team’s five objectives for rail as the assessment criteria against which each service specification is assessed.
3. Facilitate stakeholder discussion and recognition/consideration of benefits/trade-offs associated with the various service options. Begin to move towards of cross-industry consensus on the question of Kent-Gatwick rail connectivity.	<ul style="list-style-type: none"> • Present the findings of the analysis to industry stakeholders including Train Operating Companies (TOCs), Gatwick Airport, Local Government and rail user/advocacy group representatives.
4. Provide a well justified and substantiated set of suggestions for next steps for this work/topic	<ul style="list-style-type: none"> • These are listed in section five and were shared with stakeholders prior to this full report being published in autumn 2023.

Table 1: Overview of aims and objectives for the work.

1.6 EXCLUSIONS

As the first piece of in-depth work that Network Rail have undertaken on this topic in over a decade, the core scope of this work is to re-establish the strategic case and provide a high-level appraisal of service options. Rather than produce a business case, the document provides a sift of options providing a foundation which more detailed proposals can build on.

As such, from the outset the following was deemed in scope, with several more detailed considerations deemed out of scope for this work (these may be addressed in future pieces of analysis).



 In scope	 Out of scope
<ul style="list-style-type: none"> ✓ High level assessment of service improvement options between Tonbridge – Redhill – Gatwick, including consideration of timetable, rolling stock requirements and freight paths; ✓ Overall appraisal of Kent-Gatwick rail connectivity options across key metrics (for instance Generalised Journey Times, revenue, costs, operational considerations, financial sustainability, wider social/economic benefits etc.); ✓ List of options and suggestion of which option(s) to take forward and associated considerations. 	<ul style="list-style-type: none"> ✗ Detailed plans for improving rail connectivity to/from Tonbridge (e.g. operational planning or detailed timetable analysis); ✗ Detailed assessment of other long-term strategic outcomes for the Tonbridge-Redhill-Gatwick lines; ✗ Full business case/Cost-Benefit Analysis; ✗ Detailed infrastructure costs; ✗ Specific service patterns (for instance precise timetables/calling patterns and frequencies); ✗ Major infrastructure upgrade proposals (for instance the Aerodrome Chord see section 3.2.3); ✗ Freight improvements.

Table 2: Document/analysis scope (inclusions and exclusions).

Chapter

02

DRIVERS

This chapter outlines the three drivers for this work:

1. Gatwick Airport as nationally significant infrastructure with major growth plans;
2. Travel patterns and the need to enhance regional connectivity, enabling mode shift;
3. The potential for a rail case between Kent and Gatwick as an opportunity worth investigating.

Overall, this section demonstrates that there is a strong strategic justification for direct Kent-Gatwick services.

2.1 STRATEGIC DRIVER ONE: GATWICK AIRPORT: NATIONALLY SIGNIFICANT INFRASTRUCTURE

As the second busiest airport in the United Kingdom and around 35th busiest in the world, Gatwick Airport is one of the UK's most important pieces of transport infrastructure. Every day, tens of thousands of people pass through the airport to destinations across the UK, Europe, and beyond. As such, the airport plays a vital role in connecting London and the south east of England socially and economically to the rest of the world. As with any major airport, Gatwick attracts trips from a wide catchment. According to Gatwick's 2019 Surface Access Strategy, around 15 million people live within 60 minutes' travel time of the airport (by any mode).

When Gatwick first opened in 1930s, few would have anticipated the pace of its growth or the scale of change in that the airport has helped catalyse for the region and the nation. On the eve of the pandemic, Gatwick was regarded as the busiest single runway in the world with and over 46 million passengers travelling to and from nearly 100 destinations worldwide (see figures two and three). While the COVID-19 pandemic caused the biggest disruption and near collapse of the global aviation sector, passenger demand is continuing to recover, and the Airport is expecting to return to pre-pandemic passenger volumes as soon as Financial Year 2025-26.

The return of passengers to the skies following the pandemic means Gatwick aspires to expand their operations and bring their second emergency (northern) runway into regular use. To do so, Gatwick lodged a Development Consent Order (DCO) application in July 2023 meaning that if approved, Gatwick could be a two-runway Airport by the 2030s. As such, passenger volumes are anticipated to accelerate (see figure two).

Today, Gatwick is one of the country's most important pieces of transport infrastructure, is the UK's second-busiest gateway to the world and a hub for as many as 50 airlines.

According to Gatwick data, the Airport contributed around 135,000 jobs and over £8.3bn to the UK economy in 2019.

Meanwhile, the Coast to Capital Local Economic Partnership estimated the Gross value add (GVA) for the 'Gatwick Diamond' at £26.7 billion in 2019.

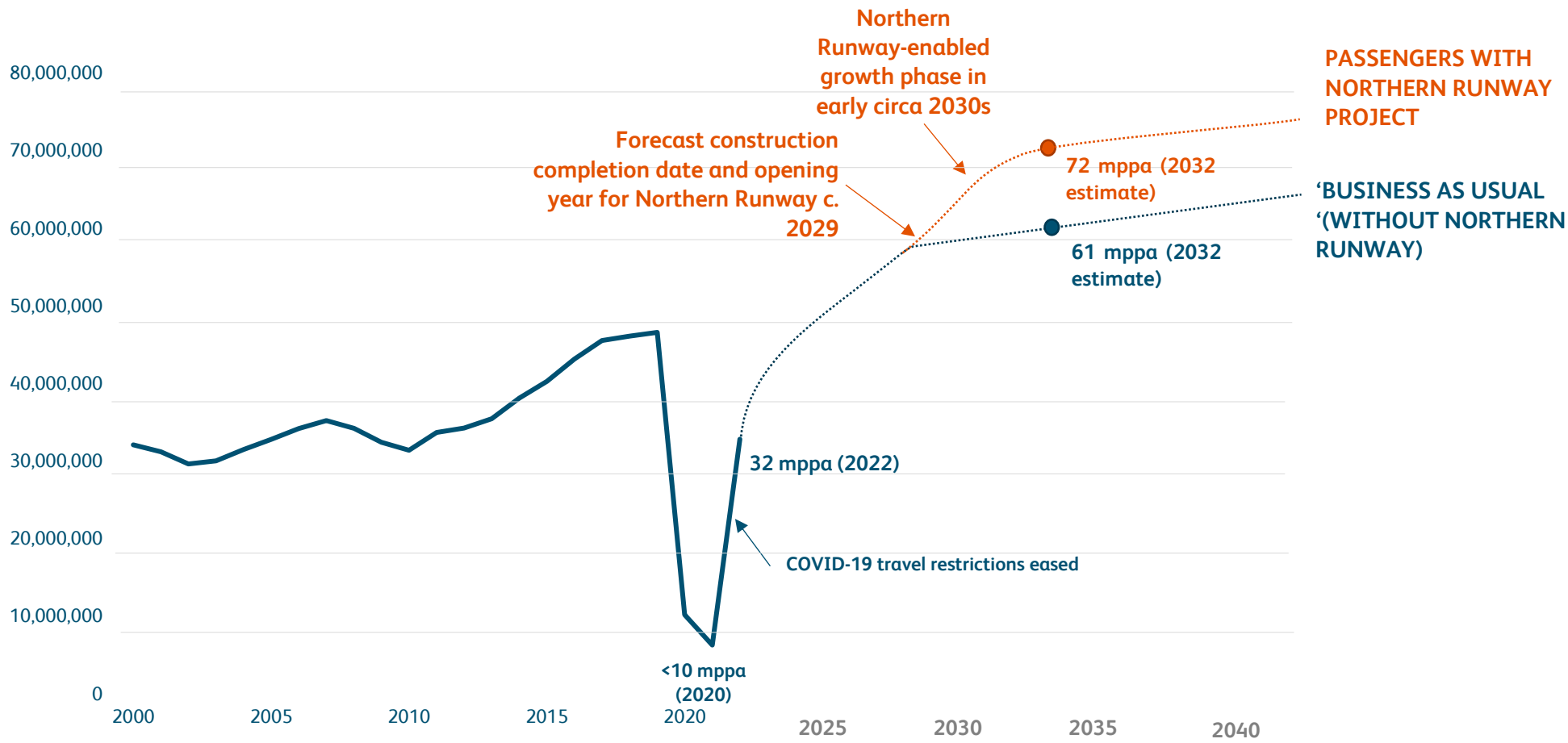


Figure 2: Gatwick Airport flight passenger volumes (shown in millions of passengers per annum, mppa) since 2000 demonstrating significant growth. This growth is partially attributable to the rise of budget airlines during the period and widening of the air travel market. The graph also shows a rapid resumption of travel volumes following the pandemic and the easing of travel restrictions. The right side of graph meanwhile shows Gatwick's growth forecast in the coming decades with and without the additional Northern Runway. In either scenario, the Airport expects passenger volumes to increase.

Source: Network Rail created with Gatwick Airport Limited and Civil Aviation Authority (CAA) data.

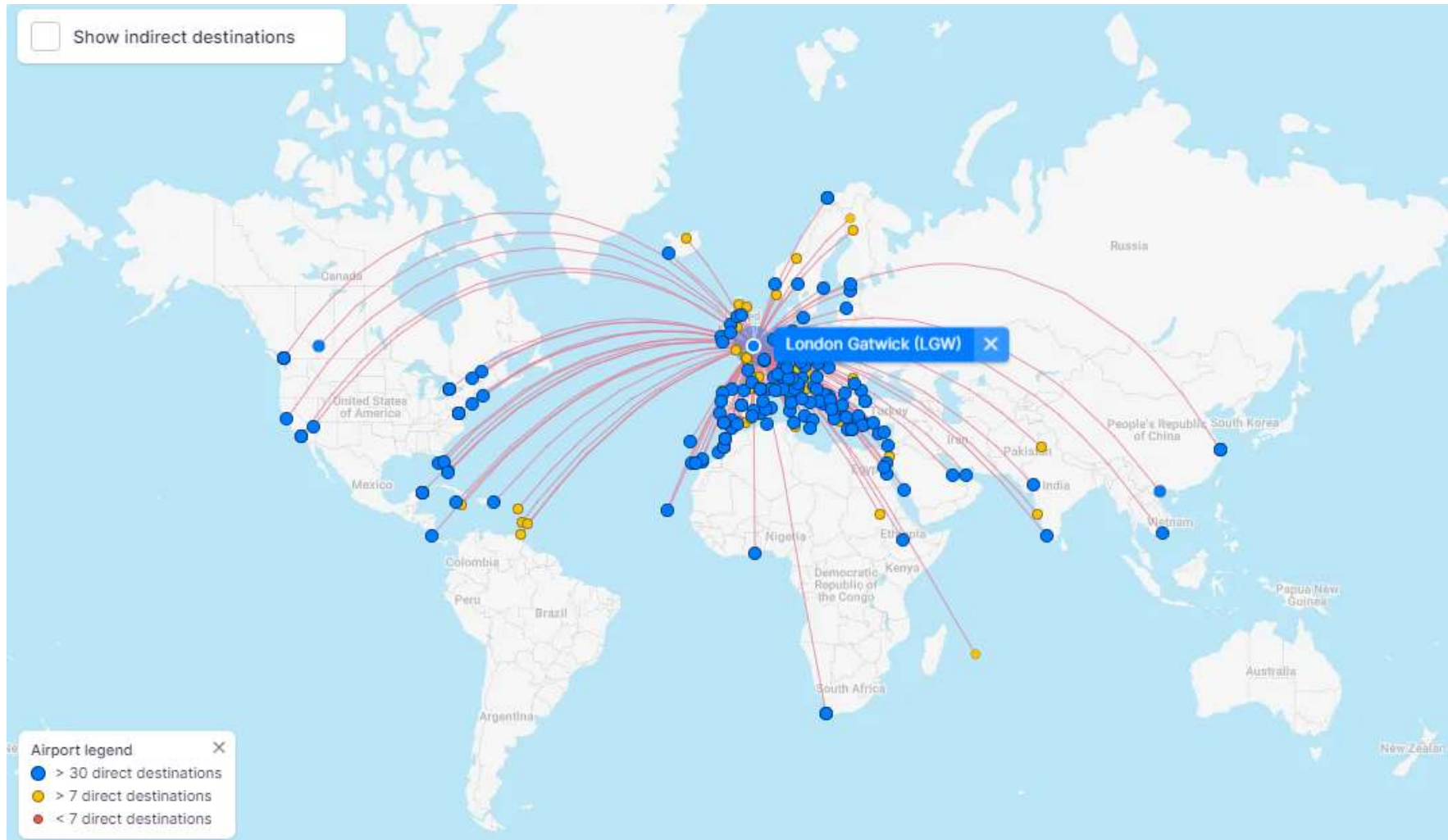


Figure 3: The wide array of flight origins and destinations is demonstrative of Gatwick's regional, national and global significance.

Source: FlightConnections.com. As of August 2023, London Gatwick Airport had scheduled flights to/from 194 destinations in 61 countries.

2.1.1 Jobs & Economic Hub

Gatwick Airport's economic footprint extends well beyond its 674-hectare footprint that houses the Airport terminals, hangars, taxi and runways and associated buildings (figure 4). These economic factors can be summarised in the following ways:

- Direct footprint:** The employment and gross value add (GVA) associated with the activities on the Gatwick Airport campus including activities directly related to the Airport. The economic benefits that Gatwick creates is much wider than the sum of individual jobs at the Airport itself. Pre-COVID-19, the Airport directly employed around 24,000 people, but according to the Coast to Capital Local Economic Partnership (LEP) supported at least 135,000 jobs within the wider South East region.
- Catalytic footprint:** The employment and GVA of firms who choose to locate or expand near the airport because of the high connectivity. According to the Coast to Capital LEP, Gatwick's economic contribution to the UK economy pre-COVID was estimated at £8.3 billion, along with around £7.5 billion annually facilitated in trade.

Gatwick plays a smaller role in terms of air freight. Gatwick handled around 6% of Heathrow's volume (97,000 tonnes in compared to Heathrow's 1,698,000 in 2018¹). Gatwick has not stated any explicit intention to markedly expand its freight operations, meaning the role of rail for Gatwick is for transporting staff and passengers to and from the airport.

As such, passenger rail is a crucial enabler of the Airport's significant economic contribution to the region.



Figure 4: The rail network is a crucial enabler of Gatwick's operations and the broader catalytic economic activity by enabling more people to reach the airport.

Source: Coast to Capital Local Economic Partnership.

2.1.2.3 Travel demand impacts

The scale of the Northern Runway Project means travel demand to and from Gatwick will increase. Given the 10-year horizon of the project, the probable transport network impacts are indicative at this stage. However, the overall trajectory of growth is shown in figure five opposite. Figure six meanwhile puts Gatwick's projected regional daily trip demand in context. It is important to note that if the Planning Inspectorate approves Gatwick's Northern Runway, it will be subject to an Environmental and Transport Assessment/Sustainable Access Commitments which will address goals for improving sustainable ground access challenges such as to/from Kent.

2.1.3 Gatwick's Modelled Trip Growth Trajectories

In terms of travel demand from Kent, trip demand modelling produced by the Airport in support of the Northern Runway project (shown in table 3/figure six below) demonstrates significant forecast growth in trips between Kent and Gatwick, and a high proportional increase in demand by public transport. For instance, public transport trips between Gatwick and the Kent/Medway region are expected to increase by 12 and 21 percentage points or around 500-1000 trips by 2032 (without and with the Northern Runway respectively). Ultimately, meeting this target will require better rail links, particularly given the difficulty of serving this market with coaches. For instance, Gatwick's most recent Kent coach service operated by Megabus from Canterbury was discontinued in summer of 2023.

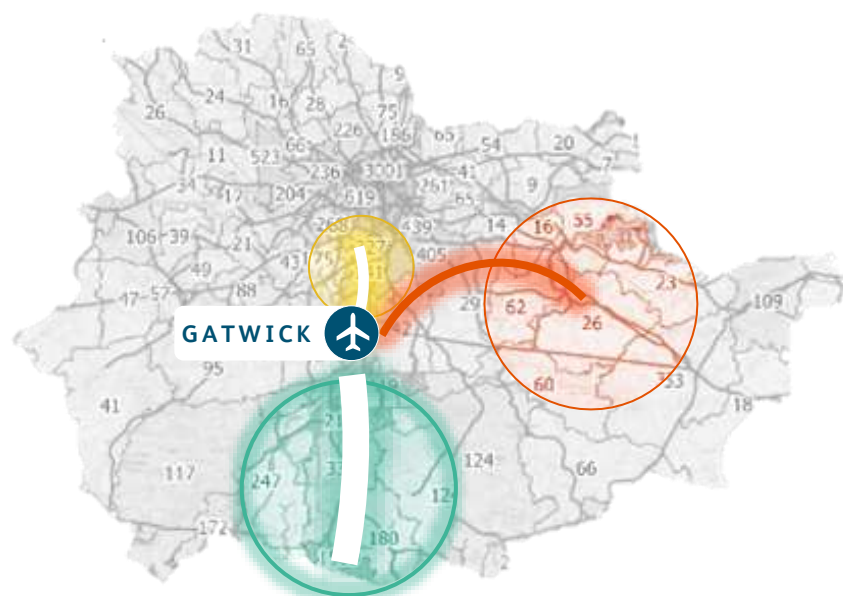


Figure 6: Daily public transport trips to/from Gatwick by local authority (2016 baseline). Source: Gatwick Airport

Region		2016	2032 Without Northern Runway	2032 With Northern Runway
Outer London	Private transport & mode share	2.8 k (80%)	3.2 k (68%)	3.6 (68%)
	Public transport & mode share	1.1 k	1.9 k	2.4 k
	Public transport mode share	24%	32%	36%
East & West Sussex	Private transport & mode share	7.7 k (85%)	8.9 k (80%)	9.6 k (80%)
	Public transport & mode share	2.7 k	3.7 k	4.7 k
	Public transport mode share	15%	20%	24%
Kent & Medway	Private transport & mode share	3.8 (93%)	4.4 k (81%)	4.8 k (81%)
	Public transport & mode share	0.3 k	0.8 k	1.3 k
	Public transport mode share	7%	19%	28%

Table 3: Daily trip rates by local authority for 2016 (base) and in 2032 with/without the Northern Runway. This table shows that all areas are forecast to increase the number of daily trips in the 2030s, but the greatest proportional increase in public transport is forecast for Kent (12 or 21% without/with the additional runway). This translates to around 500-100 additional daily trips (all modes).

2.2 STRATEGIC DRIVER TWO: 'ENHANCING REGIONAL CONNECTIVITY, ENABLING MODE SHIFT'

2.2.1 Enabling Growth in rail demand between Gatwick and Kent

In terms of Gatwick's existing rail flows, London commands the most journeys (and overall revenue, see figure seven below). This both necessitates and supports fast, frequent, and high-capacity Gatwick- London rail connections.

Figure seven also shows that where direct services (i.e. single seat rides) are available, (for instance from the South Coast and along North Downs line), annual journeys are significantly higher than comparable places that are a similar distance. Kent stands out as having particularly low rate of rail trips to/from Gatwick, indicating that the rail service provision itself could be a barrier to increasing mode share and therefore rail demand. As such, there is a clear opportunity to grow journeys between Kent and Gatwick by improving rail connectivity and attractiveness by removing the need change trains at Redhill.

Direct Kent-Gatwick services would support key stakeholder objectives for improving orbital connectivity in the region. This is a key goal for stakeholders such as Transport for the South East (TfSE), County and Local Councils. Overall, improving connectivity between Gatwick and Kent presents an opportunity to grow revenue, improve efficiency of operations, mode shift, enable cross-regional connectivity.

***"Orbital connectivity to Gatwick Airport by rail from the east and the west is poor in comparison to the radial connectivity to the airport from the north and the south."
(TfSE, Inner Orbital Options Assessment Report 2021))***

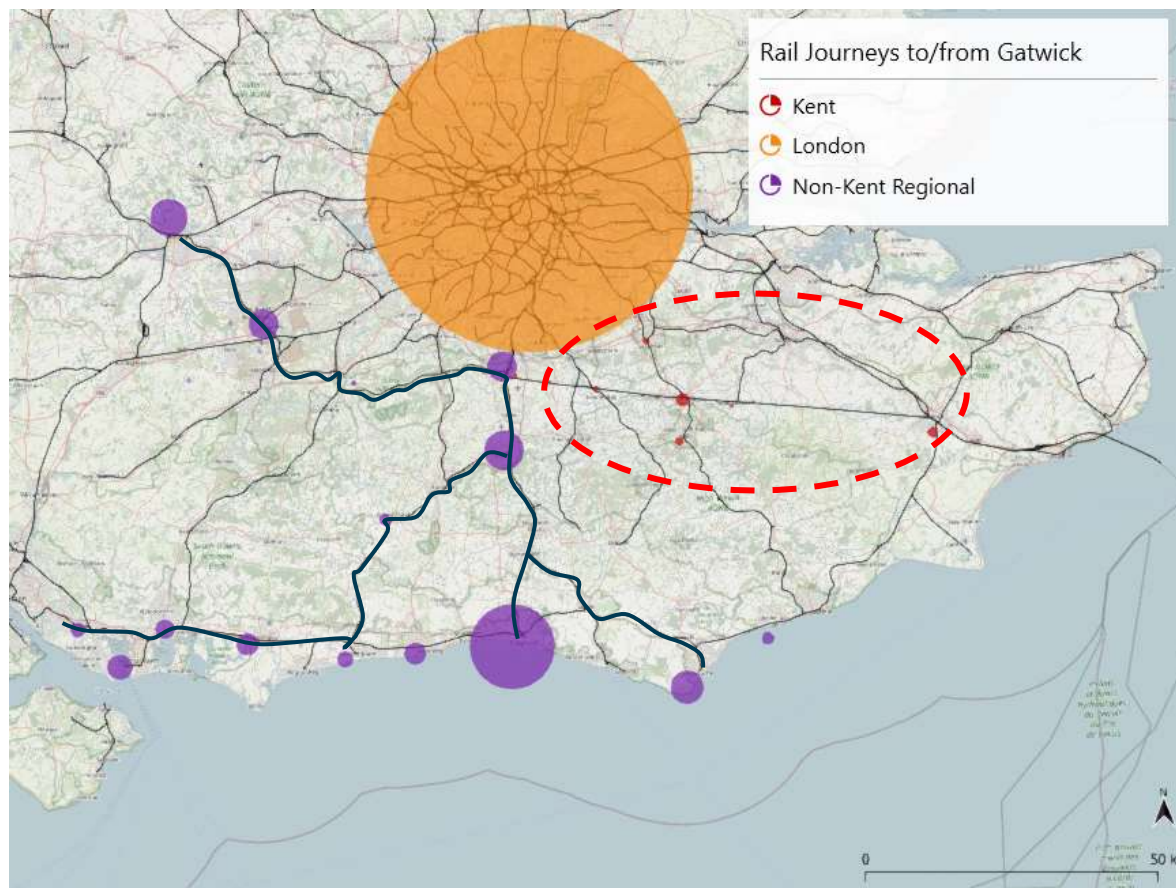


Figure 7: Total rail journeys to/from Gatwick and selected stations across the south east. Kent's rail journeys to/from Gatwick are starkly lower than equivalent regional centres with direct services to the south and west.

Source: Lennon (2019).

In this analysis, total trip rates (all modes) from rail station catchments in Kent were assessed and found to be broadly equivalent to trip rates in Sussex/surrounds. This is indicated in figure eight below by roughly equivalent size of dots. People in Kent are much more car-reliant than people in Sussex/surrounds (indicated by shade of blue, lighter blue denoting higher car mode share). The key takeaways from this are that:

1. There is passenger demand from Kent to Gatwick, broadly in line with other equivalent regional centres;
2. Rail has a low share of overall Gatwick demand; and
3. Tunbridge Wells and Edenbridge have relatively high levels of overall demand, while Paddock Wood has much lower total demand. Maidstone and Ashford as larger regional centres but with longer travel times to/from Gatwick have moderate Gatwick trip rates.

The implication of figure eight is that the low mode share of demand from places in Kent – particularly where there is more than one interchange and longer journey times when compared to Sussex destinations – can be influenced by improving the rail offer and attracting passengers from other modes.

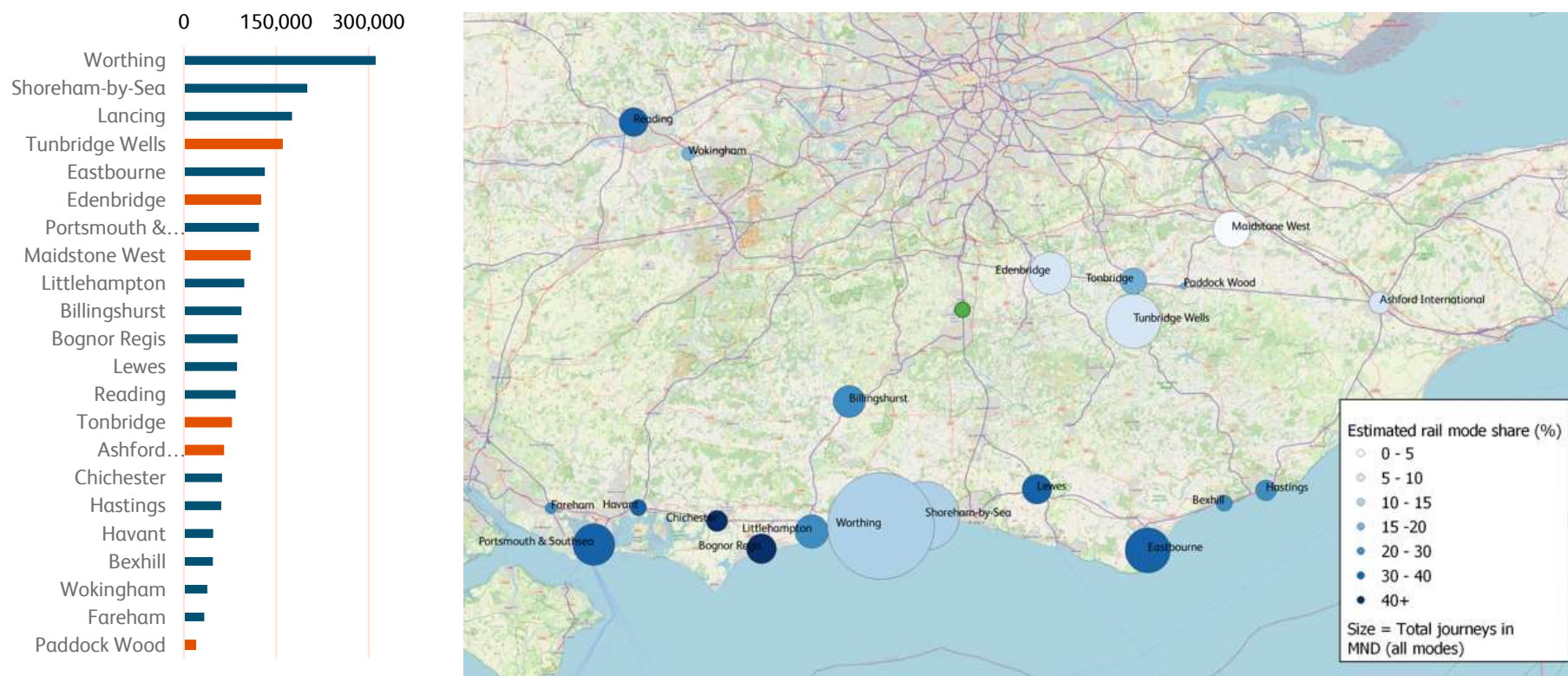


Figure 8: Journeys per year (all modes) across selected broadly equivalent settlements. Note: Journeys annualised based on 8 months of MND data between 24/07/2022 to 29/04/2023, with periods considerably impacted by strikes removed from analysis. Mobile Network Figures should be treated with caution as mobile network data dataset is still in development.

2.2.2 Improving Connectivity & Travel Times

From a cross-regional connectivity perspective, getting between Gatwick and Kent is often easiest, quickest, and often cheapest by car, not train. Not only do cars offer unparalleled convenience, security, and comfort, they are also much quicker, and for infrequent trips with multiple passengers usually cheaper than by train, especially for groups or if using the fastest rail connection via London (via High Speed One).

Figures 9 and 10 show a clear gap in rail connectivity between Kent and Gatwick. This is an opportunity to drive mode shift away from cars, by making the train more convenient. However, for people to have the choice to change their travel habits and enable a shift from private cars to trains for cross-regional transport, Kent needs more frequent and direct rail options that avoid London.

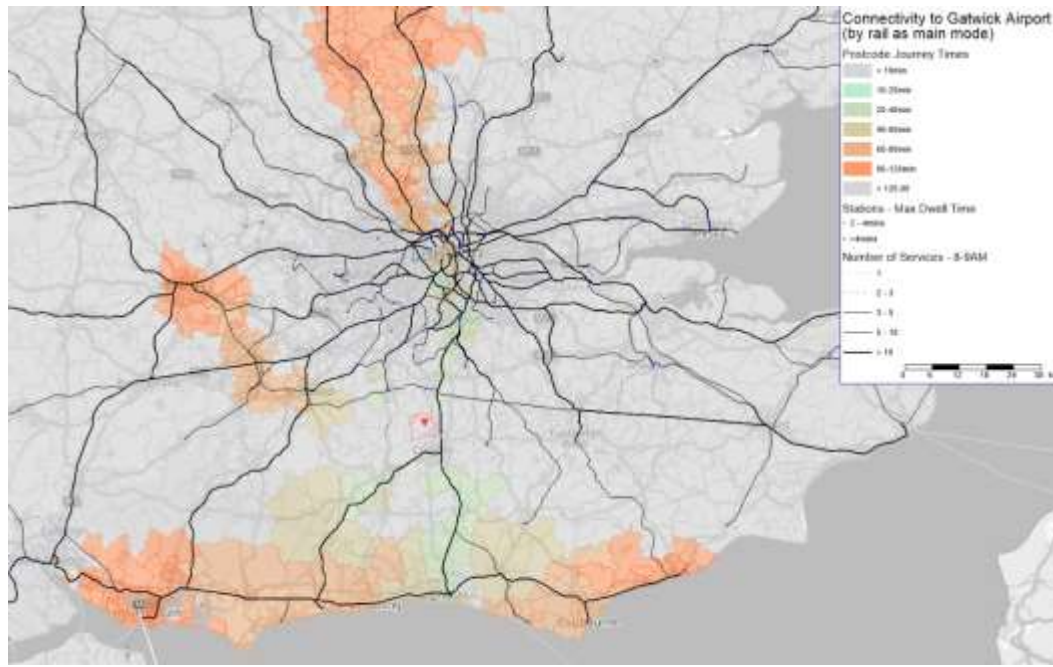
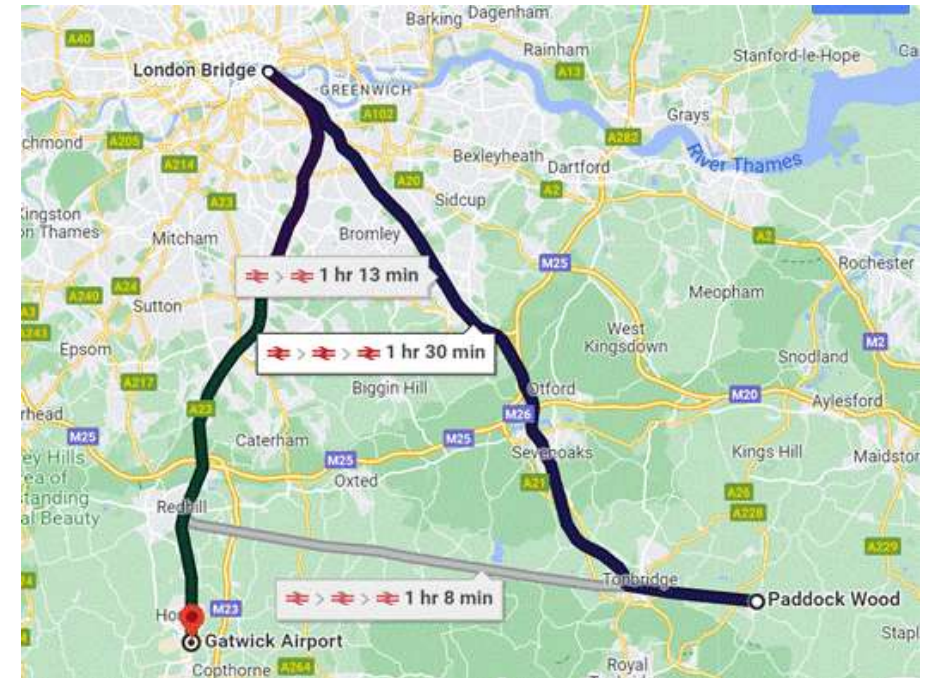


Figure 10: Postcode journey times for Gatwick trips for regions with direct (no interchange) rail connections to the Airport. Kent stands out as an area with comparatively poor connectivity.

Figure 9: Sample journey planner – what a potential Kent-Gatwick passenger currently sees. Google Maps suggests the best public transport option to get between Paddock Wood and Gatwick is via London. Even though the in-vehicle time is faster via Tonbridge/Redhill, the interchange and frequency penalties of travelling by the Tonbridge-Redhill shuttle means people may prefer to travel via London. The equivalent road journey time driving (without traffic) is around 45-50 minutes.



2.2.3 Kent-Gatwick mode shift potential

While many factors influence mode choice for Airport travel and commuting, it is well established that one of the primary drivers is travel times. Therefore, reducing journey times between Kent and Gatwick (for instance to be more equivalent to places in Sussex/Hampshire) will help drive demand and mode shift, especially if the generalised rail journey times are equivalent and competitive to driving.

As figure 11 below demonstrates, rail mode shares for journeys between Kent and Gatwick are generally lower than those for equivalent regional centres/ stations that do have direct services to/from Gatwick. For instance, by Kent standards, Tonbridge has a relatively low GJT, but has significantly lower rail mode share for Gatwick trips; as much as 30 % lower than Chichester or Bognor Regis. This may be explained by the need for passengers to change trains at Redhill to get to/from Gatwick whereas Bognor Regis and Chichester both have direct, half-hourly Gatwick services (without the need for interchange).

Most passengers will choose a 'one seat ride' over an equivalent or even slightly faster journey involving one or more transfers, especially for passengers travelling to or from airports who may have baggage making transfers even less convenient. This makes airport passengers particularly sensitive to changing trains and likely explains why Kent's rail demand for Gatwick in figures 11 and 12 is so much lower than other comparable stations – especially as routing via Redhill

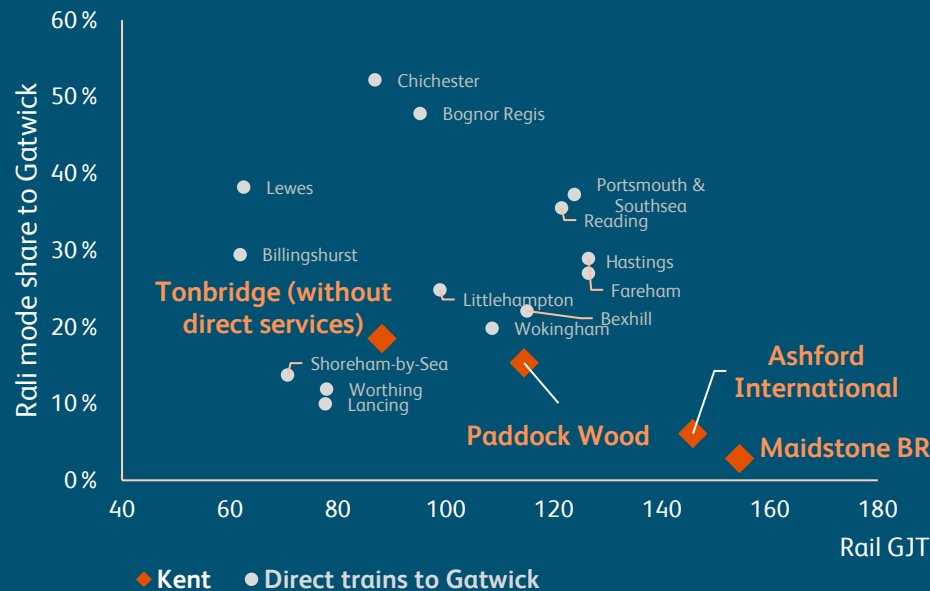


Figure 11: Rail GJTs vs Rail mode shares for Gatwick journeys. There is a trend that as rail GJs reduce, mode shares increase, but the large variance in mode shares at similar rail GJTs indicates many other factors are influencing rail mode shares.

Source: Mobile Network Data. Based on the 2019 timetable and associated journeys.

would require at least two changes. Conversely, the graph also demonstrates that Tonbridge has an existing market of people travelling with the existing rail service and changing at Redhill.

It is important to note that many other factors that that are not accounted for in this analysis also influence the mode shares for Gatwick trips. This likely explains the high degree of variance in the results in figures 12 and 13 below. A full regression analysis may help account and control for a multitude of external factors which may be contributing to relatively higher or lower demand for Gatwick Airport leisure fliers/commuters. For instance, the number of leisure trips people make to catch flights at Gatwick is likely related to socio-economic profiles of local areas of Kent. A full assessment of these factors is beyond the scope of this report. More salient is the clear trend that Kent rail journey times and mode shares lag other parts of the region.

Another key factor influencing people's mode choice is competitiveness of road options. This is shown in figure 12 and again Kent stations perform poorly compared to Sussex/surrounding stations, with driving being much faster than existing rail connections. Ultimately, these graphs clearly demonstrate the issue and opportunity which direct Kent-Gatwick rail services could address – low rail mode shares and uncompetitive rail journey times and number of interchanges.

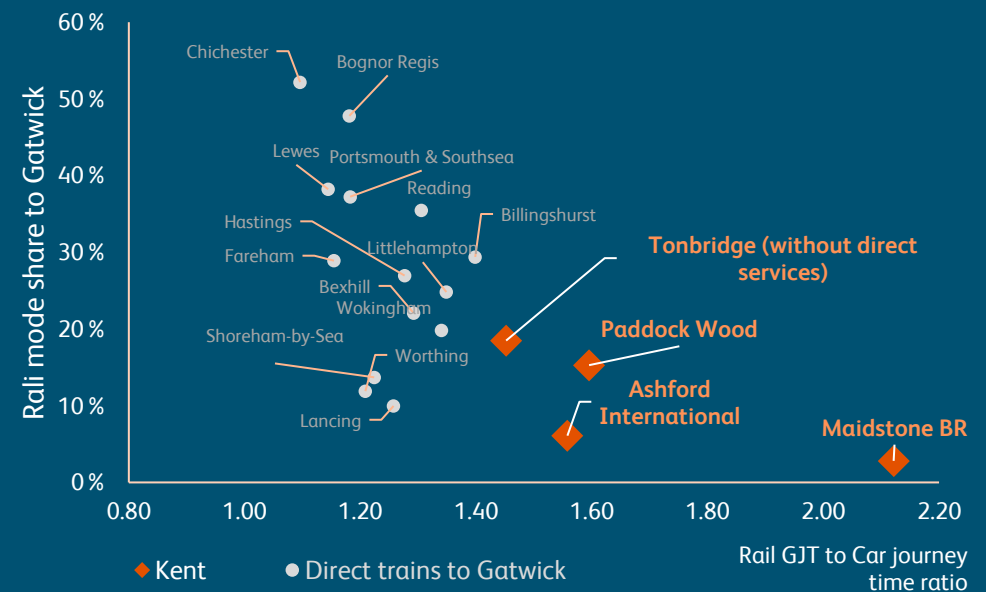


Figure 12: Ratio of Rail-to-Road GJTs vs Rail mode shares for Gatwick journeys. This demonstrates that as rail journey times become faster relative to car journey times, rail mode shares increase. This forms an evidence base for the options chosen for analysis in chapter 4. Source: Mobile Network Data. Based on the 2019 timetable and associated journeys.

2.2.4 Aligning with Urban and Regional Growth – Providing Sustainable Travel Choices

In response to ongoing population growth (both real and planned) across the south east, it is critical that growth areas are supported by robust transport links not only to London, but to other economic and transport hubs such as Gatwick. Figure 13 shows clusters of housing growth anticipated across parts of Kent. Providing more convenient rail options for getting to and from these growth areas such as Paddock Wood, Maidstone and Gatwick will bring economic/social benefits (for instance access to jobs, reduced car dependence for east-west trips) and environmental benefits (such as mode shift).

While ensuring sufficient capacity on the Brighton and South East Main Lines to support recovering London commuter growth is a priority, better cross-regional connections are important too. Critically, the housing growth areas shown in figure 13 must be supported by strong active and public transport links to stations.

Better links to stations can help overcome the ‘first/last mile’ barriers that many public transport passengers face (this is beyond the scope of this analysis).

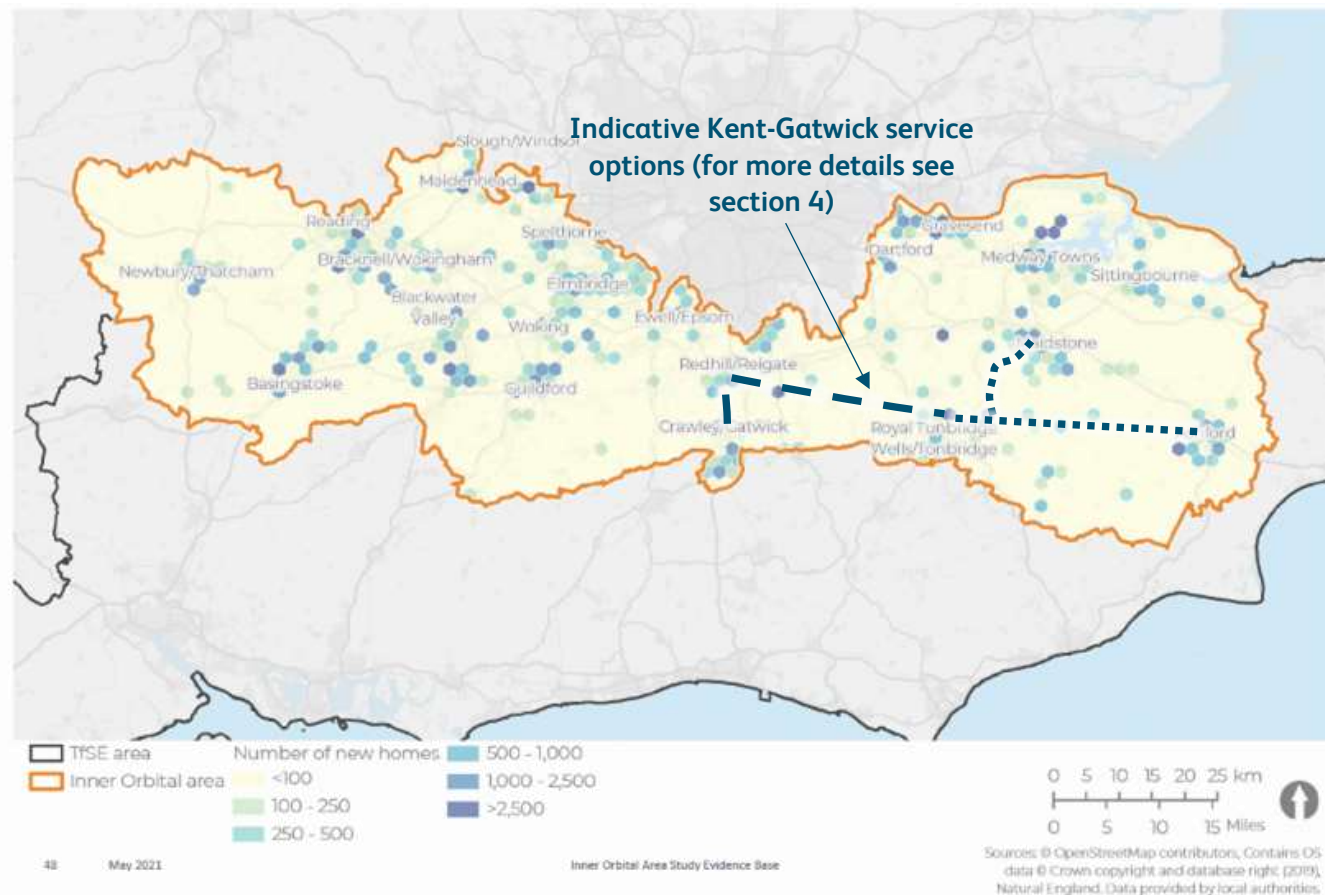


Figure 13: Transport for the South East’s Inner Area Study Area Evidence base, showing indicative locations of housing growth across the region, with potential rail service as outlined in this report overlaid.

2.3 STRATEGIC DRIVER THREE: THE POTENTIAL FOR A RAIL CASE: 'AN OPPORTUNITY WORTH INVESTIGATING'

2.3.1 Revenue

Following the pandemic, there has been a systemic shift in rail passenger demand which has left a large gap in rail industry finances. Therefore, looking to new markets could offer an opportunity to generate revenue to help plug the gap.

However, assessing the potential of, and catering to new markets in such as those in Kent is difficult. Any new service of this type presents some degree of risk from a revenue perspective. However, investing in services and removing the barriers to travel could unlock endogenous growth and enable more cross-regional train trips. Figure 14 clearly demonstrates the revenue differential from Gatwick flows from Sussex/Surrey and surrounds to the west, compared with Kent and surrounds to the east. Evidently, there is room for growth in revenue for Kent and Gatwick rail flows. Kent-Gatwick services are therefore revenue and strategic opportunity worth assessing further. Chapter 4 appraises the options for meeting this opportunity.

However, it is important to keep in mind that while there is currently the latent capacity on the BML which could be used for Kent and Gatwick services, this capacity may not be available indefinitely. Using the current capacity to trial rail demand for potential new markets and endogenous growth in Kent is logical. However, in the longer term, paths on the BML may need to be reallocated towards London if demand uptake from Kent is low. An additional risk is the likely lag between the upfront costs of establishing a new service pattern and the flow-on revenue benefits that may help pay off the investment.

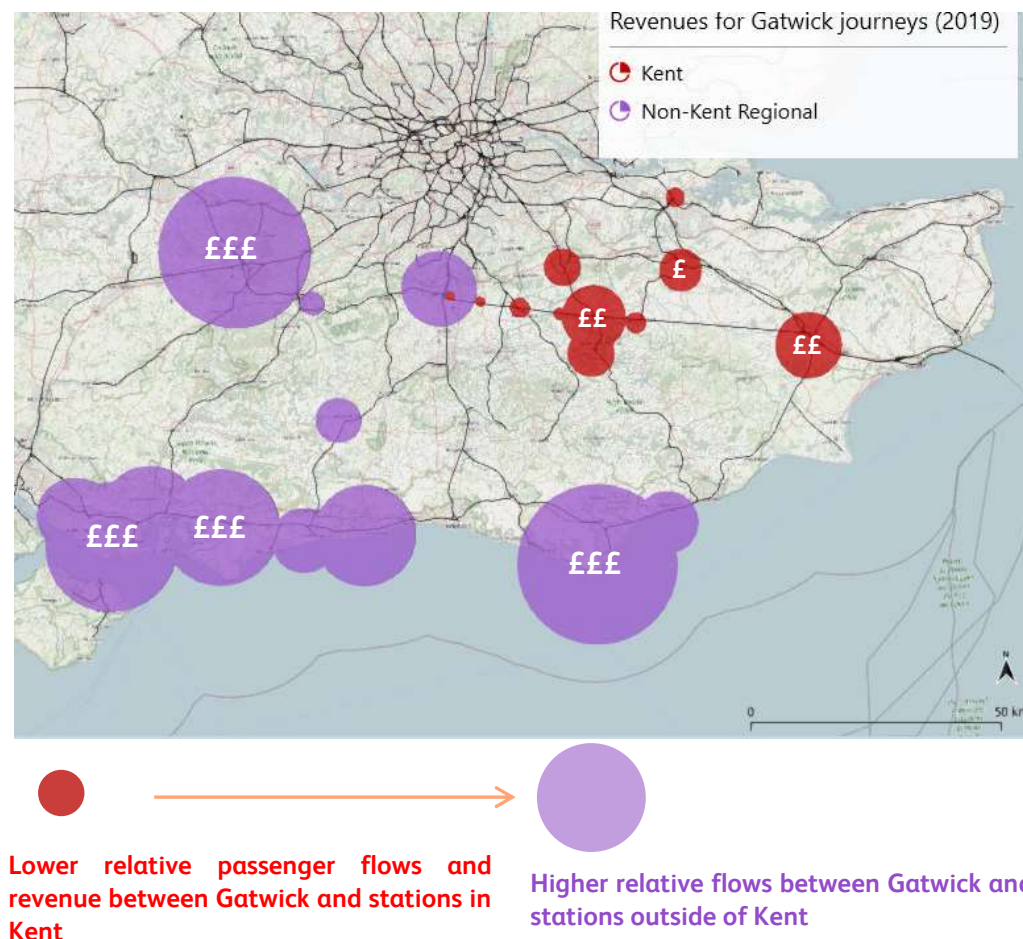


Figure 14: Revenue for Gatwick passenger flows bundled by region. Kent flows are suppressed compared to Sussex and surrounds.

DISCLAIMER: Map is presented for demonstrating the Kent-Gatwick revenue opportunity and should be interpreted with caution because it omits larger revenues for nationally significant flows that could in future be affected by direct Kent-Gatwick services for instance London-Brighton and London-Gatwick.

2.3.2 Role of Rail

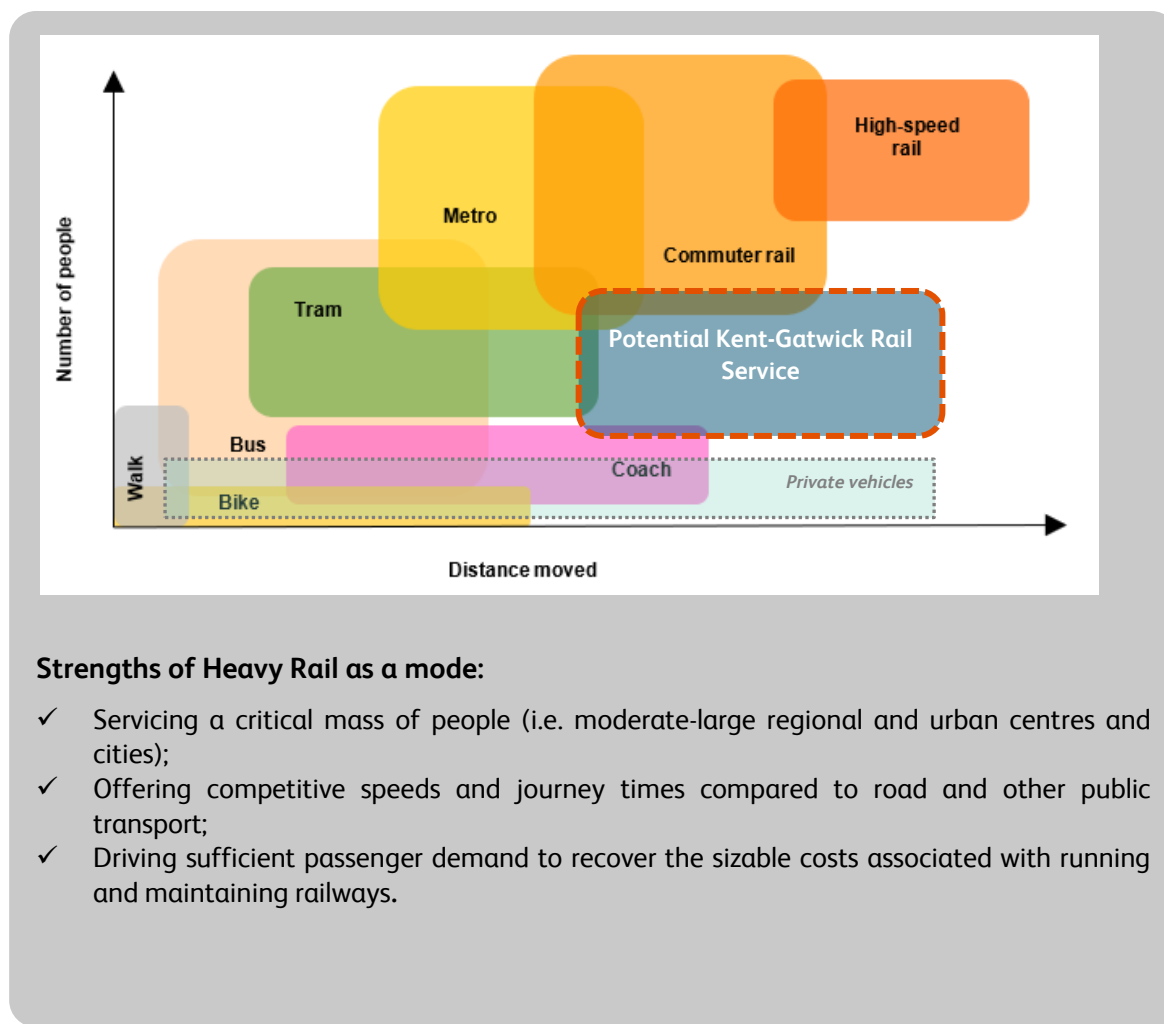
Heavy rail is not always the most efficient solution to address transport problems and objectives. Therefore, a key question for this document to address is rail the appropriate mode to fill the connectivity gap? This is a particularly pertinent question for this proposal given the relatively lower population densities and anticipated demand profiles of the proposed service areas (see figure 15).

To help answer this question, the Department for Transport, the Office of Rail and Road, and Network Rail have developed the 'Better Value Rail' toolkit. This includes a range of tools to help answer questions which can be used as an early 'check' on a proposal to confirm it is worth continuing investigation/analysis.

As shown indicatively in figure 16, it is likely that any prospective Kent-Gatwick service would be serving comparatively fewer people than commuter rail, but over an equivalent or longer distance. Therefore, while the rail case will be challenging, it nonetheless could still be feasible.

The key alternative form of public transport to rail are coaches. Over the years multiple bus and coach operators have tried various routes from Kent to Gatwick and have not been able to make these a commercial success. A rail service could generate more demand as part of an integrated network, for example by improving connections between Kent and the South Coast.

Table four below provides more detailed analysis and commentary and demonstrates that overall, Kent-Gatwick is a credible market to serve by rail.



Strengths of Heavy Rail as a mode:

- ✓ Servicing a critical mass of people (i.e. moderate-large regional and urban centres and cities);
- ✓ Offering competitive speeds and journey times compared to road and other public transport;
- ✓ Driving sufficient passenger demand to recover the sizable costs associated with running and maintaining railways.

Figure 15: Role of rail analysis. Adapted from the [Better Value Rail Toolkit](#).

Rail case factors	Commentary specific to Kent-Gatwick rail connectivity
<p>Policy alignment: Does the proposal align with policy or strategy, or deliver on plans and or achieve a new goal?</p>	<p>Yes – as section 3 below demonstrates, there is strong policy alignment with this potential service and transport policy objectives such as mode shift, cross-regional connectivity, etc. Kent-Gatwick rail services are also a key stakeholder priority.</p>
<p>Mode choice: Does the proposal play to the ‘natural advantages’ of rail?</p>	<p>Yes – It is acknowledged that the rail case for direct services in this case could be challenging and are a lower strategic priority than continuing to serve existing markets, for example between London or Brighton where passenger volumes are higher. However, trains between Kent and Gatwick can offer unrivalled speeds and convenience compared to buses and coaches. This is exemplified by Coach Operator Megabus’s decision in summer 2023 to remove their twice daily Canterbury to Gatwick coach service after only a few months of operations. This is instructive in the market opportunity for rail which:</p> <ul style="list-style-type: none"> • Is congestion free – trains do not get stuck in traffic congestion; • Cuts across geographies and jurisdictions. In the case of connecting Kent with Gatwick, rail bypasses indirect road routes and cross regional bus boundaries (see figures 15 and 16) particularly effectively in the case of connecting Ashford with Tonbridge and Gatwick. Rail:road GJT ratio of 1.1 with an hourly Ashford-Gatwick direct service – see section 4.3); • Connects intermediary destinations and improves levels of service – see section 4.4; • Provides a smoother and more pleasant customer experience – the majority of people choose trains over coaches for this reason. • A key benefit of rail its level integration as part of a wider network and the potential this unlocks for onward connections to other destinations. Gatwick has a high frequency of services across the Sussex, the South Coast and beyond which a Kent service could improve links to/from.
<p>Market size: Do the locations to be served have a large enough potential passenger base for instance are employment/residential densities sufficient and are competitive rail journey times to attract passengers from road to rail?</p>	<p>Comparatively speaking, yes –the population and jobs in the station catchments for Edenbridge, Tonbridge, Paddock Wood, Maidstone West and Ashford inform the suggested service specification and could be served by hourly trains. By benchmarking the proposals to equivalent stations/areas for instance along the North Downs Line or South Coast (which currently have direct services to and from Gatwick) it is clear these services could attract a market of rail passengers if the service can be improved sufficiently.</p>
<p>Altering infrastructure is a last resort Can timetables or rolling stock be tweaked to address the strategic objectives (changing infrastructure should be a last resort)</p>	<p>Yes –analysis commissioned by Network Rail indicates that an hourly service could likely be provided in the off-peak without infrastructure intervention. However, further analysis is needed to confirm this within the latest timetable.</p>
<p>Feasibility: Does the proposal’s Indicative Train Service Specification is feasible enough to proceed with analysis (for instance operationally and financially)</p>	<p>Yes – while more detailed timetable analysis is required to ensure the services fit into any future timetable and before the services can be put into operation, a 1 or 2 tph service from Tonbridge-Gatwick is possible operationally, and depending on the option, financially plausible. The case is also strengthened by wider benefits it would bring (see section 4).</p>

Table 4: Role of rail sifting criteria for any prospective new rail services. Cumulatively, assessing Kent-Gatwick rail proposals demonstrates the appropriate justification for and role of rail services in improving Kent-Gatwick transport connections. Source: Better Value Rail Toolkit.

Furthermore, the bus travel time isochrones in figures 16 and 17 show that as of July 2023, there are no reliable bus connections to Gatwick. Even accounting for as many as three separate bus journeys (as shown in figure 17), there is virtually no bus connectivity to Kent, and no reliable connections to the major centres of Tunbridge Wells, Tonbridge or anywhere further east. Given the absence of any reliable or feasible bus connections between Kent and Gatwick, rail could play an important role in bridging this cross-regional connectivity gap.



Figure 16: Bus/ Coach Journey times to Gatwick with a single transfer. This isochrone analysis clearly demonstrates the rail opportunity for connecting Gatwick with Kent. This catchment largely covers the immediate populated areas with relatively high rates of staff commuting such as Crawley, Redhill, East Grinstead and Brighton and surrounds.

Source: Network Rail Analysis.



Figure 17: Bus/ Coach Journey times to Gatwick with up to two transfers. This isochrone analysis clearly demonstrates the rail opportunity for connecting Gatwick with Kent.

Source: Network Rail Analysis.

Chapter

03

NETWORK CONTEXT



This chapter summarises the key work on which this document builds on. It also provides details on the ‘network baseline’ i.e. the key infrastructure, operational and other considerations and assumptions that inform option development in section 4.

Overall, this section demonstrates that direct Kent-Gatwick services are not a new concept, but highlights the complexities adding the services onto the network may entail.

3.1 EXISTING ANALYSIS REVIEW

3.1.1 Kent Route Utilisation study (2010)

In 2010, in response to stakeholder feedback, the Kent Rail Utilisation Study (RUS) considered several possible options for increasing off-peak frequencies on routes which did not serve London, such as between Hastings and Ashford, Maidstone and Tonbridge and Kent and Gatwick.

The RUS considered the feasibility of both a higher frequency shuttle (i.e. between Redhill and Tonbridge only) and direct Tonbridge-Gatwick services. According to modelling completed for the study, a 2 tph all-day Redhill-Tonbridge shuttle service would deliver a low Benefit Cost Ratio (BCR) of 0.6. This poor BCR finding was largely owing to operating costs and relatively low demand (likely owing to the interchange penalty discussed in section 2.2.3).

The RUS also modelled the BCR for direct Tonbridge-Gatwick services, however the BCR improved only marginally to 0.9. This shortfall was largely driven by demand not covering operating costs. Overall, Network Rail concluded that there was:

'insufficient demand and capacity constraints on the Brighton Main Line [...] a significant level of modal shift from road to rail would be needed to enable this option to be viable over the longer term'.

In summary, Network Rail concluded that:

[T]he analysis has shown that the RUS is unable to recommend increasing service levels on any of these routes, since there is insufficient demand forecast for the socio-economic benefits to justify the additional operating costs. However, if local or national government policies were to successfully achieve a modal shift away from travel by private car, these findings could be revisited.

Additionally, in terms of stakeholder aspirations, it was noted at the time that:

There was strong representation to improve services via the Redhill line, specifically to Gatwick Airport. Many consultees challenged the demand figures on which the appraisals were based, citing the number of trips to the airport by other modes. Additionally, some responses felt that early morning services to the airport would provide significant benefit.

Since the RUS was published, network enhancements have been delivered at Redhill station (2018) and at Gatwick Airport (2023). In addition, Network Rail has evolved from completing region-wide route studies to more targeted strategic advice. While route studies focused on major, region-wide questions, Continual Modular Strategic Plans (CMSPs) were envisaged to provide more targeted advice and take account of customer needs. Now, the focus is on Strategic Advice pieces (such as this document) that take on board and refresh findings from these previous route studies and reassess the potential case in detail.



3.1.2 South East Market Study (2013)

Following the Kent RUS, the South East Market Study (2013) analysed how rail services could best develop to meet the needs of different markets, including airport passengers across the UK's busiest region for rail traffic – the south east. Although the pandemic has disrupted some assumptions (such as commuting growth trajectories and assumed travel patterns), its general findings are still broadly applicable to this analysis. Specifically, regarding connectivity to Airports, the study states:

Good rail connectivity to airports is important in supporting economic growth, productivity and social mobility. It can play a key role in providing better access to markets, national and international destinations, business and leisure opportunities, and to jobs.

New and improved rail services and their integration with other transport modes at major airports are key to providing more sustainable travel opportunities and improving overall connectivity, acting as a transport hub both for air passengers and for other rail users.

Rail is a vital ingredient in improving the travel experience and offering for air passengers, employees and freight and in helping airports meet current and future travel demand:



The document also provides guidance on, the minimum long term service level aspiration for rail connectivity to airports stating airport rail connections should be characterised by:

1. *Frequent opportunities to travel.*
2. ***Sufficient capacity for the needs of passengers (including non-air passengers that use the airport as a transport hub).***
3. *A minimum frequency of two trains per hour during airport peak operation (which may be at different times from the general commuting peaks).*
4. *High levels of reliability and punctuality.*
5. *Journey speed (including waiting time) of c. 50–60mph.*
6. ***Direct services (i.e. minimal interchanges).***
7. ***A total journey time of less than 60 minutes to/from key airport catchments within London and the South East.***
8. ***A total journey time of less than 100 minutes to/from key airport catchments within long distance airport catchments beyond London and South East***

These principles, (particularly principles two and six-eight in bold) have informed the options developed in section 4.

3.1.3 Kent-Gatwick Direct Rail Service Report

Commissioned by Kent County Council in 2014, this report reviewed the strategic, economic, commercial, financial and management cases for an Ashford-Paddock Wood-Tonbridge-Edenbridge-Redhill-Gatwick

services. Overall, the report found the services offered relatively low value for money, due to high revenue, performance and capacity risks. The report also noted that there was very low overall demand from Kent, indicated by the lack of any existing viable bus services:

In both cases the demand which would be generated by the new services is insufficient to cover the operating costs, and the services would run at a substantial loss. Attracting double the numbers of passengers forecast would still not achieve financial viability. The fact that there are very few bus services running between Kent and Sussex (and none that support work journeys) would tend to confirm our analysis of the relative weakness of the overall market the service seeks to satisfy.

If economic benefits were taken into account (such as journey time savings, reduced car use and carbon savings) the BCR figures would improve, though again would be unlikely to achieve viability.

As such, the report concluded Kent-Gatwick services would have a weak case, attracting only a limited market. It is important to note that the report assessed the feasibility of Ashford-Gatwick services *in addition to* the existing Tonbridge-Redhill services, rather comparing the feasibility of services to the existing Tonbridge-Redhill shuttle as done in this analysis (see section four below).

3.1.4 Redhill Infrastructure and Timetable Analysis Report Summary

In 2022, Network Rail's Southern Region Strategic Planning Team commissioned a study to understand what infrastructure upgrades may be required to enable direct Kent-Gatwick services. Although the study is premised on the December 2019 timetable which is no longer in operation, it demonstrated that Tonbridge-Redhill-Gatwick services could be accommodated on the network and that relatively modest changes to infrastructure could be considered to support this should December-19 service frequencies resume (refer to section 5) or if higher frequency services were sought – for example two trains per hour between Kent and Gatwick.

This is a core assumption on which this document builds and would need further investigation if the proposals outlined here were taken forward.



3.2 LOCAL AUTHORITIES PLANS & POLICIES

Reinstating connections between Tonbridge (and/or beyond) is included as a priority in the following local authority plans:

- **Kent Rail Strategy (2020):** “KCC [Kent County Council] has long advocated a direct rail service linking Kent with Gatwick, and the Transport for the South East Transport Strategy strongly supports the concept”. KCC also note that “such a service could be introduced by extending the existing GWR Reading-Guildford-Dorking-Redhill-Gatwick service via Redhill-Edenbridge-Tonbridge-Ashford to Canterbury” (p. 16 and 48).
- **Surrey Rail Strategy (2021):** “Surrey County Council will continue to make the case for better services on the Tonbridge to Redhill line with potential for direct services to Gatwick Airport and to additional stations in Kent.” (p. 3).



3.2.1 Transport for the South East Proposals & Literature

Transport for the South East (TfSE) have developed a range of strategic transport documents many of which have specific relevance to this Advice. These emerge from detailed study and analysis of land use and associated travel patterns across the region (see for instance TfSE’s Inner Orbital Study which also establishes a strategic case for Kent-Gatwick rail connectivity, on which this Advice builds).

Specifically, TfSE have highlighted the relatively poor cross-regional connectivity in Kent and Sussex and propose direct Kent-Gatwick rail services as a potential solution (see figure 18).

TfSE state:

“direct, frequent services where possible providing seamless connectivity between Gatwick Airport and the major economics hubs of Tonbridge, Maidstone and Medway. [This would address the issue that] the quickest way to travel by rail between Gatwick and most of Kent is to travel via London. This is due to infrequent service along the Redhill to Tonbridge line and the need to interchange at least two times to travel past Tonbridge to other areas of Kent.”

According to TfSE’s proposed ‘Eastern Rail Arc Service Enhancements’ a 2-4 train per hour (tph) frequency on the Redhill-Tonbridge line and onto Gatwick would result in Generalised Journey Time (GJT) improvements of approximately 10%-50% (with the higher time savings in West Kent, and lower time savings in east/north Kent owing to more competitive rail options via London).

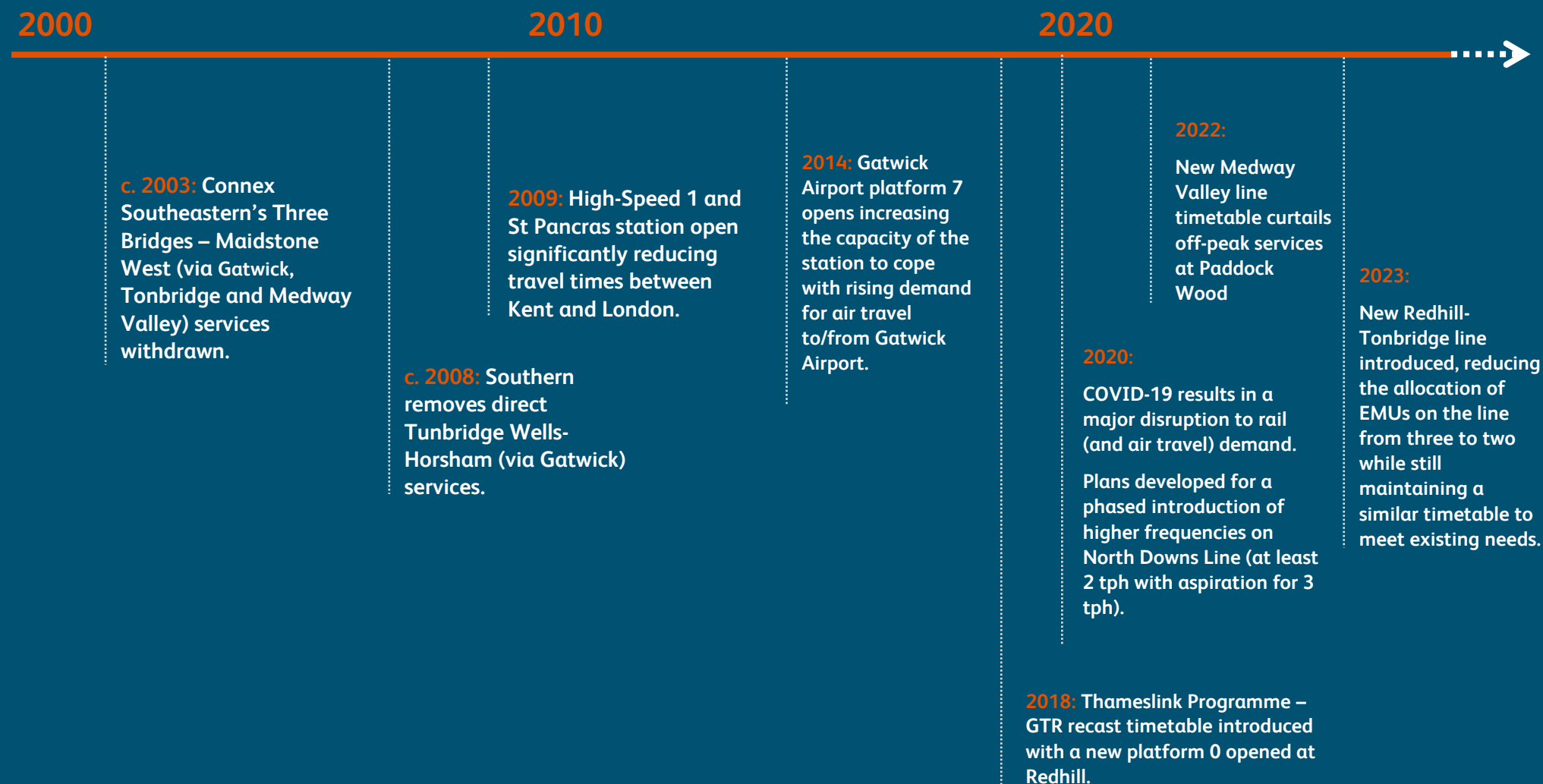
It is important to note that a travel time reduction of this magnitude would also likely require a new chord bypassing Redhill station (the Aerodrome Chord), along with Medway Valley Line level crossing upgrades and a station and track layout upgrade at Tonbridge. Assessing this proposal is beyond the tactical scope of this analysis. According to TfSE’s analysis, direct Kent-Gatwick services departing to/from Ashford would bring £140 m in gross value add (GVA) uplift per annum by 2050 (2018 prices) along with 5,000 more return rail journeys per weekday with an associated reduction in greenhouse gas emissions from road journeys. As sizable as these modelled travel time and wider benefits are, the scope of this analysis is focussed on more tactical proposals that would not involve such major infrastructure investments as the Aerodrome Chord bypassing Redhill.



Figure 18: Transport for the South East’s Strategic Programme Outline Case listing Kent-Gatwick services as a strategic rail priority, and showing some of the cumulative benefits completing these projects would enable.

3.3 NETWORK EVOLUTION

As shown below, Kent-Gatwick services last ran over a decade ago, with one service operating between Horsham and Tunbridge Wells, and one between Maidstone West and Three Bridges. In general, the changes over time demonstrate the goal of the rail industry to develop timetables that balance competing priorities, for instance providing more capacity for popular and revenue-generative services serving the large London commuter/leisure market. This has led to a positive feedback loop of passenger growth and investment for London flows. Consequently, the London market has grown and cross-regional rail connectivity (such as between Kent and Gatwick) remains suppressed.



3.4 NETWORK BASELINE

3.4.1 Timetable and passenger services

As shown in figure 19 to the right, in the December 2019 (the basis for this report), the Redhill-Tonbridge line operated as a shuttle at a 2 tph frequency in the peaks, and 1 tph in the off-peak. These are operated with 3 carriage Class 377 Electrostar EMUs on a standard gauge railway electrified with 750-volt DC third rail. Regarding service frequency and associated patronage across the line, figures 20 and 21 show:

- In the context of the wider Kent/Sussex area and particularly the BML and South East Mainline, the service pattern of 1-2 tph on the Redhill-Tonbridge line is low. This is reflective of lower revenue and passenger loadings and more local role of the Tonbridge-Redhill line compared to main lines serving markets such as London and Brighton. As indicated by the larger footfall statistics for main line stations in figure 20, the Redhill-Tonbridge line station markets are several orders of magnitude smaller than main line ones. For instance, in 2022, there were only 56,000 annual passenger journeys to/from Godstone, compared with nearly 3 million at Tonbridge.
- Tonbridge and Redhill both act as rail hubs, where relatively frequent regional trains from destinations across Kent, Sussex and Surrey converge, presenting a rail connectivity opportunity.

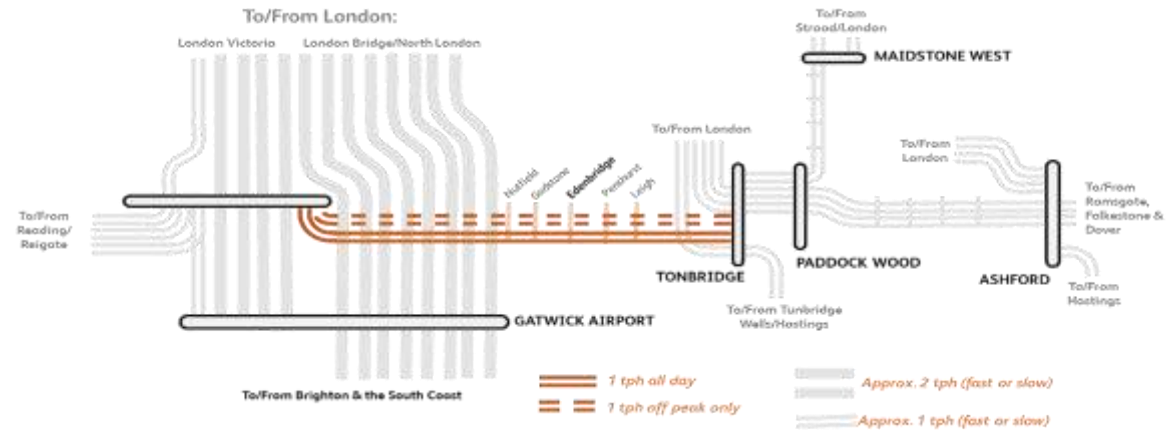


Figure 19: A generalised illustration of the December 2019 timetable (the basis on which this report builds). Each line represents an hourly service in one direction. The analysis for this report is based on the 2019 timetable because this is when the Redhill Infrastructure Report (see section 3.1.1 is based on), and due to the pandemic and associated impacts is the best year in recent times for demand baselining. Any further analysis however should be based on the next timetable iteration (i.e. December 2023).

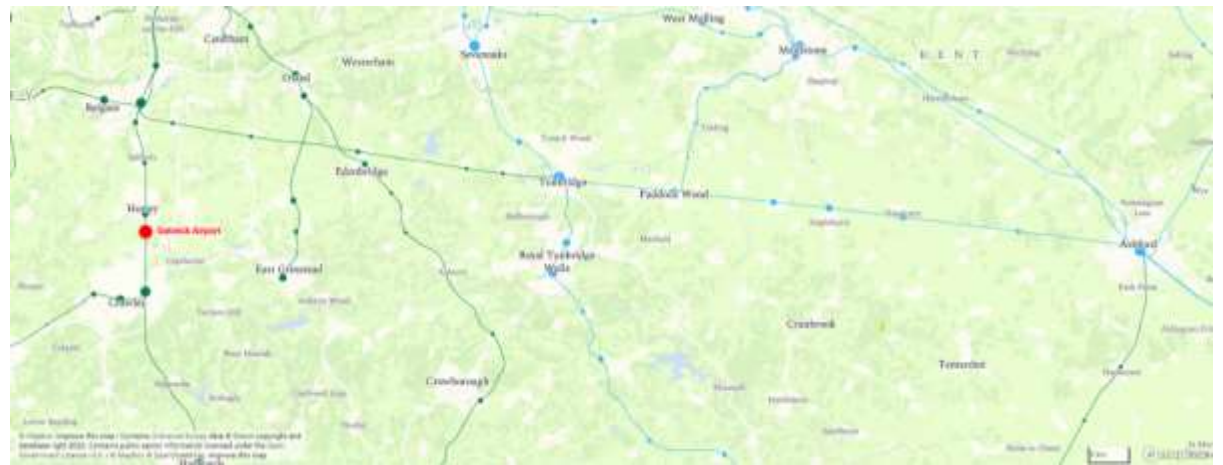


Figure 20: Footfall map showing the scope area. The size of circles represents annual station footfall as per Office of Rail and Road (ORR) data in 2021-22. The Redhill-Tonbridge line is characterised by low station footfall. Source: [Merritt Cartographic](#).

3.4.2 Freight operations

The Redhill-Tonbridge line has several interfaces with freight services, as highlighted below. Redhill is a key corridor for freight, ferrying aggregates to and from terminals on the BML. The Redhill-Tonbridge line also functions as a diversionary route for Channel Tunnel traffic (refer to figure 21). As per the Southern Region Freight Strategy, there are aspirations for two standard hour paths on the BML corridor for freight. Overall, following engagement with relevant freight stakeholders in the area and timetable analysis conducted by WSP (which demonstrated Kent to Gatwick paths could be included alongside existing freight), minor increases in frequency on the line as proposed in section four would have relatively little impact on freight operations in the area. However, it is recognised that additional passenger services need to consider the impact on capacity on the network for any prospective freight growth.

Regular: DB Cargo, GB Rail Freight, Freightliner and Colas Rail/Balfour Beatty services from across South East and further afield.

Route services to/from Tonbridge West Yard.

Aggregates to/from Acton West Yard to Newhaven, Crawley New Yard, Ardingly (Freightliner).

Main freight operators are DB Cargo, Freightliner and GB Rail freight.

Aggregates to/from Acton West Yard to Newhaven, Crawley New Yard, Ardingly (Freightliner).

Special Diversionary Clapham Junction to Euro Tunnel freight route when South East Main Line is closed.

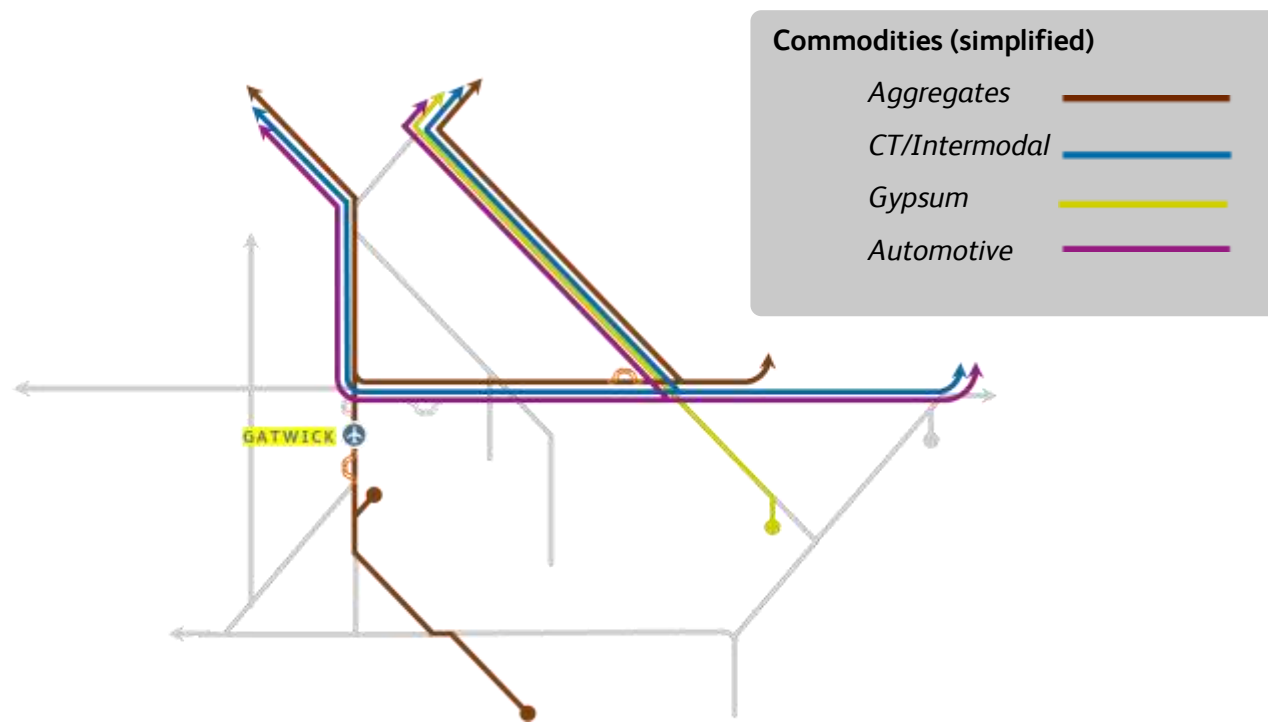


Figure 21: Freight commodity flows in/around the study area.

3.4.3 Gatwick-Redhill-Tonbridge baseline characteristics

Natural hazards	The line traverses several areas of flood risk but is mostly elevated above the flood zones. The most extensive flood risk is between Tonbridge and Leigh where the line crosses the Haysden Water facility. Climate risk management is anticipated to be managed through Network Rail's climate change resilience workstreams.
Revenue	<p>Revenues vary significantly across this report's scope area with the Tonbridge-Redhill attracting lower passenger flows and revenues than the main line services it interacts with (Brighton Main Line at Redhill and Tonbridge Main Line at Tonbridge). This contrast is important to highlight because while introducing new services on the Brighton Main Line to Tonbridge may have strategic benefits, but would also absorb some route capacity which could have revenue/demand impacts in the longer term.</p> <p>Making trade-offs between revenue for the sake of better overall network connectivity are to be expected as part of any network planning exercise to realise wider strategic social, environmental, economic benefits of rail, and as new rail markets develop and mature. Ultimately however, due to the limited capacity on the BML and high revenue delivered from existing services means that any service pattern greater than 2 tph between Kent and Gatwick may be unviable purely on a revenue basis and was not taken forward for assessment as an option in section four.</p>
Operators	The line and all stations west of Tonbridge in the scope area are operated by GTR (Southern), except for Tonbridge which is managed by Southeastern. Southeastern also provide the staffing (drivers and guards) on board the services. Southeastern operate services to and from Maidstone and Ashford and the surrounding lines and stations.
Route description including political and service group boundaries	The line traverses both Surrey and Kent County Council areas, and the Sevenoaks, Tandridge, Tonbridge and Malling and Reigate and Banstead Local Authority Areas.
Notable incidents	On 22 December 2019, a landslip between Edenbridge and Godstone caused part of the line to be temporarily closed to traffic. A shuttle train service continued to operate between Tonbridge and Edenbridge, whilst the Edenbridge-Redhill section was served by replacement buses. The line reopened and normal services resumed in March 2020.
Renewals	Some minor track, fencing and telecom renewals are planned Edenbridge in 2025/26. Redhill is also subject to a major renewal although the findings of this report indicate that additional infrastructure to enable Kent-Gatwick services is not needed or justified.
Timetable	In the latest timetable (introduced in December 2022), there is generally around one train per hour, although this varies across weekdays, with slightly more frequent services coinciding with school times, and a ramping up and down of service intervals before and after the school peak.
Average speed	The track length between Tonbridge and Redhill is around 32 kilometres, and the average journey time between the two stations is around 31 minutes meaning the average speed of services is (including stops and assuming no delays) is around 60 km/h. A speed restriction at Medhurst Row level crossing is expected to be lifted in the coming year.
Interchange opportunities	Although the line intersects both the Uckfield and East Grinstead lines, there are no direct interchange opportunities to these services. An interchange can be made with the Uckfield Line although this involves a 20 minute/1.4 km walk. There are multiple interchange opportunities at either end of the line, although due to the low frequencies and only interchanges onto mainline services are convenient. This undermines the utility of the line for return journeys, and particularly cross-regional travel (for instance the Medway Valley or North Downs lines, which also have relatively infrequent services)

Table 6: Gatwick-Redhill-Tonbridge baseline characteristics.

3.4.4 Key Infrastructure within scope area

	Signalling	Crossovers/ Junctions	Structures	Freight terminals	Journey times (eastbound)	Line speed MPH (Westbound)	Line speed MPH (eastbound, read from bottom upwards)
TON Tonbridge	TCB, Bi-di					20->35	35->20
	TCB, Bi-di	↔		Tonbridge West Yard	5	50->85	85->50
LIH Leigh (Kent)	TCB						85
PHR Penshurst	TCB		Level crossing		4		85
	TCB				8	40	40
EBR Edenbridge	TCB					85	85
	AB						
GDN Godstone	AB		Bridges over East Grinstead & Uckfield Lines		6		
	TCB	↔	M23 (Coopers Hill Viaduct) Bletchingly Tunnel	Godstone Tip sidings (not in use)	5		
NUF Nutfield	TCB	↔↔↔				60	60
	↔		Locomotive sidings		4	60	60
RDH Redhill	TCB, Bi-di	↔				60->20->15	15->20->60
	TCB	↔				15->75	75->15
	TCB					75	70
SAF Salfords	TCB						90->75
	TCB						
HOR Horley	TCB	↔		Salfords	13	90->70	70->90
	TCB						
GTW Gatwick Airport	TCB						

Table 7: Key Infrastructure within scope area

3.4.5 Performance/reliability analysis

Data for a sample period of January-February 2023 extracted from the rail data base TRUST was used as a baseline to analyse the on-time performance between Tonbridge, Redhill, and Gatwick Airport.

3.4.5.1 Tonbridge-Redhill line

From this analysis, the Redhill-Tonbridge line performs well with regards to on-time performance. From a sample of over 500 services in the early months of 2023, the average delay arriving at Redhill was under 90 seconds, which represents relatively good on-time performance (see tables eight and nine). This is likely owing to the low service frequencies (1-2 tph), simplicity of the route structure and track layout between Redhill and Tonbridge with few conflicting moves with other services. Additionally, the absence of crowding means station dwell times are met, and surplus time at both Redhill and Tonbridge enabling sufficient buffer for services to recover following any unplanned disruptions that do occur, reducing ‘knock-on’ effects across the timetable.

Route	Average lateness	Number of services in sample
Tonbridge – Redhill	00:01:17	517
Gatwick Airport – Reading	00:00:58	808
Redhill – Tonbridge	00:00:58	518
Redhill – Reading	00:00:30	326

Table 8: Redhill station average service delay analysis (January/February 2023)

Route	Average lateness	Number of services in sample
Redhill – Tonbridge	00:01:40	518
Tonbridge – Redhill	00:00:34	517
London Charing Cross – Dover Priory	00:03:55	470
Dover Priory – London Charing Cross	00:01:41	440

Table 9: Tonbridge station average service delay analysis (January/February 2023)

3.4.5.2 Brighton Main (slow) Lines (Redhill-Gatwick)

Services between Redhill and Gatwick show a less reliable pattern. This is unsurprising given the higher passenger loadings, conflicting moves, and higher frequencies. The BML is one of the busiest and most complex main lines in the country, and as such services are subject to more frequent and lengthier delays.

Tables 10 and 11 demonstrate that from a sample of London-Horsham services (the slow lines Kent-Gatwick services would use), delays are most frequent just before Gatwick Airport at Salfords in the southbound direction. This is likely attributable to congestion around Gatwick Station due to high passenger volumes which may impact train despatch times.

In the northbound directions, trains most often pick up delay at Selhurst which is likely due to known congestion issues at the at-grade junctions just north of Croydon.

London Blackfriars – Horsham	Average Lateness at Stop
London Blackfriars	00:02:15
Metropolitan Jn	00:02:06
London Bridge	00:01:45
Corbetts Lane Jn	00:01:45
Bricklayers Arms Jn	00:01:30
New Cross Gate	00:01:23
Sydenham	00:01:37
Norwood Junction	00:01:23
Norwood Fork Junctions	00:01:16
Windmill Bridge Jn	00:02:24
East Croydon	00:02:37
South Croydon	00:03:21
Purley	00:03:27
Stoats Nest Jn.	00:02:48
Coulsdon South	00:02:22
Merstham	00:02:20
Redhill	00:02:15
Earlswood (Surrey)	00:03:08
Salfords	00:05:36
Horley	00:02:31
Gatwick Airport	00:02:58
Three Bridges	00:02:59
Crawley	00:03:06
Ifield	00:02:56
Littlehaven	00:03:10
Horsham	00:03:16

Table 10: Sample of Brighton Main Line average lateness (south bound in January/February 2023).

London Blackfriars – Three Bridges	Average Lateness at Stop
London Blackfriars	00:01:40
Blackfriars Jn	00:02:58
Southwark Bridge Jn	00:02:42
Elephant & Castle	00:02:41
Loughborough Jn	00:02:55
Herne Hill	00:03:06
Tulse Hill	00:03:06
Streatham	00:03:47
Streatham Common	00:04:22
Selhurst	00:06:12
Windmill Bridge Jn	00:01:54
East Croydon	00:02:22
South Croydon	00:02:06
Purley	00:02:40
Stoats Nest Jn.	00:02:44
Coulsdon South	00:03:08
Merstham	00:03:00
Redhill	00:02:34
Earlswood (Surrey)	00:03:06
Salfords	00:01:40
Horley	00:02:58
Gatwick Airport	00:02:42
Three Bridges	00:02:41

Table 11: Sample of Brighton Main Line average lateness (north bound in January/February 2023).

3.4.6 Summary of Opportunities & Constraints between Tonbridge & Gatwick

Table 12 and figure 23 below gives an overview of some of the opportunities and constraints identified as part of baselining exercises for this advice.

OPPORTUNITIES	CONSTRAINTS
<p>1 Higher service frequencies on Tonbridge-Redhill line could enable improved cross-regional rail connectivity and more attractive travel times.</p>	<p>1 A limitation to the flexibility and capacity from the Tonbridge and Gatwick directions due to the track layout approaching Redhill. Currently, it is not possible for westbound services on the Tonbridge-Redhill line, and Northbound services on the Brighton Main Slow Lines to access platform 3 (eastern side) at Redhill station. Timetable analysis demonstrates enabling access to platform could be important in the future if running Tonbridge-Gatwick services at higher (e.g. 2 tph) frequencies although Kent-Gatwick services revenues are unlikely to fund new infrastructure like this. Consequently, 1 tph is likely the most feasible service proposition.</p>
<p>2 There is capacity in the slow lines to run a non-stopping service between Redhill and Gatwick Airport although. The further analysis is required to confirm that the potential capacity/performance risks are less than, or broadly commensurate with the benefit of direct Kent-Gatwick services.</p>	<p>2 There is a legacy speed restriction at the Medhurst Row Level Crossing (miniature stop lights). The removal of this speed restriction is planned in due course.</p>
<p>3 Tonbridge effectively functions as a hub for rail services from across west Kent – three lines converge (with a fourth, the Medway Valley Line) converging nearby. An improved service between Tonbridge and Gatwick would enable improved journey times from other parts of Kent as there would be more opportunities to travel directly or with 1 change to/from Gatwick, rather than via London (see section 4.4).</p>	<p>3 Like Redhill, the track layout at Tonbridge station is restrictive. Despite the potential benefits of upgrading the track layout to make it easier to run trains between Gatwick and areas of demand like Maidstone, Paddock Wood, Ashford or Tunbridge Wells, in practice this is would be difficult due to the volume of existing freight and passenger movements at the station, the arched overbridge preventing the installation of new junctions at the east side (likely a prerequisite to enable cross-regional services), and the fact that any change at Tonbridge station could trigger a recast of Southeastern’s timetable.</p>
<p>4 Upgrading the signalling and line speed on the Redhill-Tonbridge line to enable shorter headways and faster, more frequent services would be a more efficient use of the line asset, both for passenger and freight services. Provided signalling was upgraded, there would be opportunities to run a mix of fast/slow services, enabling more competitive journey times for travel between Kent and Gatwick than via London.</p>	<p>4 The Tonbridge Freight Yard has only one entrance. The yard is heavily used year-round by freight trains, empty coaching stock and for stabling rolling stock. The single lead junction from the South East Main Line is a constraint and can cause delays for all services departing or terminating at the station because the freight trains shunt slowly across main lines; occupying platforms and junctions in the process.</p>
<p>5 Transport for the South East propose the construction a new chord to better link the Redhill-Tonbridge line to the south. This could enable considerable time savings for trains between Kent and Gatwick, enabling services to bypass Redhill (and removing an otherwise 5-minute dwell time at Redhill for trains to turn around). However, installing this infrastructure it is likely to be prohibitively expensive and beyond the scope of this analysis.</p>	<p>5 Currently, the Tonbridge-Redhill line has several sections of absolute block signalling (the least flexible signalling type). Upgrading the signalling would likely be a prerequisite for any more ambitious service improvements along the line.</p>
<p>6 Improving the Redhill-Tonbridge line connectivity would reduce the need for passengers to travel via London, freeing up capacity on this busy line, saving time, money and reducing passenger’s likely exposure to delays when travelling to/from Gatwick via London.</p>	<p>6 Although Gatwick Station has recently been upgraded, its platforms are again nearing capacity for new services. If the existing Tonbridge-Redhill shuttle was extended to terminate at Gatwick rather than Redhill, this would place additional pressure on Gatwick Station capacity, possibly presenting performance/capacity risks. There are also operational complexities that need considering should a new service be introduced. For instance, GTR staff take breaks at Gatwick and Redhill, and turning around an additional service every/at some hours could introduce performance risk. More detailed operational analysis on this is needed, especially considering the introduction of an additional GWR train per hour, extending the pre-2023 GWR service pattern 1 tph service to 2 tph between Reading-Redhill-Gatwick.</p>
	<p>7 Extending the existing service beyond Redhill would disrupt the current service group model. Although GTR operate the existing Tonbridge-Redhill shuttle, Southeastern provide the staff. This arrangement, along with the fact that employees staffing the shuttle take breaks at Redhill stations may need to be addressed in future.</p>

Table 12: Summary of Opportunities & Constraints between Tonbridge & Gatwick.

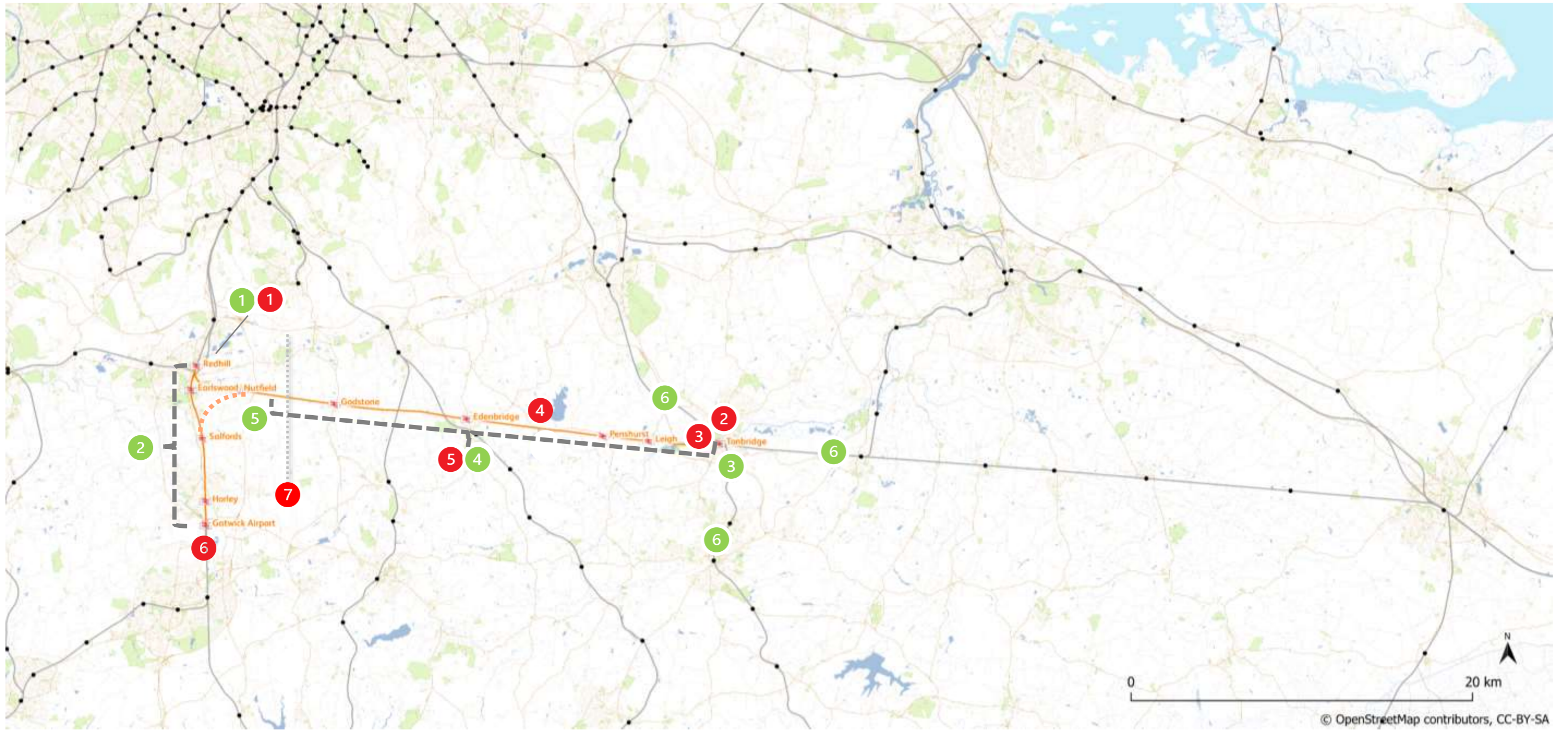


Figure 22: Reference map for table 12, showing opportunity and constraints along the Tonbridge-Redhill-Gatwick rail segments.

3.5 STAKEHOLDERS

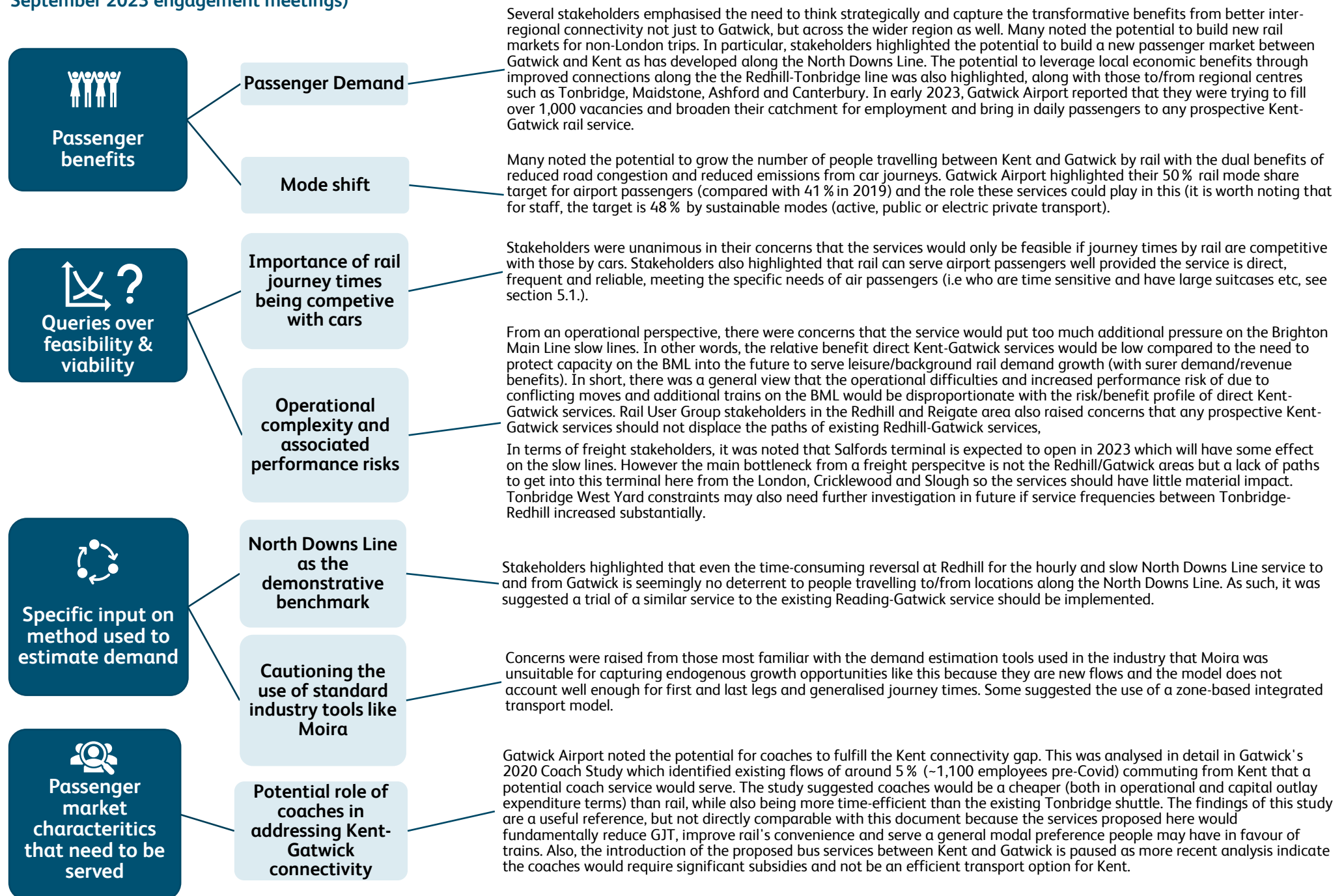
As part of developing this Strategic Advice, over twenty key stakeholders ranging from local to county councils, operators, and rail/sustainable transport advocacy groups were consulted. The overall learning from the stakeholder engagement and literature review processes was the range of perspectives regarding the relative merit and drawbacks of any prospective improvements to Kent and Gatwick rail connectivity along the Redhill-Tonbridge line.

Some were strongly in favour, and thought these services were well overdue. These stakeholders made clear their view that enabling/introducing fast, frequent and direct services from across Kent should be an immediate priority.

Others meanwhile took a different view, cautioning that while the idea has merit, the logistics and opportunity cost of doing so may well be too great. As such, these stakeholders did not necessarily see the services as a high priority. A more detailed summary of these perspectives is provided in the table below which helped form the analysis in section four.

Customers:	Train/Freight Operating Companies (TOCs/FOCs):	Funder	Other Government bodies & External Partners:
<p>Freight and passenger insights derived from analysis/literature and rail user groups.</p> 	<p>Govia-Thames Railway (GTR, encompassing ThamesLink, Gatwick Express and Southern), and Southeastern.</p> 	<p>HM Government, The Department for Transport.</p> 	<p>County (Surrey, Kent, Sussex) Councils, Borough (Tandridge, Sevenoaks, Maidstone, Tonbridge & Maling, Reigate & Banstead, Tunbridge Wells) Councils, and the sub-national transport body (Transport for the South East (TfSE)). Gatwick Airport Limited (GAL), Local Economic Partnerships (LEPs) and rail user groups/advocates etc.</p> 

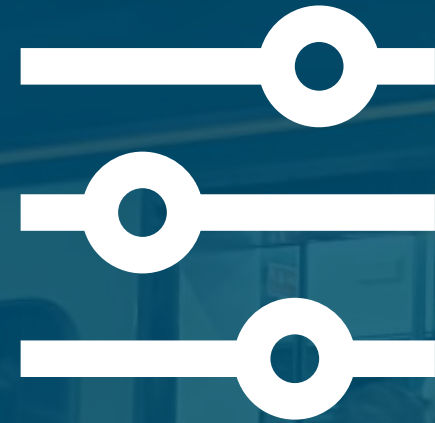
3.5.1 Stakeholder feedback by theme (emerging from February, July and September 2023 engagement meetings)



Chapter

04

OPTIONS



This chapter outlines and analyses in-depth the options assessed for prospective direct Kent-Gatwick services.

The chapter opens with a explanation and summary of the method used, and some of the key figures from the modelling of the five options.

Each option is compared across metrics related to GBR's five objectives for rail, with a page devoted to each option's respective merits and drawbacks.

4.1 SUMMARY OF METHODOLOGY

4.1.1 Options selection

The options modelled in this report (shown in figure 24) were chosen because they best aligned with the core requirements of the study. These requirements were to assess and quantify demand elasticities, while also credible proposals given the constraints of the existing infrastructure, and/or envisaged potential market sizes/journey times. Specifically, options one-five are:

- **Are realistic/evidence-based** – the options were first assessed in a timetable/infrastructure report referenced in section 3.1.3.
- **Provide sufficient and material differences between options to enable meaningful insights to be extracted;** and
- **Balance ambition** (for instance 1 tph Gatwick-Maidstone/Ashford) **with less complex options** i.e. 1 tph Gatwick-Tonbridge.

Other potential options were ruled out from the outset, as explained below:

- **Tunbridge Wells, Sevenoaks** (as discussed in section 1.3);
- **Strood:** existing rail journey times to/from Gatwick and Strood via London are around 90 minutes, which is too long to catalyse a large/commuter rail market. To catalyse sufficient revenue to justify the additional mileage required to run the service direct to Gatwick via Tonbridge, substantial journey time reductions beyond the capability of the existing Medway Valley and Tonbridge track infrastructure would be required. TfSE modelling referenced in section 3.2.1 supports an Ashford-Gatwick connection, rather than via the Medway Valley (presumably for the same reason) as Ashford which would have much faster and more competitive travel times than Strood.
- **Beyond Ashford (for instance Canterbury):** Given the above, and as Ashford was already deemed as a sufficiently ambitious option to model. Further analysis is needed to understand how services would be timetabled around the busy Tonbridge and Ashford stations areas. Therefore, the relative benefits/trade-offs of any prospective Gatwick-Canterbury services could be considered if/when Ashford services are introduced. Either way, the total market in Canterbury would be modest due to the long in-vehicle journey time, which is attractive for infrequent leisure trips, but less attractive for regular commuters who bring the revenue to fund the service.
- **North Downs Line:** Gatwick is a major hub, commanding significant demand from across the region. Service and investment options for the North Downs Line are being assessed separately as part of an ongoing Strategic Study to assess decarbonisation and service improvement options for the line. Early results from this analysis suggest that trip rates to/from Gatwick and the North Downs and Tonbridge lines are substantially higher than flows across Redhill (i.e. between the North Downs and Redhill-Tonbridge lines). This means a new Tonbridge-North Downs line direct service is likely to be a less favourable investment compared to the proposals in this report that would improve Tonbridge-Gatwick services. Cross-regional connectivity at Redhill between Kent, Surrey and beyond is still available by rail with an interchange to/from the North Downs Line at Redhill.

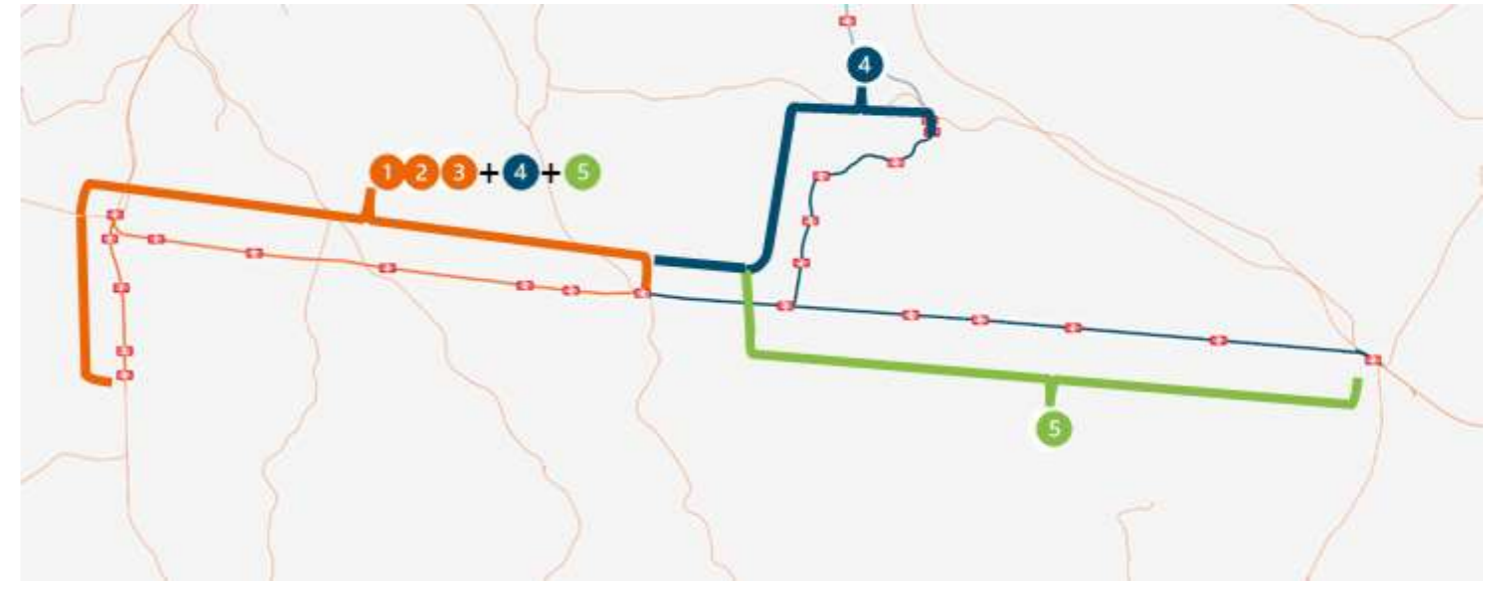


Figure 23: Geographic span of options modelled.

- **Ashford/Maidstone services modelled to Gatwick rather than Redhill:** Theoretically, curtailing services at Redhill rather than Gatwick may have reduced some performance risk associated with running more services on the busy Brighton Mainline and turning services around at Gatwick which is already a very busy station. However, running services only as far as Redhill rather than Gatwick was ruled out for the following reasons:
 - It would not reduce GJT enough. It would essentially drive extra cost with relatively low revenue. Terminating services at Redhill would provide interchange opportunities to services on the Brighton Main line, but would not reduce GJT substantially enough to attract passengers to use it and justify the extra cost of introducing the service.
 - Would still require at least one interchange for passengers going to/from Tonbridge, and two interchanges for passengers travelling to/from Tunbridge Wells/ Sevenoaks.
 - Tonbridge operational complexity – already very constrained area, if adding a new train that crosses the mainline at Tonbridge, it would need to connect to a major demand hub to make it worthwhile (e.g. Gatwick rather than Redhill).
 - Inconsistent with westerly connectivity (e.g. North Downs Line is now 2 tph all day)
- **Services modelled without calls at Earlswood, Salfords and Horley.** This was to ensure journey times were as competitive as possible from Kent, and because the respective markets at these stations are modest and already served with BML slow line services. Additionally, Kent-Gatwick service calls at these stops would offer relatively little benefit when considering the time penalty to passengers coming from/going to Kent and Gatwick.

Throughout the analysis, the emphasis has been on identifying patterns, trends and ranges of demand responses, costs, and ranges in benefits, rather than quantifying a BCR.

4.1.2 Key assessment variables

4.1.2.1 Generalised Journey Time (GJT)

Generalised Journey Time (GJT) is a measure of rail connectivity between two destinations and accounts for several factors including:

- **Total journey time** – travel time between two stations (including in-vehicle and interchange time);
- **Frequency penalty** – when services are infrequent there may be long waits between services;
- **Interchange penalty** – penalty associated with the need to interchange in a journey.

The Passenger Demand Forecasting Handbook (PDFH) provides a standard approach for Network Rail and the industry to forecast changes in demand based on empirical evidence. It provides elasticities (percent change in demand based on a percent change in service factors) for various market segments, including geographic segments and specific flows (in this case airport flows).

PDFH assumes a larger interchange penalty for Business and Leisure passengers, given these passengers will likely be carrying luggage, making an interchange more costly (in time and effort). As a result, a direct service has the potential to generate moderate-large GJT reductions for passengers travelling to and from Kent by removing the Redhill interchange and improving passenger convenience with a 'single seat ride'.

As shown in figure 25, each option modelled resulted in different levels of GJT reductions depending on the location. Option one catalysed only modest reductions in GJT of 10 % for Tonbridge (approximately 8 minutes), and less than 5 % for other locations. Options two and three meanwhile shaved a further 10 % off the GJT between Tonbridge and Gatwick, bringing GJT to around 72 minutes, and providing some marginal improvements for Paddock Wood, Maidstone and Ashford due to the removal of an interchange at Redhill. Options four and five brought substantial improvements to GJT of almost 33 % (50 minutes) and 27 % (39 minutes) for Maidstone and Ashford respectively. A full trade off analysis is provided in section 4.3 below.

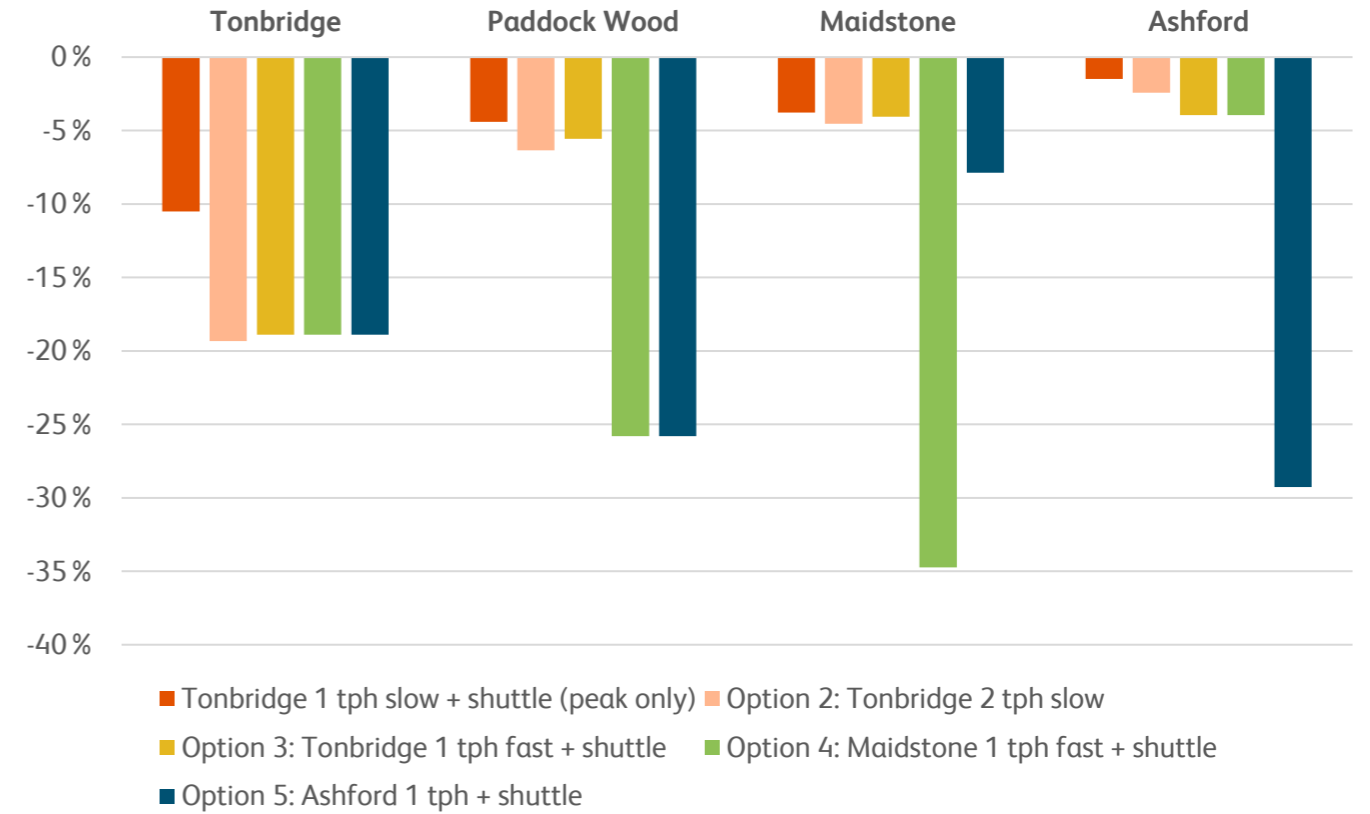


Figure 24: The four key stations in the scope area and respective GJT reductions associated with each respective option.

4.1.3 Passenger demand decay curve analysis

A key objective of the analysis was to determine the quantum of passenger demand that might be expected from various locations if journey times were reduced. This relationship between GJT and willingness to travel can be shown on a decay curve based on all ticket sales across all flows for 2019 showing how demand may be expected to change based on its original GJT. These curves demonstrate:

- A 1-minute change in GJT when the original GJT is higher (e.g. above 150 minutes) has only a small impact on willingness to travel.
- A 1-minute change in GJT when the original GJT is lower (e.g. particularly below 60 minutes) has a proportionally larger impact on willingness to travel.

This means that to catalyse the transformative levels of demand, generalised journey times should ideally be 60 minutes or better (refer to figures 26-28). If a Kent-Gatwick rail service could reduce journey times to this 60-minute threshold to/from the largest centres of demand, passenger levels would likely grow and unlock revenue and funds for further investment.

Overall, the analysis demonstrates that there is a moderate latent rail market for Gatwick flows in Kent, and the total market size is modest. Beyond Tonbridge journey times to Gatwick are very high, with Ashford and Maidstone at around 150 minutes to Gatwick. Even with the large GJT change in the new service options, there may not be a considerable change in demand even with a direct service due to the long journey times. Tonbridge is the closest regional centre and has the fastest rail journey times to/from Gatwick, but the town's population is only around half of the population sizes of Ashford or Maidstone. The Tonbridge market size could be improved by improving end-to-end journey times (e.g. feeder buses or park and ride) but any increase is likely to only to be modest.

This demonstrates the key issue suppressing rail demand for Kent-Gatwick services – to generate the most revenue and demand, the services need to link the most populous places that lie further east, but journey times are likely to be too long to coax enough of the market to shift to rail and cover the additional operating costs. This is particularly true for commuter markets, where only 10% of commuter passengers are willing to travel at a GJT of 100 minutes. The commuter market is important one since it brings frequent travellers (e.g. multiple trips per week compared to less regular leisure/business trips) and therefore the most revenue. These dynamics are explored in more detail in the following sections (4.2 – 4.4).

Tonbridge

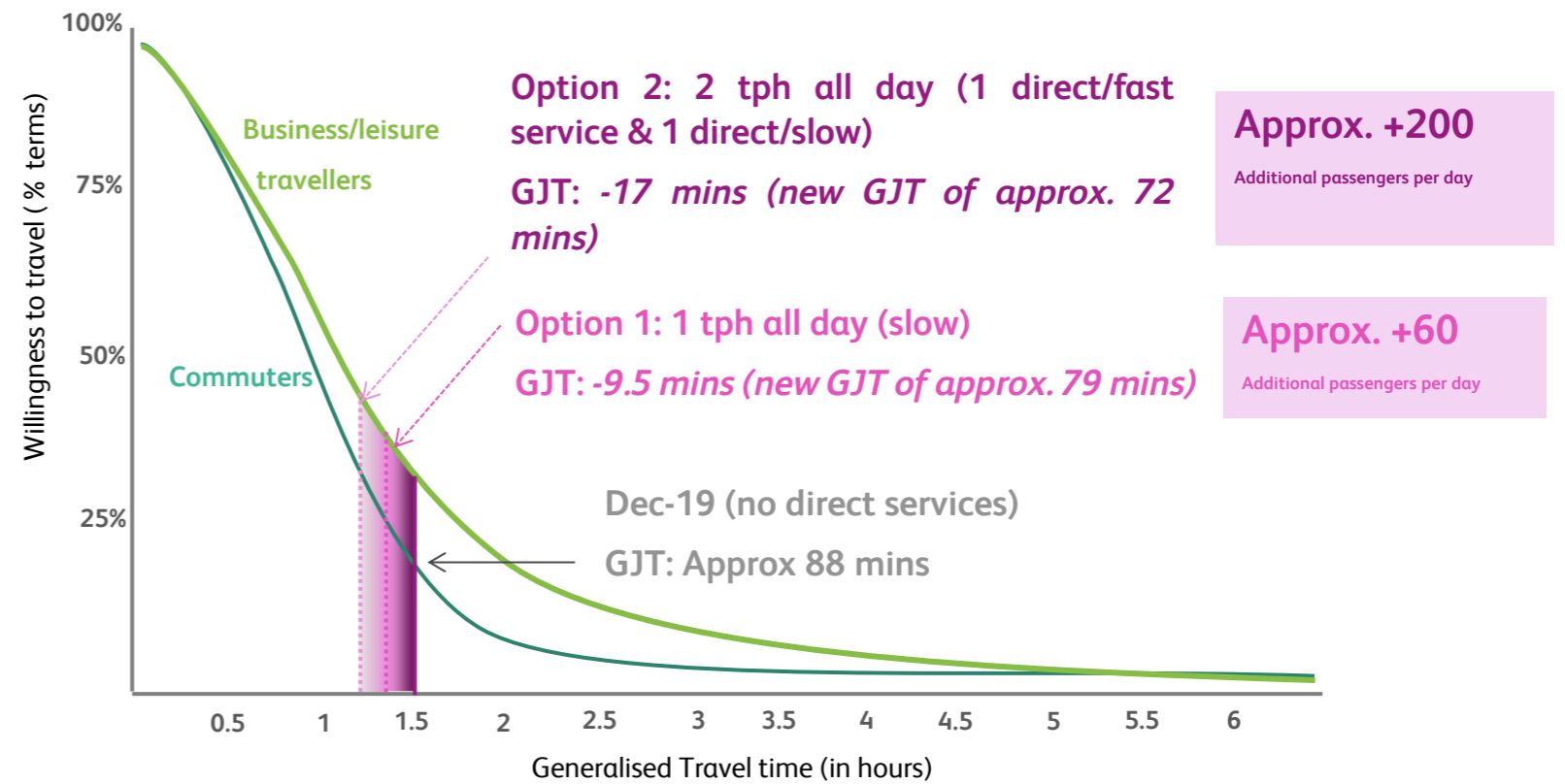


Figure 26: Tonbridge (Options 1-three) GJT reductions and associated willingness to travel (indicative only).

Ashford

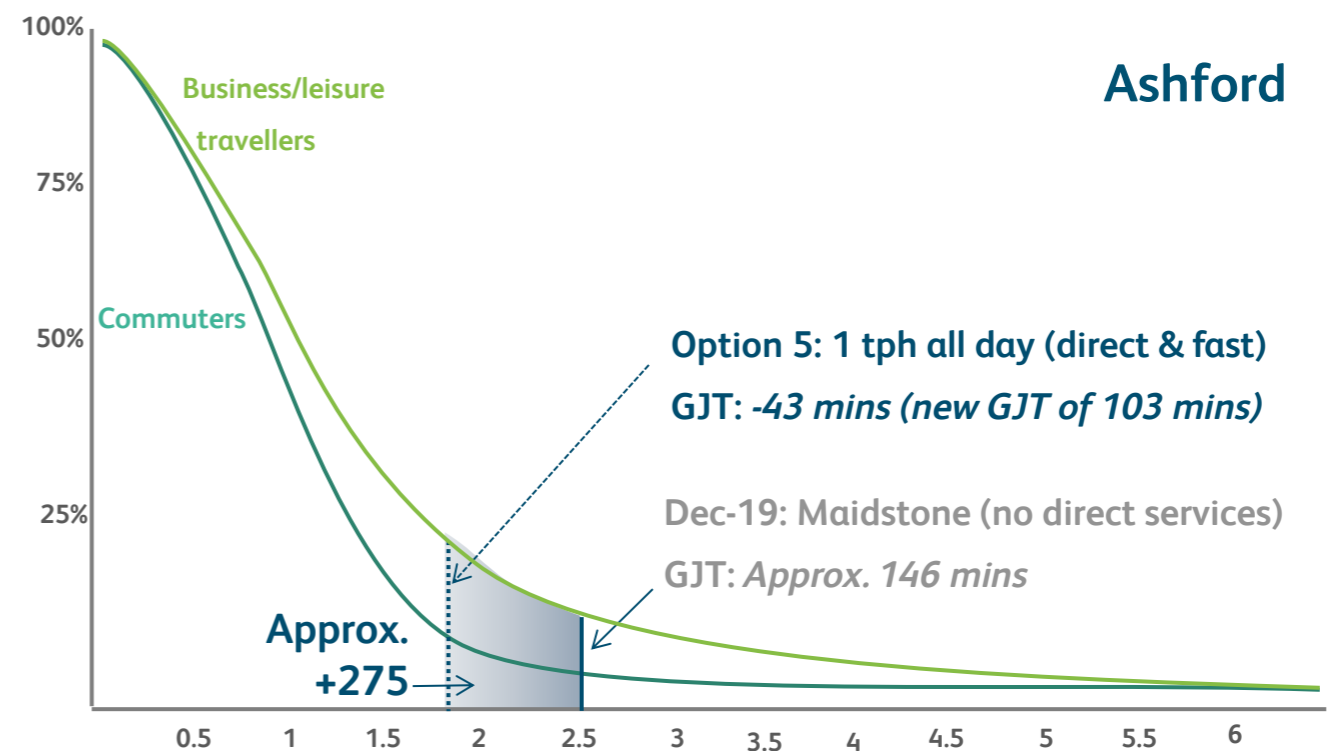


Figure 25: Ashford (Option 5) GJT reductions and associated willingness to travel (indicative only).

Maidstone West

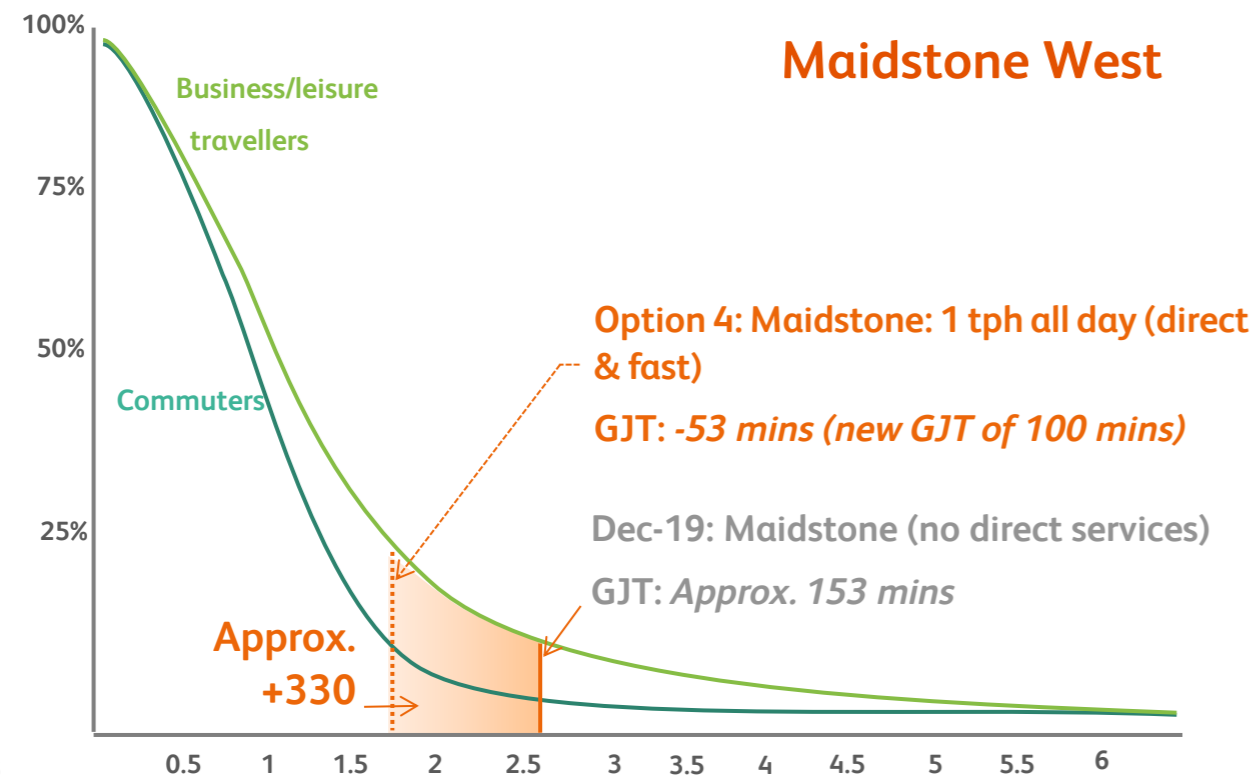


Figure 27: Maidstone West (Option 4) GJT reductions and associated willingness to travel (indicative only).

4.1.4 How demand was estimated for each option

Determining travel demand for new public transport services is a difficult and at times speculative task. The array of variables which determine aggregate demand, mode shares and trips across regions are complex and interacting. Variables include the socio-economic profile of regions, journey times, cost, personal preferences, parking availability/cost, and road taxes as well as housing/employment growth. Often, investment in rail can generate its own markets and demand, especially if it catalyses faster journey times to major centres of demand. However, as noted in the PDFH, the industry standard tool for estimating rail demand (Moir) can be inaccurate when dealing with large reductions in GJT or new passenger flows. Therefore, to overcome this bias in Moira, a novel method of demand estimation was used. The method used Moira, coupled with Mobile Network Data to uplift expected Moira-modelled flows to/from Maidstone and Ashford (where the GJT reduction opportunities are most material) to be broadly equivalent to regional comparators (see figures 30 and 31). It is important to note, this method was used for options 4 and 5 (Maidstone/ Ashford 1 tph) only. Option 1 demand uptake is based solely on Moira modelling. Option 1 was not uplifted because MND showed Tonbridge already has an active –albeit modest– rail market and so would be inappropriate to uplift.

For Maidstone and Ashford, in the current service involves multiple interchanges. Consequently, rail mode shares between these locations and Gatwick are low. As a result, the demand response from Maidstone/ Ashford for GJT reductions may not be modelled accurately with PDFH assumptions, as it will be based off current low demand levels. Mobile Network Data (MND) is new data source for analysing how people travel based on an aggregation of geo-location of anonymous mobile phone signals. These signals are transformed into a rich data set of journey modes, travel times, frequencies, origins, and destinations. Naturally, with any new data series, there is data error and noise. and provides an insight into the mode share of journeys and can provide a new method to consider the scale of demand change that may be seen by a transformational service change. This approach should be considered a first step to give an indication of an upper bound, before committing to time consuming/ data hungry modelling.

This method considers what the demand level would be if Ashford and Maidstone had a mode share that is already seen at a comparator station with a similar service as what the option provides. The comparator station is selected carefully based on the Rail GJT, the ratio of rail GJT to road journey time and number of direct trains per hour (refer to figure 30). Other geographic and demographic characteristics can also be used to strengthen the case for the comparator station.

To ensure data validity the Mobile Network Data was triangulated with established data sources. For instance, travel surveys and modelling from Gatwick Airport and 2019 Lennon data was broadly consistent with the outputs from the Mobile Network Data, giving confidence in the results. The diagram below explains in more detail the bespoke method used to determine demand estimates for each option. While every effort has been made through an internal quality assurance process to ensure the estimates are robust, the findings should be treated as estimates only, not forecasts.

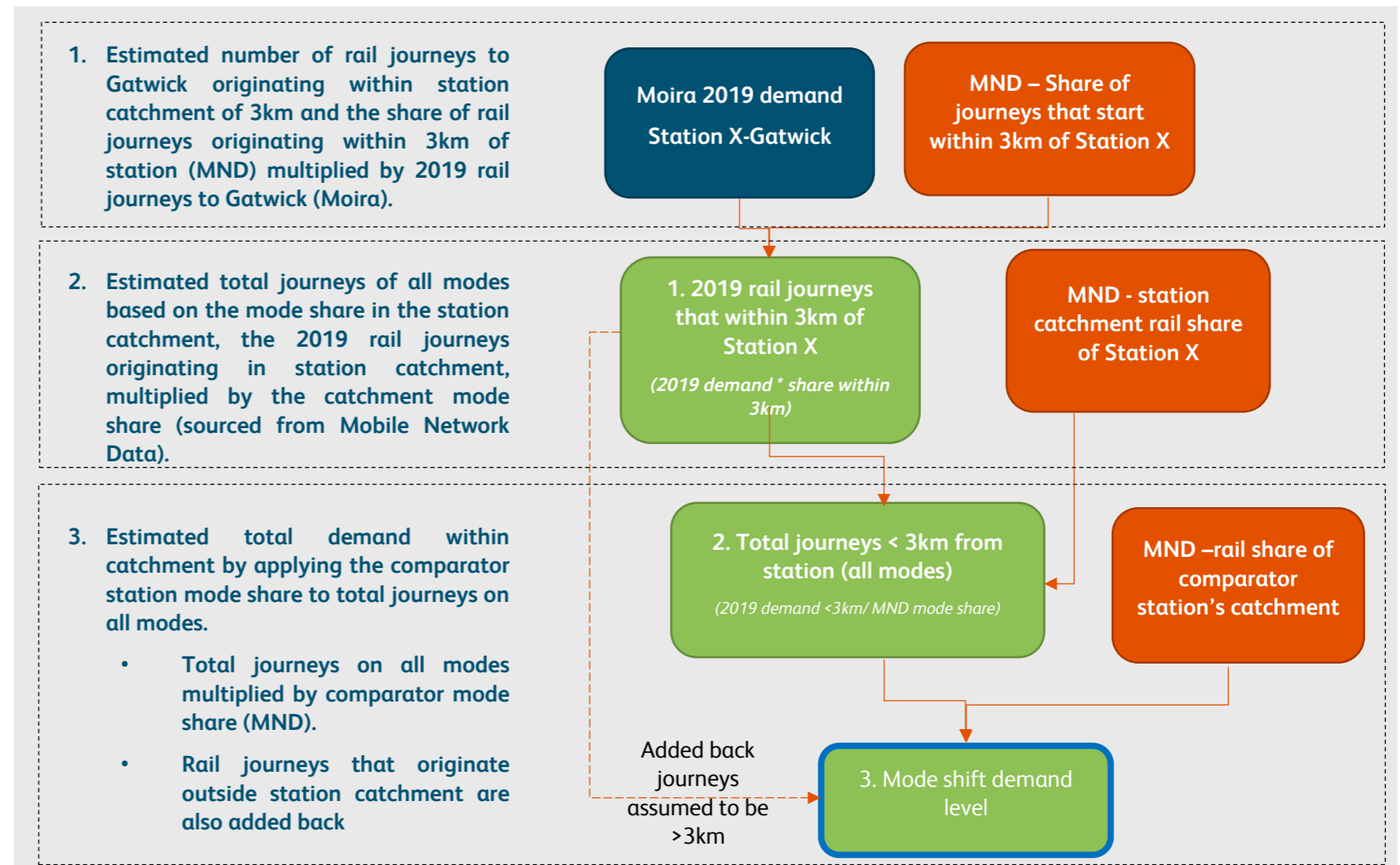


Figure 28: Details and steps used to calculate demand estimate. MND refers to mobile network data.

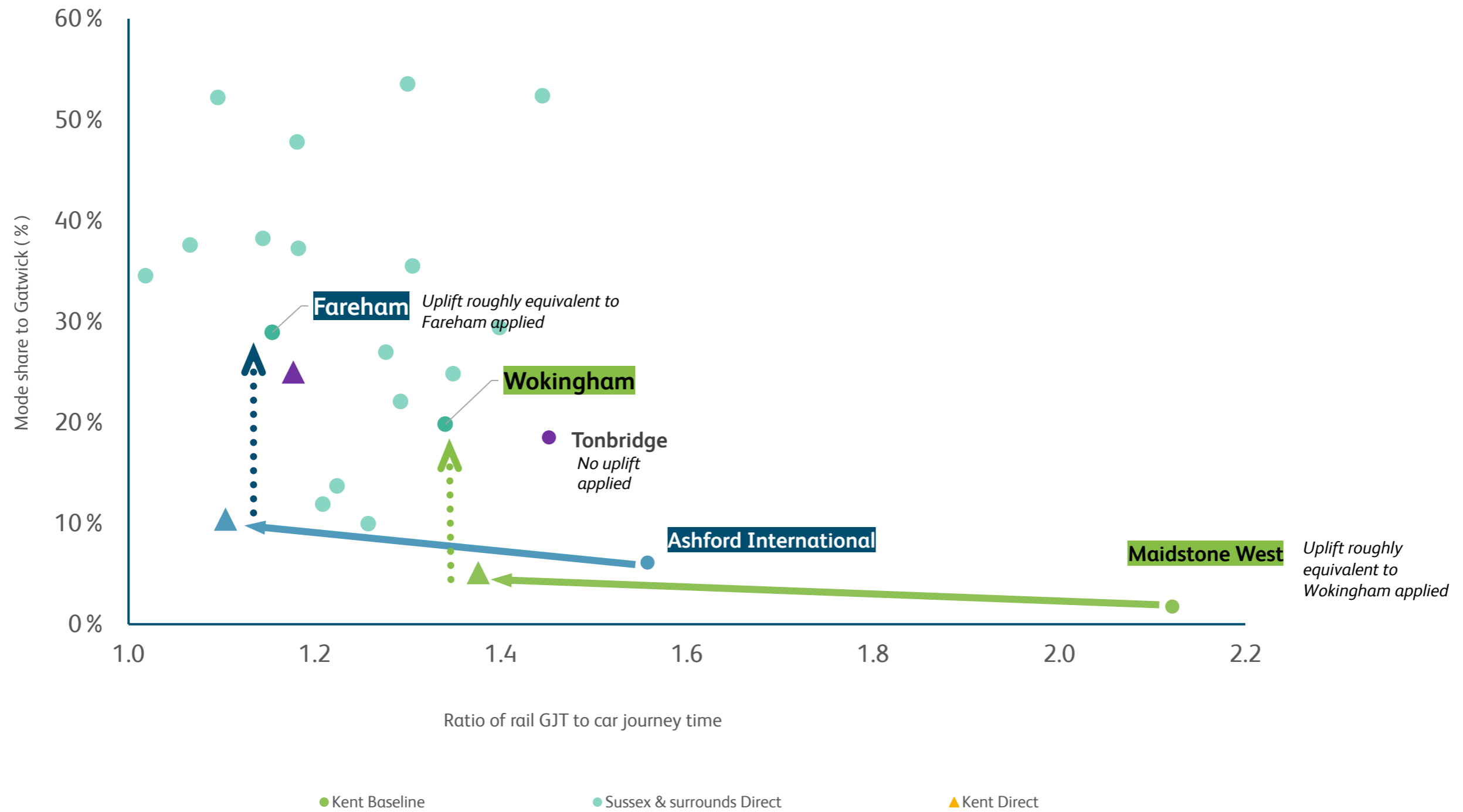


Figure 29: Graph showing results of Moira modelling and the uplift applied to Maidstone and Ashford (green and blue triangles) based on the comparators of Wokingham and Fareham respectively. Moira outputs indicated modelled mode shares between Gatwick and Maidstone and Ashford (green and purple dots on right) would be very low, so these were uplifted to give a better 'moderate bound' demand estimate based on broadly equivalent stations (Wokingham for Maidstone West and Fareham for Ashford). Refer also to the accompanying Technical Appendix for further details.

4.2 ASSESSING THE OPTIONS: COST, REVENUE & DEMAND

As shown in figures 31 and 32 below, the modelled financial performance of the service in each option varied considerably. While the robust wider/strategic case for direct Kent-Gatwick services assessed outlined in section two remains, the high operating costs that outpace revenue generation speaks to the challenging rail economics associated with any new service for regional areas. While option one breaks even (marginally and within an error margin) it does nonetheless represent better value for money than the existing Redhill-Tonbridge shuttle. However, option one catalyses a third of the demand of a more frequent service (option two).

Figure 31 meanwhile shows both that even after applying a demand inflation factor to match comparator stations for Maidstone and Ashford (options four and five, refer to section 4.1.3 above), operating subsidies or major demand growth beyond what was modelled in this piece would still be required to financially break even. A full economic valuation though could provide a fuller assessment of the wider social, economic and environmental benefits of an Ashford connections (refer to section 4.3 below).

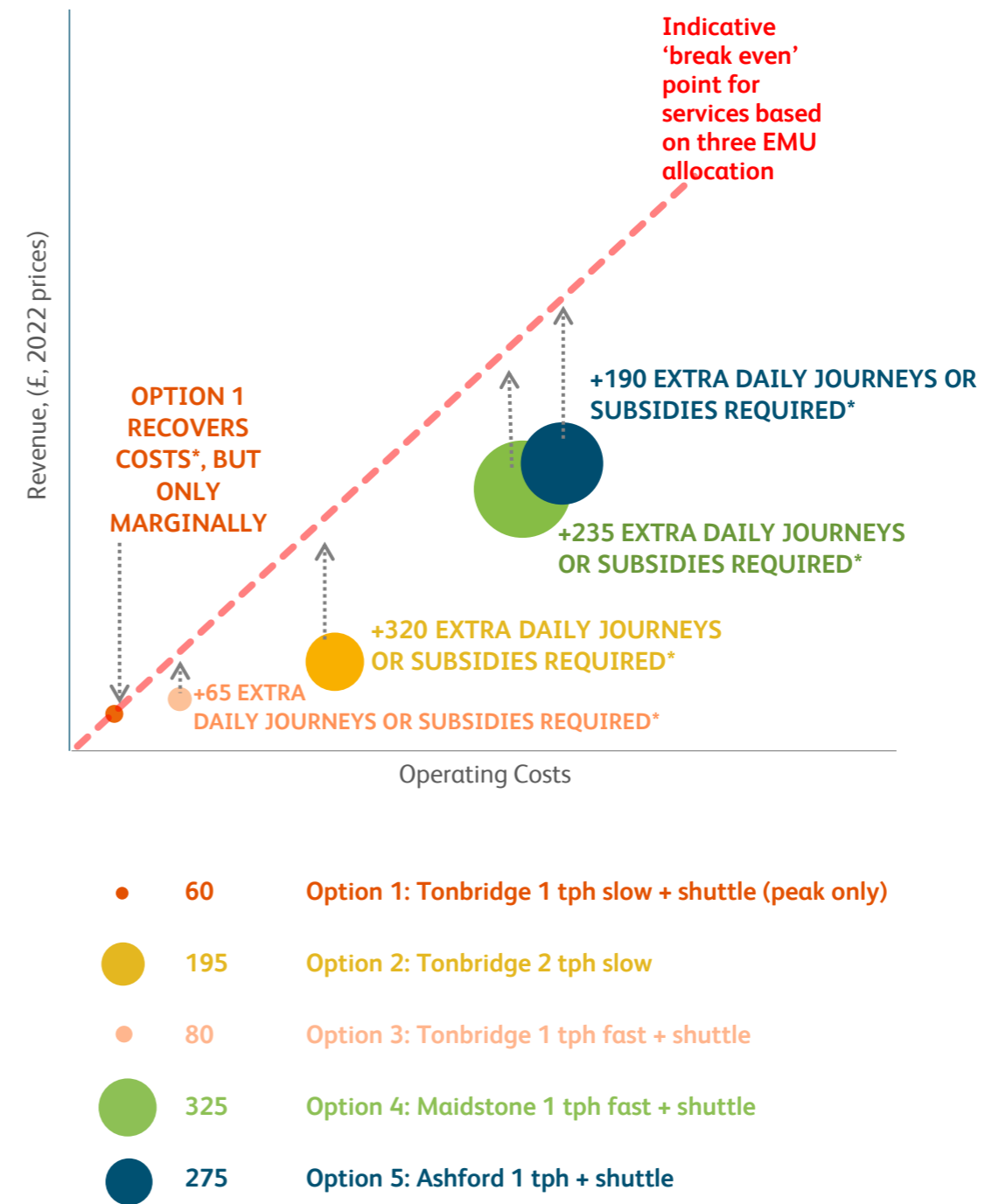


Figure 30: Graph showing modelled revenue and costs for each option (*relative to Dec-2019 baseline). When compared to the new baseline (Dec-2022) the subsidy required increases. Calculated in 2022 prices and using comparator uplift for Maidstone and Ashford. They key takeaways are that:

- The more invested, the greater the return, but services are not revenue generative.
- Only option one breaks even (although only marginally). All others require significant subsidies or major growth in demand well in excess of what was modelled.
- Maidstone catalyses the most estimated demand (but these are mainly short local trips, so it brings in slightly less revenue).
- Wider benefits (such as value of time and mode shift benefits may sweeten the cases, but still leaves a sizable raw cost gap).
- Assumptions around staffing, rolling stock and post-COVID demand may influence of options, but is unlikely to fundamentally change the need for the fact that relatively large subsidies are required to operate the services.

4.3 OPTIONS ASSESSMENT METHOD

4.3.1 Why present the outputs of the modelling as per figure 33 and what are the caveats?

To assess each option, multi-criteria analysis 'radars' were prepared to provide an at-a-glance indication of the relative strengths of each option relative to the others and condense a large amount of relatively complex information (figures 33). Clearly, presenting information in this way is useful at this early stage of the service proposal of option sifting. However, the analysis is preliminary only. It is important also to look at the absolute figures and assess each option on its merits. The ranking system is intended to effectively 'tease out' the differences and relative strengths/weaknesses of each option.

4.3.2 What data feeds the radar scores?

The rankings shown in each radar are derived from the variables shown in table 13. Each option was then ranked according to the quantitative figures derived, which fed the scores each respective option was assigned on the radar.

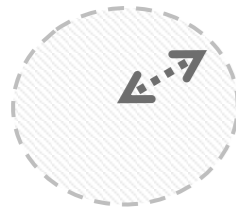
4.3.3 Interpreting the radars



The width of each segment represents the proportional importance of the objectives with respect to the Kent-Gatwick rail case and is the same across all options. The respective weightings for each objective are shown on table 13.



The relative 'depth' of each segment represents the performance of the indicators in each option. In other words, the longer the slice, the better this option performs indicatively across that objective's indicators.



The large grey outer circle is demonstrative of the fact the overall strategic benefits of Kent-Gatwick connectivity options are only moderate in the context of the significantly larger benefits that could be realised from addressing 'bigger-ticket' regional infrastructure items. For instance, upgrading the Brighton Main Line to address capacity and performance issues would enable much larger benefits across the five objectives to be leveraged.

Essentially, introducing direct services between Tonbridge/ Maidstone/ Ashford would absorb capacity on the Brighton Main Line and carry a fraction of the number of passengers as could be served compared to upgrades to the BML. However, BML upgrades are out of scope for this work, and the subject of alternative strategy work. As such, the options are scored within the inner circle, but it is important to put the scheme and its potential benefits in context.

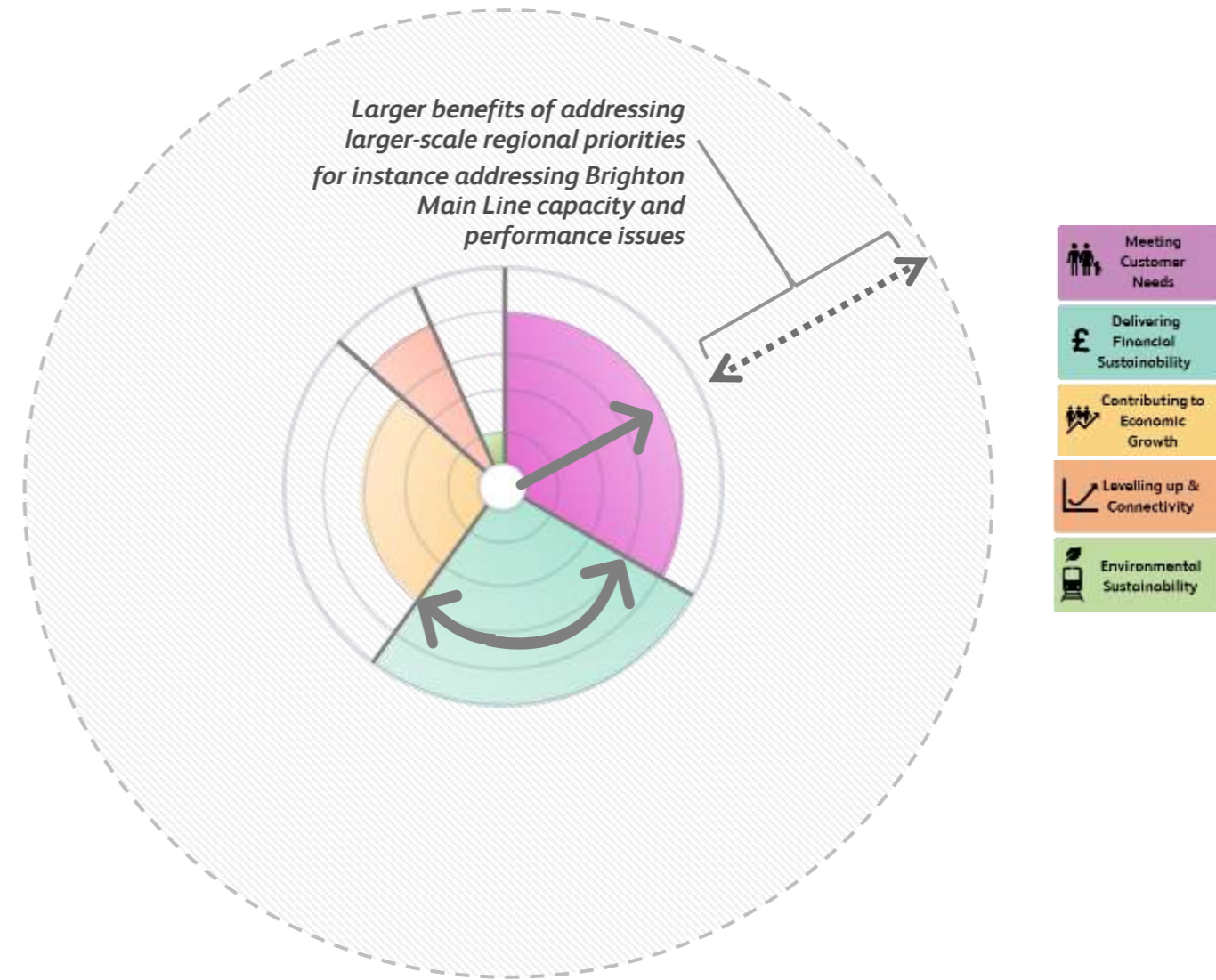


Figure 31: Schematic explaining how to interpret radar diagrams.

Meeting Customer Needs (30 % weighting)	Delivering Financial Sustainability (30 % weighting)	Contributing to Economic Growth (25 % weighting)	Levelling Up & connectivity (7.5 % weighting)	Environmental Sustainability (7.5 % weighting)
Operational Complexity	Ratio of Revenue to Operating Expenditure	Value of time reduction (New User Benefits)	IMD decile for station catchments	Car miles travelled reduction
Total additional demand catalysed	Net revenue position (revenue minus operating costs)	People within working age of 3 km of station		
Rail GJT reduction to Gatwick for destination/origin station				
Daily passenger minutes reduction				

Table 13: Great British Rail Transition Team objectives. These were used to help select appropriate metrics/indicators against each option was ranked.

1

Tonbridge-Gatwick: 1 tph slow + 1tph shuttle (peak only)

The existing Tonbridge-Redhill shuttle is extended to Gatwick Airport (1 tph all day). The service stops all stations between Redhill and Tonbridge but runs fast to Gatwick after a five-minute reversal at Redhill. The five-minute turn around at Redhill is the same across all options.

The Redhill-Tonbridge shuttle operates at 1 tph shuttle in peak times only as it did in the December 2019 Timetable.

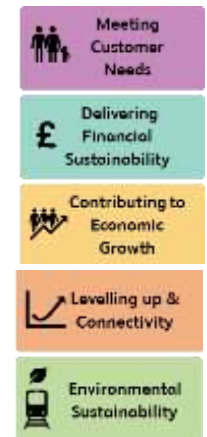
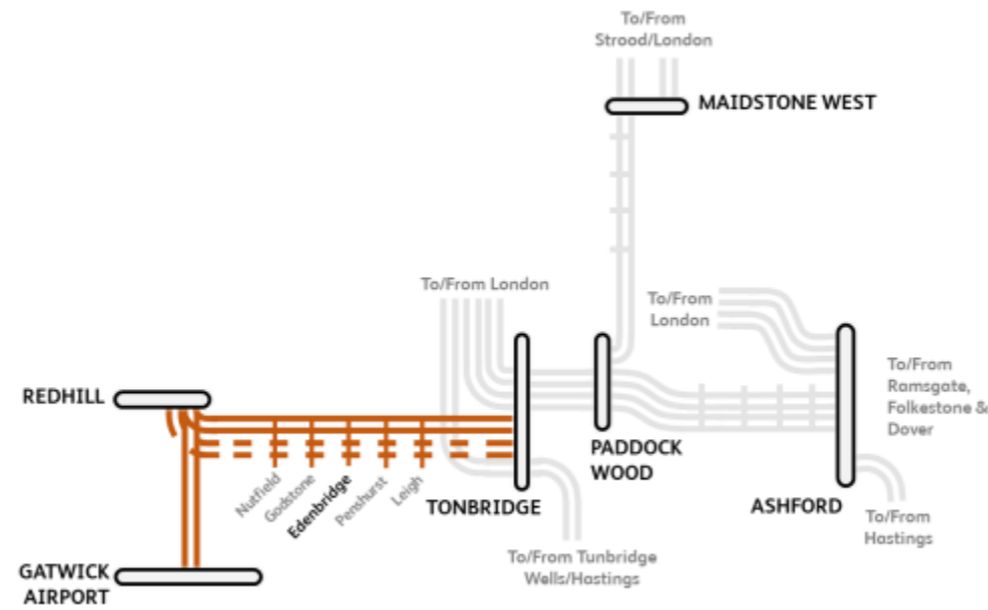
This option was modelled to understand how a relatively modest and tactical proposal would perform in terms of demand and revenue.

Top 5 new/enabled journeys

1. Gatwick – Redhill
2. Gatwick – Tonbridge
3. Gatwick – Canterbury
4. Brighton – Redhill
5. Gatwick Airport – Edenbridge

By revenue:

1. Gatwick Airport – Canterbury
2. Gatwick Airport – Tonbridge
3. Gatwick Airport – Redhill
4. Gatwick Airport – Tunbridge Wells
5. Brighton – Redhill



A 1 tph Tonbridge-Gatwick service is the simplest and likely quickest option to deliver. In raw terms, it drives the lowest overall growth in passenger demand at only approximately 59 journeys per day. Most, but not all are new flows to Gatwick, for instance only 10 daily trips are modelled from Tonbridge, six from Canterbury and two from Edenbridge (refer to table 15). However, this is the only option modelled that could fully recover its costs, relative to the December 2019 timetable. In terms of journey times, the hourly Tonbridge-Gatwick service option also improves the competitiveness of rail to/from Tonbridge, reducing the rail-to-road GJT ratio by 11 % from 1.45 to 1.30.

While this option would not bring as many strategic benefits as higher frequency and more far-reaching (for instance options two, four and five which bring up to five times greater user benefits and ten times the vehicle miles travelled reduction), this option is the necessary ‘building block’ for any future services reaching further into Kent. As such, this option could be used to prove Tonbridge/Kent rail demand before more ambitious and expensive proposals to Ashford or Maidstone West are taken forward (which have much higher operating costs and require subsidies).

Relative to other options, option one is less operationally complex, less expensive to operate and decreases the amount of subsidy required to operate the Tonbridge-Redhill shuttle, while still catalysing (modest) benefits to strategic outcomes. These include connecting more people with jobs/travel opportunities at Gatwick and enabling mode shift to reduce vehicle kilometres travelled.

In summary, this option has:

- Lower operational/performance risk than other options.
- Operationally and financially it is more efficient for shuttle to connect to major source of demand at Gatwick.
- Help deliver against key strategic and stakeholder objectives.
- Deliverable with some timetable flexing, plus strategic benefits, does not require new infrastructure.
- Potential subsidy reduction/revenue generation opportunity;

This service could then be used to demonstrate Tonbridge/Kent rail demand before more ambitious and expensive proposals to Ashford or Maidstone West are considered. For these reasons, it is the suggested proposal to progress when industry finances stabilise and Dec-23 Tonbridge-Redhill timetable has bedded in.

Meeting customer needs	Operational Complexity: absorbs some capacity/paths on Brighton Main Line, likely to require some timetable flexing, particularly during the peaks and service levels increase post-COVID on the BML if/when a full timetable on this corridor resumes.	Medium
	Additional journeys per day (estimated)	59 journeys
	COVID-19 sensitivity (deflation in daily journeys to account for potential slower uptake post pandemic)	55 journeys
		88 mins → 79 mins
	December 2019 timetable vs Modelled Rail GJT (Gatwick-Tonbridge)	
	Passenger minutes reduction (daily)	3.7 k
	Rail:Road GJT ratio reduction (Gatwick-Tonbridge)	11%
	New Rail:Road Journey Time ratio (Gatwick-Tonbridge)	1.2
	Potential for cost recovery	Subsidy required initially. Potential for cost recovery in future due to revenue growth and relatively lower operating costs than options 2-5.
	Residents brought within 3 km of station with a direct Gatwick train.	47,000 people
Levelling Up	IMD decile for station catchment	7.7 27,000 people
	People within working age of 3 km of station	
Environmental Sustainability	Car miles reduced	174 k
	Assumed rail mode share without direct services	18.5%
	New rail mode share with direct services to/from Tonbridge (same as options 2 and 3).	25.0%

2

Tonbridge-Gatwick: 2 tph slow

The existing Tonbridge-Redhill shuttle is removed, with a 2 tph service between Tonbridge-Gatwick all day.

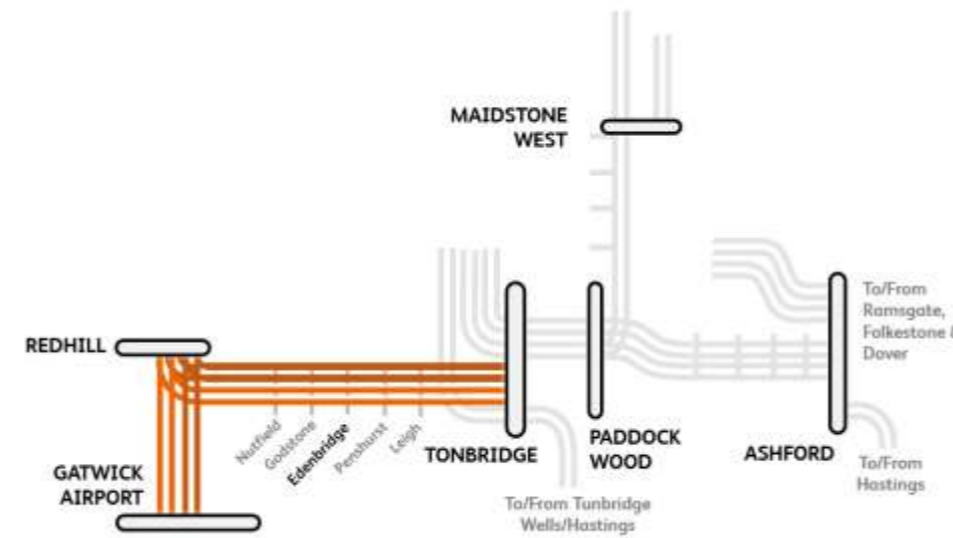
This option was modelled to test the elasticity of demand from Tonbridge would increase substantially or not if more frequent services were provided.

Top 5 new/enabled journeys

1. Gatwick Airport - Redhill
2. Gatwick Airport - Tonbridge
3. Tonbridge - Edenbridge
4. Gatwick Airport - Canterbury
5. Godstone – Redhill

By revenue:

1. Gatwick Airport - Redhill
2. Gatwick Airport - Tonbridge
3. Tonbridge - Edenbridge BR
4. Gatwick Airport - Canterbury BR
5. Godstone - Redhill

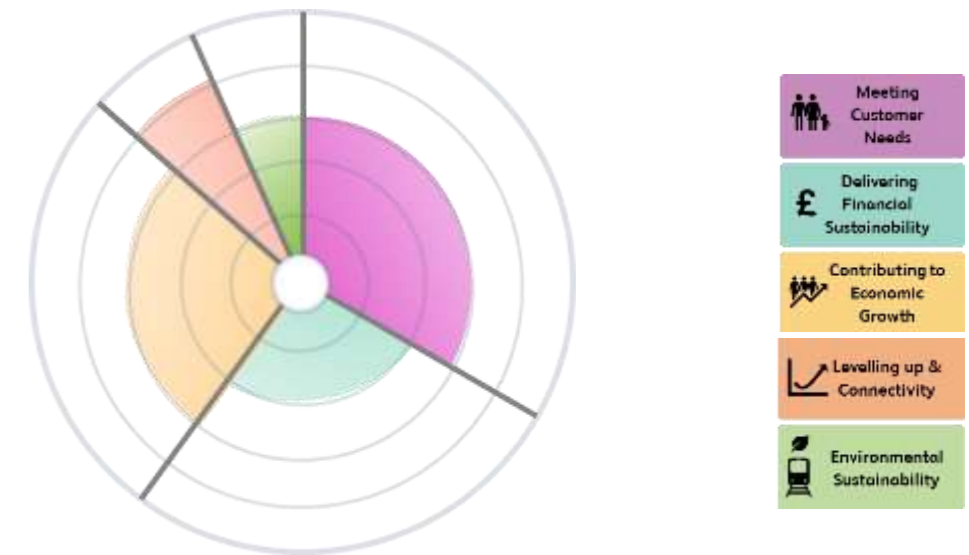


This option adds an extra train between Tonbridge and Gatwick to create a 2 tph frequency. This decreases GJT between Gatwick Tonbridge GJT by around 17 minutes compared to the December 2019 timetable, and is 6 minutes less than option one. Although these generalised travel time reductions are modest, it brings Tonbridge-Gatwick rail GJT to 71 minutes, down from 88 minutes in the December 2019 timetable. Consequently, rail becomes more competitive with car travel (rail-to-road travel time ratio of 1.2 compared to 1.3 in option one or 1.5 in December 2019). The consequence of these travel time reductions is noteworthy – this option catalyses more than three times the demand seen in option one growing demand to around 200 additional daily journeys, an increase of 140 trips. This threefold increase compared to option one is attributable the steep increase in attractiveness/willingness observable in figure 27. When generalised travel times are reduced below 60 minutes, services become much more attractive than when travel times are brought down from 90 minutes (as seen in options four and five) even though the total population brought within a one seat ride of Gatwick (around 47,000 in Tonbridge) is a fraction (around a third) of options 4 and 5 (145,000 and 127,000 for Maidstone and Ashford respectively).

Option two also brings the highest mode shift and connectivity benefits of all options that only serve Tonbridge. However, the higher frequency service requires an extra unit of rolling stock unit. This puts a significant dent in the financial viability of the service, with conservative staffing assumptions which allow for an additional driver and four additional guards for one extra unit (this accounts for staff training needs). However, the better performance of this option against value of time, user benefits and mode shift objectives improve the merit of this option well beyond that of a 1 tph service.

It should be noted that 2 tph Tonbridge-Gatwick service imposes higher additional operational complexity on the busy BML, especially between Redhill and Gatwick. Finding two additional paths per hour in both the peak and off-peak on the BML/at Gatwick station for terminating/starting services would be very challenging, particularly as/when the frequency of BML services increases following the pandemic. Significant flexing in the scheduling of services on BML slow lines, especially in the peaks is likely to be required to enable this option, and the trade-offs of this would need to be considered.

Therefore, a more realistic proposal could be a hybrid option where the service runs as a shuttle in the off-peak to reduce pressure on the BML during the peak. While less attractive from a passenger perspective than a standard two train per hour all day pattern, there would still be ample transfer opportunities at Redhill due to the frequency of BML services cancelling out some of the passenger interchange penalty.



Meeting customer needs	Operational Complexity: Finding two spare paths on the BML each hour in each direction likely to require moderate-major flexing of timetable and make Redhill working challenging, presenting much higher performance risks than option one. Detailed performance and timetable trade-off analysis needed.	High
	Additional journeys per day (estimated)	197 journeys
	COVID-19 sensitivity (deflation in daily journeys to account for potential slower uptake post pandemic)	186 journeys
	December 2019 timetable vs Modelled Rail GJT (Gatwick-Tonbridge)	71 mins (-17 mins reduction)
	Passenger minutes reduction (daily)	11.6 k
Levelling Up	Rail:Road GJT ratio reduction (Gatwick-Tonbridge)	11%
	New Rail:Road Journey Time ratio (Gatwick-Tonbridge)	1.17
	Overall financial sustainability rating	Subsidy likely required indefinitely, potential capital costs have not been included in this assessment.
	Residents brought within 3 km of station with a direct Gatwick train.	47,000 people
	IMD decile for station catchment	7.7
Environmental Sustainability	People within working age of 3 km of station	27,000 people
	Car miles reduced	174 k
	Assumed rail mode share without direct services	18.5%
	New rail mode share with direct services to/from Tonbridge (same as options 2 and 3).	25.0%

3

Tonbridge-Gatwick: 1 tph slow + shuttle (all day)

This option mirrors option one except that the Redhill-Tonbridge shuttle runs all day (not just in the peaks) to provide better connectivity to Leigh, Penshurst, Godstone and Nutfield. This enables a 1 tph service that calls at only Tonbridge-Edenbridge-Redhill-Gatwick to reduce travel times.

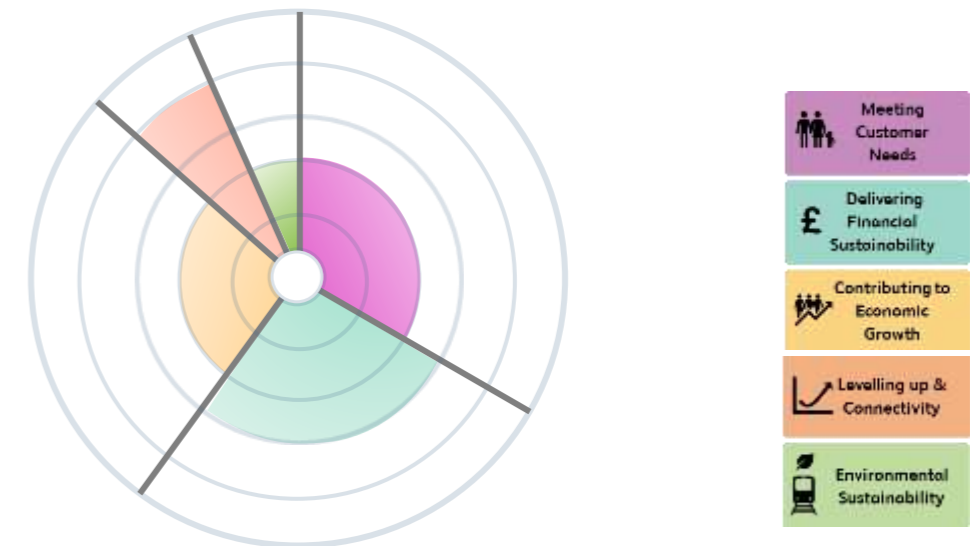
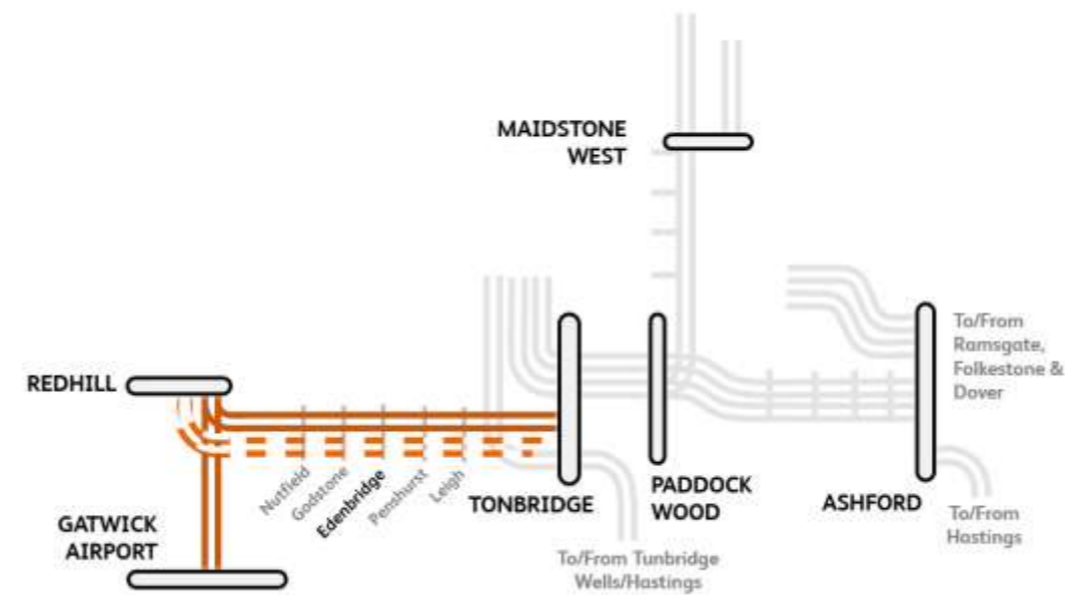
This option was modelled to understand whether removing calls at relatively low patronage stations of Leigh, Penshurst, Godstone and Nutfield made a material difference to travel times, demand and revenue between Tonbridge and Gatwick.

Top 5 new/enabled journeys

1. Tonbridge - Edenbridge BR
2. Gatwick Airport - Redhill
3. Gatwick Airport - Tonbridge
4. Redhill - Tonbridge
5. Redhill - Edenbridge

By revenue:

1. Gatwick Airport - Tonbridge
2. Gatwick Airport - Canterbury
3. Tonbridge - Edenbridge
4. Gatwick Airport - Redhill
5. Redhill - Tonbridge



In essence, this option presents a similar pattern of costs and benefits as option one although only with slightly faster (8 minute) in-vehicle travel times for the hourly Tonbridge-Gatwick direct service owing to the removal of calls at the minor stations. From a cost perspective, the main difference is that the three units allocated to the Redhill-Tonbridge line in the December 2019 scheduled are used all day, rather than just in the peaks. This drives a small amount of additional demand and revenue compared to option one with around 20 additional journeys per day compared to option one. However, this demand/revenue benefit is offset by the additional cost due (mileage, staff costs associated with running the shuttle in the off-peak as well as the peak).

Meanwhile, the all-day shuttle does not catalyse enough demand to cover its additional cost owing to the low number of passengers who use Leigh, Penshurst, Godstone and Nutfield stations.

There are several useful findings to draw from modelling this option:

- Faster journey times from Tonbridge are valuable, but the additional revenue is not large enough to subsidise the relatively high cost of running the shuttle into the off-peak to the smaller stations between Redhill and Tonbridge that enables this fast service.
- In terms of the stations between Tonbridge and Redhill, only Edenbridge generates any material levels of demand to justify a 2 tph calling service. This means calls at other stops should be optional although this would remove peak connectivity at smaller stations/
- Building on this finding, an optimised arrangement could be to run a fast Gatwick train at peak times along with a slow shuttle calling all stations, reverting a slow Tonbridge-Gatwick service in the off-peak. This would make journey times more competitive in the peak when there are more people travelling. In essence, this builds on the strengths of option one (creating a faster Tonbridge-Gatwick connection) but without imposing as many costs as option two (notably additional rolling stock and staff resources).

Meeting customer needs	Operational Complexity: This option is slightly more High complex than option one as it involves four crossing moves at Redhill each hour, presenting performance risks and requiring flexing in the timetable.
	Additional journeys per day (estimated) 82 journeys
	COVID-19 sensitivity (deflation in daily journeys to account for potential slower uptake post pandemic) 76 journeys
	December 2019 timetable vs Modelled Rail GJT (Gatwick-Tonbridge) 72 mins (-16 mins reduction)
	Passenger minutes reduction (daily) 4.8 k
Levelling Up	Rail:Road GJT ratio reduction (Gatwick-Tonbridge) 19%
	New Rail:Road Journey Time ratio (Gatwick-Tonbridge) 1.18
	Overall financial sustainability rating Subsidy required, lower value for money than option 1.
Environmental Sustainability	Residents brought within 3 km of station with a direct Gatwick train. 47,000 people
	IMD decile for station catchment 7.7
	People within working age of 3 km of station 27,000 people
	Car miles reduced 174 k
	Assumed rail mode share without direct services 18.5%
	New rail mode share with direct services to/from Tonbridge (same as options 2 and 3) 25.0%

4

Maidstone West-Paddock Wood-Tonbridge-Gatwick: 1 tph fast + shuttle (all day)

A new service is introduced, running all day Maidstone West-Paddock Wood-Tonbridge-Edenbridge-Redhill-Gatwick.

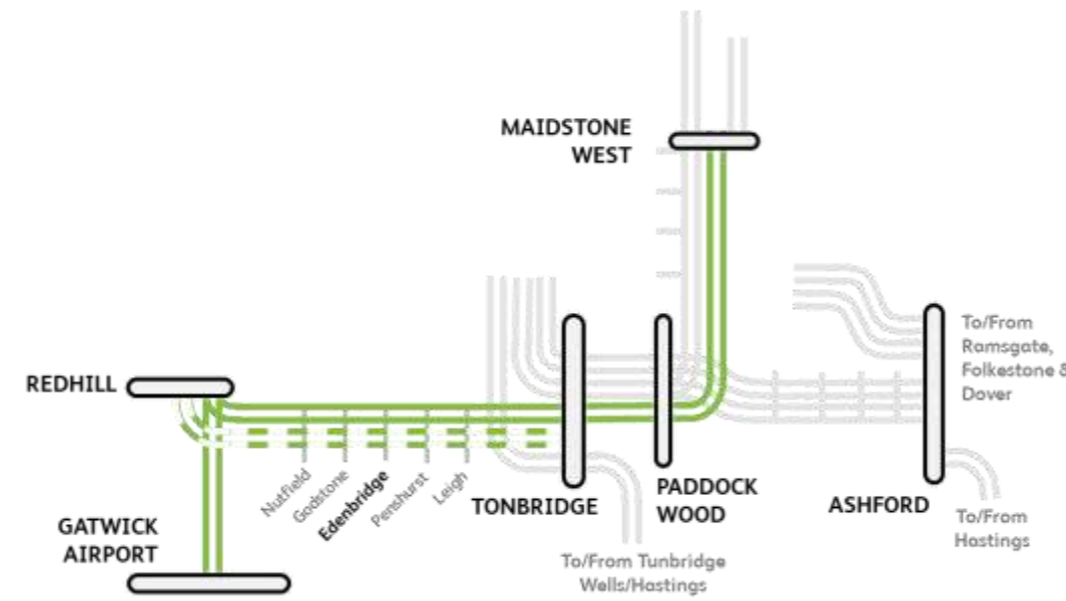
This option was modelled to assess the demand and revenue potential of providing a direct connection to Maidstone – one of Kent’s major population and economic centres which currently has limited rail connectivity to Gatwick. The key question is whether additional costs of running services further (mileage, additional rolling stock, staff) would be offset by demand and revenue uplift and associated strategic benefits.

Top 5 new/enabled journeys

1. Paddock Wood - Maidstone
2. Tonbridge - Edenbridge
3. Tonbridge - Maidstone
4. Paddock Wood - Tonbridge
5. Gatwick Airport – Redhill

By revenue:

1. Gatwick Airport - Maidstone
2. Gatwick Airport - Tonbridge
3. Paddock Wood - Maidstone
4. Tonbridge - Maidstone
5. Gatwick Airport - Canterbury



Base estimate Upper bound – based on mode share of Wokingham’s Gatwick flows

Compared to options one, two and three, both this option and option five (Gatwick-Ashford) leverage significantly more social, economic, and environmental benefits than the previous three options. This is primarily because Maidstone and Ashford are larger population centres than Tonbridge. For instance, compared to the Tonbridge-only options, a direct Maidstone-Gatwick rail link triples the number of people living within 3 km of a station with direct Gatwick services. Both this option (Maidstone) and option five (Ashford) also perform better as a ratio of revenue than options two and three, despite the higher operating expenditure. This indicates that introducing direct Gatwick-Maidstone or Ashford services would provide a better and more useful stitch across the region. Financially, the services only recoup around two-thirds of their additional costs (assuming the demand uptake is equivalent to comparator station of Wokingham) which also is better from a financial sense than options two and three, but still requiring subsidies.

The additional demand figure of 327 daily journeys is the highest of any option and is based on modelling Maidstone’s potential demand uptake to be broadly equivalent to Wokingham. This means uplifting the daily passenger demand modelled in Moira by a further 28% (from 255 to 325 daily journeys). This brings Maidstone’s Gatwick trip mode share to 21%, equivalent to Wokingham (considered to be a fair comparator, refer to Technical Appendix pp. 11-14). However, even when inflating the demand estimate this way to cancel out Moira’s bias against new flows (refer to section 4.3) the service only recovers just over half over the additional cost. This is largely owing to the high leasing costs of the two additional units required to operate the specification.

Although connecting Maidstone with Gatwick brings an order of magnitude more cost, it also grows the strategic benefits which grow roughly in line with these additional costs. For instance, compared to the core option (option one), new user benefits and passenger minutes reduction improve fivefold, with a sixfold reduction in vehicle miles travelled compared to option one. The key message from this is that benefits grow roughly proportionately with costs – the more invested, the greater the benefits.

For this option it is also important to emphasise that most of the journey benefits are on existing flows that are not related to Gatwick. For instance, the Maidstone to Gatwick route generates only around 3.5 k annual trips compared to 6.8 k from Ashford and 5.3k from Canterbury. Additionally, adding more services on the Medway Valley line to Maidstone would require the Medway Valley and Tonbridge-Redhill service groups to merge, bringing operational complexity. Moreover, several level crossings and signalling limitations on the Medway Valley Line also complicate things. Therefore, Ashford may be the preferred option if implementing services beyond Tonbridge (see next page).

Meeting customer needs	Operational Complexity: Both this and option 5 require at least a moderate recast of operating patterns and service groups. In addition to the performance risks outlined in options one-three, serving Maidstone would likely require a major timetable shift, while introducing new Southeastern main line crossing moves at Tonbridge and Paddock Wood would make operations particularly complex.	Very High		
	Additional journeys per day (estimated)	255	327 journeys	
	COVID-19 sensitivity (deflation in daily journeys to account for potential slower uptake post pandemic)	270 journeys		
	December 2019 timetable vs Modelled Rail GJT (Gatwick-Maidstone)	104 mins (-50 mins)		
	Passenger minutes reduction (daily)	16.5 k	18.3 k	
	Rail:Road GJT ratio reduction to Gatwick-Maidstone	35%		
	New Rail:Road Journey Time ratio	1.38		
	Overall financial sustainability rating	Subsidy required, however full socio-economic benefits case not assessed or quantified. Potential demand response for Gatwick trips is lower than option 5 (Ashford).		
	Contributing to Economic Growth	Residents brought within 3 km of station with a direct Gatwick train.	145,000 people	
	Levelling Up	IMD decile for station catchment	7.3	
People within working age of 3 km of station		86,000 people		
Environmental Sustainability	Car miles reduced	685 k	1,076,158	
	Assumed rail mode share without direct services	1.7%		
	New rail mode share with direct services from Maidstone	5%	21%	

5

Ashford-Paddock Wood-Tonbridge-Gatwick:

1 tph fast + shuttle (all day)

A new service is introduced, running all day and fast calling only at Ashford-Paddock Wood-Tonbridge-Edenbridge-Redhill-Gatwick.

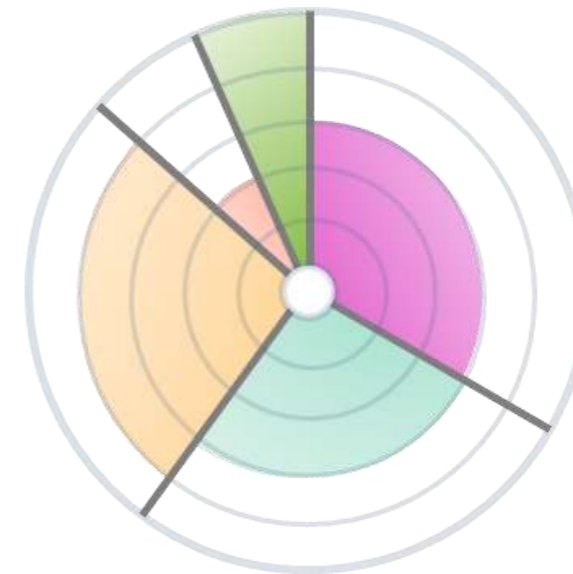
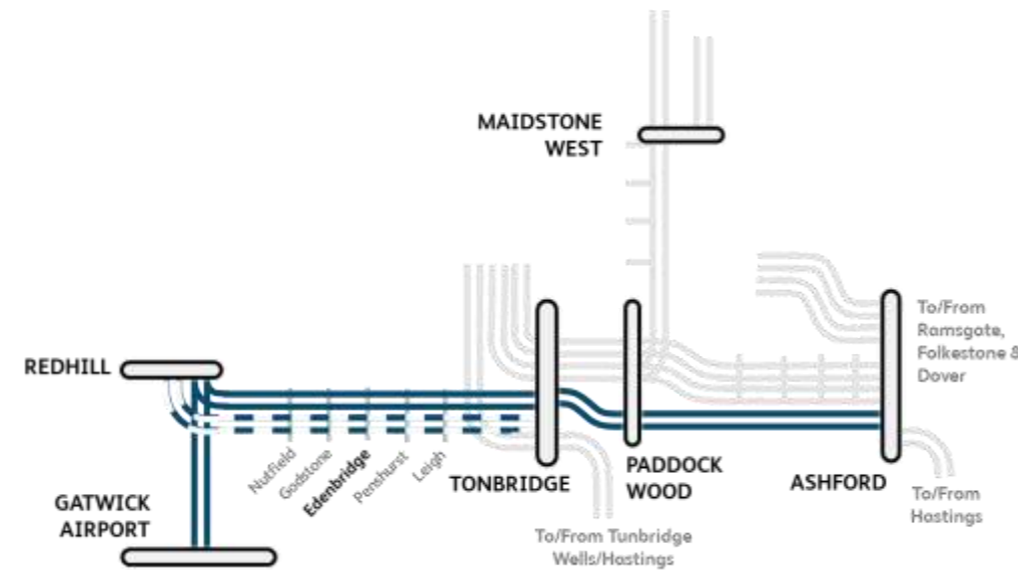
This option was modelled as the alternative 'going further aspiration' to compare Maidstone against. As such, most of the comparative analysis provided assesses this option against the previous one.

Top 5 new/enabled journeys

1. Tonbridge - Edenbridge
2. Paddock Wood - Tonbridge
3. Gatwick Airport - Redhill
4. Ashford International - Gatwick Airport
5. Gatwick Airport - Tonbridge

By revenue:

6. Ashford International - Gatwick Airport
7. Gatwick Airport - Canterbury
8. Gatwick Airport - Tonbridge
9. Tonbridge - Edenbridge
10. Ashford International – Staines



Upper bound – based on mode share of Fareham's Gatwick flows
Base estimate

Overall, of the more ambitious proposals (this and option four), linking Ashford to Gatwick with direct, hourly services is preferable to option four (Maidstone) even despite the slightly lower passenger volumes estimated (275 additional daily journeys compared to 327 for Maidstone). This is for the following reasons:

- Despite Maidstone having a slightly lower GJT than Ashford (104 compared to Ashford's 107 minutes), Ashford has a less attractive road travel time to Gatwick compared to Maidstone (this is owing to Maidstone's proximity to the M25). The rail-to-road GJT ratio of Ashford is a much more competitive 1.10 compared to Maidstone's 1.38, giving Ashford the edge in journey time competitiveness, and catalysing a 10% rail mode share for Gatwick trips compared to Maidstone's 5%.
- While both Maidstone and Ashford require a similar level of subsidy, Ashford's strategic case in mode shift terms is stronger. Ashford has a greater mode shift/vehicle kilometre travel reduction potential, catalysing 7% greater reduction in road miles than the Maidstone option. Having said this, Maidstone would connect 86,000 people to an hourly direct Gatwick service as opposed to only 75,000 for Ashford. However, Ashford may have more growth potential as the market matures since its journey times would be much more competitive with cars compared to Maidstone.
- Ashford is also likely to be slightly less operationally complex than Maidstone (as described on previous page the Medway Valley line is constrained). Ashford services would not need to cross the Southeastern Main Line at Paddock Wood, simplifying the route structure and reducing performance risks.
- According to Moira, Ashford would double the number of direct Gatwick direct trips (around additional 19 daily journeys compared to Maidstone's nine additional journeys (not inflated to comparator estimate).

Given that both Maidstone and Ashford lie outside of most people's reasonable commuting timescales, neither are likely to attract particularly large commuter volumes. However, Ashford attracts flows from other parts of Kent for instance from Canterbury (which emerges as a relatively strong new flow in Moira considering the long journey times, see section 4.4 below). Given the rail network geography in Kent, Ashford also presents more wider connectivity benefits, as the station connects to more rail lines than Maidstone.

Meeting customer needs	Operational Complexity: While potentially less operationally complex than option 4 to Maidstone due to the removed main line crossing at Paddock Wood, more analysis is needed and may require relatively significant changes to base timetable to facilitate as the Ashford station area is a busy part of the network..	High
Additional journeys per day (estimated)	200	275 journeys
COVID-19 sensitivity (deflation in daily journeys to account for potential slower uptake post pandemic)	236 journeys	
December 2019 timetable vs Modelled Rail GJT (Gatwick-Maidstone)	107 mins (- 39 mins)	
Passenger minutes reduction (daily)	15.9 k	17.4 k
Rail:Road GJT ratio reduction to Gatwick-Maidstone	29%	
New Rail:Road Journey Time ratio	1.10	
Overall financial sustainability rating	Subsidy required, however full socio-economic benefits case not assessed or quantified. Potential demand response for Gatwick trips is greater than option 4 (Maidstone).	
Contributing to Economic Growth	People within 3 km of station	127,000 people
Levelling Up	IMD decile for station catchment	6.6
	People within working age of 3 km of station	74,601
Environmental Sustainability	Car miles reduced	895,171 1,413,300
	Assumed rail mode share without direct services	6.1%
	New rail mode share with direct services from Maidstone	10% 29%

4.4 SUMMARY OF PERFORMANCE OF OPTIONS AGAINST THE OBJECTIVES FOR RAIL

As the options analysis above demonstrates, due to the nature of railway economics, the feasibility of new rail services in regional areas that have lower passenger volumes are challenging, particularly from a pure value-for-money perspective. Any prospective Kent-Gatwick rail services present the risk that passengers demand uptake is simply too low for the services to break even. On the other hand, rail provides significant social, economic, and environmental value, which can be more fully accounted for at Business Case stage (for instance through a full Benefit Cost Ratio analysis). To help inform further analysis, a summary of each option’s merits and drawbacks clustered by objective is provided in table 14 below. Future business cases may seek build on and address the themes raised below.

Objective	Overall Comment regarding Kent-Gatwick rail connectivity proposals assessed in this report:	
Meeting Customer Needs & Financial Sustainability	<p><i>Tonbridge services (options one-three)</i></p> <p>Focussing on the core proposal of extending the existing 1 tph Redhill-Tonbridge shuttle service to Gatwick, this option emerges as a good first step. Option one would be better value for money than the existing Redhill-Tonbridge shuttle service, and partially fulfil a strategic passenger need for better east-west connectivity and public transport travel options to Gatwick.</p> <p>However, in the scheme of the rail network across Kent and Sussex, the value for money savings would be minimal. Additionally, looking at the strategic implications of the service more broadly, it would necessarily absorb capacity from higher revenue and demand flows on the Brighton Main Line. The trade-offs of this given the proportionally greater long-term growth potential on the BML needs detailed consideration (see section 5.3).</p>	<p><i>Maidstone/Ashford services (options three and four)</i></p> <p>Although the services would help meet a strategic need and gap in terms of regional rail connectivity in Kent and Sussex, the new passenger demand estimates for the new services are modest. Although there is some potential for Kent-Gatwick rail demand to grow, geographic, economic and operational factors reduce the feasibility of the case for services going to more distant locations (for instance Maidstone/Ashford). This is owing to the decay in passenger willingness to travel with the long journey times proposed in these options and timetable complexity in delivery. Additionally, premising service viability on speculative estimate of future growth brings greater revenue risks.</p> <p>It is unclear whether the operational/performance trade-offs required to make the services happen are proportionate to the benefits for what is ultimately projected to be only a handful of passengers. Therefore, in the scheme of network planning for Kent and Sussex, the strategic planning, Kent to Gatwick services are likely a lower priority in terms of meeting customer needs, but their feasibility could be revisited in future if/when a successful Tonbridge service is operating, and/or by third parties or as Gatwick grows.</p>

Economic growth	As demonstrated in this report, Gatwick plays a critical role in the economic prosperity across Kent, Sussex, Surrey and beyond. Gatwick is a hub of jobs related both directly and indirectly to the Airport and its operations. As such, enabling better rail connectivity between Kent and the Airport has merit. This analysis suggests that the greatest economic benefits would be realised if direct services ran from Maidstone and to a lesser extent Ashford, rather than just Tonbridge. However, this analysis also demonstrates that even with fast services calling only at Paddock Wood, Tonbridge and Redhill, the catalysed journeys from either Maidstone or Ashford are relatively low. This is because the travel times getting to Gatwick are too long to bring about a step-change in demand from either market. Ultimately, although economically speaking direct services between Gatwick and Maidstone/Ashford make sense, in practice and in the wider context of railway economics and operations introducing these services would be difficult.
Levelling up & Sustainability	The relative benefits of the options across the Levelling Up and Sustainability criteria correlate strongly with service mileage and journey times. In short, the faster the service in GJT terms and the more places it connects, the greater the environmental and levelling up benefits. In this sense, Ashford and Maidstone present the strongest case. However, to realise these benefits, services must be operationally and financially feasible, and cannot be justified purely on the basis of environmental or levelling up benefits.

Table 14: Summary of insights by objective.

4.5 SUMMARY OF NEW FLOWS ENABLED

Table 15 below show the results of Moira modelling in terms of journeys between location pairs. In summary, the estimated modelling results indicate a modest but not transformational uptake in Kent-Gatwick rail trips. This may be partially due to the long journey times which make the services less attractive as described above. This is particularly applicable for the commuter market, which brings more annual trips and revenue than the leisure market. If a large Kent-Gatwick commuter market developed, this would help increase uptake and improve the feasibility of services. However, given the GJT variance from 70-110 minutes across the options, the Kent-Gatwick rail commuter market is likely to remain relatively small in the context of the region (particularly compared to London commuter flows). While it is easy to picture the service being popular with some leisure travellers may be relatively insensitive to 60+ minute in-vehicle times, (especially if their competing mode is an expensive taxi or car trip) the service will still be unattractive to commuters, suppressing the trip volumes and revenue required to bolster financial case for the services. People usually have a choice about where to gain employment and it is understandable the service may not be overly popular for commuting due to the long journey times.

Tonbridge 1 tph slow + shuttle (peak only)			Option 2: Tonbridge 2 tph slow			Option 3: Tonbridge 1 tph fast + shuttle		
	Additional journeys	Per day		Additional journeys	Per day		Additional journeys	Per day
Gatwick Airport - Redhill	7,315	20	Gatwick Airport - Redhill	18,435	50	Tonbridge - Edenbridge BR	13,170	36
Gatwick Airport - Tonbridge	3,715	10	Gatwick Airport - Tonbridge	6,840	19	Gatwick Airport - Redhill	7,500	21
Gatwick Airport - Canterbury BR	2,080	6	Tonbridge - Edenbridge BR	6,555	18	Gatwick Airport - Tonbridge	6,555	18
Brighton - Redhill	820	2	Gatwick Airport - Canterbury BR	2,615	7	Redhill - Tonbridge	2,905	8
Gatwick Airport - Edenbridge BR	705	2	Godstone - Redhill	2,555	7	Redhill - Edenbridge BR	2,105	6
Redhill - Three Bridges	700	2	Brighton - Redhill	2,405	7	Tonbridge - Croydon BR	1,825	5
Gatwick Airport - London BR	640	2	Nutfield - Redhill	2,380	7	Gatwick Airport - Canterbury BR	1,795	5
Gatwick Airport - Tunbridge Wells	475	1	Leigh (Kent) - Tonbridge	1,655	5	Edenbridge BR - London BR	1,220	3
Gatwick Airport - Reigate	435	1	Penshurst - Tonbridge	1,615	4	Gatwick Airport - Edenbridge BR	1,065	3
Gatwick Airport - Nutfield	370	1	Redhill - Edenbridge BR	1,420	4	Gatwick Airport - Tunbridge Wells	975	3
Haywards Heath - London BR	335	1	Gatwick Airport - Edenbridge BR	1,365	4	Tunbridge Wells - Edenbridge BR	840	2
Brighton - Godstone	295	1	Redhill - Tonbridge	1,180	3	Brighton - Redhill	775	2
Brighton - Tonbridge	270	1	Redhill - Three Bridges	1,165	3	Croydon BR - Edenbridge BR	650	2
Earlswood (Surrey) - Gatwick Airport	270	1	Gatwick Airport - Reigate	995	3	Redhill - Three Bridges	625	2
Haywards Heath - Redhill	250	1	Godstone - Tonbridge	905	2	Redhill - Tunbridge Wells	570	2
Gatwick Airport - Maidstone BR	250	1	Gatwick Airport - Tunbridge Wells	880	2	Staines - Tonbridge	485	1
Ashford International - Gatwick Airport	240	1	Gatwick Airport - Nutfield	765	2	Gatwick Airport - Reigate	455	1
Godstone - Gatwick Airport	225	1	Nutfield - London BR	690	2	Sevenoaks - Edenbridge BR	360	1
Gatwick Airport - Penshurst	185	1	Haywards Heath - Redhill	670	2	Brighton - Tonbridge	355	1
Gatwick Airport - Leigh (Kent)	185	1	Brighton - Tonbridge	530	1	Crawley - Edenbridge BR	300	1

Option 4: Maidstone 1 tph fast + shuttle			Option 5: Ashford 1 tph + shuttle		
	Additional journeys	Per day		Additional journeys	Per day
Paddock Wood - Maidstone BR	20,220	55	Tonbridge - Edenbridge BR	13,170	36
Tonbridge - Edenbridge BR	13,170	36	Paddock Wood - Tonbridge	8,445	23
Tonbridge - Maidstone BR	11,990	33	Gatwick Airport - Redhill	7,200	20
Paddock Wood - Tonbridge	8,445	23	Ashford International - Gatwick Airport	6,805	19
Gatwick Airport - Redhill	7,200	20	Gatwick Airport - Tonbridge	6,555	18
Gatwick Airport - Tonbridge	6,555	18	Gatwick Airport - Canterbury BR	5,310	15
Gatwick Airport - Maidstone BR	3,540	10	Redhill - Tonbridge	2,905	8
Redhill - Tonbridge	2,905	8	Ashford International - Tonbridge	2,775	8
Tunbridge Wells - Maidstone BR	2,685	7	Ashford International - Paddock Wood	2,440	7
Redhill - Edenbridge BR	2,095	6	Redhill - Edenbridge BR	2,095	6
Tonbridge - Croydon BR	1,825	5	Tonbridge - Croydon BR	1,825	5
Gatwick Airport - Canterbury BR	1,795	5	Ashford International - Redhill	1,590	4
London BR - Maidstone BR	1,570	4	Ashford International - Staines	1,285	4
Redhill - Maidstone BR	1,245	3	Edenbridge BR - London BR	1,220	3
Edenbridge BR - London BR	1,220	3	Ashford International - Brighton	1,170	3
High Brooms - Maidstone BR	1,125	3	Paddock Wood - Tunbridge Wells	1,085	3
Paddock Wood - Tunbridge Wells	1,085	3	Gatwick Airport - Edenbridge BR	1,065	3
Gatwick Airport - Edenbridge BR	1,065	3	Gatwick Airport - Tunbridge Wells	975	3
Marden - Maidstone BR	985	3	Brighton - Canterbury BR	870	2
Gatwick Airport - Tunbridge Wells	975	3	Tunbridge Wells - Edenbridge BR	840	2

Table 15: Breakdown of estimated additional flows by origin pairs catalysed by each option. Gatwick-specific flows are shaded in blue. Note these are estimated model outputs – Maidstone and Ashford flows have not been uplifted as per the method described on Page 56.

It is notable that:

- *The overall daily increase in journeys is relatively low – only a handful of passengers are travelling from Tonbridge or other main centres and Gatwick;*
- *In all options, Redhill sees the greatest estimated growth in trips to Gatwick, but already has a relatively frequent and convenient Gatwick service;*
- *Additionally, the estimated growth in trips to/from Canterbury and Gatwick is higher than any of the intermediate stops between Redhill-Tonbridge;*
- *The services would not just benefit Gatwick flows, but many other flows such as to Brighton, Marden, High Brooms and others.*

Chapter

05

CONCLUSIONS



This chapter provides a summary and synthesis of the report and suggestions for next steps.

Opening with a summary of the core passenger requirements for any successful airport service, the chapter continues with a summary of the role rail could play between Kent and Gatwick.

The chapter closes by suggesting some high-level success criteria upon which any further work on this topic can build.

5.1 ENSURING PASSENGER'S NEEDS ARE MET

5.1.1 Core passenger requirements for success of a prospective airport service

The success of any service is contingent not only on providing competitive journey times as highlighted in this report but meeting as many of passenger's needs as possible. Given the service proposals in this report are focussed on serving Gatwick Airport, it is important to acknowledge the core passenger requirements which will contribute significantly to the success of the service.

These include:

- **Sufficient service span.** Early morning and late evening rail services are critical to serve the early morning/late evening flight departures, arrivals, and shift start/finish times at the Airport. According to Gatwick Airport's Staff Travel Survey, approximately 80 % of employees are shift workers, many of whom have shifts starting in the early hours of the morning. Additionally, for passengers Figures 34 and 35 demonstrate that the peak time for flight departures is just before 6 am, while the peak for arrivals is around 10 pm. This underscores the importance of rail services operating early in the morning.

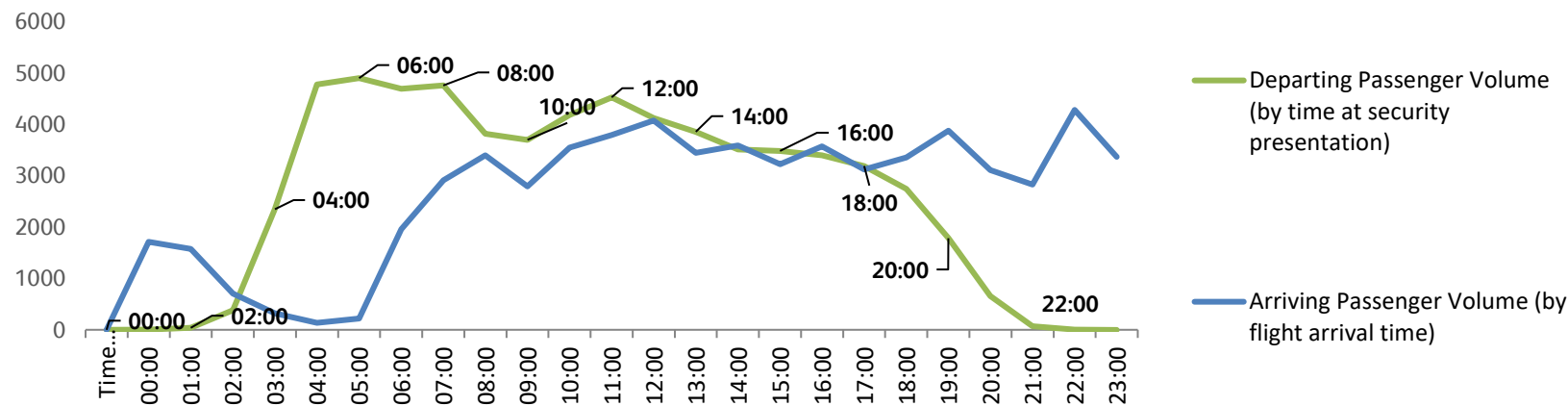


Figure 32: Gatwick security presentation and flight arrival times. Daily airport flows/peaks are not the same as other major hubs for instance central London – there are many early morning and late evening trips/shift times. Source: Gatwick Airport.

- **A reliable service.** People must have trust and confidence that it will get them to their workplace/ flight on time (see figures 35 and 36). The ability to curtail services early at Redhill in the event of a major delay to recover the timetable while allowing passengers to still get to their destination (on ThamesLink or GWR services) mitigates the reliability risk of the proposed Tonbridge-Gatwick service.
- **Fast generalised journey times.** Passengers prefer services that are direct, frequent and fast (without too many calls). This keeps journey times by rail competitive with driving (see figure 35).
- **Competitive pricing and easy to understand ticket pricing.** If passengers do not understand or have trust and confidence in the ticketing system, they will avoid taking the train. In terms of Kent-Gatwick connectivity, the competing options are driving, or taking the train via London. Fares need to be affordable especially for group travel/families for whom taxis may be more price-competitive and convenient (figures 35-37).
- **Good safety, comfort, safety and amenity.** This is particularly applicable for Airport passengers (for instance with luggage).
- **Awareness.** The service must be supported with a promotion/awareness-raising campaign customers to drive patronage.
- **Excellent end-to-end (i.e. first and last mile) journey provision (buses, safe walking/cycling routes).** Given the mixed rural and urban catchments in Kent, improved walkability, cycle access (such as secure facilities) and Park and Ride may help address this issue.

These passenger needs were derived from a review of relevant documents, (refer to figures 35 - 38). Any prospective Kent-Gatwick service must seek to meet these passenger requirements.

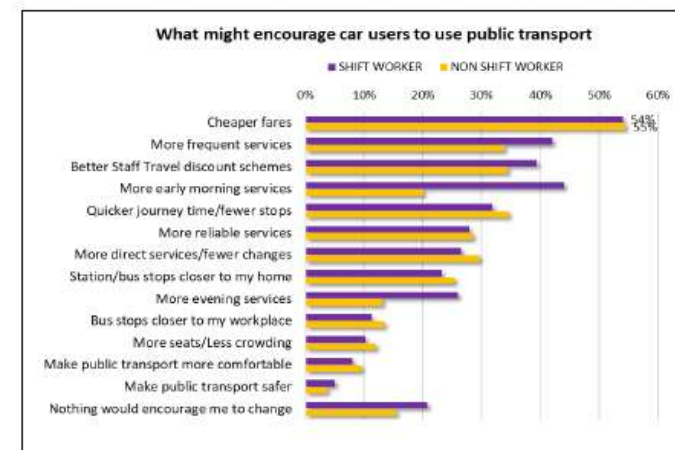
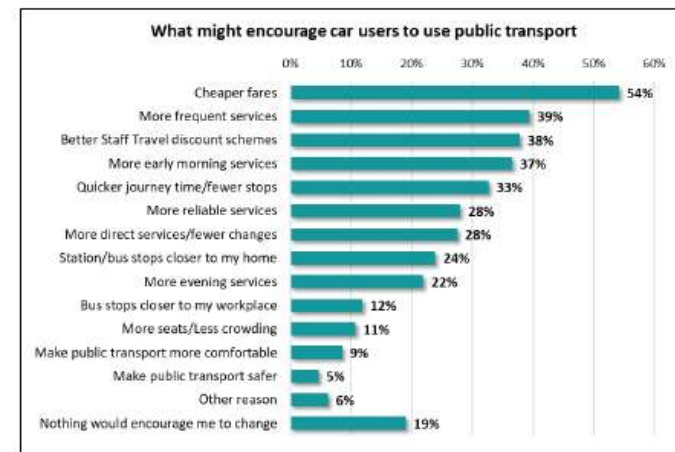


Figure 33: Factors that might encourage public transport use. The importance of lower fares frequent, reliable and early morning/late evening services is notable. Source: Gatwick Travel Survey.

10 most important considerations overall, when travelling to the airport

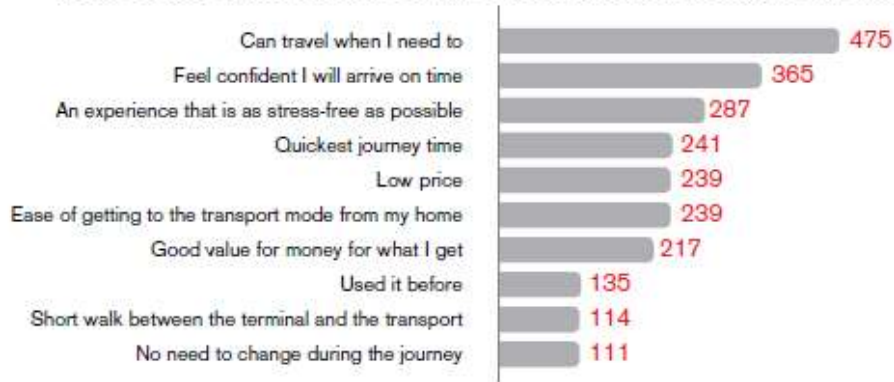


Figure 34: Top ten considerations for airport passengers. Source: Heathrow Airport Coach Survey.

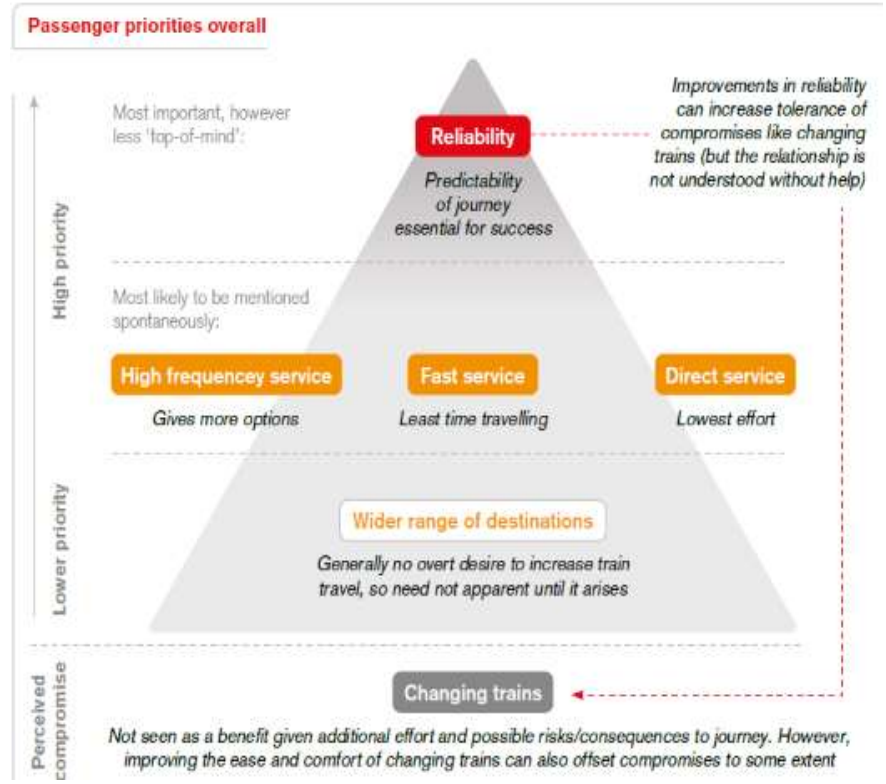


Figure 38: Research by Transport Focus indicates that passenger's top priority is first and foremost for a reliable service. Passengers also value service frequency, speed, and directness, but this varies according to the context.

5.2 OVERALL CONCLUSION

In summary, this analysis concludes that there is a market for travel between Kent and Gatwick but that the current rail offer is not attractive. Therefore, an hourly Tonbridge-Gatwick (or similar) service has a somewhat marginal financial/rail case (based on a three EMU base service operation) but with potential to grow as the market matures and Airport expands. While direct services from Tonbridge only would fall short of catalysing the kind of transformational benefits required to meet the cross-regional mode shift aspirations for Kent from stakeholders such as TfSE, Local Authorities and Gatwick Airport, an hourly Tonbridge-Gatwick (or similar) service still has a sound strategic case considering the wider benefits it would enable. It would also be a more efficient operation in terms of demand/revenue than the December 2019 timetable. More detailed analysis is needed to understand how operational constraints and any performance risks can be mitigated (particularly around Redhill, Gatwick and the BML). Ultimately however, Network Rail Strategic Planning's position is that an hourly Tonbridge-Gatwick service is credible and appropriate to take forward for further work.

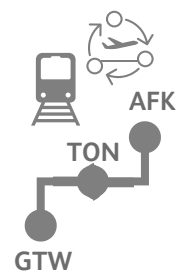
This does not preclude bodies with a wider remit such as TfSE with a wider remit pursuing the opportunities presented in options two to five or similar configurations of these options in future. More ambitious options could link communities economically with the airport, drive new revenue and potentially catalyse greater mode shift and economic benefits than option one. While each option has its relative strengths and drawbacks, no option emerges as a 'silver bullet' that would fully meet all stakeholder ambitions and needs. Table 16 summarises the key conclusions and next steps emerging from this report.

☰ Conclusions

➔ Suggested next steps



There is a modest rail case – a Kent-Gatwick service should cover its costs (relative to the December-19 baseline but not necessarily the December-23 baseline). The service has a good strategic case.



In the longer-term, direct services between Ashford and Gatwick may have a good economic/strategic benefits case but it would still increase subsidy.

1. Propose to review the rail case for Kent-Gatwick service in coming years when industry finances stabilise, the Dec-23 Tonbridge-Redhill timetable has bedded in and the reliability of the North Downs service enhancement can be reviewed.
2. Continue to work with Gatwick Airport Limited to promote sustainable access to/from the Airport and the wider region, exploring opportunities to unlock third party funding (e.g. associated with Northern Runway).
3. Work with Transport for the South East around their longer term aspiration for enhancing Ashford-Gatwick rail connections.

Table 16: Summary of Network Rail Southern Strategic Planning's position on strengths, risks and potential next steps for any prospective Kent-Gatwick services.

5.2.1 Potential next steps and success criteria

Based on the analysis and findings of this report, table 17 below provides a broad framework of goals, non-negotiables, next steps and success criteria to be built upon to progress any prospective Kent-Gatwick services in future.

Goal	Non-negotiable(s)	Next step	Potential success criteria (draft)
Improve the convenience and connectivity of cross-regional rail journeys between Kent, Gatwick and beyond without compromising existing flows, capacity and network performance on the BML.	Protect main line performance and revenue, headroom for BML passenger growth.	Conduct detailed timetable/performance modelling of option one in the latest timetable.	1. Timetable/performance modelling demonstrates that extending the Redhill-Tonbridge shuttle to/from Gatwick in the off-peak/peak does not have material or disproportionate consequences on the scheduling of existing services (for instance North Downs, BML slow lines)
	Prospective Gatwick direct service must meet customer needs and generate revenue in the mid-term.	Work to meeting success criteria. Adjust service pattern as necessary.	1. Gatwick-Tonbridge GJT of below 80 minutes. 2. Early morning and late evening services to meet Gatwick's demand peaks. 3. Affordable fares and other marketing incentives such as promoting Park and Ride/ drop off at Tonbridge, liaising with airlines to encourage people to use the service especially if an early morning service is introduced, providing discounts for staff etc. 4. Update demand estimates following the Planning Inspectorate's decision on Gatwick's Northern Runway Proposal.
Improve efficiency of Tonbridge-Redhill line	New service must be revenue generative compared to 2019 pattern within a few years of introduction (i.e. the additional opex offset by additional revenue)	New service could be third-party funded or funded as part of Annual Business Plan. If the service fails to attract the demand to justify it, the service could be discontinued in future timetables.	5-year funding commitment/subsidy with 6-monthly rolling revenue/opex reviews to monitor uptake/costs.
	Tonbridge-Gatwick services operate without needing to lease additional units.	Conduct detailed operational analysis of diagrams/staffing and tweak service specification to meet success criteria.	Due to the high leasing costs, service pattern can be tweaked to ensure it can be operated with existing rolling stock Redhill-Tonbridge shuttle allocation (unless third party subsidised).
Ensure and promote network safety	Ongoing safety of passengers and other members	Conduct safety assessment of Tonbridge/Redhill stations and level crossings to ensure they are fit for purpose to accommodate any additional interchanges/more frequent trains.	Maintain progress towards meeting Network Rail's existing safety commitments, standards and objectives.

Table 17: A suggested framework outlining the goals, bottom lines, next steps, and indicative success criteria. These can be further tweaked and built upon in further work.

5.2.2 Final word

Ultimately, this document has established that direct Tonbridge-Gatwick services would be strategically valuable, but detailed analysis is needed to confirm their viability. From Network Rail's perspective, the strategic case is clear, but determining the deliverability of services requires assessment of several key factors. It is important to note that Network Rail's support for the reintroduction of direct Kent-Gatwick services is conditional on the following specific matters being assessed and resolved:

- Operational considerations (e.g. timetabling, staffing and rolling stock allocation);
- Costs (particularly for staff which could vary from the figures stated in the report);
- Potential performance/reliability risks, particularly at/around Redhill and Gatwick on the Brighton Main Line.

However, assessment of the above is best completed by operators who have ready access to the information necessary to complete the assessment robustly.

Following this detailed viability assessment, it will be important consider the degree to which a prospective service planned all these considerations would still meets passenger's needs. Presuming a workable service pattern and funding source can be found, this report highlights how connecting Kent and Gatwick by rail once again could enable the industry and region to leverage a range of strategic benefits.

