



# HS1 supports Kent in achieving its net zero objectives

steer

## Introduction

Ever since HS1 Ltd launched its Sustainability Strategy in 2020, identifying how the HS1 line can make the greatest environmental and economic contribution possible to the Kent-region and beyond has been a priority.

This research was commissioned by HS1 Ltd to inform the first-ever Kent Rail 'COP' in March 2022. It explores the possible economic and environmental benefits that could be gained if more people travelled by high-speed rail and the high-speed infrastructure was used to its full potential. It also adds to the case for why Kent-based businesses, politicians, community organisations, academic institutions and green groups should come together to achieve a modal shift to high-speed.

The findings of this report clearly demonstrate the enormous potential of the HS1 line to deliver important environment benefits, including better air quality and reducing greenhouse gas emissions by over 18,500 tonnes CO<sub>2</sub>e from 2025 to 2035 if we can remove an additional two million car trips from the roads of Kent and East Sussex.

This is an important moment to talk more about the actions we could take to get more people to choose a greener way to travel in the Kent region.

## Around 90% of trips in Kent were made by car before COVID-19

Kent has a well-connected transport network. There is a mature motorway and trunk road network, well connected to the M25, the UK's only high-speed line and the existing commuter rail network. This connects significant existing urban areas, locations for future housing and employment growth, and centres of high-value economic activity in London and the South East. Further the transport infrastructure in Kent is the primary gateway to mainland Europe.

Kent's reliance on cars is an important contributor to carbon emissions and local air quality problems in Kent. Around 90% of trips were made by car before COVID-19 across local authorities in Kent, and greenhouse gas emissions from road transport (as a share of total emissions) increased in all local authorities in the 2015-2019 period. In addition, in the three years before 2019, average speed on the Strategic Road Network reduced by 2.5% across Kent<sup>1</sup>, resulting in slower journeys and congestion, reduced efficiency and increased emissions.

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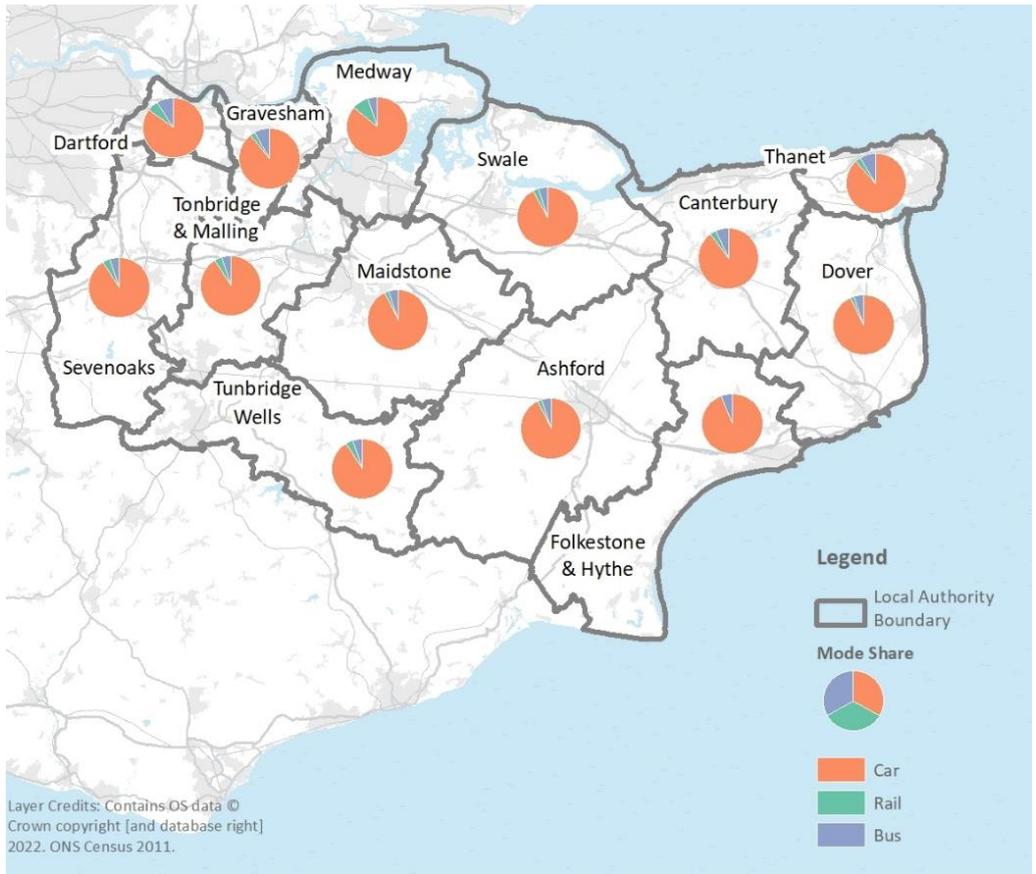
“ Around 90% of trips were made by car before COVID-19 in Kent. ”

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<sup>1</sup> Steer analysis of Department for Transport Strategic Road Network average speed data

**Figure 1: Car dominates trips in Kent – Modal shares by Local Authority in Kent before COVID-19**

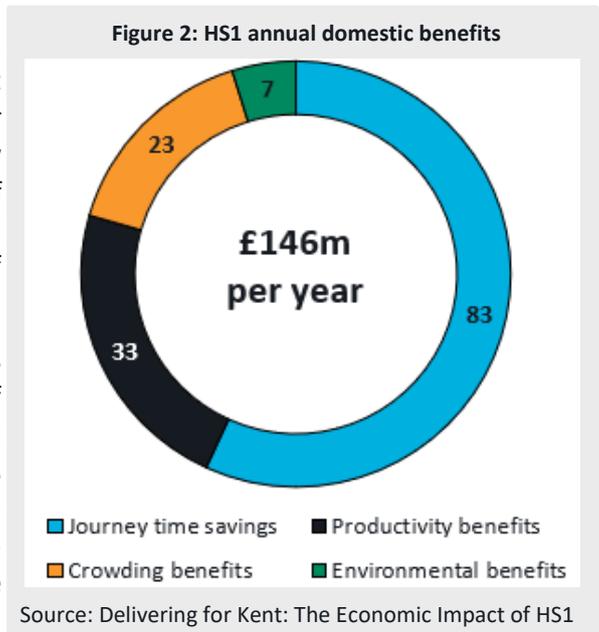


Source: Analysis by Steer based on Kent Bus Service Improvement Plan (BSIP), 2021

## Highspeed services in Kent have delivered large economic and environmental benefits

Since the introduction of domestic highspeed services, HS1 has delivered significant environmental benefits as a result of people choosing to take the train instead of driving or flying. This modal shift to more environmentally friendly domestic rail journeys generates around £7m of environmental benefits each year. In terms of international travel, emissions saved by HS1 equal to 750,000 tonnes of carbon dioxide, or 60,000 short-haul flights, annually.

On top of the environmental benefits, HS1 generates significant benefits to the domestic economy in the form of faster journey times, reduced crowding, and improved reliability. Each year trips made on HS1 services by business users, commuters, and leisure passengers lead to £139m in direct socioeconomic benefits; these benefits deliver the equivalent economic outputs of an additional 2,050 full-time employees.



“ Highspeed 1 domestic trips generate £7m of environmental benefits per year. ”

## The COVID-19 pandemic disproportionately affected rail trips

The public health policy response to COVID-19 has had an unprecedented impact on the direct demand for rail travel, in terms of both advice restricting and deterring travel by rail, the need to travel (for instance to work) and the downturn in economic activity which rail services support.

In response to the restrictive travel advice and widespread homeworking and hybrid working mandates, demand for rail dropped significantly over the course of 2020 and 2021 and not yet recovered to its pre-COVID levels in 2022. This is driven by the characteristics of rail users, where remote working can be more prominent than for users of other modes.

In terms of transport demand in Kent, analysis of Department for Transport (DfT) road traffic data and station usage data from the Office of Road and Rail (ORR) shows that rail demand reduced, on average, by around half, compared with around 30% reduction in personal car use. This illustrates that the pandemic disproportionately affected rail trips, and it is estimated that during the first quarter of 2022, demand on Southeastern highspeed services was 65% of the average weekly pre-COVID demand<sup>2</sup>.

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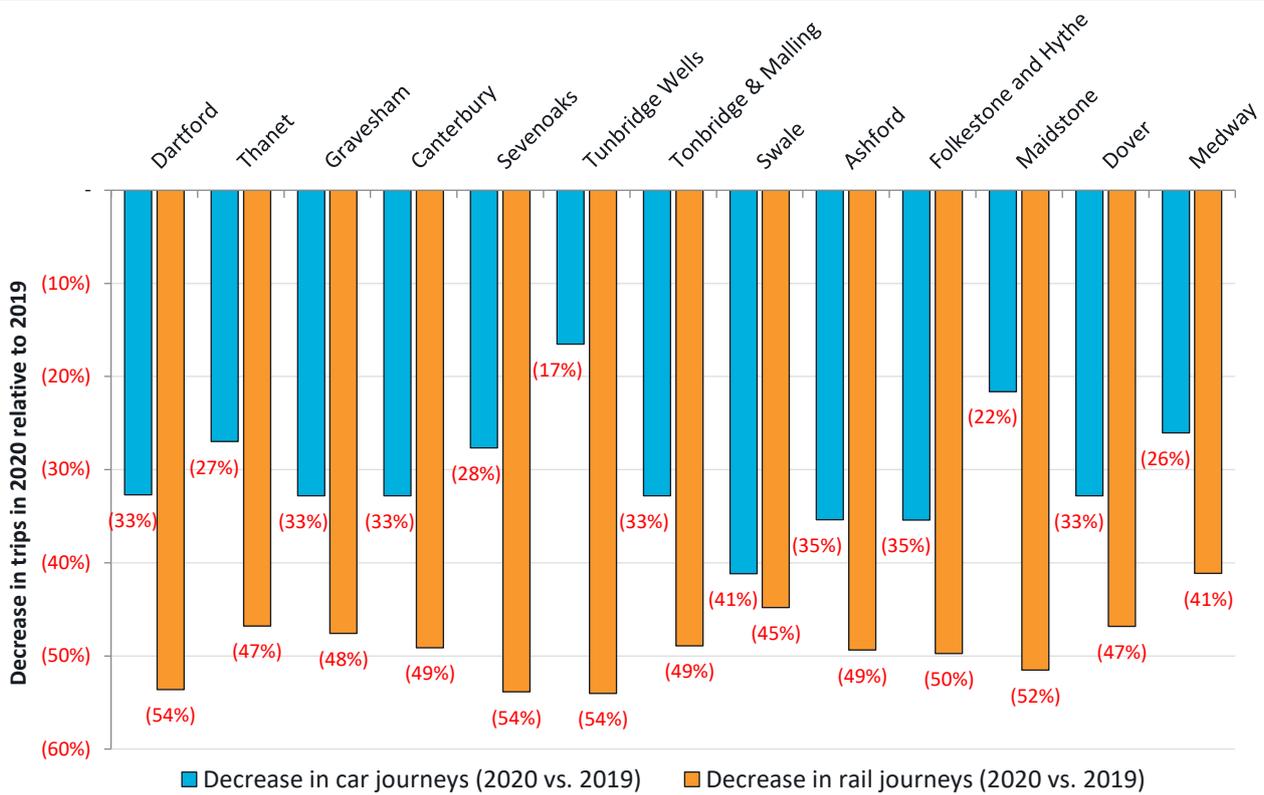
“ Rail trips reduced by 50% in 2020, compared to a 30% decrease in car trips. Southeastern rail demand in Q1 2022 is only 65% of pre-COVID levels. ”

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<sup>2</sup> Based on Southeastern's records of weekly demand on their services.

Figure 3: COVID-19 severely affected rail trips – Decrease in journeys for rail and car by Kent Local Authority (2019 vs. 2020)



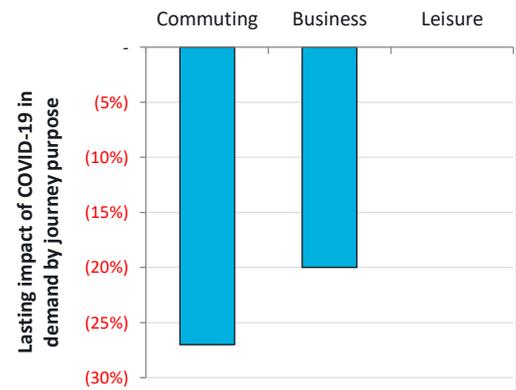
Sources: Department for Transport, Office for Rail and Road

### Lasting changes in travel behaviour have been originated by COVID-19

Currently, demand on Southeastern highspeed domestic services is around 65% of pre-COVID levels, though the return of passengers varies depending on the purpose of their journey. This is driven by multiple factors, including a gradual, and part time, return to work at the office, and possible quicker journeys by car given the general reduction in car traffic during the pandemic. Further, to reflect lower passenger demand and reduce financial support for rail, the frequency of rail services has been reduced.

Survey analysis and demand modelling from the DfT suggest that rail demand will not fully recover to its pre-COVID levels and that recovery will vary by journey purpose and market segment. This includes a full recovery of leisure trips but a 20% to 25% reduction in commuter and business trips. Therefore, rail demand is anticipated to experience a lasting impact driven by changes during the COVID-19 pandemic.

Figure 4: Lasting impact of COVID-19 on rail demand



Source: DfT Surveys to inform forecasting framework

“ While leisure trips are anticipated to fully recover, a lasting impact on business and commuting trips is expected, reducing pre-COVID demand by 20% to 25%. ”

## In this context, Kent is at a crossroads to address climate change and meet their net zero targets

Kent County Council announced the climate emergency in May 2019 and has committed to implementing a climate action plan that will reduce greenhouse gas emissions from the whole county to net zero by 2050. Decarbonisation is at the forefront of Kent County Council's decision-making, considering that the impacts of climate change are likely to be felt acutely in Kent with its long, strategically important coastline.

Of all carbon dioxide emissions, 44% can be attributed to road transport<sup>3</sup> with pollutants also having a negative impact on air quality, human health and the natural environment. Although air quality is generally improving in line with national trends, there are still 43 Air Quality Management Areas across Kent and Medway and significant pockets of poor air quality along the county's major road networks<sup>4</sup>.

Figure 5: Local Authorities with a declared Air Quality Management Area in Kent (highlighted in blue)



Source: Department for Environment, Food and Rural Affairs (DEFRA)

Without addressing the source of harmful emissions and mitigating the impacts of climate change, Kent's transport network faces the risk of disruption and reduced performance and resilience<sup>5</sup>. Pre-COVID, HS1 reduced net emissions equivalent to removing 6,000 cars from the roads every year<sup>6</sup>, and increasing the use of the line could help deliver additional environmental benefits both locally and internationally, in the form of lower greenhouse gas emissions and noise pollution, and better air quality.

<sup>3</sup> Kent County Council (2020): Kent State of the Environment Report: Travel and Transport Update

<sup>4</sup> Kent County Council (2020): Kent and Medway Energy and Low Emissions Strategy

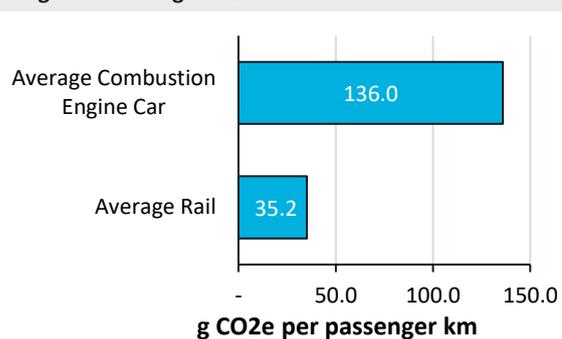
<sup>5</sup> JBA Consulting (2020): Climate Change Risk and Impact Assessment for Kent and Medway

<sup>6</sup> Steer (2019): Delivering for Kent: The Economic Impact of HS1

## HS1 can support Kent in achieving these environmental objectives

According to modelling from the DfT and ORR, the average car passenger emits over three times as much carbon dioxide as the average rail passenger over comparable journeys, before accounting for the source of energy for traction<sup>7</sup>. Considering that HS1 is the first railway to run entirely on renewable electricity and that it aims to become fully carbon neutral by 2030<sup>8</sup>, increasing demand on the line would provide additional environmental benefits in addition to those already generated and would be a viable alternative to other transport modes.

Figure 6: Average CO2e emissions car vs. rail



Source: DfT and ORR

To estimate the additional environmental benefits arising from higher demand shifting onto HS1 domestic services, two scenarios are considered:

- **Scenario 1:** No change in highspeed domestic service provision, i.e. Southeastern highspeed domestic services remain at reduced COVID-19 levels; and
- **Scenario 2:** Increase in the number of highspeed domestic services beyond its 2019 levels, i.e. Highspeed 1 infrastructure is used to its full potential.

### Scenario 1: Southeastern highspeed domestic services remain at reduced COVID-19 levels

This assumes that highspeed domestic services continue to operate at the COVID-19 levels, because it lacks the necessary financial support to return to pre-COVID services. In this case, demand will be constrained by both the attractiveness of the services and by passenger crowding, which could lead to previous highspeed demand switching to less convenient non-highspeed rail services, switching to private cars or stopping travel altogether. A possible outcome is that the levels of demand remain at around 65% of pre-COVID levels instead of reaching the anticipated steady state described above.

Based on evidence from the 2013 First Interim Evaluation of the Impacts of HS1, 11% of previous car demand switched to highspeed rail services<sup>9</sup>. A reduced level of service could lead to some existing highspeed rail demand switching back to cars. Assuming that highspeed demand remains at 65% of pre-COVID levels, 11% of the difference between this and the anticipated levels of recovery would switch back to cars. This would result in around 325,000 additional car trips per year with negative impacts including:

- additional road congestion costing the economy around £27m over the 10-year period between 2025 and 2035; and
- environmental impacts linked to poorer air quality and greenhouse gas emissions around £10m over the same period<sup>10</sup>.

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“ Highspeed rail demand not recovering beyond Q1 2022 levels could lead to 325,000 additional car trips per year, with a negative congestion impact of £27m and environmental impact of £10m between 2025 and 2035. ”

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<sup>7</sup> Steer analysis of Department for Transport and Office for Road and Rail emissions data

<sup>8</sup> HS1: Delivering the green gateway, Our 2020/21 ESG Report

<sup>9</sup> First Interim Evaluation of the Impacts of HS1, Table 2.6

<sup>10</sup> Benefits are expressed in 2010 prices in accordance with Green Book and TAG guidance

These impacts would be coupled with the negative socioeconomic impacts of those passengers who would stop travelling (10% of the difference in demand between this scenario and the anticipated level of recovery, according to HS1’s first evaluation) and the disbenefits of rail passengers choosing a less convenient rail option (77% of the difference in demand, according to HS1’s first evaluation, provided that alternative rail options have sufficient capacity).

**Do Something: Highspeed 1 infrastructure is used to its full potential**

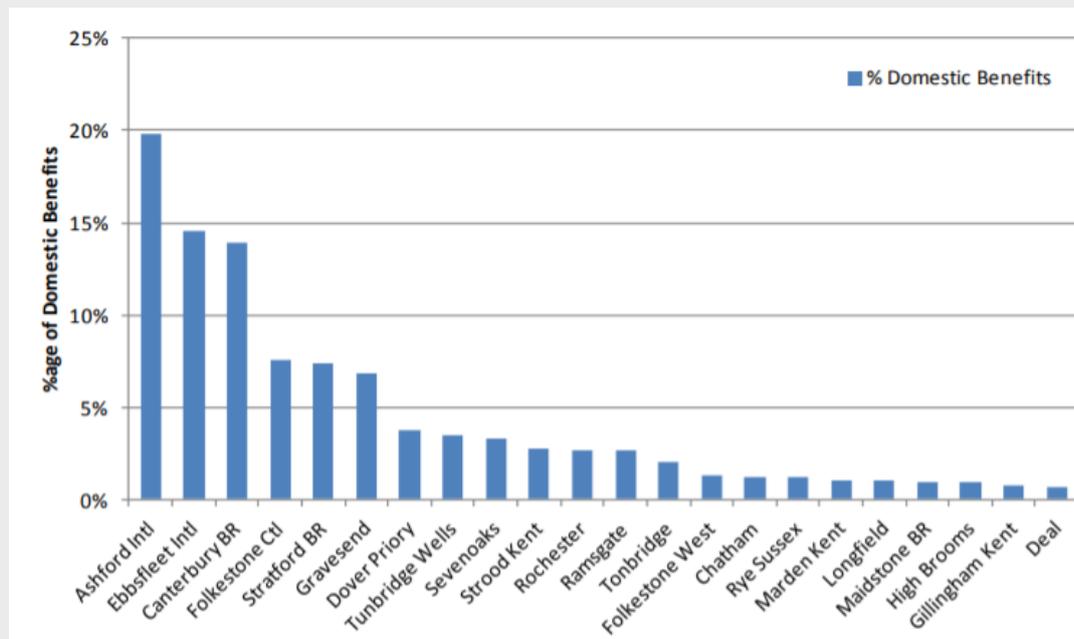
Even before COVID-19, Highspeed 1 was not operating to its full potential, with spare capacity available to run additional services (the infrastructure has capacity for up to twelve trains per hour, with four trains per hour being operated during the off-peak and eight trains during the peaks). Enhanced rail services present an opportunity to abstract car trips which are more damaging to the environment, and therefore support Kent in meeting their net zero targets.

Enhanced domestic services on HS1<sup>11</sup> could attract a total of 2.0 million car trips per year, leading to a decongestion benefit of around £124m, an environmental benefit thanks to better air quality and reduced greenhouse gas emissions of around £47m, and a reduction of 18,600 tonnes in CO2e (carbon dioxide equivalent), for the period between 2025 and 2035.

“ Utilising Highspeed 1’s spare capacity in delivering additional rail services could remove up to 2 million car trips per year, with a decongestion benefit of £124m, environmental impact of £47m, and CO2e saving of 18,600 tonnes between 2025 and 2035.”

The interim evaluation of HS1 showed that the largest proportion of its benefits came from Ashford, Ebbsfleet and Canterbury (between 45% and 50% of all benefits), followed by Folkstone, Stratford and Gravesend (together with the previous three stations amounting to two thirds of total benefits). This means that any changes in the level of domestic highspeed services would affect more pronouncedly these locations within Kent, either negatively under the first scenario or positively under the second one.

Figure 7: Distribution of benefits from HS1 by non-London station in Kent



Source: First Interim Evaluation of Highspeed 1

<sup>11</sup> The estimate assumes additional services to Ramsgate, Medway, Dover and Maidstone, but this is not intended as an exhaustive list of potential services, rather as an indication of the potential benefits for a selection of them.