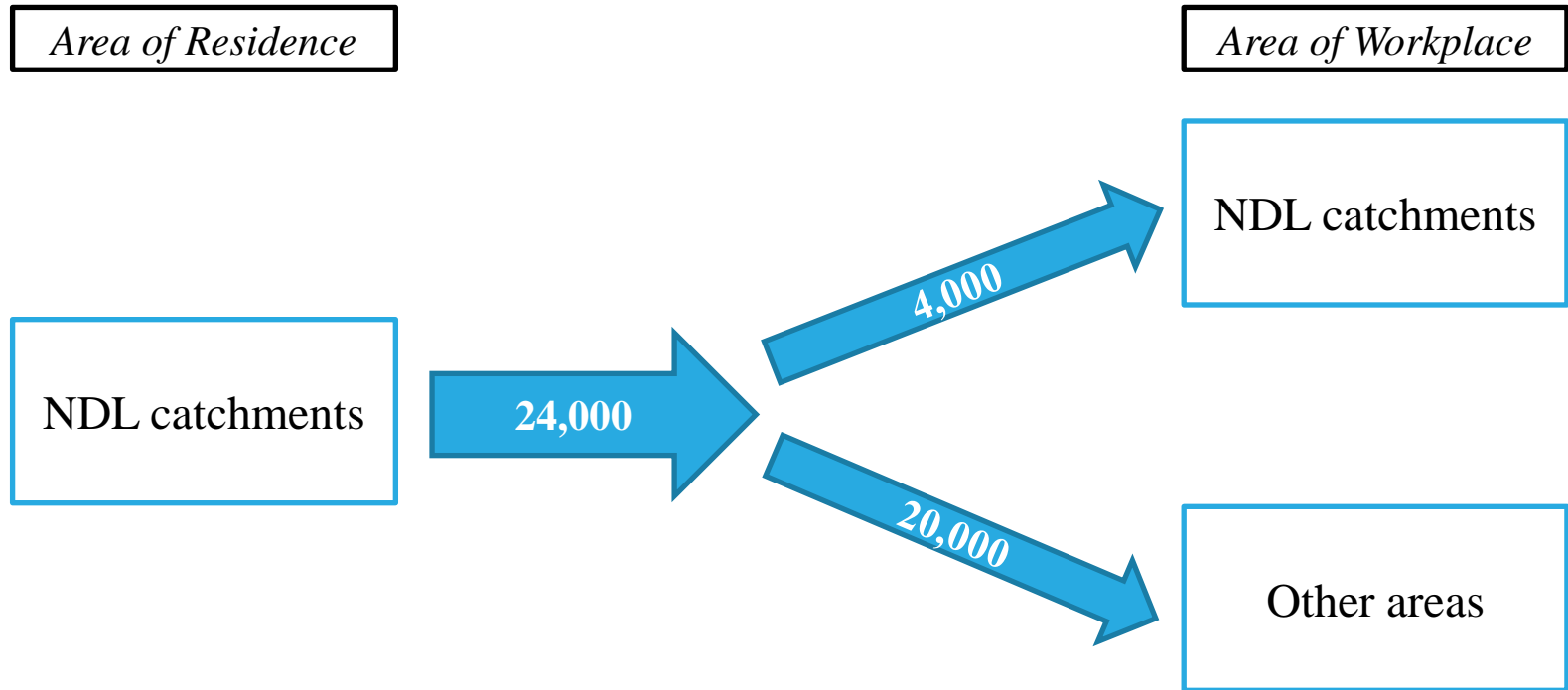


# Outward Commuting by Rail

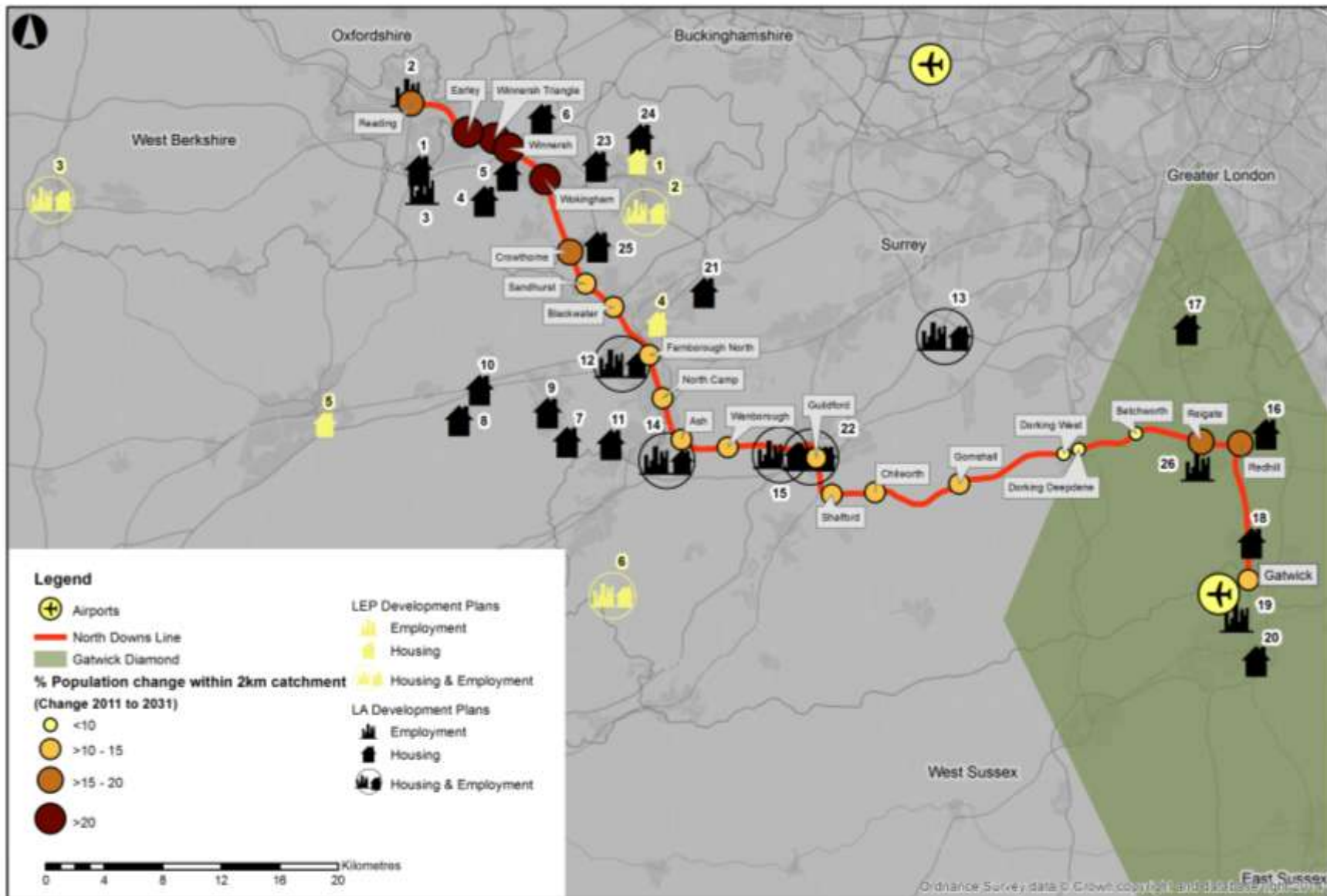


Rail based commuting flows by destination	Rest of Surrey, Berkshire, Hampshire & Reading				
	NDL Station Catchment Areas	Central London	Outer London	Rest of UK	
<b>Residents of North Downs Line Station Catchment Areas</b>	<b>18%</b>	<b>53%</b>	<b>6%</b>	<b>7%</b>	

Source: Census 2011 journey to work data

# Major Projects and Developments


Source: Arup review of Local Development Plans and LEP Strategies




# Local Authority Development Plans

LA Development Plans

 Employment

 Housing


 Housing & Employment

No. on Map	Location	Details of Development
1	South Reading, Reading BC	Three strategic sites have been identified in South Reading to deliver mixed use developments with between 925 and 1,575 dwellings.
2	Central Reading, Reading BC	The Reading Central Area Action Plan sets out Central Reading as a significant opportunity area. A regional centre to be promoted and maintained as a top class location for business, leisure, culture and learning.
3	Shinfield Science Park, Wokingham BC	A Science and Innovation Park with approx. 55,000m <sup>2</sup> of floor space to be developed by 2026.
4	Arborfield Garrison, Wokingham BC	A mixed use development to include around 3,500 dwellings, and employment and retail space.
5	South of the M4, Wokingham BC	A mixed use development to include around 2,500 dwellings, and employment and retail space.
6	North and South Wokingham, Wokingham BC	North: A mixed use development to include around 1,500 dwellings, and employment and retail space. South: A mixed use development to include around 2,500 dwellings, and employment and retail space.
7	Queen Elizabeth II Barracks area, Church Crookham, Hart DC	Planning permission granted for 872 dwellings. These are in construction with a delivery date of March 2015. A further 100 homes may be developed on site in the future.
8	Hook, Hart DC	Approx. 550 dwellings planned primarily at North East Hook strategic location.
9	Fleet and Church Crookham, Hart DC	1,040 dwellings planned including approx. 700 at West Fleet Strategic allocation and 100 at the town centre strategic location.


Source: Arup review of Local Authority Development Plans (adopted and emerging)

# Local Authority Development Plans

LA Development Plans

 Employment

 Housing


 Housing & Employment

No. on Map	Location	Details of Development
10	Winchfield, Hart DC	Early development of potential plans for 4,000 to 5,000 new dwellings.
11	Aldershot Urban Extension, Rushmoor BC	A mix used development to include approx. 4,250 dwellings, and employment and retail space. Dwellings planned to be delivered by 2027.
12	Farnborough, Rushmoor BC	Potential for approximately 900 dwellings and 140,000 sqm of employment floor space. Major employment growth to take place at IQ Farnborough, and on the Aerospace Centre.
13	Former Wisley Airfield, Guildford BC	Potential development for up to 2,100 dwellings and employment and 1,000 sqm of retail floor space.
14	Ash and Tongham urban area, Guildford BC	Potential development for up to 1,215 dwellings and up to 95,500 sqm of employment space and 3,000 sqm of retail space.
15	Urban extensions to Guildford, Guildford BC	Potential development for up to 5,015 dwellings and 43,000 sqm of employment space and 2,000 sqm of retail space.
16	Redhill/ Reigate area (including urban extensions), Reigate and Banstead BC	At least 1610 dwellings are planned for the Redhill/Reigate area, with up to 1,000 to 1,400 dwellings through urban extensions. An additional 815 dwellings planned to be delivered through windfall and other urban extension.
17	Preston regeneration area and Banstead village centre, Reigate and Banstead BC	Approx. 930 dwellings planned between 2012-2027, including 340 in the regeneration area and 180 in the village centre. Limited employment provision.
18	Two new Horley neighbourhoods and Horley town centre in the Low Weald area, Reigate and Banstead BC	Horley will provide for at least 2,440 new dwellings in the urban area between 2012 and 2027. The majority of this development will be in the two planned new neighbourhoods to the north east and north west of the town.


Source: Arup review of Local Authority Development Plans (adopted and emerging)

# Local Authority Development Plans

LA Development Plans

 Employment

 Housing

 Housing & Employment

No. on Map	Location	Details of Development
19	Manor Royal, Crawley BC	240 hectares site. A Masterplan for the Manor Royal Business District has been adopted setting the future vision of the area as the South East's leading mixed activity employment hub, providing modern business accommodation, a range of supporting amenities and achieving environmental excellence to drive the growth of Crawley and the Gatwick Economy."
20	North East Sector, Pound Hill, Crawley BC	Planned development for up to 1,900 dwellings by 2024.
21	Princess Royal Barracks, Deepcut, Surrey Heath BC	Outline planning permission granted for 1,200 dwellings.
22	Guildford Town Centre and Guildford Urban Area (excluding Town Centre, including Slyfield), Guildford BC	Guildford Town Centre has potential for 1,932 dwellings, 16,500 sqm of employment space and 50,000 sqm of retail space. Guildford urban area (excluding Town Centre, including Slyfield) has potential for 2,285 dwellings, up to 44,400 sqm of employment floor space and 10,000 sqm of retail space.
23	Land at Amen Corner (South), Bracknell Forest	Planned development for approx. 725 dwellings, including employment space.
24	Land at Warfield, Bracknell Forest	Planned development for approx. 2,200 dwellings, including employment space.
25	Sandhurst and Crawthorne area, Bracknell Forest	1574 dwellings allocated in the Sandhurst and Crowthorne area to be developed by 2026.
26	Reigate town centre and Borough wide employment, Reigate & Banstead BC	46,000 sqm of employment floorspace planned across the borough, with a concentration of 7,000 sqm in Redhill town centre.

Source: Arup review of Local Authority Development Plans (adopted and emerging)

# Local Enterprise Partnership Projects



No. on Map	Location	Local Authority/ LEP	Details of Development	Source: Arup review of LEP Plans
1	Bracknell	Thames Valley Berkshire LEP	Commitment to develop 2,200 new dwellings and 770 permanent jobs.	
2	Bracknell		Bracknell Coral Reef transport improvement forms part of a series of planned access improvements along the A322/A329 corridor between the M3 and M4 motorways. This will help deliver 5,792 jobs and 4,462 new dwellings across the area.	
3	Newbury		Commitment to develop 300 new dwellings, 14,000 sqm of commercial space and 1,150 permanent jobs.	
4	Surrey Heath	Enterprise M3	Commitment to deliver 1,350 new dwellings in Surrey Heath	
5	Basingstoke		Commitment to deliver 1,400 new dwellings at Basingstoke.	
6	Whitehill and Bordon		Investment in the Whitehill and Bordon inner relief to release 4,000 new homes and 5,500 new jobs	
7	Gatwick Diamond	Coast to Capital	Centred on Gatwick Airport, a key economic driver and international hub with a hinterland of strategic employment locations with potential for substantial business and residential growth. Plans to develop 3,300 dwellings, 5,000 jobs and 78,500 sqm of employment space.	

## Thames Valley Berkshire LEP:

*The Thames Valley Berkshire Growth Deal will deliver growth by **enhancing urban connectivity** and **addressing strategic infrastructure priorities** across the LEP area. This will enable the delivery of essential **housing at flagship sites in Newbury, Wokingham and Bracknell** and improve access and reduce journey times across the LEP area. It will also bring businesses and students together at specialist science, technology, engineering and mathematics (STEM) facilities to provide a **critical skills supply chain for the future Thames Valley Science Park**.*

## Enterprise M3:

*The Enterprise M3 Growth Deal aims to drive growth by investing in key infrastructure projects to **improve connectivity** across Hampshire and Surrey in **support of the SciTech corridor**, by strengthening science, technology, engineering and maths (STEM) and construction skills – helping young people to capitalise on the area’s science and technology credentials and **new housing developments**, and by **supporting new small and medium enterprises**. The LEP will also get greater freedoms and flexibilities to support a **more strategic approach to the release of public sector land** and business support.*

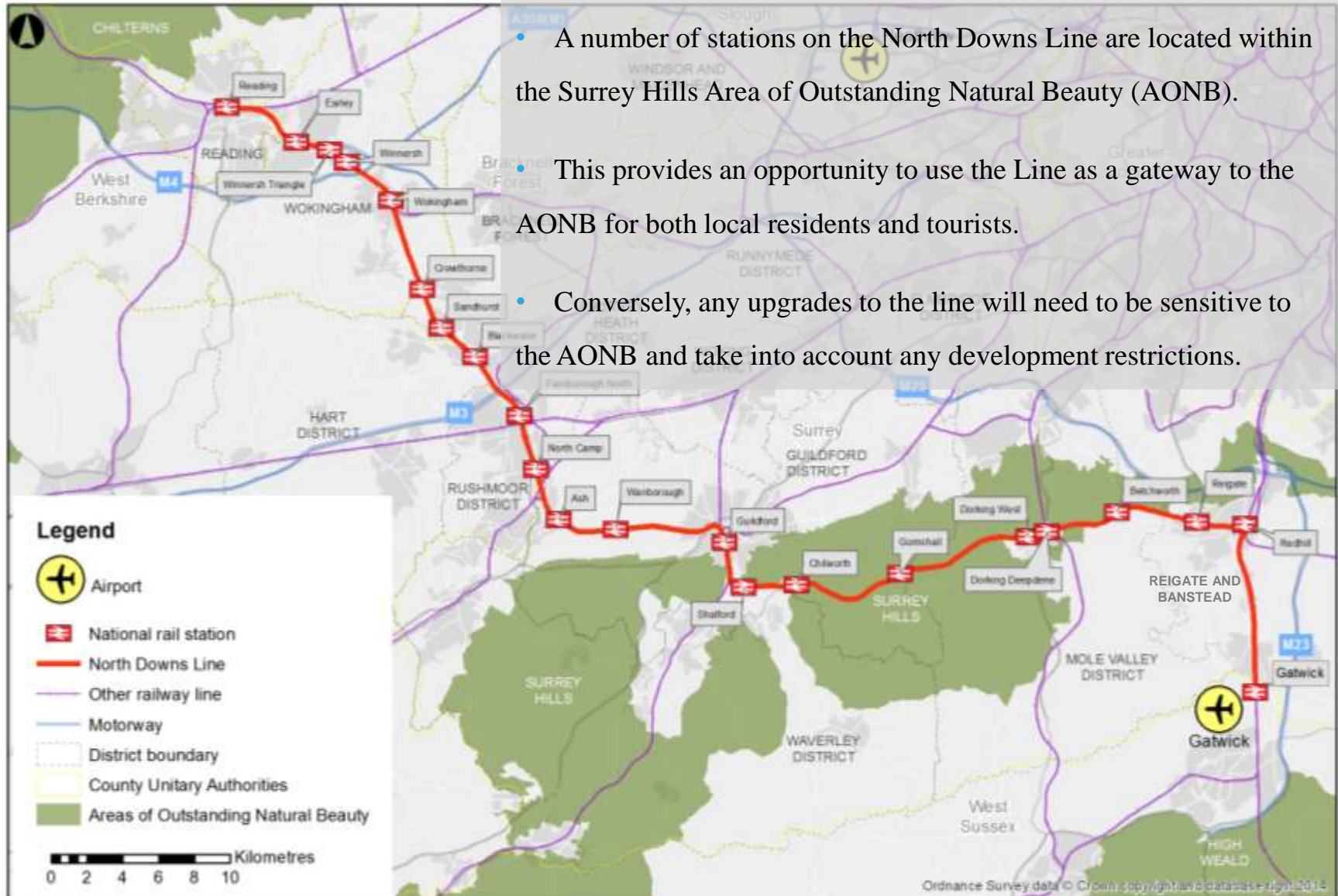
## Coast to Capital LEP:

*The Coast to Capital Growth Deal aims to encourage growth across the Coast to Capital area, through **targeted investment in infrastructure and innovation**, as well as supporting Coast to Capital’s thriving business base. The Growth Deal, subject to a satisfactory conclusion of the funding agreement, will bring together local, national and private funding as well as new freedoms and flexibilities to focus on three key priority areas as identified in the Local Enterprise Partnership’s Strategic Economic Plan: **Enhance business support and skills**; **Accelerate research and innovation**; and **Invest in transport, flood defences and resilience**.*

# Major Projects and Developments

- The review of major projects and developments re-affirms the scope for growth in the vicinity of the North Downs Line.
- Major economic development is likely to be focussed on the Reading to Guildford section.
- New employment sites likely to attract increasing commuting into Reading.
- Guildford Urban Extensions and other mixed use developments set to strengthen Guildford's role as a regional centre in Surrey.
- There is a notable cluster of new housing development in Wokingham Borough in line with population growth forecast in Winnersh, Earley and Wokingham itself.
- Housing and employment developments coupled with employment and population growth are set to strengthen the Gatwick Diamond.

# Environmental Designations





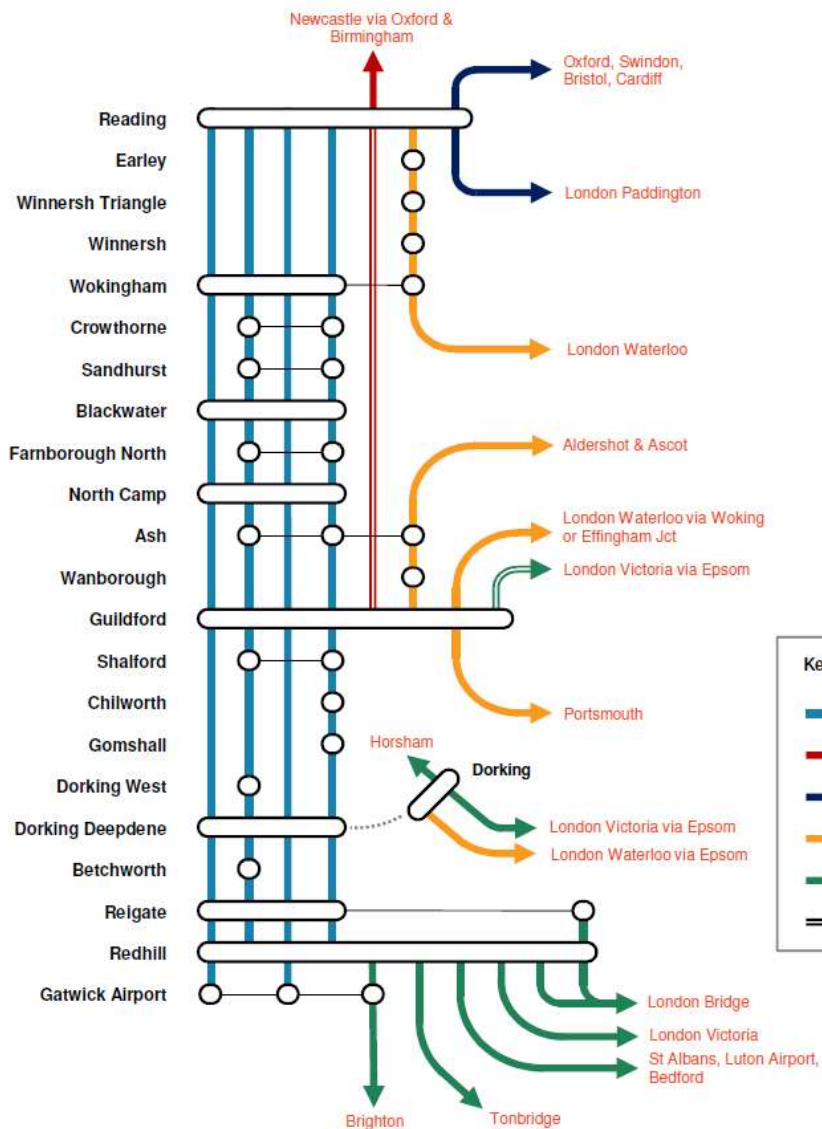
# Summary: Planning and Economic Baseline

- The North Downs Line serves an estimated 392,000 people and 290,000 jobs within a 2 kilometre catchment area.
- There will be an additional 63,000 people and 34,000 jobs within 2 kilometres of a North Downs Line station by 2031.
- Guildford and Reading are the largest towns on the route but NDL also serves a number of important regional population centres – e.g. Wokingham, Farnborough and Redhill.
- The Reading to Guildford section is associated with large population and employment catchments – contrasts with rural character of Guildford to Redhill.
- Future population and employment growth expected, particularly centred on area between Reading and Wokingham.
- NDL serves various major housing and employment developments, particularly around Reading, Wokingham, Guildford, and Redhill/Reigate.

# Transport Baseline

Current Service Pattern  
Station Usage  
Journey Times and Costs  
Highway Network  
Station Facilities

# Current Service Pattern and Connections



- Currently there is one fast service per hour between Reading and Gatwick Airport, with a typical journey time of 1hr 16mins.
- There is also one stopping service per hour between Reading and Redhill, with a typical journey time of 1h 21min.
- Some rural stations are served by alternate stopping services (i.e. they have a service every two hours).
- Reading, Wokingham, Guildford, Dorking and Redhill offer connections lines to/from London.



- North Downs Line services do not currently stop at Earley, Winnersh Triangle and Winnersh, so passengers travelling east to Guildford and beyond have to change at Wokingham.

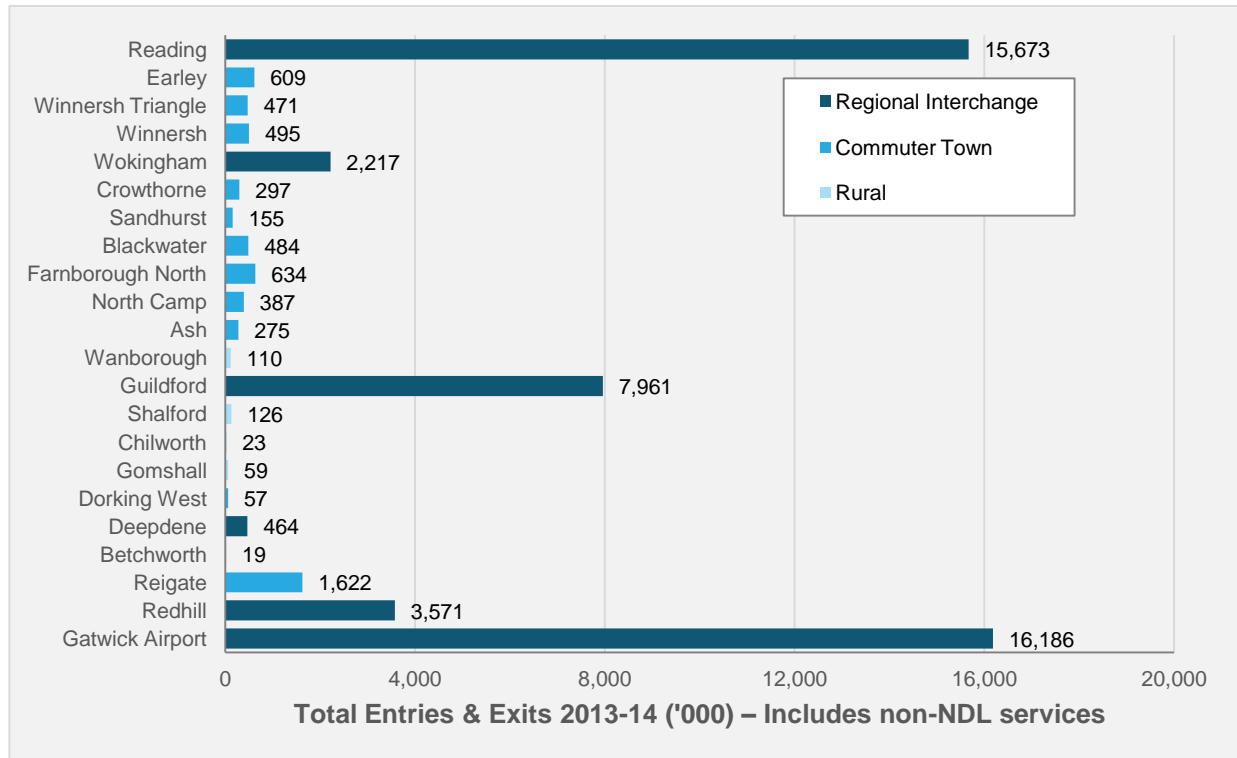
# Station Hierarchy

<b>Regional Interchanges</b> economic centres providing connections with radial routes into London	<b>Commuter Towns</b> growing centres of population and/or employment	<b>Rural Stations</b> small rural stations
Reading	Crowthorne	Shalford
Wokingham	Sandhurst	Chilworth
Guildford	Blackwater	Gomshall
Dorking Deepdene	Farnborough North	Dorking West
Redhill	North Camp	Bletchworth
Gatwick	Ash	<i>Wanborough</i>
	Reigate	
	<i>Earley</i>	
	<i>Winnersh</i>	
	<i>Winnersh Triangle</i>	

*Stations in italics not currently served by North Downs Line services*

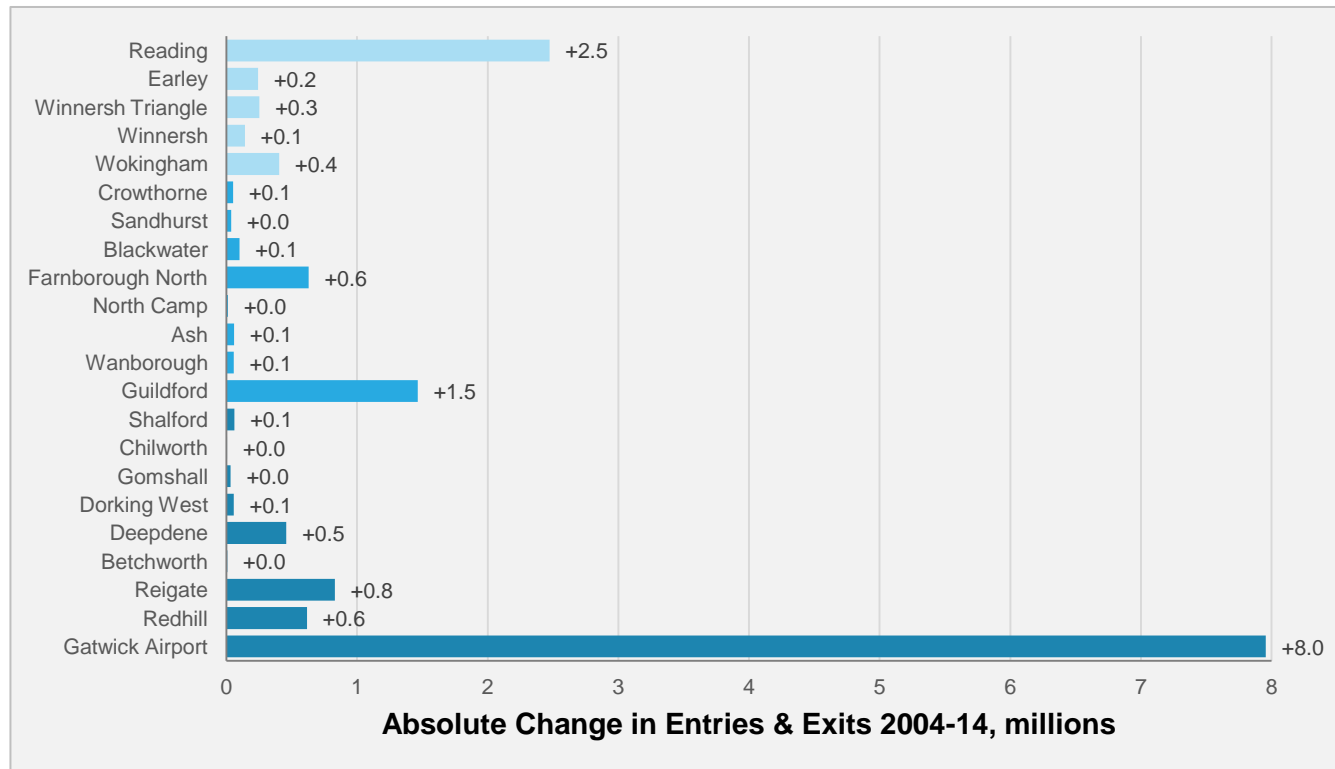
# Existing Station Usage

Source: ORR



- The line is characterised by important trip generators clustered at either end of the line, and a major interchange approximately in the middle (Guildford) with relatively lightly used stations in between.
- Gatwick and Reading are by far the busiest stations on the route, followed by Guildford, Redhill and Wokingham. These stations are all served by non-NDL services, which account for the vast majority of traffic.
- Stations between Guildford and Redhill have relatively low patronage as they are located in rural areas; the area between Guildford and Reading is more built-up and stations are located in low density suburban areas.

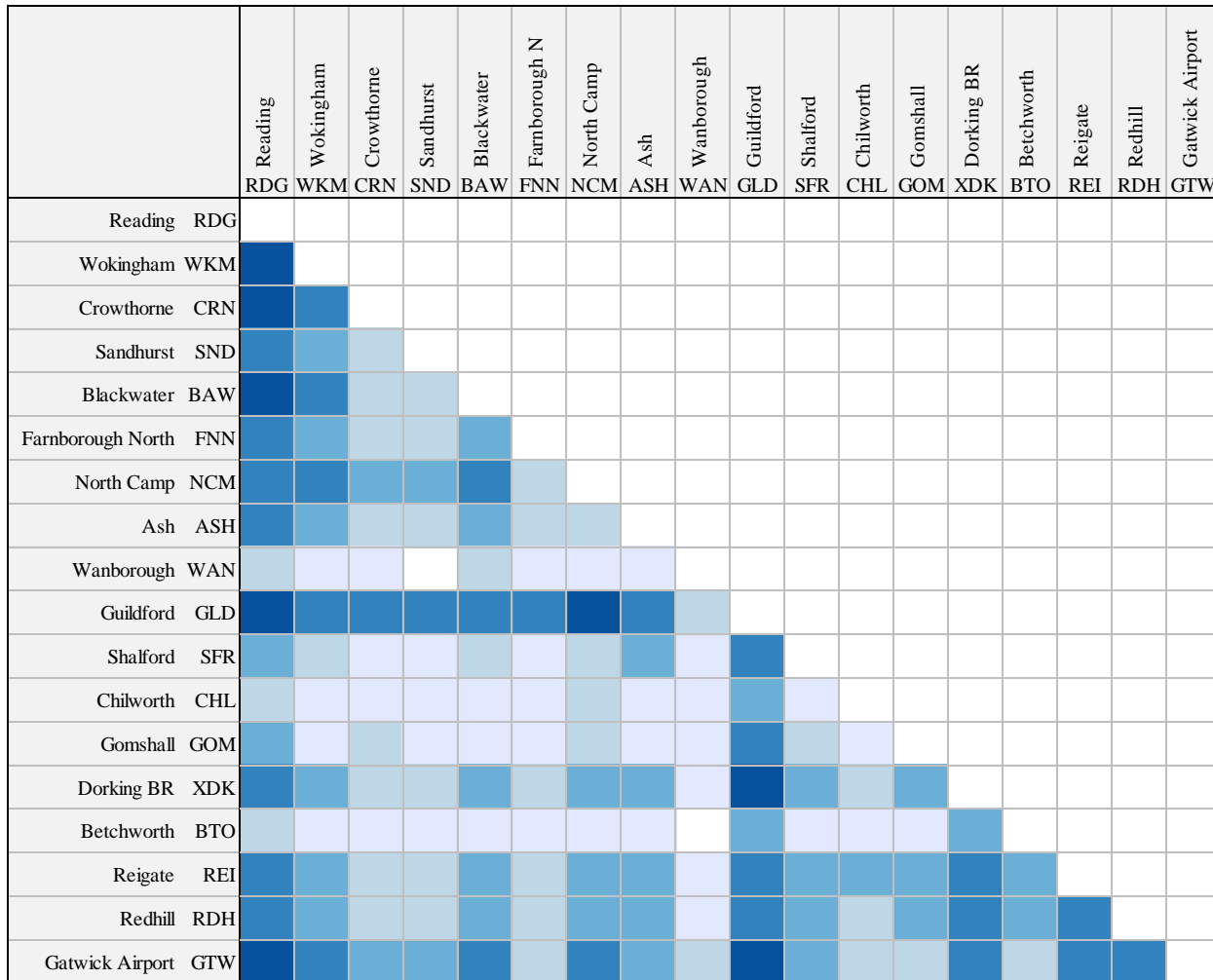
# Station Usage Growth (2004-2014)



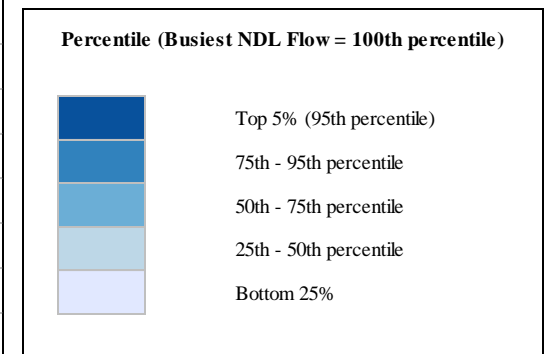
Source: ORR

- On average, station usage on the NDL grew by 4.2% p.a. in the period 2004-14. This is slightly higher than the Surrey average (3.7%) but lower than the England average (6.0%).
- The *rate* of growth was highest at rural stations located between Guildford and Redhill, however in absolute terms these stations have made a relatively modest contribution to growth in patronage.
- In absolute terms the interchange stations on the route added the most passengers in the period 2004-14.
- The growth at Gatwick dwarfs all other stations.

# Analysis of Current Flows

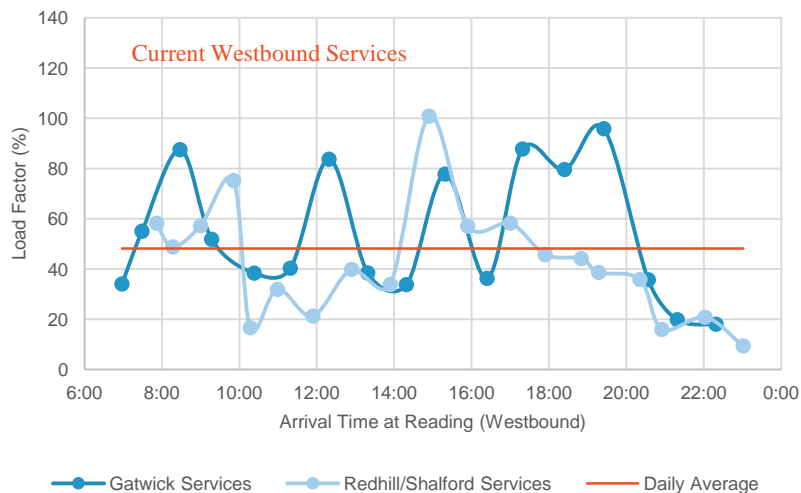
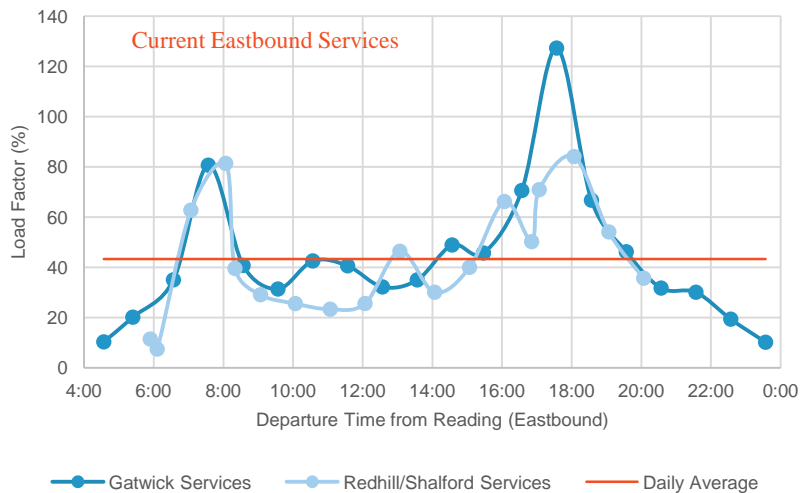


- The chart shows that the busiest flows on the NDL are dominated by Reading, Guildford and Gatwick. Demand is relatively high from stations between Reading and Guildford to each of these towns.



Source: LENNON

# Crowding Levels



- Eastbound services on the NDL have high load factors in both peaks, although crowding is worse in the evening peak.
- The most crowded service is the 19:00 departure from Reading. Three other services have load factors greater than 80%.
- Westbound services have high load factors on several interpeak services as well as in the peaks. Seven services have load factors in excess of 80%.
- Critical load points tend to be at either end of the line (Reading, Wokingham, Reigate and Gatwick) although in peak periods Ash and Guildford are also critical points. This is in line with station usage and LENNON data.
- Services operated by Class 166 rolling stock have lower load factors than similarly-timed services using Class 165 rolling stock, due to higher seating capacity. The loading data suggests that there is a requirement for 3-car trains on the majority of peak services. As demand grows, there may be a need for 4-car rolling stock on the busiest services.



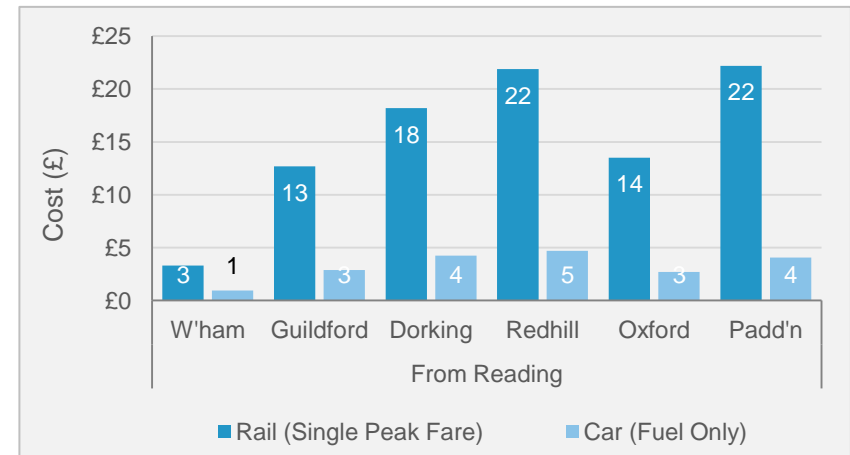
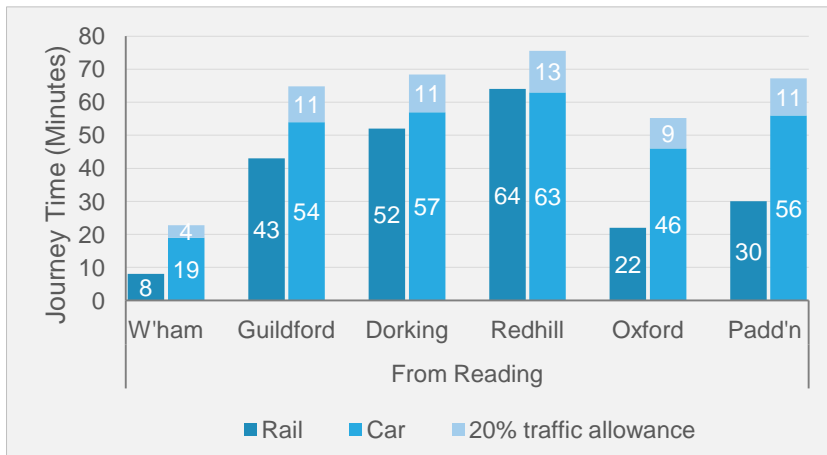
# Journey Times and Costs

- It is important to understand where rail is most competitive against car travel for North Downs Line journeys.
- An analysis of journey times and costs by car and rail has been undertaken for selected origin and destination stations on the North Downs Line as well as for Heathrow, London and Oxford.
- Journey times are point-to-point and do not include station access times or waiting times, or time for finding a parking space by car.
- Rail journey times also vary from service to service and therefore the journey times represent a ‘typical’ journey. Where appropriate, the average of the semi-fast and stopping service journey times have been taken.
- Journey times by car are measured from station to station using a route finder.
- Peak traffic adds around 15-20% to the road journey times (but higher for Central London) so the travelling by car may be less attractive than the data indicates for many travellers. The charts presented here include a 20% increase on road journey times to take into account average traffic delays.
- Rail fares are based on a single one-way peak time ticket.
- Car journey costs have been calculated by applying typical fuel consumption rates and costs and do not include parking costs.

# Journey Times and Costs

- Average rail speeds are lower between Reading and Guildford (60kph) than between Guildford and Redhill (70kph – fast service) because of the higher frequency of stops on this section.
- Rail travel between Reading and Guildford is faster than driving, even without taking into account road congestion, and travel between Reading and Redhill or Gatwick has a comparable travel time to driving.
- Drive times to the east of Guildford are particularly unreliable because it typically involves travelling on A25 (a single carriageway road passing through towns and villages) or taking a longer route via the M25. Travel to London for the interchange stations along the route is always faster by rail, even before peak time congestion is taken into account.
- Peak rail fares tend to be around four times the fuel cost of driving. Inclusion of parking costs would narrow the gap – for example, a full days parking in the centre of Guildford would cost around £10 on a week day.

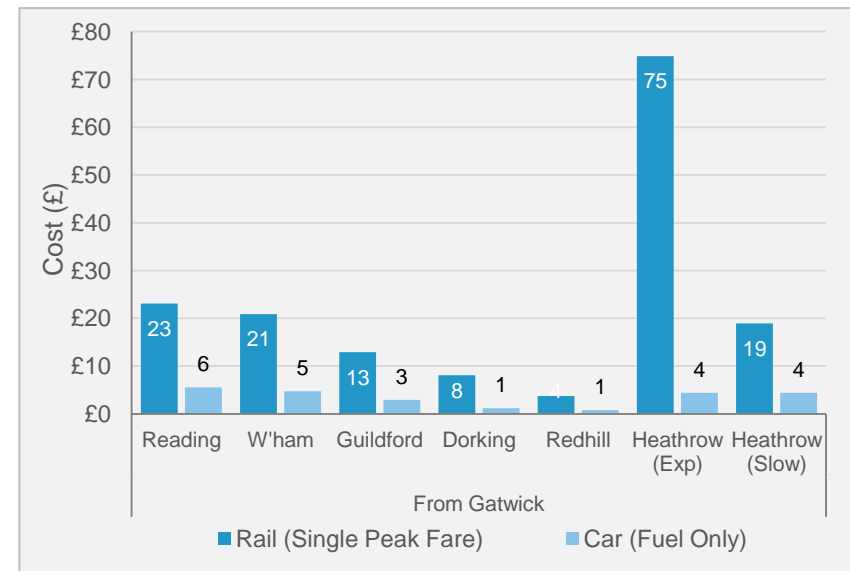
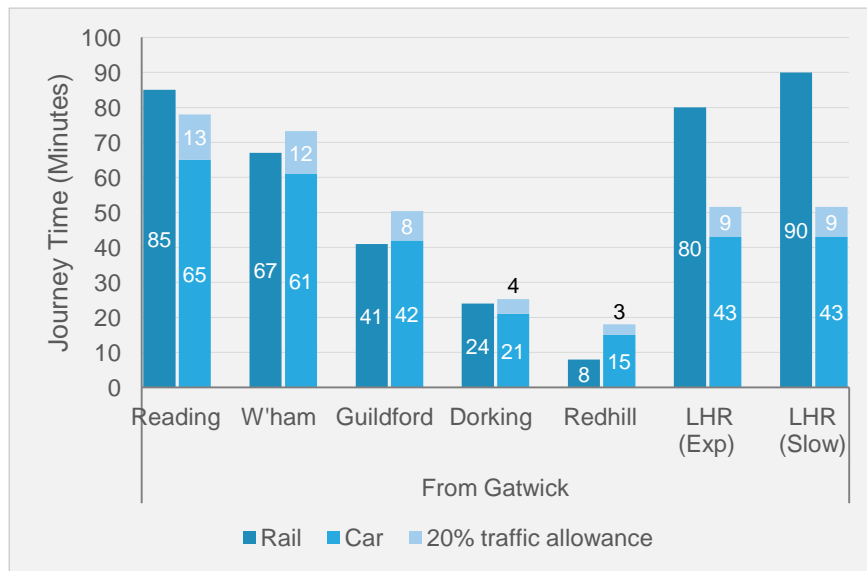
## To/from Reading





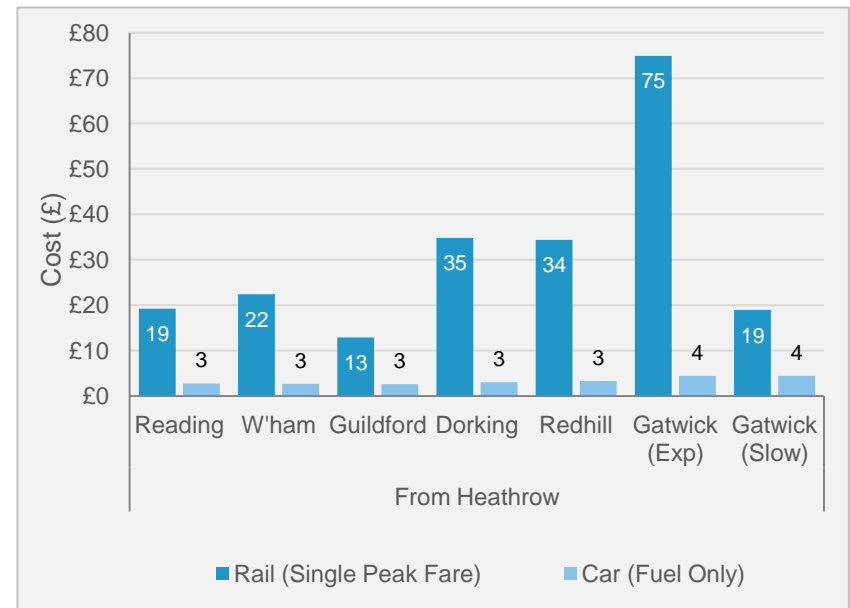
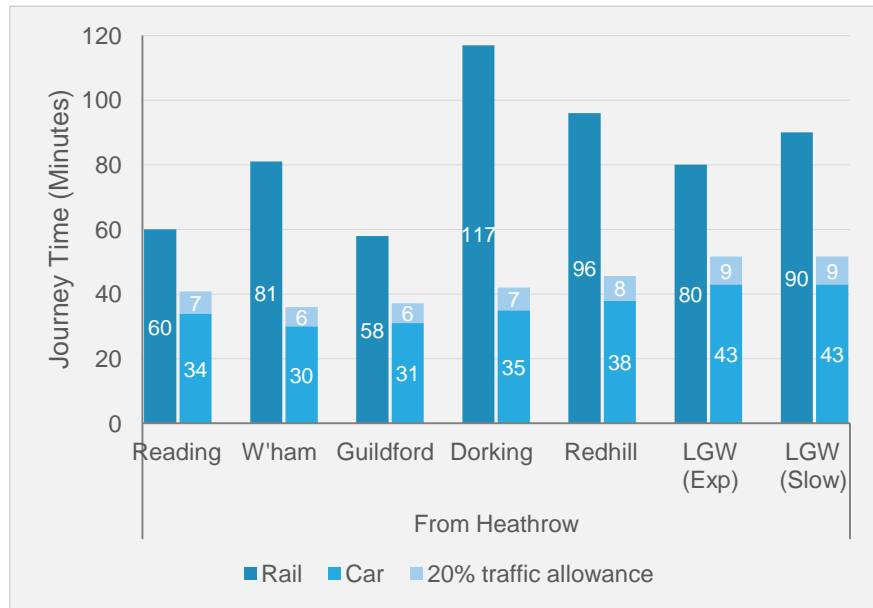
# Journey Times and Costs - Gatwick

- From Reading, the free-flow drive time to Gatwick is 20 minutes faster than the rail journey time, but when traffic delay is taken into account, the travel times are comparable.
- Travelling by rail to Gatwick from Wokingham, Guildford and Dorking is faster than driving, and from Redhill, the train journey time is half that of driving.
- Travel between the two airports using Gatwick Express and Heathrow Express takes 80 minutes, only a 10 minute saving on the (much cheaper) route via the North Downs Line. This is around twice the free-flow drive time. Travel between the two airports involves busy roads such as the M25 – as an indication of the impact of traffic congestion on this journey, the National Express coach is timetabled to take between 65 and 90 minutes (vs 43 mins ‘free flow’).



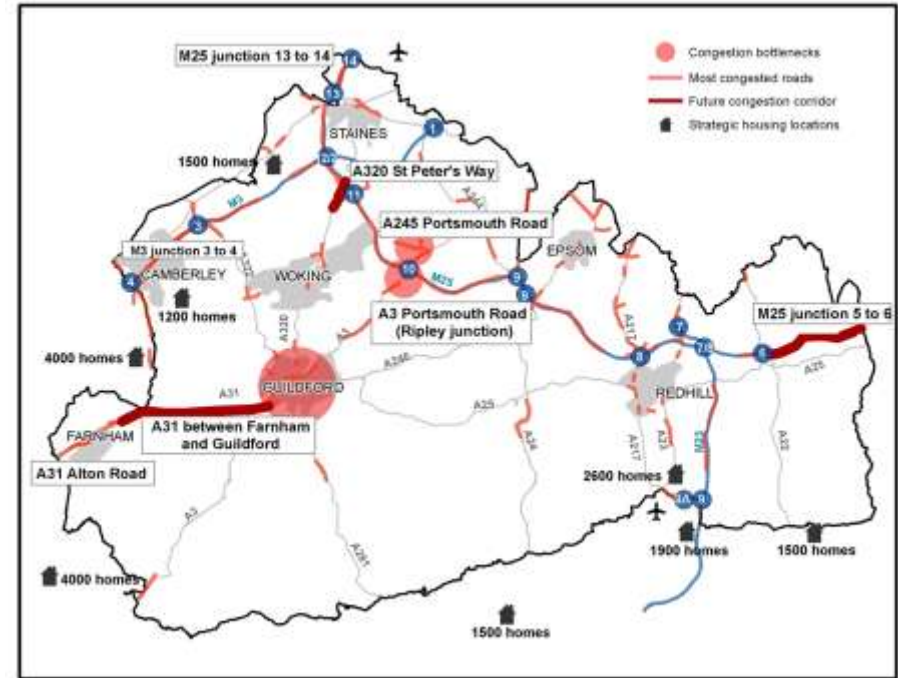
# Journey Times and Costs - Heathrow

- Journey times from Heathrow to all destinations considered in this analysis are longer by rail than by car, in free-flow traffic conditions. Current rail access to the airport is oriented towards London, so rail travel from much of Surrey to Heathrow involves routing via Central London.
- For most stations, access to Heathrow is fastest if connecting to coach links to the airport from Reading (journey time 45 min), Woking (50 min) and Feltham (30 min).
- A direct service between Heathrow and Reading could result in a much improved route between Surrey and Heathrow via the North Downs Line, making it quicker than travelling via Central London.



# Highway Network

- The eastern section of the North Downs Line runs parallel to the A25 – a single carriageway road which passes through Dorking, Reigate and Redhill town centres as well as several villages; even in free flow conditions the 20 mile journey between Guildford and Redhill takes 43 minutes at an average speed of 28mph.
- West of Guildford the Line follows the route of the A31 and the A331. These roads are dual carriageways with grade separated junctions as far as the M3 (between Farnborough North and Blackwater), but are still very congested routes. The main routes between Wokingham and Reading are the single-carriageway A329 and the A329(M).
- Several routes close to the North Downs Line have been identified as the most congested roads in the county – these include the A3 and radial routes around Guildford, roads around Dorking and Reigate, and the A331 which runs parallel to the Line between Sandhurst and Ash.



Source: Surrey Future Congestion Programme Consultation Draft, March 2013