



Strategic Case for Metroisation in south and south east London



March 2019

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0 Executive summary

Introduction

Population and employment growth in London is expected to generate about **six million additional trips** in London each day by 2041¹. To support and sustain this growth, while ensuring the Capital remains an attractive place to live, work and visit, the existing services on railways will need to become more efficient, accessible and frequent.

Train frequencies depend on where you live, not necessarily where the demand lies. While the Tube upgrade programme and the creation and improvement of the Overground has dramatically changed this for many, those living and working in south London depend more on National Rail for their travel and do not receive the same level of service as elsewhere in London. There are a number of challenges in south London:

- The majority of people travelling to/from south London rely on rail for all or part of their journeys. In south London, rail mode share is at its highest outside of central London (**6.9 per cent of trips** originating in the south sub-region²)
- There are relatively few planned and proposed rail schemes for delivery in the next decade
- National Rail contracted services are performing poorly compared to other heavy rail networks, such as London Overground.

The role of this Strategic Case is to set out the need to make better use of the south and south east London suburban rail network to serve all those who live, work and visit there and to encourage greater public transport use in these areas to support continued and sustainable growth.

The 'metroisation' concept

We want to create a more reliable, efficient and integrated public transport network across south London, Surrey and Kent. This will help support new, affordable homes while making it easier and quicker to travel.

¹ Mayor's Transport Strategy 2018

² LTDS 2014-17

Metroisation has six key elements:

1. **Predictable services**, including identifiable 'lines' with consistent stopping patterns and even intervals between trains
2. **Better connections**, based on higher frequencies and upgraded interchanges
3. **More capacity**, through longer trains and relieving bottlenecks
4. **Shorter journey times**, supported by trains that accelerate and decelerate faster, and have wider doors so that boarding and alighting is more efficient
5. **A more reliable service**, from simplified service patterns
6. **Better customer service and experience**, similar to the benefits delivered by transferring services to London Overground

The Mayor's Transport Strategy (MTS) sets out the Mayor's long-term vision for transport in London. A core aim of this strategy is that 80 per cent of all trips in London will be made by active, efficient and sustainable modes of travel by 2041.

The Mayor of London's ambitions for metroisation are set out in Proposal 65 of the MTS:

'The Mayor, through TfL, will work with Network Rail, train operating companies and stakeholders to seek the modification of the planning of local train services from Moorgate, Victoria and London Bridge to create a London suburban metro, offering improved frequencies, journey times and interchange opportunities by the late 2020s'.

This is also supported by the London Assembly Transport Committee's recent Broken Rails paper³, which states 'it is critical that improvements to London's suburban rail services are prioritised now and regardless of which operators are running the services'.

The change required

To deliver this proposal we need to change how we plan and run the rail network. By viewing the transport network as a whole, rather than individual lines run by different companies, we have an opportunity to radically reshape the network at the same time as running it more efficiently. Rather than building new lines from scratch we can use the existing network in better ways to deliver for London.

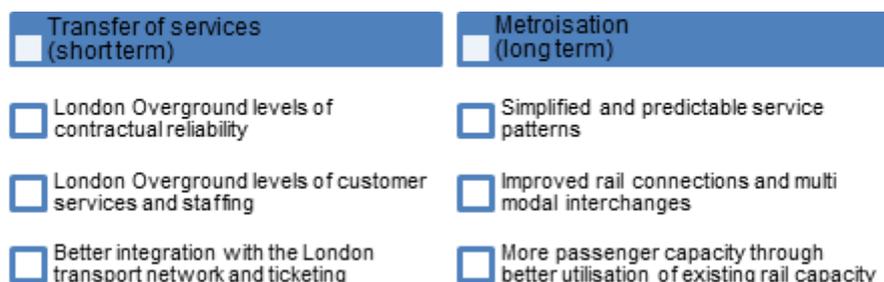
Currently, the industry tends to be focussed on short-term incremental change, driven by existing railway demand rather than broader social and economic objectives, such as housing, mode shift, air quality and city-wide connectivity. This is a consequence of the rail network being planned independently from the rest of the public transport network, and the fragmented commercial aspect of the rail industry,

³ https://www.london.gov.uk/sites/default/files/broken_rails__a_rail_service_fit_for_passengers_final_report.pdf

which tends to result in revenue-driven business cases, and risk-averse decision-making.

The transfer of services to Transport for London (TfL) would make metroisation much more likely and much easier to achieve, however metroisation is not dependent on this (see Figure 1).

Figure 1: The relationship between short-term interventions (transfer of services) and long-term interventions (metroisation)



While metroisation is focussed on local stopping services, the interventions outlined in this Strategic Case would also improve fast services from the wider South East, spreading the benefits beyond London.

The case for change

The south and south east London public transport network is not delivering to its full potential.

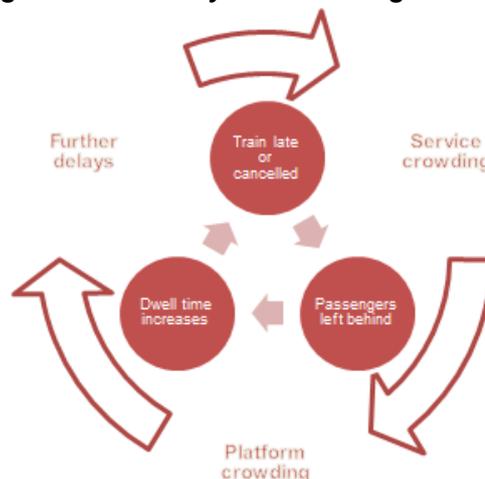
The National Rail network has been developed incrementally by multiple competing operators. This limits connectivity between the south central and south eastern rail networks in particular.

Operational performance is poor, with Southern and Southeastern metro services consistently underperforming compared to London Overground services. For example, in the period between 2010/11 and 2017/18 London Overground had an average of **80 per cent** of all trains achieving the Right Time measure, whereas Southeastern only achieved this for **62 per cent** of the mainline and metro services, and Southern for only **53 per cent**.

This is influenced by the train design, which is not suited to efficient boarding and alighting, or to the short dwell times associated with a metro service. The combination of competing operators, poor performance and inefficient operational design creates a vicious circle of delays and crowding (see Figure 2).

This leads to many customers instead using local bus services to bypass their local rail station in favour of a more reliable Tube service.

Figure 2: Reliability and crowding vicious circle



This adds pressure on the Tube and bus networks in areas where they are already at capacity. For example:

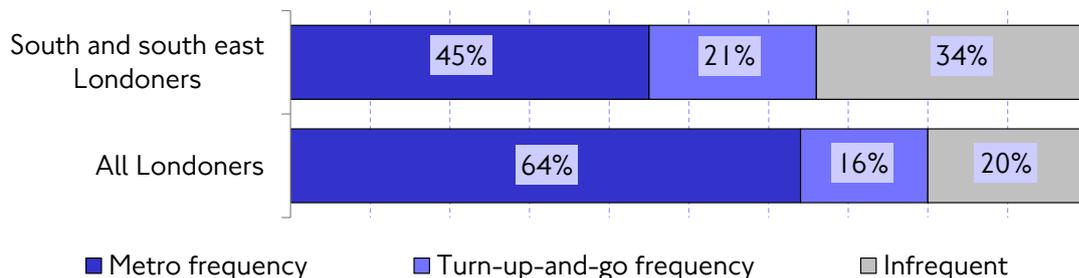
- Each day **33 double-deck bus loads** of Londoners living within a 10 minute walk of West Norwood station use a bus to access Brixton Tube station instead of using their local rail service.
- **5,000 people** travel by bus from, or past, stations on the Wimbledon Loop to access the Northern line at Morden.
- While the journey from Eltham to Southwark takes less time on a Southeastern service, **taking a bus to the Jubilee line at North Greenwich is a quicker option** when estimated wait time is factored in.

Customers using the south and south east London rail network are not getting a good public transport experience.

Rail customers are less satisfied with overall levels of service, frequencies and value for money than customers in other parts of London. Overall customer satisfaction on Southern and Southeastern metro services has consistently trailed that of London Overground services by **10-20 points** since 2014.

For example, as shown in Figure 3, customers are getting a less frequent service.

Figure 3: Level of service provided to Londoners with a nearby rail service (current)



Metro: Average passenger wait time, taking into account actual departure times, is less than or equal to 5 minutes. This level of service is provided on the Tube and the busiest parts of the London Overground network.

Turn-up-and-go: Average passenger wait time, taking into account actual departure times, is less than or equal to 7.5 minutes. This level of service is provided on most of the London Overground network.

Infrequent: Average passenger wait time, taking into account actual departure times, is greater than 7.5 minutes

As shown in Table 1, this means that the public transport network is not delivering access to jobs.

- There are **four times as many jobs within 45 minutes** of Harrow compared to Sutton
- There are **nearly three times as many jobs within 45 minutes** of Walthamstow compared to Streatham
- Tooting Broadway on the Northern line has **nearly three times as many jobs within 45 minutes** compared to Streatham on the National Rail network.

This leads to people either driving more, or making fewer journeys.

Table 1: Connectivity to jobs

Location	Centre	Zone	Peak		Off-peak	
			Jobs within 45 mins	Jobs within 60 mins	Jobs within 45 mins	Jobs within 60 mins
Sutton station	Metropolitan	5	253,270	1,409,365	306,210	1,846,093
Harrow-on-the-Hill station	Metropolitan	5	1,020,209	2,830,150	1,232,601	2,951,761
Streatham station	Major	3	669,480	2,677,712	1,162,318	2,849,828
Walthamstow Central station	Major	3	1,943,460	3,009,060	2,059,465	3,123,810
Tooting Broadway station	Major	3	1,898,496	3,185,080	2,081,551	3,301,033

Source: WebCAT, All PT modes, AM and PM peak, From location

South and south east London is not realising its potential for housing delivery and economic growth

Since 2001, housing delivery in south and south east London has lagged behind the London average, with most outer boroughs in the sub-region seeing growth of between **six and eight per cent** compared to the London average of **14 per cent**. There are also fewer houses being built in areas around National Rail stations in south and south east London, compared to stations operated by TfL.

Over the same period, the south and south east economy has performed poorly compared to other areas in London, and employment growth has been lower than other sub-regions of London.

Why introduce a new metro service in south and south east London?

We have three objectives for the rail network in south and south east London and neighbouring districts. These have been drafted by TfL and align with both the DfT’s national strategic vision for rail (‘Connecting people: a strategic vision for rail’⁴) and the MTS.

Figure 4: Objectives for metroisation

A more reliable, better connected and expanded public transport network in south London, Surrey and Kent	A good public transport experience for all passengers on the network	A public transport network that supports national and regional housing delivery and economic growth ambitions
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⁴ Connecting people: a strategic vision for rail
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/663124/rail-vision-web.pdf

These objectives aim to address the existing challenges:

- The south and south east London rail network is not delivering to its full potential
- The south and south east London rail network is failing to provide customers with a good public transport experience
- The south and south east London rail network could do more to unlock housing and economic growth

The ‘core’ metroisation option

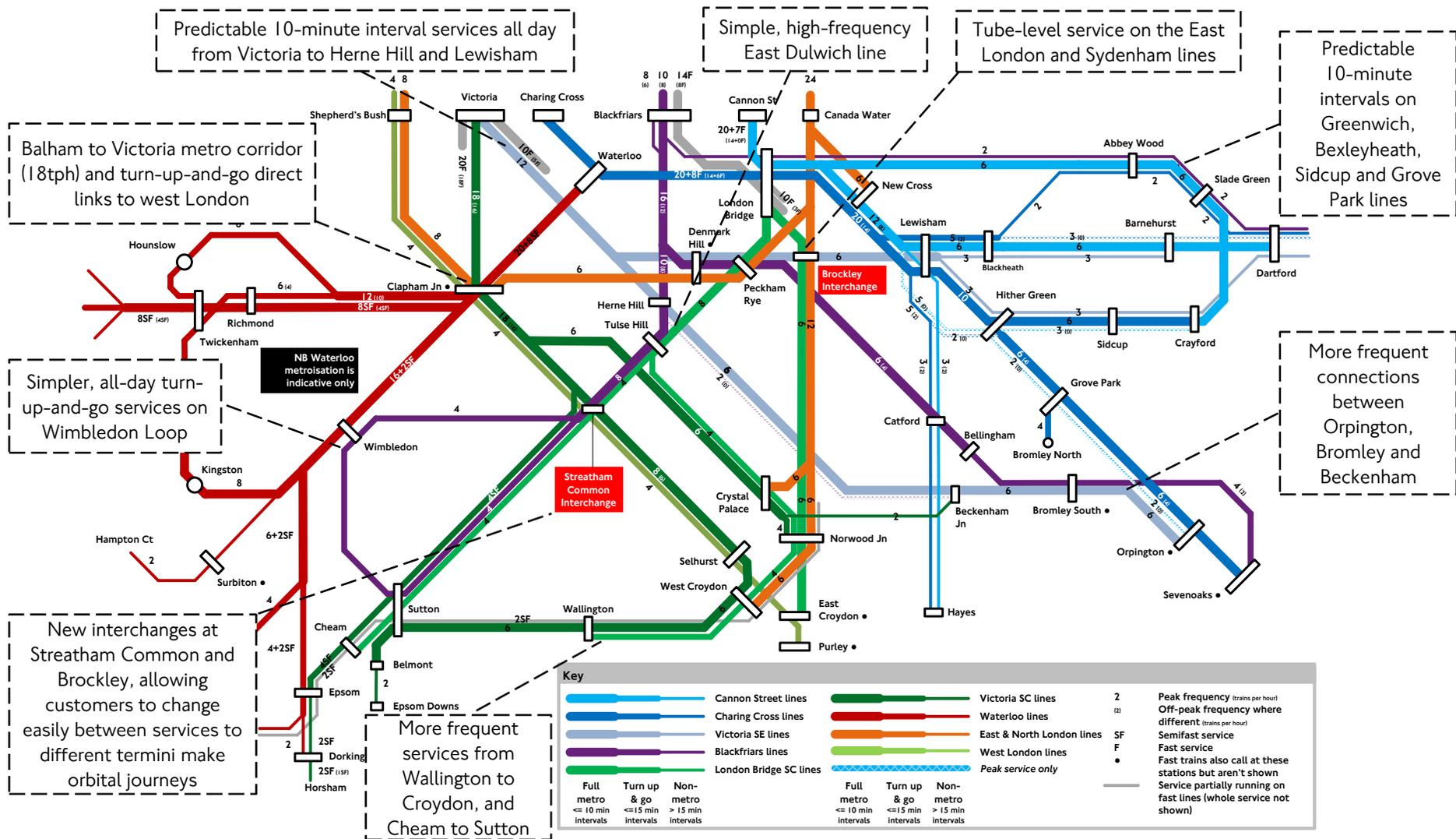
Figure 5 shows an option for the network under metroisation (‘core’ metroisation scheme option), developed for the purposes of this Strategic Case. This shows how more could be delivered from the existing network.

When compared against the base service pattern (see Table 2) this would deliver an additional 39 trains during the morning peak hour (a 22 per cent increase), and an additional 36 trains per hour during the off-peak (a 30 per cent increase). These benefits would be spread across the network, with better frequencies on both local stopping services and longer-distance fast services.

Table 2: Frequency changes (trains per hour) – Metro & regional services

Terminus	Peak Hour			Off Peak		
	2019 Base	‘Core’ option	Change	2019 Base	‘Core’ option	Change
Blackfriars	29	32	+ 3 tph	20	24	+ 4 tph
Cannon Street (SE Metro)	16	20	+ 4 tph	12	14	+ 2 tph
Charing Cross (SE Metro)	20	20	=	12	14	+ 2 tph
London Bridge (BML Slow)	4	6	+ 2 tph	4	6	+ 2 tph
London Bridge (via Peckham Rye)	6	8	+ 2 tph	4	8	+ 4 tph
Victoria (BML Slow)	14	18	+ 4 tph	12	16	+ 4 tph
Victoria (SE Metro)	7	12	+ 5 tph	6	12	+ 6 tph
East London Line	18	24	+ 6 tph	18	24	+ 6 tph
West London Line	2	4	+ 2 tph	1	4	+ 3 tph
Bromley North – Grove Park	4	4	=	3	4	+ 1 tph
Cannon Street (Kent Services)	7	7	=	0	0	=
Charing Cross (Kent Services)	8	10	+ 2 tph	6	6	=
London Bridge (BML Fast)	8	10	+ 2 tph	5	3	- 2 tph
Victoria (BML Fast)	16	20	+ 4 tph	14	18	+ 4 tph
Victoria (Kent Services)	7	10	+ 3 tph	5	5	=
Total Change	166	205	+ 39 tph	122	158	+ 36 tph

Figure 5: 'Core' option service pattern (MET01: S5D+K5B) – morning peak



Key changes include:

- A flagship route between Balham and Victoria with up to 18 trains per hour (tph), regular and frequent direct links to west London via the West London line, and more services from Wallington to Croydon, and Cheam to Sutton
- Predictable 10-minute interval services all day from Victoria to Herne Hill and Lewisham, between town centres in south east London such as Orpington and Bromley, and on the Greenwich, Bexleyheath, Sidcup and Grove Park lines
- Tube-level service on the East London and Sydenham lines with trains every seven to eight minutes from London Bridge to Tulse Hill, and every 15 minutes to the Crystal Palace and Hackbridge lines
- Simpler all-day four tph service on the Wimbledon Loop
- New Streatham Common and Brockley interchanges, allowing customers to change easily between services to different central London termini and orbital lines

In 2014 we estimated the total capital cost to be around £1.7bn in 2014 prices, including optimism bias. As these costs are indicative only, we would need to do further work to update these costs and include more details in advance of developing a full business case.

Benefits of metroisation

Metroisation could deliver benefits across to the London and south east transport network and beyond.

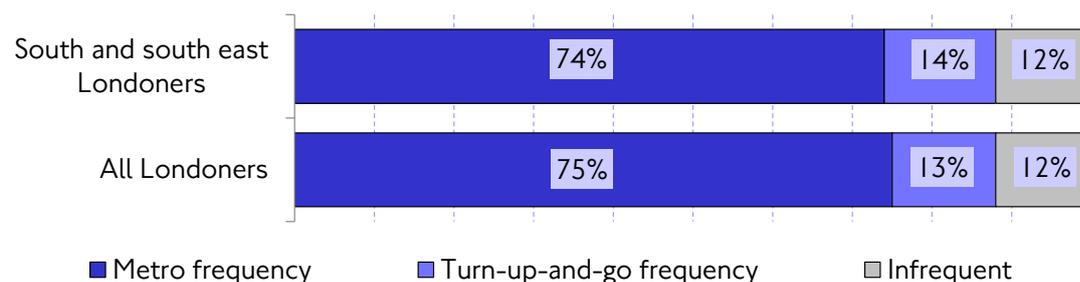
On the **network**, a new service design could deliver predictable services and better connections. Targeted capital interventions to increase capacity, reduce journey time and improve reliability include:

- New turnback facilities
- Grade separation and smaller-scale junction remodelling
- Digital signalling delivering Automatic Train Operation
- New tracks, platforms and stations

Effective platform management and rolling stock design would support this, as would contracts that include strong performance incentives linked to customer experience.

More predictable services could build trust and encourage the use of the rail network. **Customers** could benefit from more frequent services and well-designed interchanges, reducing stress and saving time. Levels of service across south and south east London would be comparable with the rest of the London, as shown in Figure 6. Predictable and frequent services, and a more open layout on metro-style trains, could make travel easier and more accessible. Improved connectivity could deliver social benefits by encouraging more active travel and reducing social isolation, as well as improving air quality.

Figure 6: Level of service provided to Londoners with a nearby rail service ('core' option)



Metro: Average passenger wait time, taking into account actual departure times, is less than or equal to 5 minutes. This level of service is provided on the Tube and the busiest parts of the London Overground network.

Turn-up-and-go: Average passenger wait time, taking into account actual departure times, is less than or equal to 7.5 minutes. This level of service is provided on most of the London Overground network.

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Higher capacity and improved connectivity could support the delivery of **new homes**. Up to 130,000 new homes could be within 1km of stations that would benefit from improved services, with up to 65,000 directly supported by the scheme. A more dependable service would also support the viability of town centres across outer London and the wider South East area.

Delivering metroisation

There are three potential routes to deliver metroisation:

- DfT Rail National Enhancements Pipeline
- Franchising process
- Transfer of services to TfL

The funding and financing challenges of delivering the scheme could be addressed partly by delivering component packages incrementally, as on the London Overground network. Transfer of services would enable some key components of metroisation, including increased contractual incentives to improve reliability, off-peak frequency enhancements, more station staffing and metro-style rolling stock. While the transfer of services to TfL would make metroisation much more likely and much easier to achieve, the case for change stands irrespective of the contracting authority. We are committed to working with the DfT and other stakeholders as needed to ensure that these changes are made.

Constraints and dependencies

Our proposals ensure these changes wouldn't make longer distance services slower - recognising that current frequencies will need to grow in line with demand. We have also considered freight requirements while researching this strategic case, following the principles laid out in the MTS, and the differing planning policies of local authorities, including in the wider South East.

Next steps

This Strategic Case provides an argument for change in the planning and operation of rail services in south and south east London. It will form the basis for our conversations with stakeholders in south and south east London to build consensus on the long-term vision for the rail network and inform engagement with the DfT and HM Treasury regarding long-term infrastructure funding in London.

In line with DfT processes, this Strategic Case would form part of a complete business case for metroisation, supported by an economic case, including testing the benefits of the core metroisation option and relevant variants, as well as the financial, commercial and management cases.

1 Strategic Case

1.1 The role of the Strategic Case

- 1.1.1 Metroisation encompasses a change in approach for rail service provision and network design, through integrating stopping services within (and just beyond) the London boundary into a single network delivering seamless transfers, increased passenger capacity and improved customer outcomes.
- 1.1.2 The role of this Strategic Case for metroisation is to set out the need for investment in a transport intervention on the south and south east London rail network to enable the public transport network to realise its full potential to support mode shift and new homes and jobs.
- 1.1.3 This Strategic Case is based on three main tenets:
- 1) The south and south east London (and wider South East) public transport network is not delivering to its full potential
 - 2) South and south east Londoners and customers from the wider South East are not getting a good public transport experience
 - 3) South and south east London and the wider South East is not realising its potential to deliver new homes and jobs
- 1.1.4 These form the basis of the objectives for metroisation, and have informed the development of the 'core' option.

2 Context

2.1 London is growing

- 2.1.1 London's future international competitiveness is threatened by significant transport challenges and a severe housing shortage. The opportunities available in London mean that people want to live and work here in ever greater numbers. Population is forecast to grow from 8.7 million today to 10.8 million by 2041⁵. This growth is expected to generate about 6 million additional trips in London each day by 2041.
- 2.1.2 The combination of population and employment growth means more public transport capacity is needed and more affordable, well-connected homes must be built. This needs to take place in the context of environmental challenges, notably London's air quality and national commitments on carbon reduction. In order to sustain its success in the face of these challenges, London must become a city where walking, cycling and public transport becomes the most appealing and practical choice for many more journeys.
- 2.1.3 Good public transport is also needed for travel between London and the wider South East. Improvements to the rail network are particularly important, as they can support efficient and sustainable travel at a regional scale.
- 2.1.4 These challenges drive the aims of the Mayor's Transport Strategy (MTS)⁶. The MTS, adopted in March 2018, sets out the Mayor's vision for transport in London to 2041. Integral to this vision is the aim to reduce car dependency in favour of walking, cycling and public transport use. This is stated in Policy 1, which sets the aim for 80 per cent of all trips in London to be made by these active, efficient and sustainable modes of travel by 2041. The Strategy is underpinned by the Healthy Streets Approach, which provides the framework for putting human health and experience at the heart of planning the city.

2.2 The capacity challenge: Central London needs more rail capacity

- 2.2.1 Central London radial rail corridors are where the transport network is under most strain. Rail-based modes of travel cater for 80 per cent of the 1.3 million trips to central London in the average weekday morning peak period⁷. This includes a significant number of commuters from the wider South East, with about one quarter of all commuters to City of London and City of Westminster living outside of Greater London⁸.

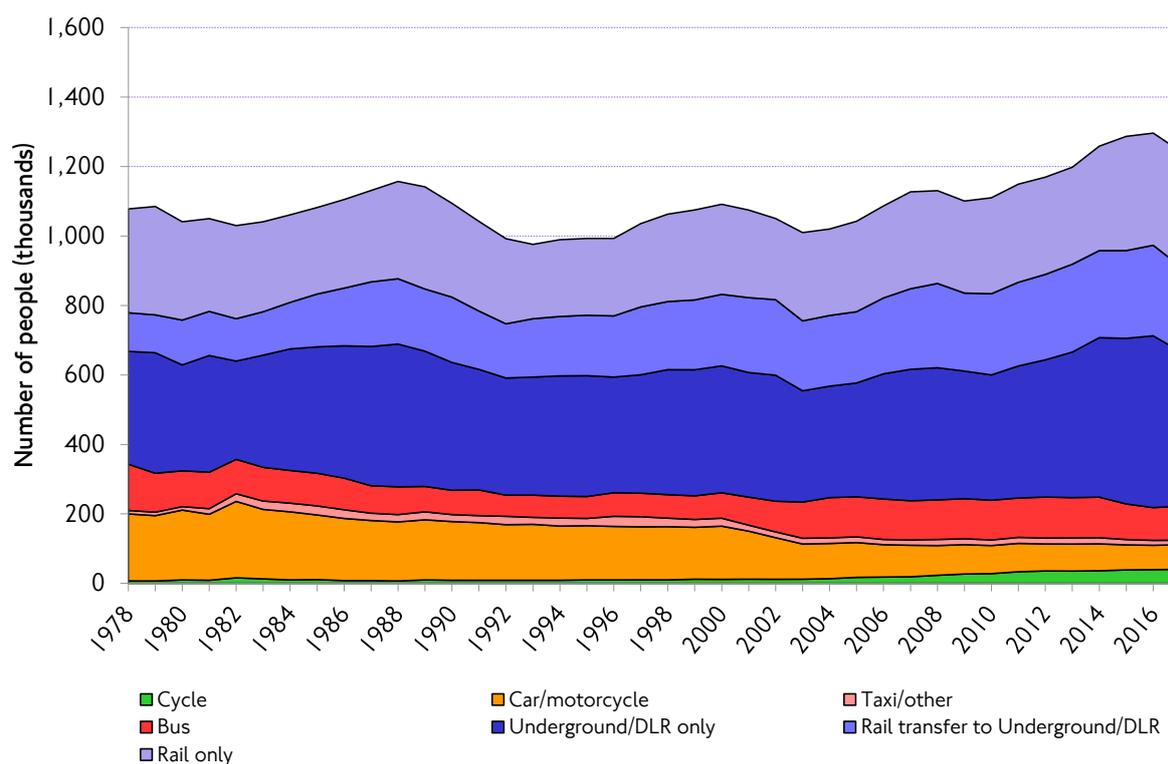
⁵ Mayor's Transport Strategy (2018)

⁶ Ibid

⁷ Travel in London 10

⁸ Census 2011

Figure 7: Central London weekday morning peak arrivals



Source: *Travel in London 10*

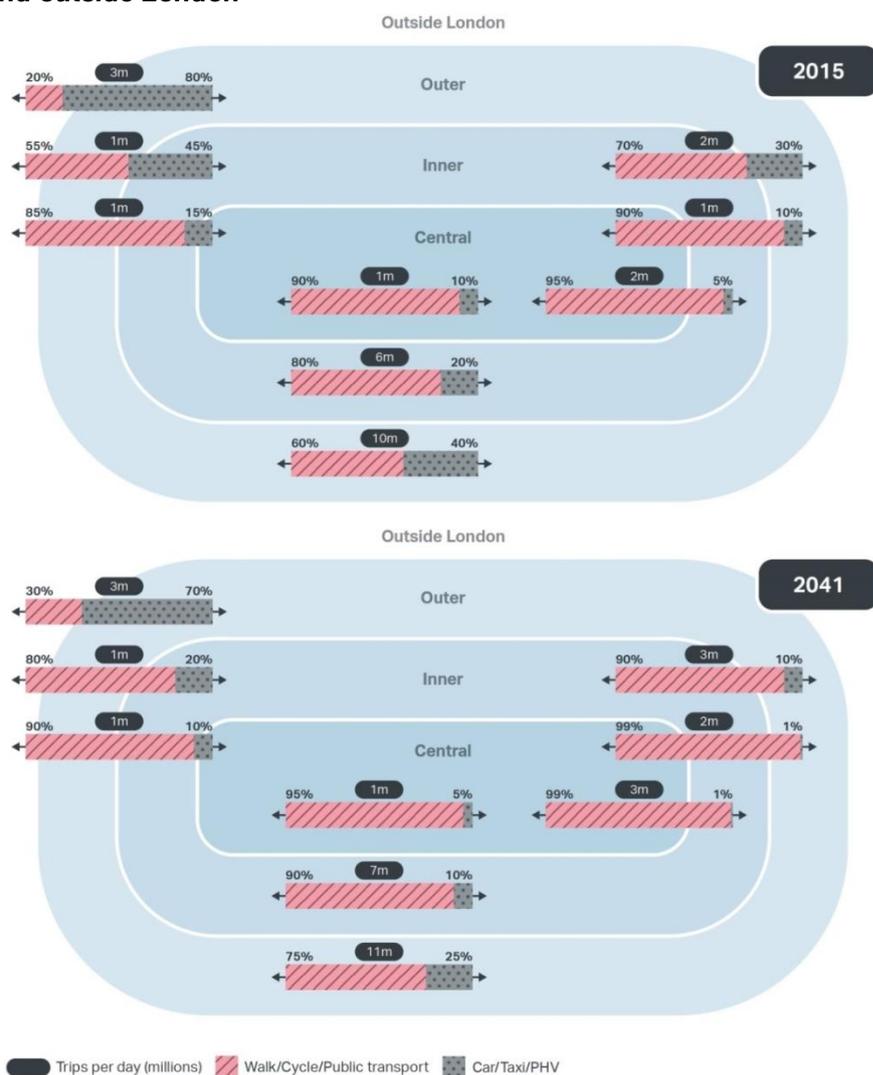
2.2.2 Employment growth means that travel on all rail modes is forecast to increase by more than 50 per cent by 2041, exacerbating crowding on radial routes into central London. Most people travelling on crowded parts of the network have limited scope to change their travel patterns. Therefore providing additional capacity is essential to tackle crowding and cater for the forecast growth in London’s population and employment.

2.3 The mode shift challenge: Action is needed to improve public transport connectivity in outer London to achieve the MTS aims

2.3.1 The mode shift challenge is greatest outside of central London. As shown in Figure 8, a high majority of London trips take place in inner and outer London, and this is where car mode share is highest.

2.3.2 Public transport has a vital role in reducing car use for these trips, as it can be competitive with the car over longer distances, but in many cases it is not yet realising this potential. Improving public transport connectivity in inner and outer London, particularly to town centres and other regional trip attractors, is critical for the delivery of the public transport, environment and growth outcomes of the MTS.

Figure 8: Current and forecast mode share for travel within and between central, inner, outer and outside London



Source: Mayor's Transport Strategy 2018

2.3.3 As shown in Table 3, the South sub-region is the most car dependent in London. Car ownership is also the highest out of London's five sub-regions by a substantial margin, nine per cent higher than the second ranked sub-region (West sub-region). Car dependency means the sub-region has the lowest active, efficient and sustainable mode share in London, at only 54 per cent.

Table 3: Car ownership and active, efficient and sustainable mode share by sub-region

Sub-region	Car ownership	Active, efficient and sustainable mode share
South	70%	54%
West	61%	57%
North	59%	58%
East	56%	63%
Central	37%	83%

Source: LTDS (2014/15 – 2016/17)

2.4 The housing and economic challenge

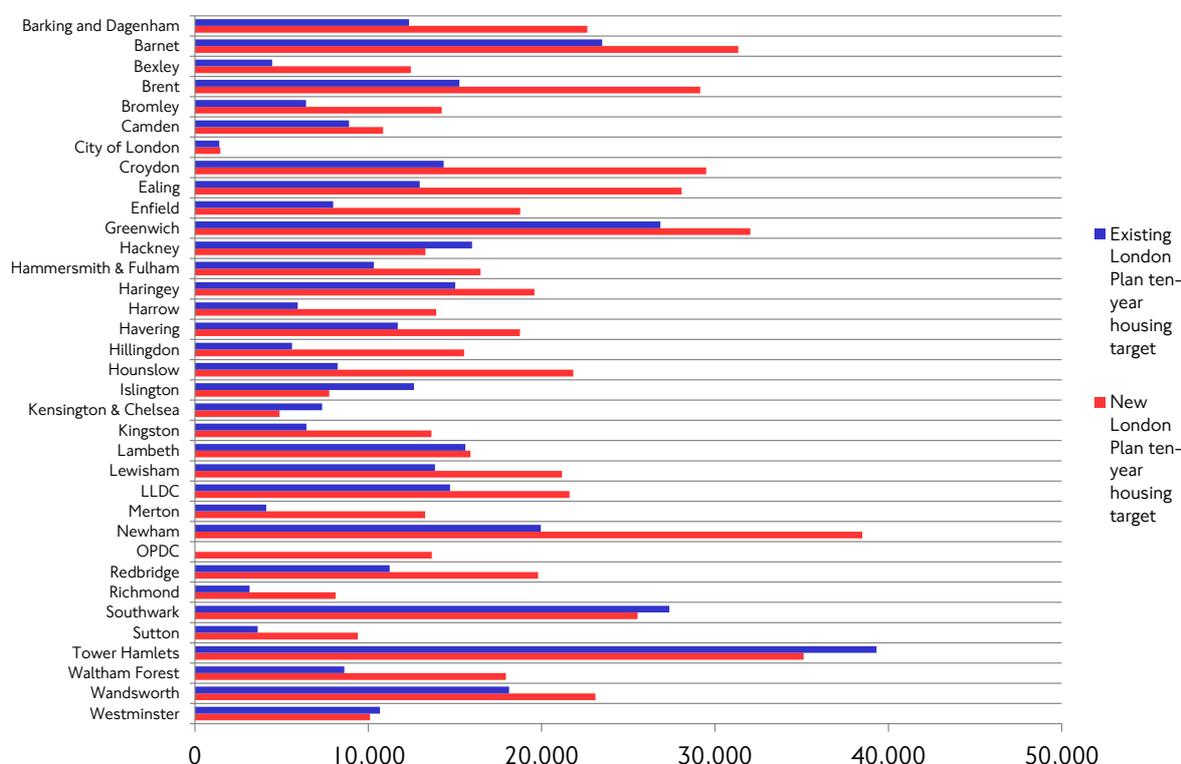
- 2.4.1 Housing affordability has reached a critical point in London and the wider South East. The average house now costs half a million pounds, which is more than 12 times the median income of Londoners, and is the highest the ratio has been seen since records began.
- 2.4.2 This has resulted in a range of social problems, such as overcrowding, poor health, increasing inequality, and is also affecting the Capital's economic competitiveness. London is already the most expensive place to accommodate a new worker, according to combined analysis of residential and office rental costs⁹. London's economy relies on its ability to recruit and retain talented staff. But increasingly the high cost of housing is affecting recruitment with half of London's businesses finding that housing costs and availability are already having a negative effect on the retention of entry-level staff¹⁰. In short, if we don't address London's housing crisis, the health of the national economy will suffer.
- 2.4.3 To accommodate the expected rate of population growth, the London Strategic Housing Market Assessment identifies that the Capital needs to deliver 66,000 new homes every year between now and 2041. In 2017/18 40,000 new homes were built. This is the highest rate of delivery for over 40 years, but is still well short of the number required to meet demand.
- 2.4.4 Because rail is so critical to accessing employment in London and the wider South East, people want to live close to stations with excellent rail services. This means that excellent quality rail is fundamental to delivering the step change in housing delivery required.
- 2.4.5 But over the past 15 years, south London boroughs have delivered much lower numbers of housing units compared to other parts of the Capital (see Section 5), held back by a rail network which has lower frequencies and poorer reliability, which has in turn depressed prices and made developers less likely to build.
- 2.4.6 The draft new London Plan recognises that all boroughs will need to significantly increase housing delivery to meet the Capital's need, particularly boroughs in outer south London. As a result, housing targets have now more than doubled in most outer south London boroughs (see Figure 9). These are areas where new homes can be delivered for market sale at mid-market prices, and where small scale intensification and redevelopment will form an important part of the total supply of homes, but where the constraints of poor rail services are holding back delivery.

⁹ Savills, where is the world's most expensive city to live and work? March 2016

¹⁰ Moving Out (London First 2015)

2.4.7 Addressing the poor levels of frequency, reliability and quality on the national rail network is therefore critical to increasing housing supply.

Figure 9: London Plan ten-year housing targets



Source: Draft New London Plan

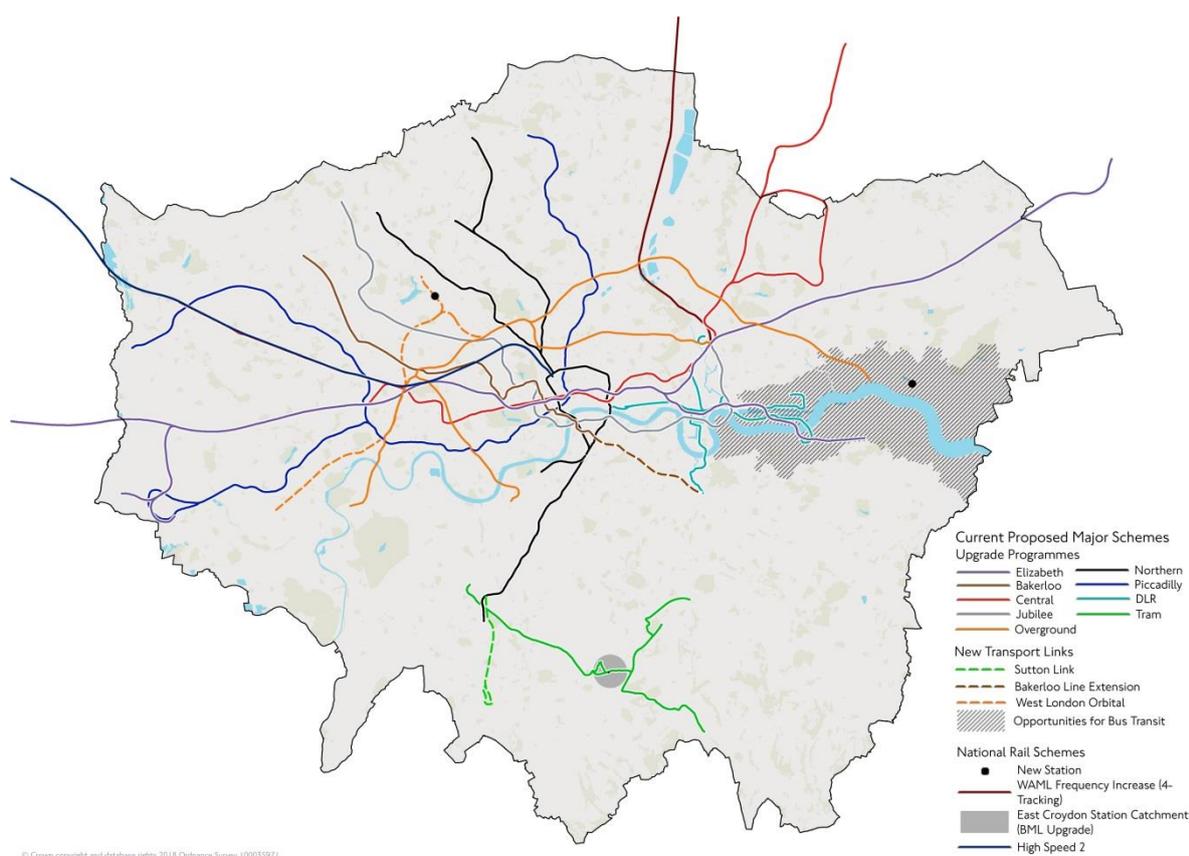
2.5 Planned schemes

2.5.1 Any intervention to the transport network will take place in the context of the delivery of the wider package of measures outlined in the MTS. As shown in Figure 10, key changes to the London public transport network are planned between 2020 and 2030, but mainly focused north of the River Thames.

2.5.2 With the exception of the Bakerloo Line Extension, and Docklands Light Rail (DLR) extensions at the northern part of the sub-region, and capacity increases at East Croydon arising from upgrades to the Brighton Main Line, there are limited major interventions planned for south and south east London in the medium to long-term (2020s) when compared to north London. This underlines the need for a transport intervention on the south and south east London rail network to address the challenges outlined above.

2.5.3 In the longer-term (2030s onwards), Crossrail 2 will be the primary new infrastructure scheme in south London, providing a step-change in capacity along the south west corridor, delivering connectivity from the south west through central London and beyond, and unlocking housing along the route. This scheme will enable the rail network in south west London to function more effectively.

Figure 10: Major planned and proposed schemes 2020 – 2030 ¹¹



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Schemes as listed in MTS Implementation Plan

2.5.4 Crossrail 2 is proposed to run on the south west rail network, south of Wimbledon, and will in turn unlock capacity on the rest of the network. For this reason, large-scale changes to the south west rail network are not considered in this Strategic Case, but the interface between this network and the south central and south east networks remains in scope, particularly from the customer perspective.

2.6 The opportunity: There is substantial underutilised capacity on the National Rail network in south and south east London

2.6.1 We need to make the most of existing assets to address these challenges. Building new rail lines is capital-intensive and requires long lead-in times covering planning, design, consents, construction and testing. The investment required to leverage the existing network to provide better outcomes would typically be lower than that needed to build a new line.

¹¹ As described in MTS Implementation Plan. Not all schemes are funded.

- 2.6.2 However, there is substantial underutilised capacity on the National Rail network that could be released at relatively low capital cost. London's transport network coverage is excellent in terms of both its length and number of stations.
- 2.6.3 Of 23 cities surveyed by the European Metropolitan Transport Authority, only Turin has a denser metro and rail network, and only Budapest has denser station coverage¹². Despite these advantages, in south and south east London its potential is held back by the poor service provided on the rail network.
- 2.6.4 It is therefore essential that we make the most of existing assets by optimising service patterns and integrating operating models. London's rail network is comprehensive geographically, but falls short in terms of connectivity outcomes in many places, in the south and south east in particular. Redesigning services and unlocking capacity at bottleneck junctions would cost significantly less than building new lines from scratch, avoid the unintended consequences of extending lines already at operating at capacity, and deliver benefits for users across the wider South East rail network. This forms the basis of the case for metroisation (as described in the following section).

2.7 Metroisation is a change in approach for rail service provision and network design

- 2.7.1 Metroisation refers to service provision and service structure within a franchise, including associated infrastructure improvements (e.g. increased frequency, grade separated junctions). It encompasses a change in approach for rail service provision and network design, through integration of stopping services that operate within (and just beyond) the London boundary, into a single network delivering seamless transfers, increased passenger capacity and improved customer outcomes. The Mayor of London's ambitions for metroisation are set out in Proposal 65 of the MTS:

'The Mayor, through TfL, will work with Network Rail, train operating companies and stakeholders to seek the modification of the planning of local train services from Moorgate, Victoria and London Bridge to create a London suburban metro, offering improved frequencies, journey times and interchange opportunities by the late 2020s'.

¹² <http://content.tfl.gov.uk/csopp-20170713-part-1-item12-tfl-international-benchmarking-report.pdf>

2.7.2 **Metroisation** has six key elements:

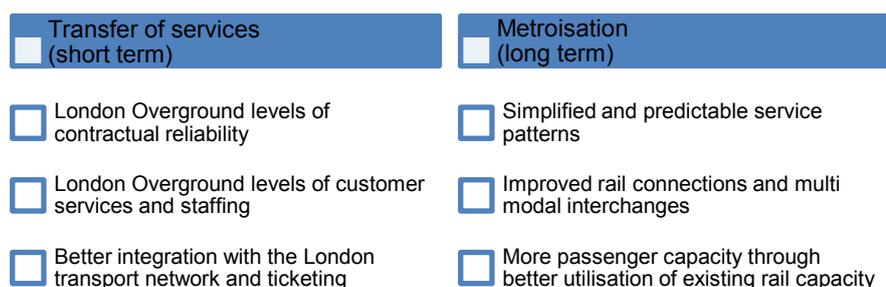
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3. **More capacity**, delivered through longer trains and relieving bottlenecks
4. **Shorter journey times**, supported by trains that accelerate and decelerate faster, and have wider doors so that boarding and alighting is more efficient
5. **A more reliable service**, arising from simplified service patterns that reduce conflicts at junctions
6. **Better customer service and experience**, similar to the benefits delivered by transferring services to London Overground

2.7.3 Delivering these elements will require a fundamental change to the way the network is planned and run. This means moving from the prevailing industry-focussed approach to a broader, ‘whole transport network’ view that considers the impact of rail services across the communities they serve alongside the efficient operation of the railway.

2.7.4 The benefits of metroisation would be realised in the longer-term. In the short-term, transferring local stopping service in London could bring about better reliability, improved off-peak frequencies, more welcoming stations, all day staffing, better integration with buses and other transport modes and turn-up-and-go services. The Mayor of London’s plans for the transfer of services are set out in Proposal 66 of the MTS.

2.7.5 The transfer of local rail services to TfL is not strictly necessary to deliver metroisation (see Figure 11). Most of the tools described in this Strategic Case could theoretically be delivered by operators contracted to the DfT, and enshrined through DfT’s franchising process. However, the transfer of services would make metroisation much more likely and much easier to achieve.

Figure 11: The relationship between short-term interventions (transfer of services) and long-term interventions (metroisation)



3 The case for change 1: The south and south east London public transport network is not delivering to its full potential

3.1 South London is more dependent on National Rail services than other sub-regions

3.1.1 As shown in Table 4, south London has the highest mode share for rail trips outside of central London (6.9 per cent). East London (which includes LB Bexley, LB Greenwich and LB Lewisham) has a rail mode share of 5.2 per cent. In contrast, the north and west sub-regions, which lie entirely north of the river, have rail mode shares of less than three per cent. Limited Tube coverage south of the river is reflected by a Tube/DLR mode share of only 2.5 per cent for south London, substantially lower than all other sub-regions.

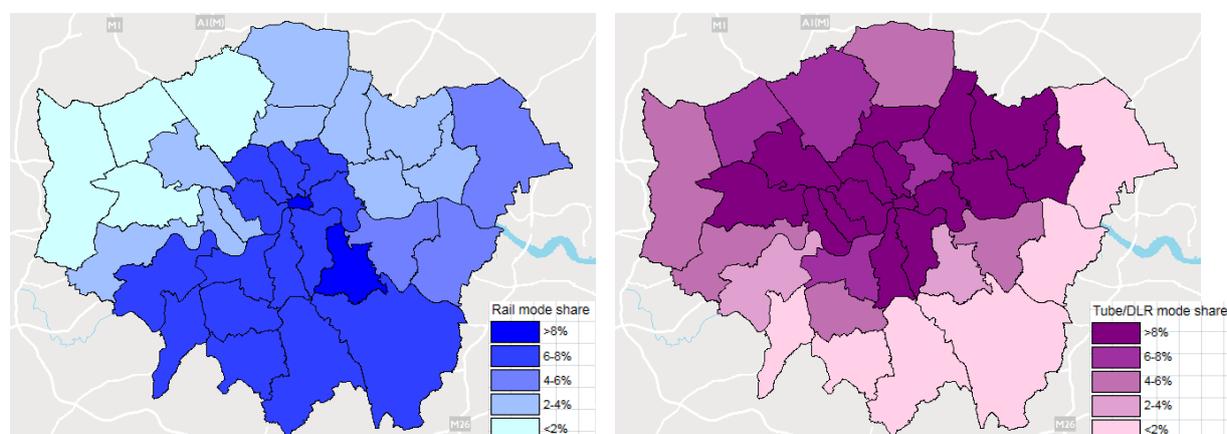
Table 4: Mode share by London sub-region

London sub-region	Rail	Tube /DLR	Bus /tram	Taxi /other	Car/moto rcycle	Cycle	Walk
Central Sub-region	7.7%	17.8%	15.7%	2.6%	14.8%	3.6%	37.8%
South Sub-region	6.9%	2.5%	12.2%	0.9%	45.5%	2.8%	29.3%
Greater London	5.3%	9.4%	14.3%	1.5%	34.3%	2.7%	32.5%
East Sub-region	5.2%	8.5%	14.8%	1.2%	36.0%	2.5%	31.8%
North Sub-region	2.5%	6.8%	14.5%	0.8%	40.8%	1.6%	32.8%
West Sub-region	2.3%	8.7%	14.1%	1.4%	41.4%	2.3%	29.8%

Source: LTDS 2014-2017 (trip origin borough)

3.1.2 The southern parts of LB Lambeth and LB Southwark are also highly dependent on rail, as there is limited Tube coverage within these boroughs, beyond the Central Activities Zone (CAZ) boundary. Similarly, RB Greenwich and LB Bexley have higher rail mode share than neighbouring boroughs on the opposite side of the river, as Tube and DLR coverage is limited to the north western part of RB Greenwich (see Figure 12).

Figure 12: Rail and Tube/DLR mode share by borough origin

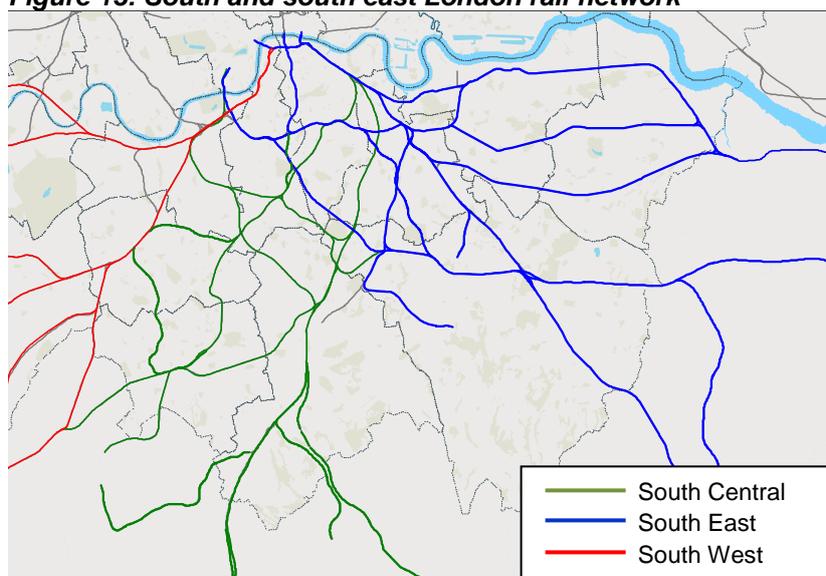


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Source: LTDS 2014-2017

3.2 National Rail in south London has been developed in a piecemeal way

3.2.1 The south and south east London rail network consists of the Brighton Mainline, South East Mainline, Chatham Mainline associated branch lines. Operations are split between two franchises: Thameslink Southern Great Northern, which serves the south central network, and Southeastern, which serves the south east network. As shown in Figure 13, the south central network (in green) intersects the south west network (in red) at Clapham Junction and Wimbledon, as well as just outside London at Epsom.

Figure 13: South and south east London rail network



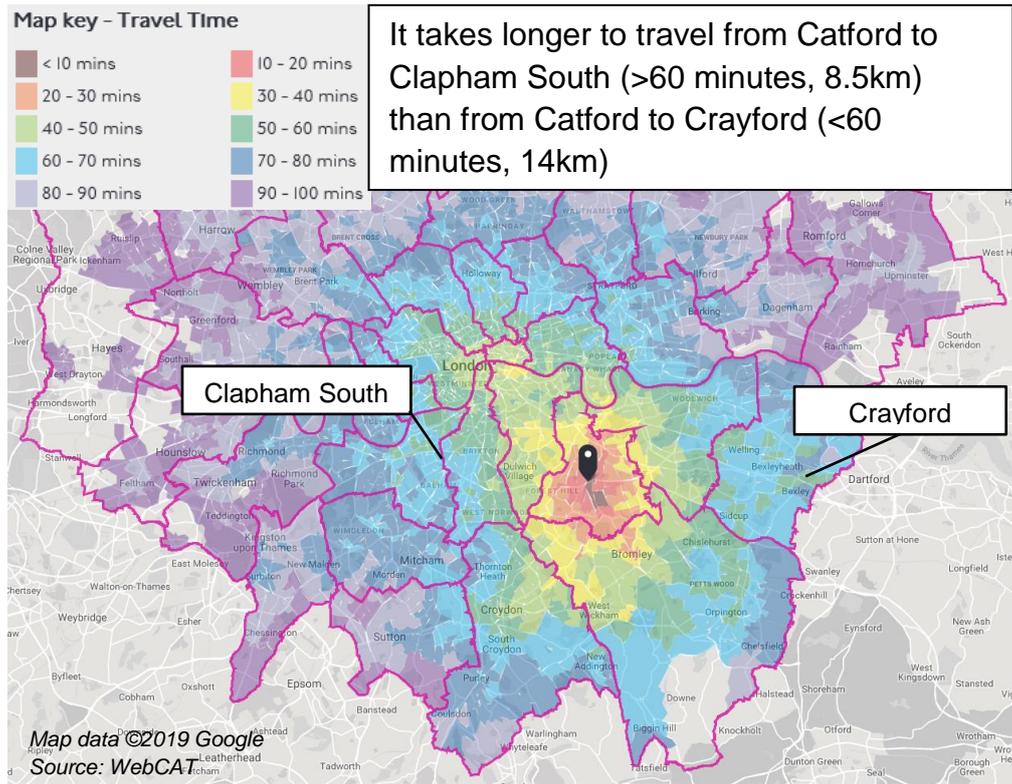
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3.2.2 In 2017/18, there were 51 million journeys on Southern Metro and 81 million journeys on Southeastern Metro services, accounting for 275 million and 578 million passenger miles respectively.

3.2.3 Historically south and south east London's heavy rail network was developed in a piecemeal way by competing entities. This led to the establishment of operational networks which were essentially separate. The piecemeal development of the south London rail network means there are limited opportunities for interchange between the south central and south east networks outside of the central London termini, despite the networks intersecting each other at several points (e.g. Brockley). Even within the south central network there are points where lines intersect without any interchange being provided (e.g. Brighton Mainline and Sutton & Mole Valley line between Streatham and Streatham Common).

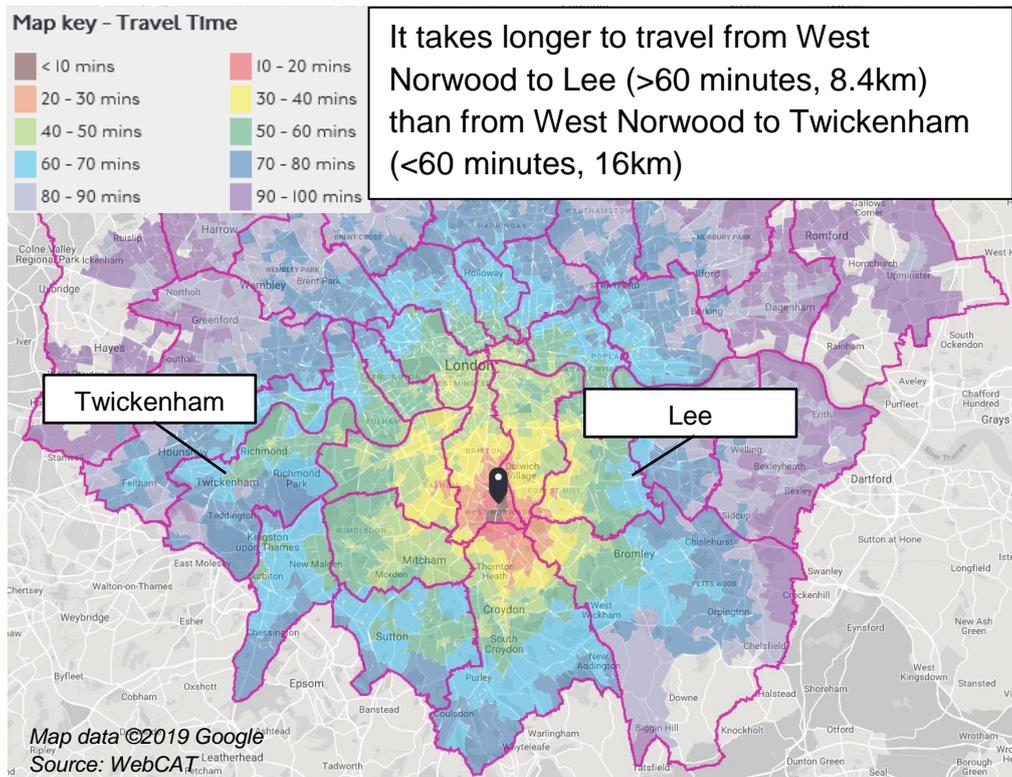
3.2.4 This results in large disparities in journey times for trips requiring the use of different networks. As shown in Figure 14, it takes longer to travel from Catford to Clapham South than to Crayford, despite the latter being nearly twice the distance.

Figure 14: Public transport journey times from Catford (AM peak)



3.2.5 Similarly, as shown in Figure 15, it takes longer to travel from West Norwood to Lee than to Twickenham.

Figure 15: Public transport journey times from West Norwood (AM peak)



3.2.6 In many cases, the fastest journey times require travel via busy central London termini. This adds further demand to the most capacity-constrained parts of the network.

3.2.7 The rail network is planned independently of the rest of London’s public transport network, as ultimate responsibility has historically not been held by the city’s strategic transport authority (TfL). This means that the network has tended to be planned with a focus on efficient train operations rather than the whole journey for customers and the city-region economy. This exacerbates the issues described above, as services are not always designed in a way that maximises synergies with the wider public transport network.

3.3 National Rail in south London is performing poorly

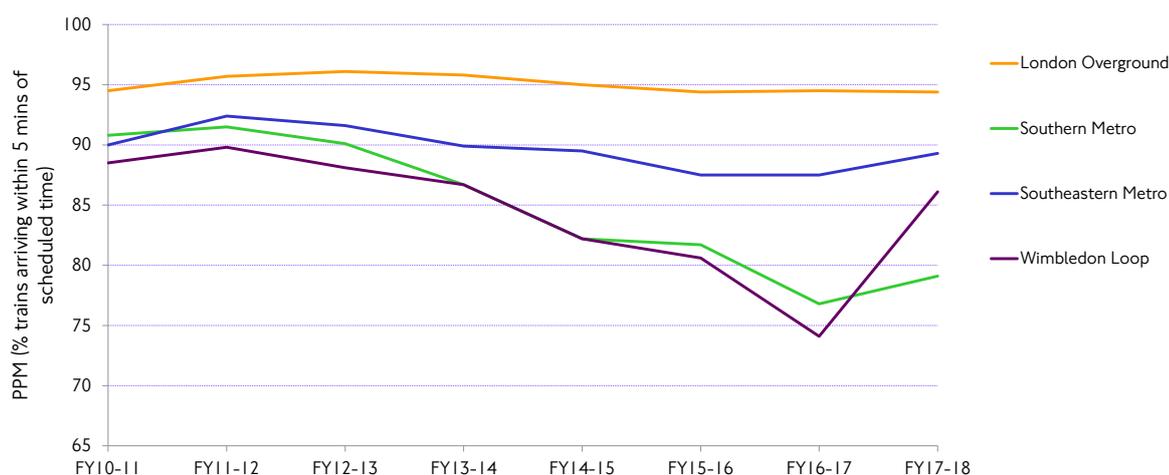
3.3.1 Southern and Southeastern rail services consistently perform worse than London Overground services on three key metrics described below.

3.3.2 This data shows that the reliability of National Rail services in south London is poor. Conversely all the London Overground services have consistently offered a reliable and timely service since they began running.

Public Performance Measure (PPM)

3.3.3 Public Performance Measure (PPM) is the percentage of trains which arrive within 5 minutes of their scheduled time. London Overground has consistently achieved high PPM scores, with an average of 95 per cent between 2010/11 and 2017/18 (see Figure 16). Conversely, Southern and Southeastern rail services have had significantly lower PPM scores over the same period.

Figure 16: PPM scores for London Overground, Southern, Southeastern and Wimbledon Loop

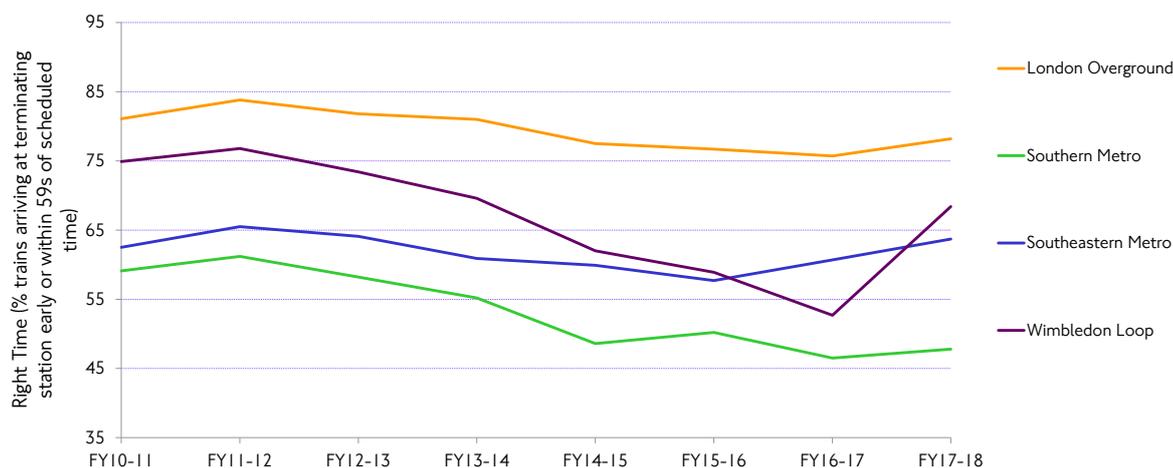


Source: Created using data from ORR data portal

Right time

3.3.4 Right Time measures the percentage of trains arriving at their terminating station either early or within 59 seconds of the scheduled arrival time. Figure 17 shows again that Southern and Southeastern services are significantly and consistently less reliable than London Overground services.

Figure 17: Right Time data for London Overground, Southern, Southeastern & Wimbledon Loop



Source: Created using data from ORR data portal

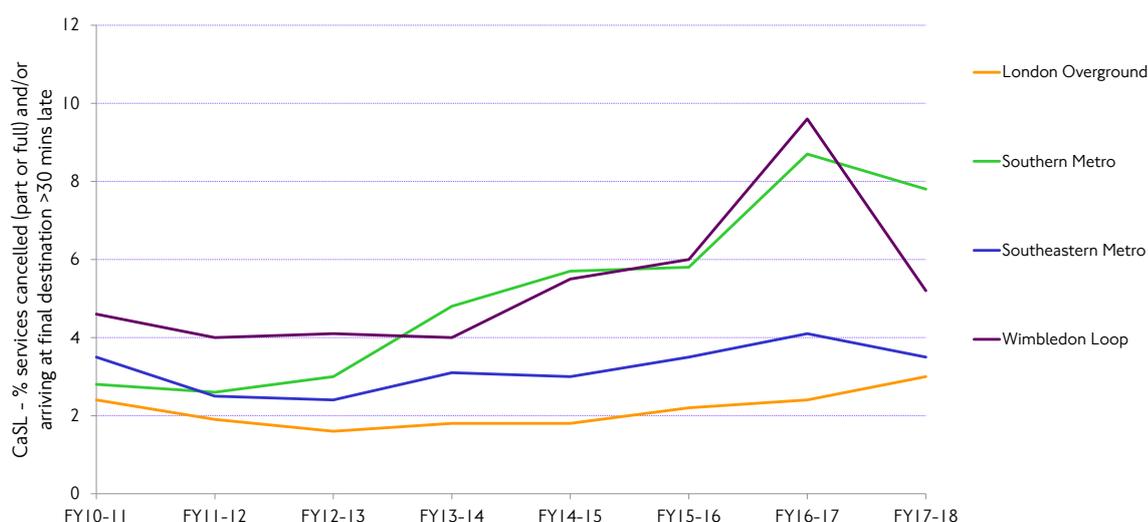
3.3.5 In the period between 2010/11 and 2017/18 London Overground had an average of 80 per cent of all trains hitting the Right Time measure, whereas Southeastern only achieved this for 62 per cent of mainline and metro services. Southern services performed even worse, with only 53 per cent of mainline services and metro services arriving before or within 59 seconds of the scheduled arrival time.

Cancelled or Significantly Late (CaSL)

3.3.6 The percentage of services that are cancelled or significantly late is a third measure of reliability. In this case a lower percentage indicates a more reliable service, and again London Overground has consistently performed better than Southern and Southeastern services in this measure (see Figure 18), with an average of only 2.1 per cent of all services cancelled or significantly late (CaSL) over the period 2010/11 to 2017/18.

3.3.7 Conversely, CaSL figures for Southern metro services have generally increased over the years, peaking in 2016/17 at 8.7 per cent. While this is somewhat inflated by the industrial action in 2016 which led to unprecedented cancellations and delays, Southern services were still not performing as well as London Overground before or after that time. Southeastern CaSL figures have remained more steady, but have still been consistently higher than London Overground.

Figure 18: CaSL data for London Overground, Southern, Southeastern & Wimbledon Loop



Source: Created using data from ORR data portal

3.4 National Rail rolling stock in south London is not tailored to provide an urban metro service

3.4.1 In addition to better reliability, the operation of London Overground services is also more efficient than other local stopping services in south and south east London. In large part this is due to the rolling stock which is used and enables more efficient boarding and alighting, and shorter dwell times in stations.

3.4.2 Table 5 illustrates this by comparing the characteristics and performance of current rolling-stock (e.g. Class 377 trains used on Southern services) against metro-style trains (e.g. S Stock trains). This shows that metro-style trains offer significant benefits over current rolling stock, as the carriages have a much higher overall capacity, and more and wider doors.

3.4.3 This means that more people are able to board and alight more quickly and easily on metro-style services than on Southern services. Where boarding and alighting can take place more quickly and efficiently, dwell times are reduced. This time saving is particularly important when stations and platforms are crowded.

Table 5: Rolling stock attributes: Class 377 (Southern) versus S Stock equivalent (metro-style)

Stock attribute	10 car Class 377 train (Southern)	S Stock equivalent train (metro-style)
Seats per train	600	459
Crush standing capacity	1400	1827
No. of doors per side	20	36
Width of doors (m)	1.3	1.6

3.4.4 The use of metro-style trains could offer a further time saving as the ‘static components’ (the time when the train is stopped in the platform but boarding and alighting are not taking place) are significantly lower. The ‘Journey Time Capability Model’ and dwell time survey data were used to forecast current and future dwell times for various stations on the Brighton Mainline line under ‘busiest train’ conditions.

3.4.5 As shown in Table 6, the use of metro-style trains could offer significant time savings at each station (between 16 and 43 seconds), as compared to current rolling stock. This would, in turn, enable a faster and more efficient service to be run on these routes.

3.4.6 For example, the current run time from West Croydon to Victoria (via Norbury) is about 34 minutes. Reducing dwell time could reduce total journey time by up to 4 minutes – a saving of 12 per cent.

Table 6: Dwell time analysis

Station	Boarding & Alighting time (seconds)			Total station stop time (seconds)		
	Class 377 (Southern)	S Stock equivalent train (metro-style)	S Stock saving	Class 377 (Southern)	S Stock equivalent train (metro-style)	S Stock Saving
Selhurst	27.0	21.4	5.6	49.7	33.3	16.4
Thornton Heath	37.7	27.4	10.3	60.4	39.3	21.1
Norbury	47.6	30.7	16.9	70.3	42.6	27.7
Streatham Common	62.0	34.9	27.1	84.7	46.8	37.9
Balham	67.5	38.1	29.4	90.2	50	40.2
Wandsworth Common	45.9	27.0	18.9	68.6	38.9	29.7
Clapham Junction	72.7	40.9	31.8	95.4	52.8	42.6
Battersea Park	48.3	28.6	19.7	71.0	40.5	30.5

Source: South London Overground – Southern dwell time analysis, February 2016¹³

3.4.7 On Southeastern services, Class 376 trains are used. These have an internal layout which is more metro-style than Class 377s, with large standback areas around the doors, and therefore differ less from metro-style trains.

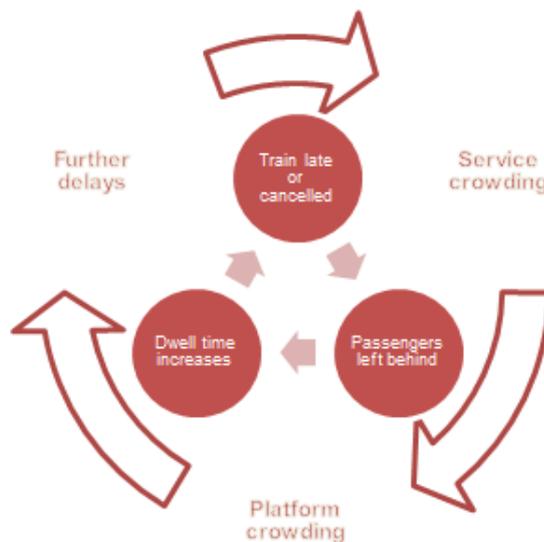
3.4.8 TfL customer insight surveys have shown that a reliable and frequent service is a key part of what customers expect from the Tube. We assume these factors would be similarly important for customers using other rail services. The above discussion shows that the current services are not consistently offering a reliable and frequent service, but metroisation of these lines would provide a significant improvement in these key areas.

¹³ Spreadsheet model using London Underground’s detailed understanding of how different elements of the train’s interior and exterior layout and performance affect its run and dwell times.

3.5 Poor performance and inefficient operational design creates a vicious circle

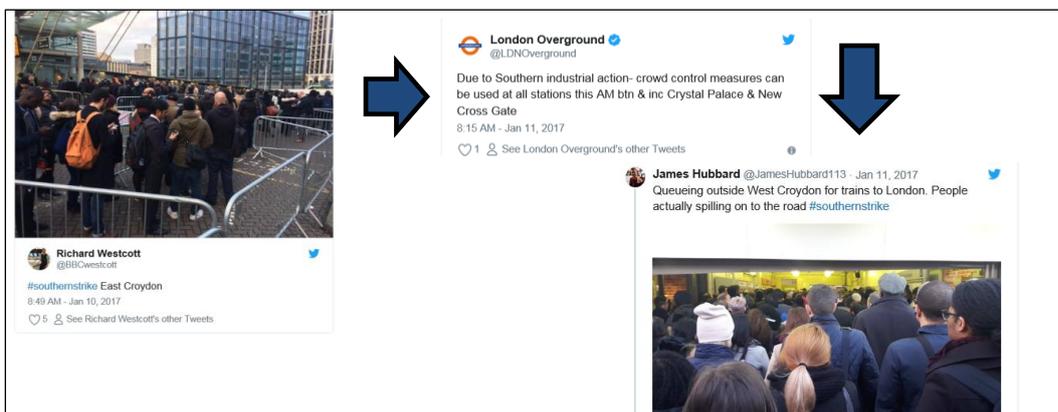
3.5.1 When services are unreliable and not operating as efficiently as they could, crowding at stations increases. This is exacerbated when train services are cancelled or arrive significantly late. When this happens a vicious circle is created. Delayed trains are often crowded as passenger volumes have built up at stations along the route. This increases dwell times and also results in passengers being left behind, adding to the problem for later trains. The delays incurred from increased dwell times then cause the cycle to continue (see Figure 19).

Figure 19: Reliability and crowding vicious circle



3.5.2 Furthermore, crowding at stations due to a poor service from one operator, leads to a worse experience at stations for users of other services. For example, during the Southern Railway strikes in January 2017, passengers tried to use London Overground services in the absence of Southern services. This led to severe overcrowding which resulted in passengers waiting outside stations and some stations (including Crystal Palace, New Cross Gate, Forest Hill and West Croydon) being closed during the morning peak (see Figure 20).

Figure 20: Spread of disbenefits from Southern network to London Overground



3.6 Poor performance and poor level of service affects customer decisions

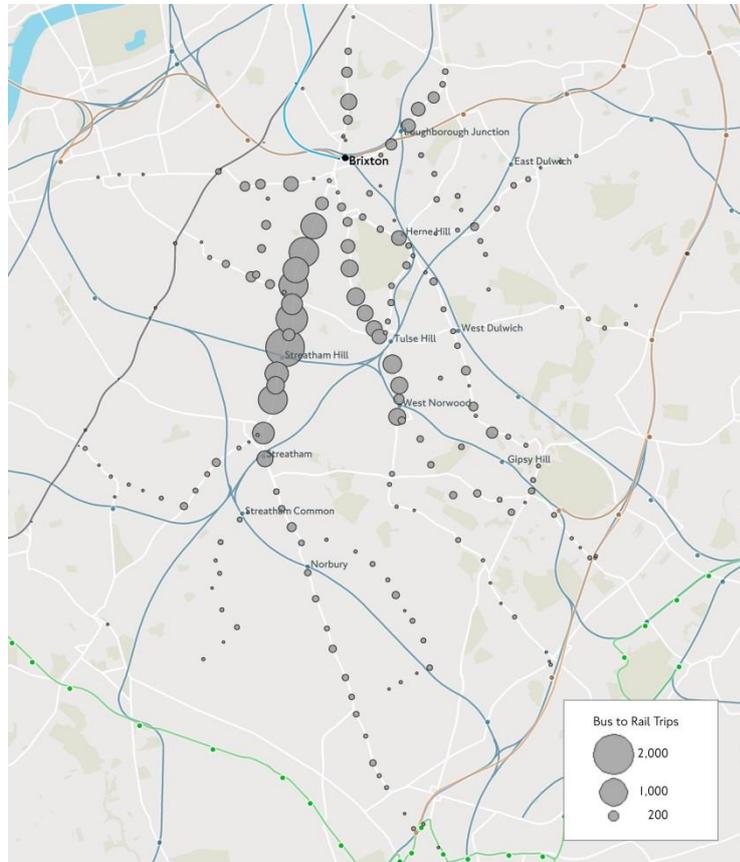
3.6.1 When service is unpredictable, customers avoid using their local station. As a result of a lack of reliability and inefficient operation of the south London National Rail network, many south Londoners travel by bus to access their nearest Tube or DLR station. In some cases this results in customers passing National Rail stations which could be used to reach their final destination, in order to access stations on the Northern, Victoria and Jubilee lines which provide a more frequent and reliable service.

Brixton Tube catchment

3.6.2 Brixton Tube station has the highest volume of bus to rail trips on the network. It also has a large bus to rail catchment, covering a significant amount of south London (see Figure 21). The average distance travelled to access the station is 2.4km, 1km higher than the London-wide bus to rail average.

3.6.3 Bus trips are particularly high along the A23 corridor, with customers travelling past rail stations at Streatham and Streatham Hill to access the Tube at Brixton. A large number of trips also originate in Norwood and Tulse Hill, despite both of these having rail stations providing links to a variety of central London termini including Victoria and London Bridge.

Figure 21: Bus-to-Tube journeys (Brixton station, 2 October 2017)



There are 27,000 bus trips to Brixton Tube station each day; the origins of these trips and total daily trips by origin bus stop are shown in Figure 21. Some of these trips originate in locations as far as Crystal Palace, almost 6km away.

This results in a significant amount of south London bus capacity being used as feeders to Underground stations, for example:

- The bus stop where the highest trip numbers originate is Streatham Hill station, with **almost 2,000 trips a day**, equivalent to **26 double-decker bus loads**.
- Each day **33 double-decker bus loads** of Londoners living within a 10 minute walk of West Norwood station use a bus to access Brixton Tube station, as opposed to using their local service.

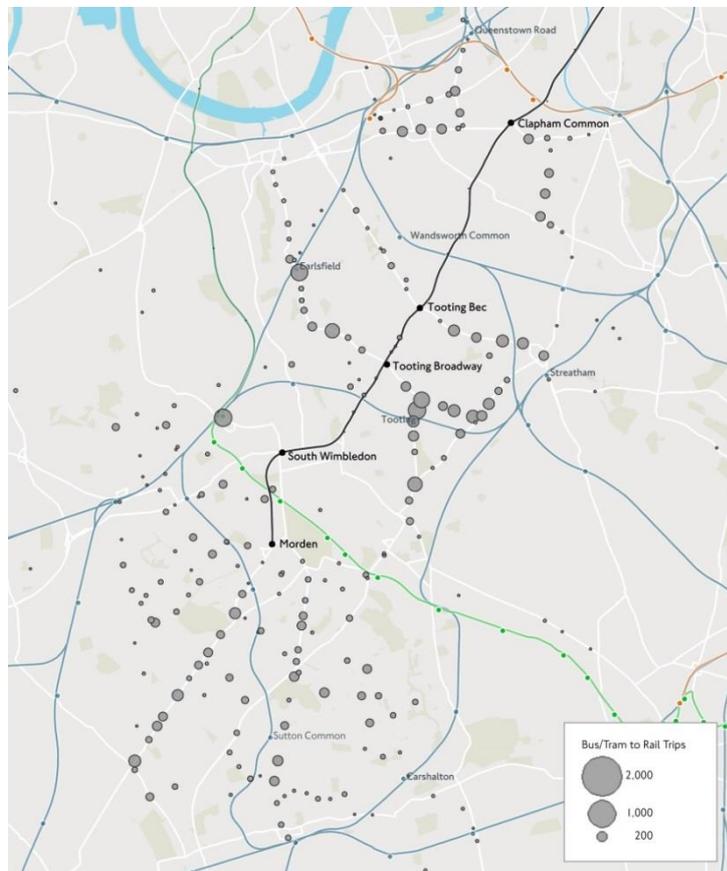
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Source: Oyster data

Northern line catchment

3.6.4 The Northern line catchment attracts largely orbital bus links, with customers moving away from radial rail corridors to access the Tube. Morden also has a large bus to rail catchment to the south (see Figure 22). Customers travel past stations on the Wimbledon Loop to access higher frequency and more reliable services at Morden.

3.6.5 Additionally, from Earlsfield and Streatham customers travel to Tooting Broadway instead of using more local South West Rail and Southern services to access central London. The highest numbers of trips are to Oxford Circus, which could be facilitated on the rail network by changing at Vauxhall (from Earlsfield) or Elephant & Castle (from Tooting).

Figure 22: Bus-to-Tube journeys (Northern line, 2 October 2017)



The number of people boarding a bus to access the Northern line each day, from the trip origin bus stop.

There are almost **22,000 bus-to-Tube trips a day** to stations on the Northern line south of Stockwell, the highest numbers of these trips are to Morden (7,100) and Tooting Broadway (6,100). A large proportion of these trips originate close to, or pass, National Rail stations. These include:

- **1,170 people** each day travelling from bus stops within walking distance of Earlsfield Station, or past Earlsfield station, to access the Northern line at Tooting Broadway.
- **5,000 people** each day travelling by bus from, or past, stations on the Wimbledon Loop, to access Northern line services at Morden.

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Source: Oyster data

North Greenwich Tube catchment

3.6.6 North Greenwich Tube station has the third highest daily number of bus to Tube trips, after Brixton and Stratford. This catchment is also larger than most other Tube stations, with customers travelling on average 2.7km by bus to access North Greenwich, compared to an average bus to rail trip length of 1.4km.

3.6.7 Stratford and Canary Wharf are the final destinations for the highest proportion of these trips, which is expected due to the access the Jubilee line provides to east London from south east London. However, when Jubilee line destinations east of Canada Water are taken out (Canary Wharf, Canning Town, West Ham and Stratford), the bus to rail catchment remains large (see Figure 23).

Figure 23: Bus catchment to North Greenwich station and final trip destination (excluding trips to Canary Wharf, Canning Town, West Ham and Stratford)



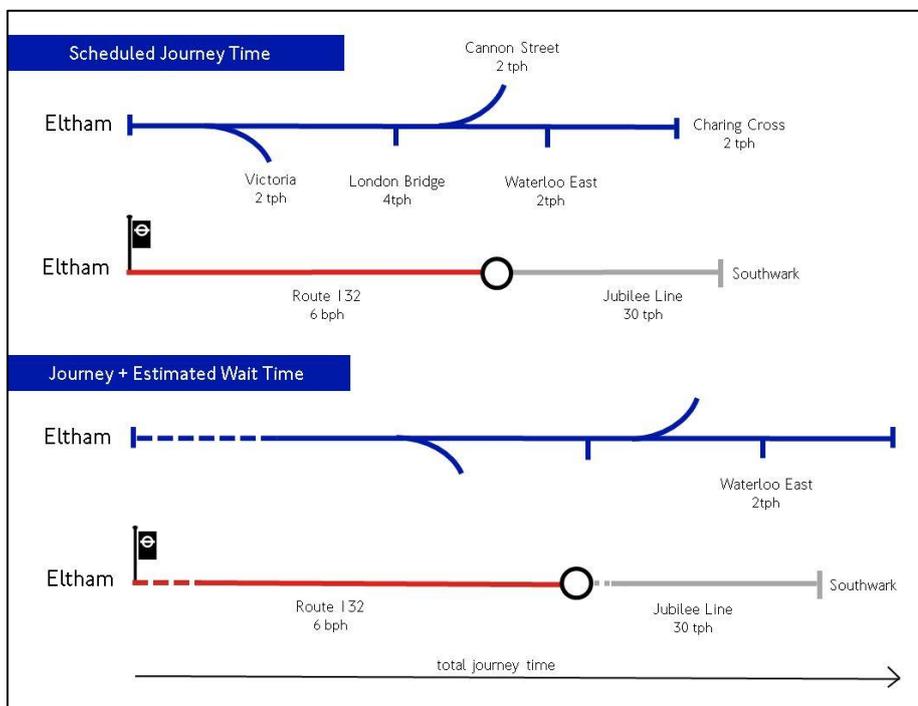
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Source: Oyster data

3.6.8 West of Canada Water, London Bridge and Waterloo are the final destinations with the highest number of trips, accounting for 1,000 bus trips to North Greenwich a day each, despite these destinations also being served from stations on the Southeastern network. Customers travel past stations at Eltham, Kidbrooke and Charlton to access the Tube at North Greenwich.

3.6.9 An analysis of stopping patterns and destinations at these stations provides an explanation for this. From Eltham, there are 2 trains per hour (tph) to Charing Cross, Cannon Street and London Victoria, which provides a 2tph service to Waterloo East and 4tph service to London Bridge. From Charlton, there are 4tph to Cannon Street and 2tph to Charing Cross, providing a 2tph service to Waterloo East and 6tph service to London Bridge. Additionally, there are 2tph through the Thameslink core serving Blackfriars and St Pancras. As exemplified through these service patterns, there are few destinations that are served by a ‘turn-up-and-go’ service, thus many customers in south east London choose to travel longer distances to a more frequent service at North Greenwich Tube station.

3.6.10 Figure 24 demonstrates the trade-off customers must make. While the journey from Eltham to Southwark takes less time on a Southeastern service, taking a bus to North Greenwich poses a quicker option when estimated wait time is factored in. As the train service is only half-hourly, the estimated wait time is 15 minutes, resulting in a total journey time of 41 minutes. By bus, the estimated wait time is five minutes and one minute for the tube, meaning a total journey time of 37 minutes. Therefore, travelling by bus and Tube is a more attractive option due to the low frequency of the direct National Rail service.

Figure 24: Eltham – Southwark journey options



3.6.11 This adds demand to some of the most congested links on the Tube network between Canary Wharf and London Bridge, contributing towards passengers being left behind and the activation of station control measures at stations such as Canada Water.

3.6.12 Modelling of a previous scheme for South Central metroisation¹⁴ showed a reduction in bus boardings of around 17,000 in the peak period, particularly on routes to Brixton, as rail services from local stations become more attractive. Tube boardings reduce by around 6,700, mainly between Brixton and Victoria on the Victoria line, but also between Canada Water and London Bridge on the Jubilee line and between Balham and London Bridge on the Northern line.

3.6.13 Modelling of a previous scheme for South Eastern metroisation¹⁵ showed similar reductions, with bus boardings dropping by around 16,000 in the peak period and Tube boardings dropping by 3,200 as rail services from local stations become more attractive.

3.6.14 A combination of the two scenarios, delivering metroisation across the entire south and south east London rail network together, could potentially deliver even more capacity benefits to the bus and Tube networks as the rail network takes on a more important role.

3.7 The consequences of this are felt beyond London

3.7.1 Commuters and businesses outside of London depend on the south London rail network. Between one third and one half of all London-bound commuter trips from districts bordering London to the south are made by rail with typically less than five per cent being made by bus. Given the fragmentation of the bus market, and lower bus frequencies compared to London more generally, driving tends to dominate even for short trips between adjacent districts on either side of the GLA boundary.

3.7.2 Rail is dominant for trips to central London. The scale of commuting to London means a significant proportion of residents are reliant on the south London rail network to get to work. In the cases of Elmbridge, Epsom & Ewell and Sevenoaks, more than one in five residents in employment are London-bound rail commuters (see Table 7).

Table 7: Rail commuters to London from wider South East

Origin district	Rail commuters to London	% of all residents in employment commuting by rail to London
Dartford	7,176	17%
Elmbridge	11,061	22%
Epsom & Ewell	6,141	20%
Mole Valley	3,988	13%
Reigate & Banstead	7,889	14%
Sevenoaks	9,302	22%
Spelthorne	3,004	7%
Tandridge	5,878	19%

Source: Census TTW 2011 (selected districts)

¹⁴ S5 model scenario

¹⁵ K5 model scenario

- 3.7.3 In some cases, communities in these districts are served directly by local stopping services which continue across the GLA boundary for a short distance. In others, they rely on fast and semi-fast services. These fast and semi-fast services serve other regional centres further afield such as Guildford, Brighton and the Medway towns, all of which see many commuters travel in both directions. All of these groups depend on the efficient operation of the south London public transport network to complete their journeys.
- 3.7.4 More generally, the rail network is vital for connecting town centres on either side of the London boundary. Towns such as Epsom, Ewell, Caterham and Dartford rely on rail as a public transport option to attract Londoners to their high streets and business parks, and to connect residents to jobs and services in outer London metropolitan centres.
- 3.7.5 The limitations of the south London rail network mean the wider South East public transport network is not delivering to its full potential. As shown in Table 8, districts in Surrey and Kent draw commuters from London, with over 10,000 London residents commuting to work in Dartford and Reigate & Banstead. However rail mode share is considerably lower for these movements than for commuters travelling in the other direction. In the cases of Dartford and Spelthorne, more people commute from London by bus than by rail.

Table 8: Commuters from London to wider South East

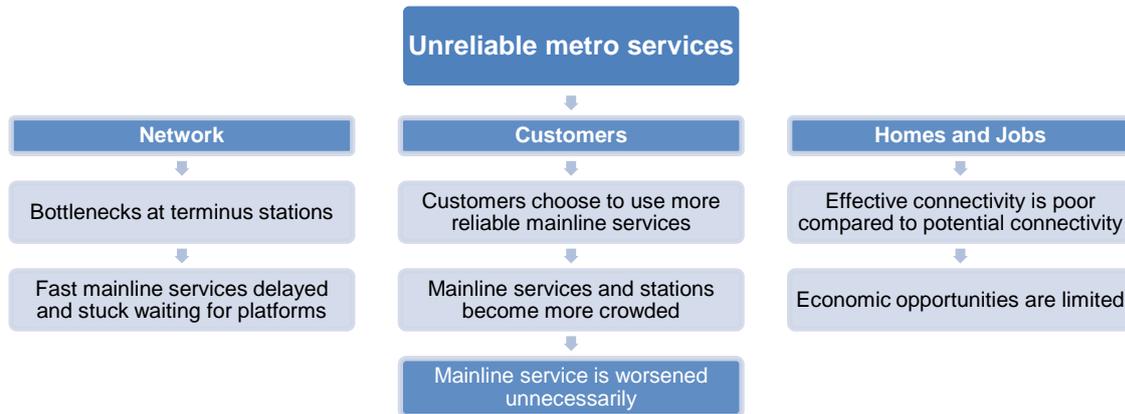
Origin district	Total commuters from London	Rail mode share	Bus mode share	Car mode share
Dartford	11,746	8.7%	13.4%	71.7%
Elmbridge	9,444	15.0%	7.0%	68.6%
Epsom & Ewell	8,013	17.8%	9.1%	64.9%
Mole Valley	6,075	22.9%	4.2%	66.3%
Reigate & Banstead	10,732	16.0%	8.4%	69.1%
Sevenoaks	5,768	8.2%	6.0%	81.0%
Spelthorne	9,197	13.3%	13.9%	64.1%
Tandridge	4,922	12.0%	11.3%	70.7%

Source: Census TTW 2011 (selected districts)

- 3.7.6 Rail is usually only competitive for cross-boundary trips where the origin and destination are directly connected, and rarely when interchange is required. Poor connectivity within the south London public transport network means that rail is not a viable option for many of these journeys, resulting in under-utilisation of services going out of London in the morning, and returning to London in the evening, and increased traffic congestion in outer London and town centres across the wider South East.

3.7.7 In a similar way to south and south east London as described above, non-Londoners are not getting the good public transport experience they need. The inconsistent reliability of Southern and Southeastern metro services has knock on impacts for mainline services. This means the disbenefits of a railway that is not delivering to its full potential are felt by customers across the wider South East.

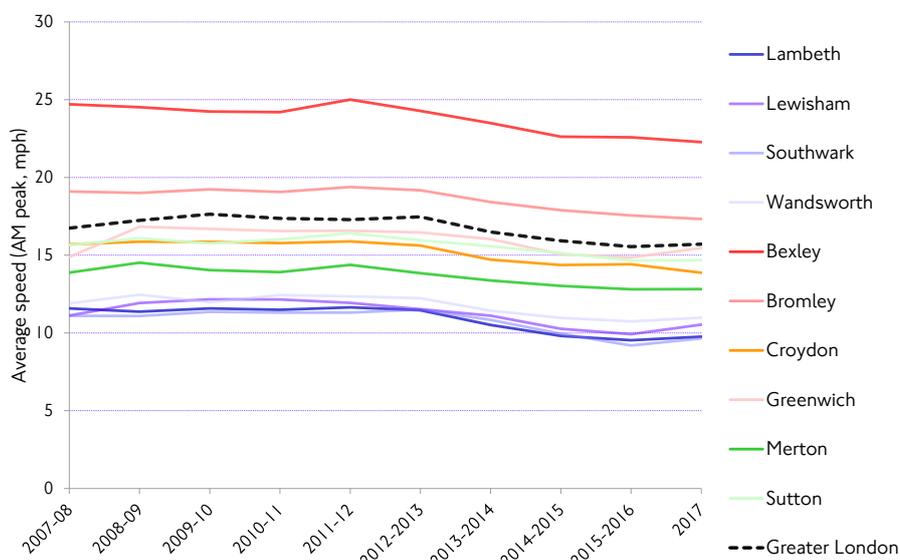
Figure 25: Knock-on negative impacts that a poor metro service has on mainline services.



3.8 The consequences of these issues are also felt across the wider transport network

3.8.1 The inefficiencies of the south London public transport network, and resultant car dependency, have knock-on effects on the efficiency of the road network. While average morning peak speeds in Greater London have increased modestly in the most recent year of data, speeds in LB Bexley, LB Bromley and LB Croydon have continued to decline, and speeds in RB Kingston, LB Merton and LB Sutton have remained flat. Over the longer term, speeds in LB Bexley, LB Bromley and LB Croydon have seen declines of over nine per cent since 2007, compared to an overall decline in outer London of 5.6 per cent.

Figure 26: Average speeds on road 'network of interest' (morning peak)



Source: Trafficmaster (2018)

3.8.2 Delay on the road network is detrimental to bus speeds and reliability, which in turn makes public transport a less attractive option, leading to more car dependency. It also affects overall public transport resource requirements, as more buses are required to maintain route frequency.

3.8.3 Furthermore, the customer behaviours outlined in Section 3.6 increase demand on the bus network. The extra buses required to mitigate traffic congestion combined with the additional bus capacity outlined in Section 3.6 result in a significant potential saving in bus operating kilometres. These buses could be better allocated to other parts of outer London to support metroisation and link housing to stations with increased frequency.

3.8.4 The inefficiencies of the rail network also have knock-on effects on the Tube network, as customers choose to travel by Tube rather than use their local rail station (see Section 3.6). On the Northern line, severe crowding occurs between Clapham Common and Stockwell during the morning peak hour. This leads to passengers being left behind and control measures being put in place at station entrances. If National Rail services in the area were more attractive to passengers, this could free up some space on the Northern line and improve journeys for all customers.

Figure 27: Crowding (pax per square metre), Northern Line, Northbound

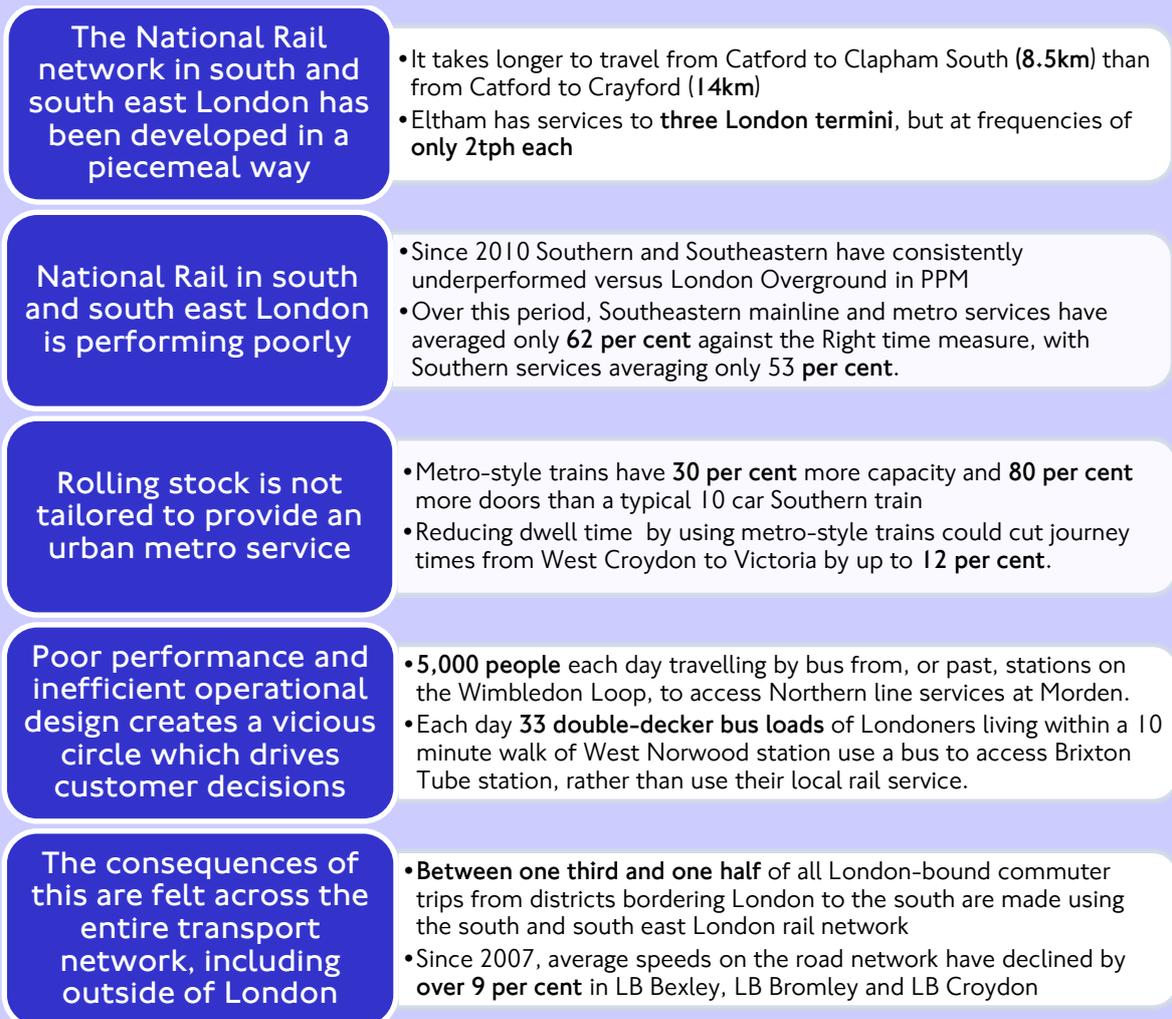
	0700-0715	0715-0730	0730-0745	0745-0800	0800-0815	0815-0830	0830-0845	0845-0900	0900-0915	0915-0930
MORDEN TO SOUTH WIMBLEDON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOUTH WIMBLEDON TO COLLIERS WOOD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLLIERS WOOD TO TOOTING BROADWAY	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
TOOTING BROADWAY TO TOOTING BEC	0.0	0.0	0.4	0.8	1.3	1.4	0.9	0.3	0.0	0.0
TOOTING BEC TO BALHAM	0.0	0.5	1.0	1.6	2.2	2.4	2.0	1.2	0.5	0.0
BALHAM TO CLAPHAM SOUTH	0.5	1.1	1.9	2.7	3.5	3.8	3.4	2.5	1.5	0.6
CLAPHAM SOUTH TO CLAPHAM COMMON	0.7	1.6	2.6	3.6	4.5	4.8	4.3	3.3	2.2	1.2
CLAPHAM COMMON TO CLAPHAM NORTH	1.0	1.9	3.0	4.1	5.0	5.3	4.9	4.0	2.9	1.7
CLAPHAM NORTH TO STOCKWELL	1.1	2.2	3.3	4.4	5.3	5.6	5.3	4.4	3.3	2.1
STOCKWELL TO OVAL	0.2	0.9	1.7	2.6	3.5	4.0	4.0	3.4	2.4	1.4

Source: TfL 2015

3.9 Summary findings

- 3.9.1 The south and south east London public transport network is not delivering to its full potential.
- 3.9.2 The rail network has been developed in a piecemeal way, and in a way that is not tailored to providing an urban metro service. Combined with poor operational performance on the rail network, this puts added pressure on the bus and Tube networks as customers seek alternative, more reliable options. The negative consequences of this are spread beyond London across the wider South East.
- 3.9.3 Metroisation provides an opportunity to address these challenges by reducing operational complexity, reducing conflict between slow and fast services, and changing the planning approach on the rail network.

Figure 28: The case for change: The transport network



4 The case for change 2: South and south east Londoners and customers from the wider South East are not getting a good public transport experience

4.1 South and south east Londoners experience a lower level of public transport service than the rest of London

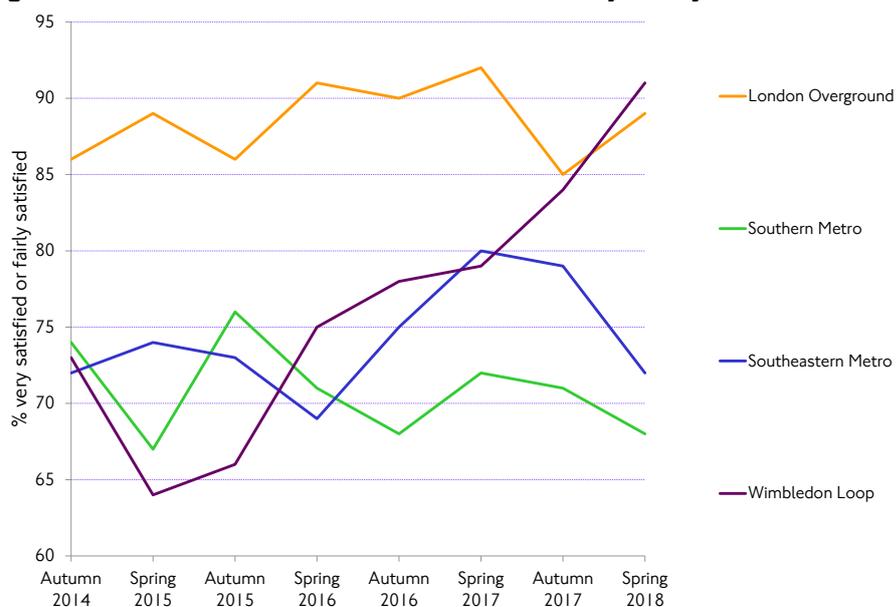
4.1.1 Customers consider the ease of making a journey, signage and wayfinding, and routine information (e.g. next train, how the service is running) as minimum requirements in a transport service. For the Tube, these expected features also include good reliability and service frequency¹⁶. The south London public transport network does not offer these features to an acceptable standard at many stages in the journey. The simpler, more reliable services provided by London Overground show that a good public transport experience can be achieved on the suburban rail network when the service provided is more metro-like.

4.2 South and south east London customers are less satisfied with their local rail service than London Overground customers

4.2.1 Customer satisfaction metrics show that customers using south London rail services are less satisfied than those on comparable London Overground lines, which mostly serve north London.

4.2.2 As shown in Figure 29, overall customer satisfaction on Southern and Southeastern metro services has consistently trailed that of London Overground services by 10-20 points since 2014.

Figure 29: Overall customer satisfaction with rail journey



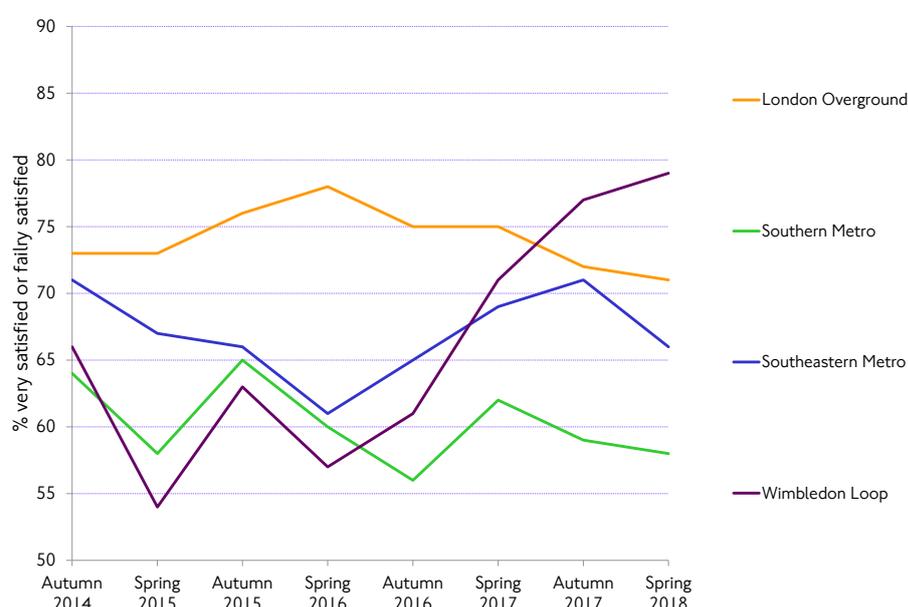
Source: NRPS

¹⁶ TfL Key Driver Analysis 2018, TfL Gain Points analysis, TfL reputation tracker, TfL Customer Satisfaction Surveys (and other surveys), Complaints analysis, Qualitative research

4.2.3 Over the same period Wimbledon Loop customer satisfaction has closed a gap that peaked at 25 points in spring 2015, exceeding London Overground satisfaction in the most recent survey wave. During this time new rolling stock better suited to metro-style operation was introduced and reliability was improved. This demonstrates the impact of employing a more metro-style approach to the running of the railway on customer satisfaction.

4.2.4 As shown in Figure 30, customer satisfaction with frequency of trains on Southern Metro routes has also consistently trailed London Overground by 10 points. While satisfaction on Southeastern metro routes has improved, it has remained below London Overground.

Figure 30: Satisfaction with frequency of trains on route



Source: NRPS

4.2.5 A consequence of the above is that Southern and Southeastern metro customers have a substantially lower perception of value for money than those using London Overground, or in more recent years, Wimbledon Loop services. Only one third of Southern and Southeastern metro customers are very or fairly satisfied with value for money, compared to over 50 per cent of London Overground customers, and over 40 per cent of Wimbledon Loop customers¹⁷.

¹⁷ NRPS Spring 2018

4.3 Poor information provision and unreliable and overcrowded services can be a barrier to travel

- 4.3.1 The poor level of service on the south and south east London rail network can also be a barrier to travel. Poor reliability and crowding interact to create a negative feedback loop (see also Section 3.5). This in turn increases stress levels, reduces personal comfort and makes travel feel more difficult. Crowding is also the most frequently cited barrier to travelling by public transport for disabled customers¹⁸.
- 4.3.2 Similar to poor reliability and crowding, poor information increases stress levels, makes travel feel more difficult, and can be a barrier to travel for some groups. One in ten Londoners cite a lack of information about how to use public transport services as a barrier to travel¹⁹. Travel information on the south and south east London rail networks is not always provided for the entire public transport network.
- 4.3.3 The complex rail network, and its confusing service patterns, is not easily understandable for passengers making unfamiliar journeys. For example, a passenger travelling from central London to Hackbridge station in the late evening may travel to London Bridge expecting to catch the half-hourly service that operates in the morning only to find that these trains don't run outside of the peaks.

4.4 South Londoners are getting a less frequent rail service

- 4.4.1 For customers to trust a rail service and depend on it for much of their travel, they need it to be predictable and frequent. This should mean being able to turn up at the station at any time throughout the week other than night-time, and expect to wait no longer than 10 to 15 minutes for a train. However, rail services in south London often fail to meet this basic criterion. They generally offer much lower frequencies than those in other parts of London, and to compound this, trains often depart at uneven intervals, making wait times even longer.
- 4.4.2 Of the 5.4 million Londoners with access to a nearby²⁰ rail service, 80 per cent can access a turn-up-and-go level of service throughout the week²¹. Nearly two-thirds of all Londoners with access to a rail service can access services of a higher *metro* frequency (mostly Tube and London Overground services), with average wait times of less than five minutes.

¹⁸ <http://content.tfl.gov.uk/travel-in-london-understanding-our-diverse-communities.pdf>

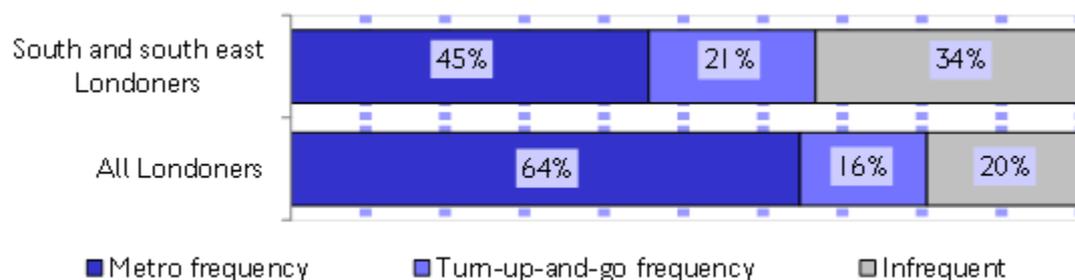
¹⁹ Ibid

²⁰ Nearby rail service is assumed to be within 800m

²¹ Throughout the week considers Monday – Saturday 07:00 – 22:00 and Sunday 10:00 – 22:00

4.4.3 In contrast, south and southeast Londoners are provided with less frequent services. Only two-thirds of the 1.9 million south Londoners with access to a nearby rail service can avail of a turn-up-and-go service, and only 45 per cent can access a metro level of service.

Figure 31: Level of service provided to Londoners with a nearby rail service (current)



Metro: Average passenger wait time, taking into account actual departure times, is less than or equal to 5 minutes. This level of service is provided on the Tube and the busiest parts of the London Overground network.

Turn-up-and-go: Average passenger wait time, taking into account actual departure times, is less than or equal to 7.5 minutes. This level of service is provided on most of the London Overground network.

Infrequent: Average passenger wait time, taking into account actual departure times, is greater than 7.5 minutes

4.4.4 100 per cent of TfL service in south and south east London is turn-up-and-go compared to only 35 per cent of non-TfL service. As a result, 68 per cent of south Londoners with a turn-up-and-go rail service have it provided by TfL.

4.4.5 Figure 32 highlights poor connectivity in south and south east London by mapping how predictable rail services are across London, using the measure of ‘longest effective interval’²².

²² By measuring the timetabled intervals between trains at each station (rather than just counting the number of trains) and looking across the week rather than just at the peaks or on weekdays, we can map how predictable rail services are across London, using a measure of ‘longest effective interval’ – the worst level of service that customers at that station (or travelling between two stations) are likely to receive. Using this measure, the longest typical time between trains experienced by passengers at a TfL-served station is 7 minutes. For National Rail stations with Overground or TfL Rail services it is 15 minutes, whereas for other National Rail stations it is 25 minutes

Figure 32: Longest effective interval for best service on link (Monday – Saturday 07:00-22:00, Sunday 10:00-22:00)



4.5 South and south east Londoners are missing out on opportunities because of the public transport network is not delivering connectivity

4.5.1 South and south east London residents, visitors and businesses suffer from poor connectivity both within the sub-region and beyond. Access to jobs declines rapidly in gaps between the Northern line, East London line and DLR corridors despite good access to the public transport network in general. Figure 33 demonstrates that while there is good access *to* bus and rail services, together these are not providing the same connectivity *through* the network as the higher frequency Tube and DLR services, or the better integrated East London line.

4.5.2 When comparing south London metropolitan and major town centres with equivalent centres in north London, the difference in connectivity to employment by public transport is stark (Table 9). There are four times as many jobs within 45 minutes of Harrow compared to Sutton. There are nearly three times as many jobs within 45 minutes of Walthamstow compared to Streatham.

4.5.3 There is a significant decline in access to jobs for neighbouring town centres accessed by the rail network compared to those relying on the Tube. Tooting Broadway on the Northern line has nearly three times as many jobs within 45 minutes compared to Streatham on the national rail network.

Table 9: Connectivity to jobs

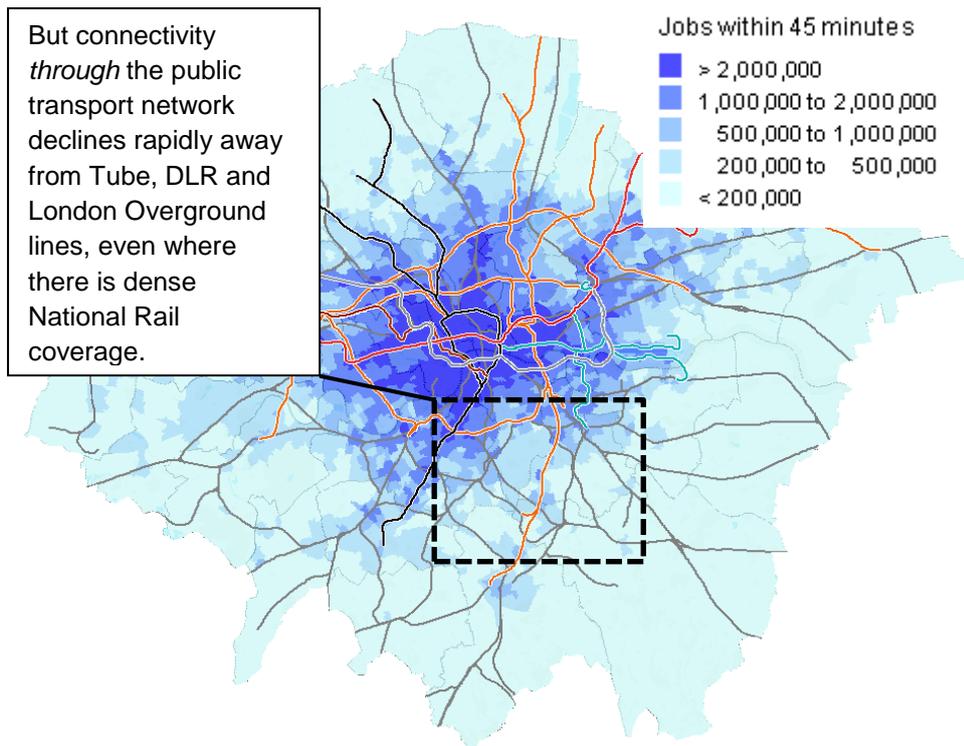
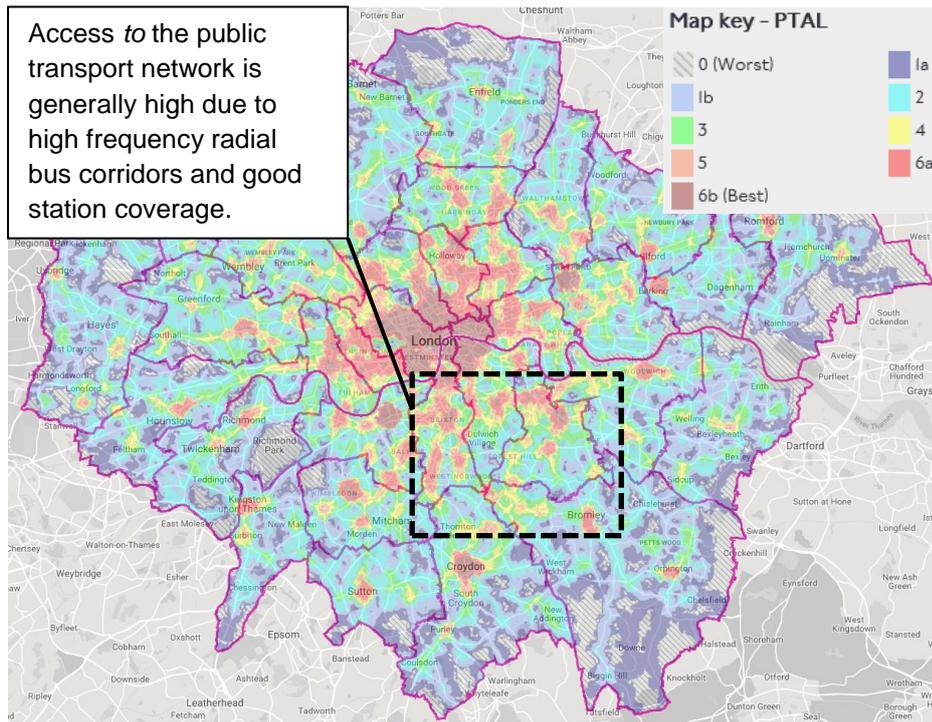
Location	Centre	Zone	Peak		Off-peak	
			Jobs within 45 mins	Jobs within 60 mins	Jobs within 45 mins	Jobs within 60 mins
Sutton station	Metropolitan	5	253,270	1,409,365	306,210	1,846,093
Harrow-on-the-Hill station	Metropolitan	5	1,020,209	2,830,150	1,232,601	2,951,761
Streatham station	Major	3	669,480	2,677,712	1,162,318	2,849,828
Walthamstow Central station	Major	3	1,943,460	3,009,060	2,059,465	3,123,810
Tooting Broadway station	Major	3	1,898,496	3,185,080	2,081,551	3,301,033

Source: WebCAT, All PT modes, AM and PM peak, From location

4.5.4 As well as the economic impacts of poor connectivity, there are also social impacts. Londoners are more likely to experience social isolation and loneliness than people in other parts of the UK²³. Poor connectivity can act as a barrier to seeing friends and family, and engaging with the wider community.

²³ GLA Analysis of Understanding Society, 2013/14

Figure 33: Comparing connectivity to and through the public transport network



Map data ©2019 Google
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 Source: WebCAT, TfL Strategic Analysis

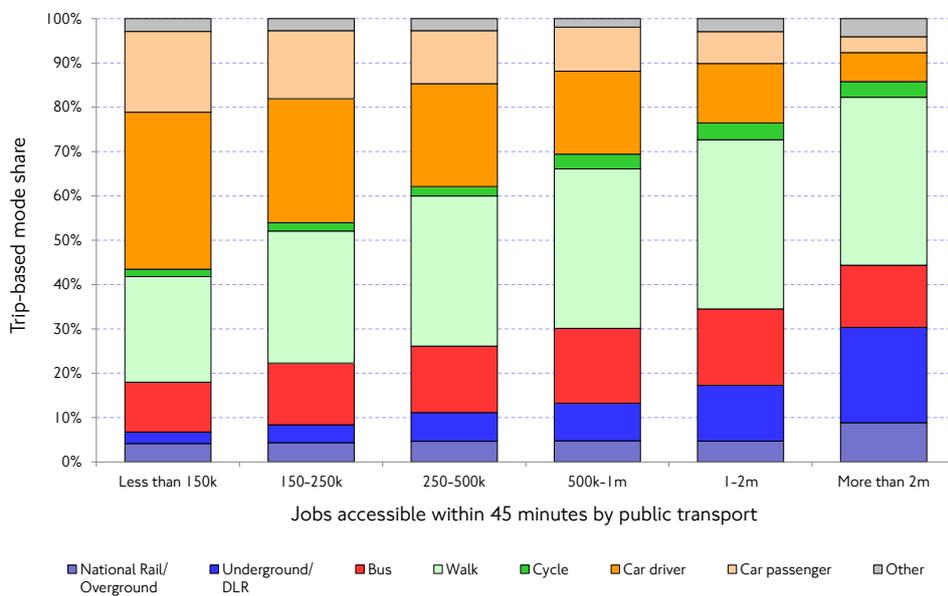
4.6 Poor levels of service drive customers to unsustainable modes

4.6.1 In large parts of south London, there are few alternatives to rail travel for longer radial trips. This means that not only are most south Londoners getting a poorer public transport experience than their counterparts in north London, they also typically have fewer alternative public transport options.

4.6.2 Poor connectivity affects the choices people make when it comes to when, where and how they travel. Longer journey times and complex service patterns mean that for many south London residents the public transport option is regarded as inconvenient, complicated and unreliable. It becomes too much of a hassle in already busy lives, especially, for example, for working families. This in turn leads to more people either choosing to travel by car or not to travel at all.

4.6.3 The impact of poor connectivity cuts across all journey purposes, not just travelling to work. Public transport mode share for all trips correlates closely with access to employment by public transport. In the best connected areas, 44 per cent of all trips are made by public transport compared to only 10 per cent by car. In contrast, for areas with the poorest levels of access to jobs, public transport mode share drops to 18 per cent, whereas 54 per cent of all trips are made by car (Figure 34).

Figure 34: Relationship between connectivity and mode share

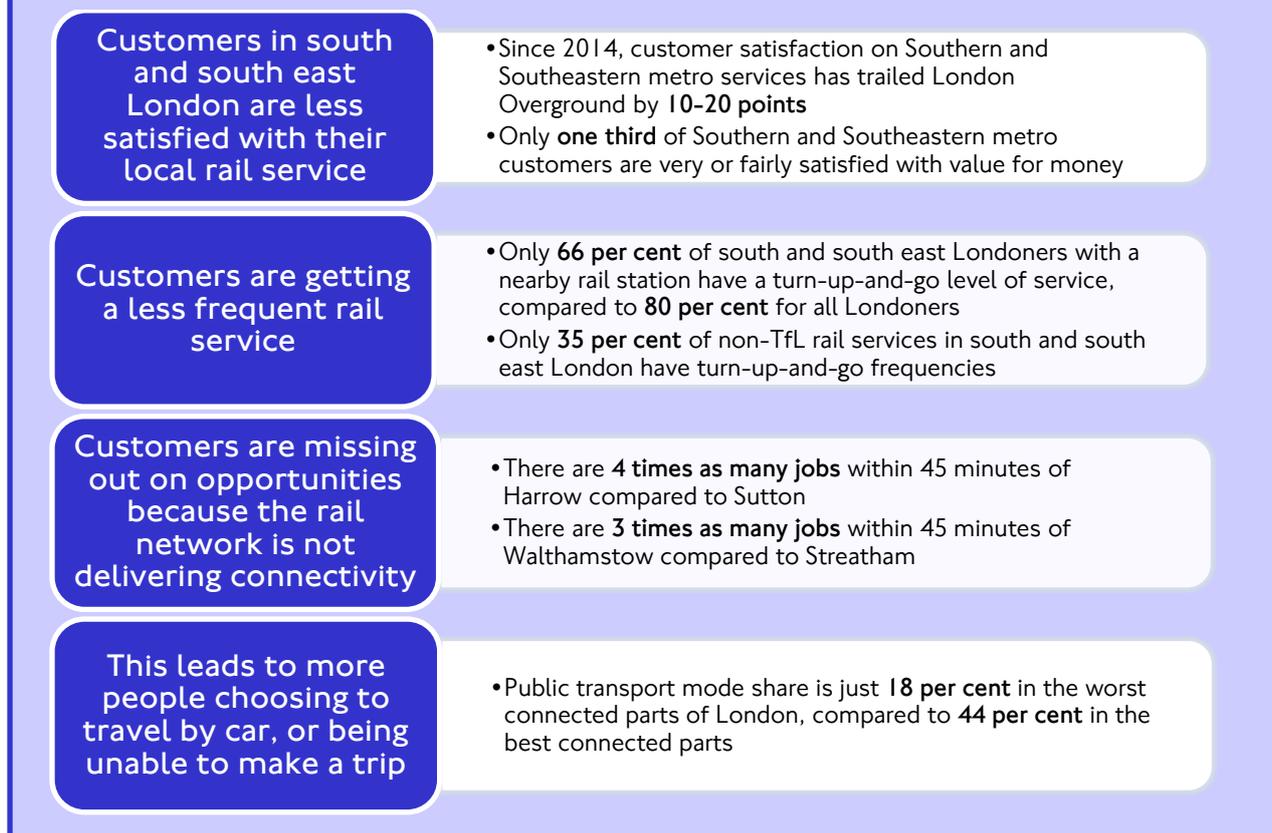


Source: LTDS, WebCAT

4.7 Summary findings

- 4.7.1 South Londoners are not getting a good public transport experience. Rail customers are less satisfied with overall levels of service, frequencies and value for money than their counterparts in north London.
- 4.7.2 Rail customers are getting a less frequent service, and the public transport network is not delivering connectivity. This drives more people towards the car, which is seen as a more competitive alternative, and acts as a barrier to making the trip for those without any alternative.
- 4.7.3 Metroisation provides an opportunity to address these challenges by enabling higher frequencies, thereby improving connectivity.

Figure 35: The case for change: Customers



5 The case for change 3: South and south east London and the wider South East is not realising its potential to deliver new homes and jobs

5.1 South and south east London is not realising its housing potential

5.1.1 Since 2001, boroughs in outer south and south east London have delivered new housing at rates much lower than the London average. Most outer boroughs have seen growth of six to eight per cent, about half the London average of 14 per cent. Growth has been higher in LB Croydon, where a significant amount of housing has come forward in the town centre, but at 11 per cent is still below the London average. The highest growth has been in boroughs where there are alternative high frequency rail options: RB Greenwich is served by both the Jubilee Line and DLR, LB Lambeth is served by the Northern, Bakerloo and Jubilee lines and LB Lewisham is served by the DLR, which has been the catalyst for significant growth in Lewisham town centre (see Table 10).

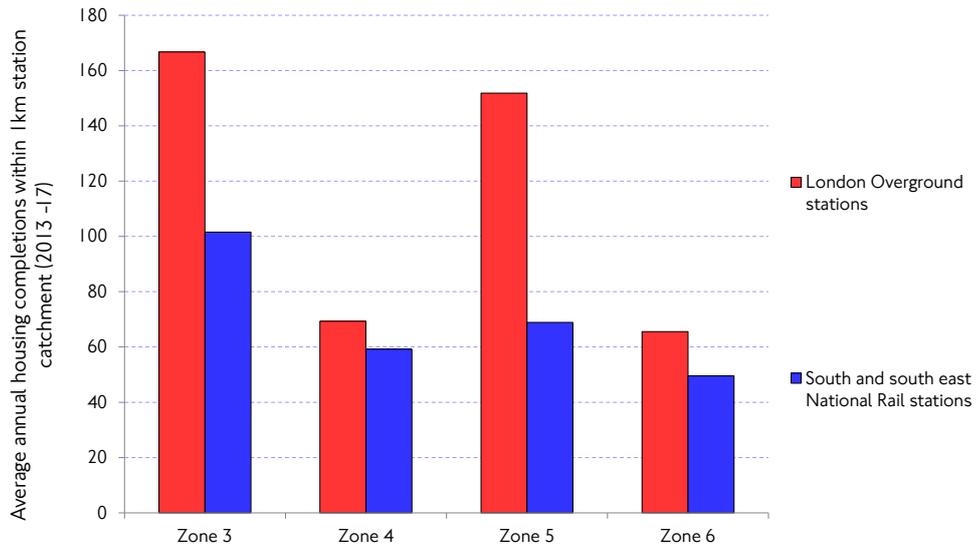
Table 10: Housing delivery 2001/02 – 2016/17

	Borough	Total housing delivery 2001/02 – 2016/17	% Increase in dwelling stock 2001/02 – 2016/17
Inner	Lambeth	18,355	15%
	Lewisham	16,997	16%
	Southwark	16,094	11%
Outer	Bexley	6,022	7%
	Bromley	9,705	8%
	Croydon	16,094	11%
	Greenwich	15,577	16%
	Merton	2,860	4%
	Sutton	4,580	6%
	London-wide	434,036	14%

Source: MHCLG (<https://www.gov.uk/government/collections/local-authority-housing-data>)

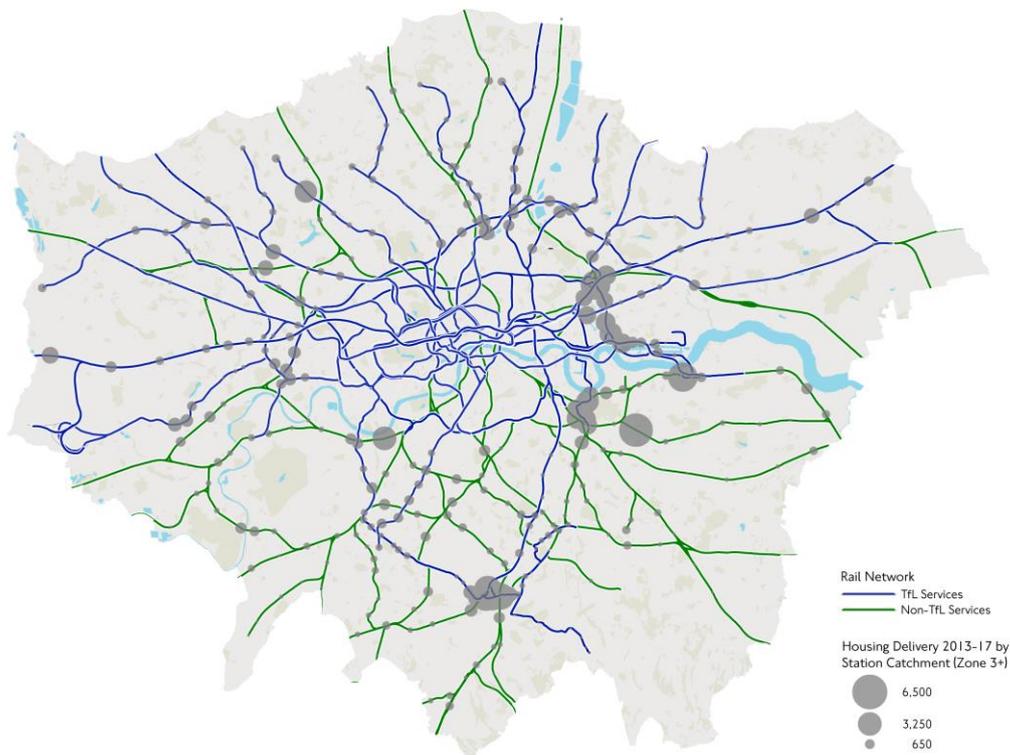
5.1.2 Areas around National Rail stations in south and south east London have historically not delivered housing to the same extent as stations operated by TfL. As shown in Figure 36, between 2013 and 2017, stations in south and south east London have delivered lower average housing numbers per station within a 1km catchment, compared to 1km catchments of London Overground stations (operated by TfL) within the same zone.

Figure 36: Housing completions within 1km of stations



5.1.3 The most significant areas of housing growth in south and south east London have been around the DLR network, with limited growth around the National Rail network (Figure 37). Given the greater reliance of south and south east London on the National Rail network, this has led to notably lower housing growth across the outer parts of south and south east London in particular.

Figure 37: Housing delivery 2013 - 2017



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Source: TfL Spatial Planning

5.1.4 The draft New London Plan sets a target for over 174,000 new homes to be delivered in south and south east London over the next decade (Table 11). Delivering this will require a step-change in the quality, frequency and reliability of rail services in this area.

Table 11: Ten year housing delivery targets

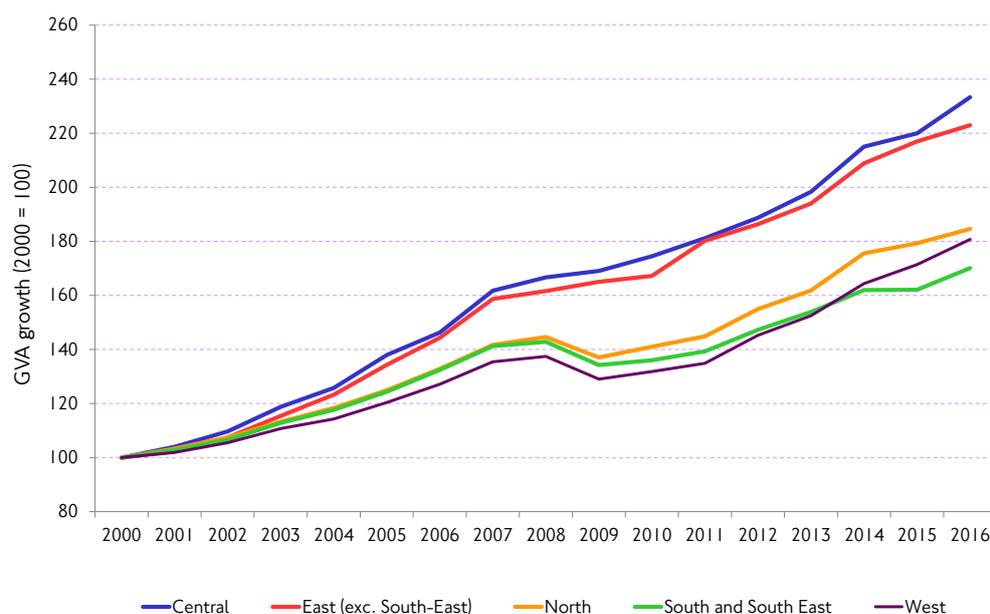
	Borough	Existing targets	New London Plan targets	Percentage change
Inner	Lambeth	15,594	15,890	2%
	Lewisham	13,847	21,170	53%
	Southwark	27,362	25,540	-7%
Outer	Bexley	4,457	12,450	179%
	Bromley	6,413	14,240	122%
	Croydon	14,348	29,490	106%
	Greenwich	26,850	32,040	19%
	Merton	4,107	13,280	223%
	Sutton	3,626	9,390	159%

Source: Draft New London Plan

5.2 The south and south east London economy is not realising its full potential

5.2.1 Over the past 15 years, south London’s economy has struggled in comparison with the rest of London. The total value of goods and services (GVA) produced in the south London sub-region has grown by less in percentage terms than that of all other London sub-regions since 2000 (Figure 38). Since the end of the financial crisis in 2009-10, the annual growth rate of south London’s economy has consistently lagged behind the rest of London.

Figure 38: Growth in GVA by London sub-region, 2000-2016

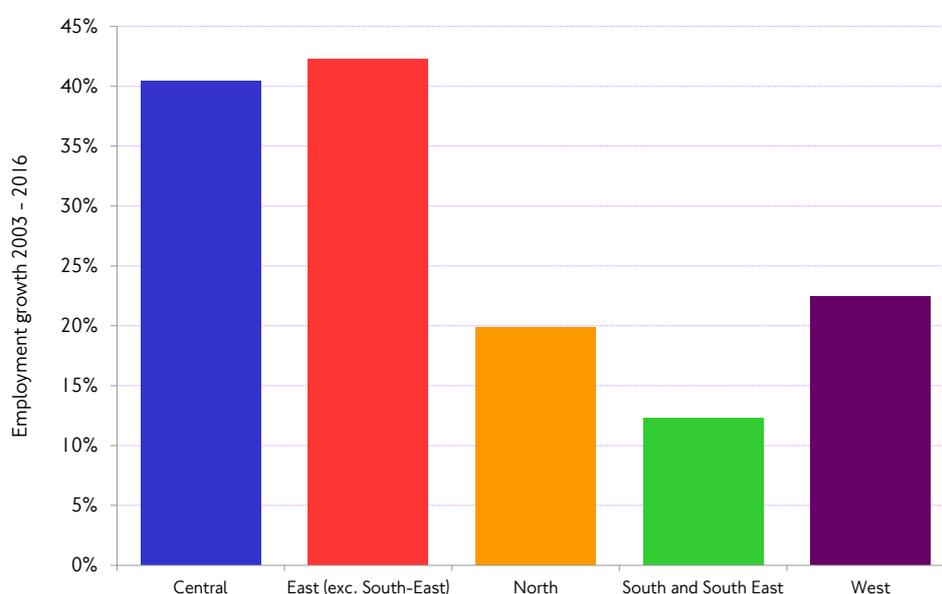


Source: ONS

5.2.2 Employment growth in south London is also lagging behind the rest of London. Between 2003 and 2016, south and south east London has had the lowest percentage growth in employment (Figure 39). LB Croydon and LB Bromley are among the few London boroughs where total employment did not rise between 2003 and 2013, largely as a result of a reduction in office based jobs in town centres. In the case of LB Croydon growth has been negative.

5.2.3 As outlined in Section 4.5, this is partly because businesses in south London have access to fewer customers and suppliers than other parts of London. Shortening journey times by increasing frequencies and improving reliability on the rail network would mean businesses have more opportunities to access workers, customers and suppliers and therefore increase their competitiveness.

Figure 39: Employment growth, 2003-2016



Source: ONS

5.2.4 Over the same period, house prices (similarly influenced by poor connectivity) have risen at some of the slowest rates in London, with LB Bromley, LB Sutton and LB Croydon ranking in the bottom four London boroughs for average house price growth since 2003²⁴.

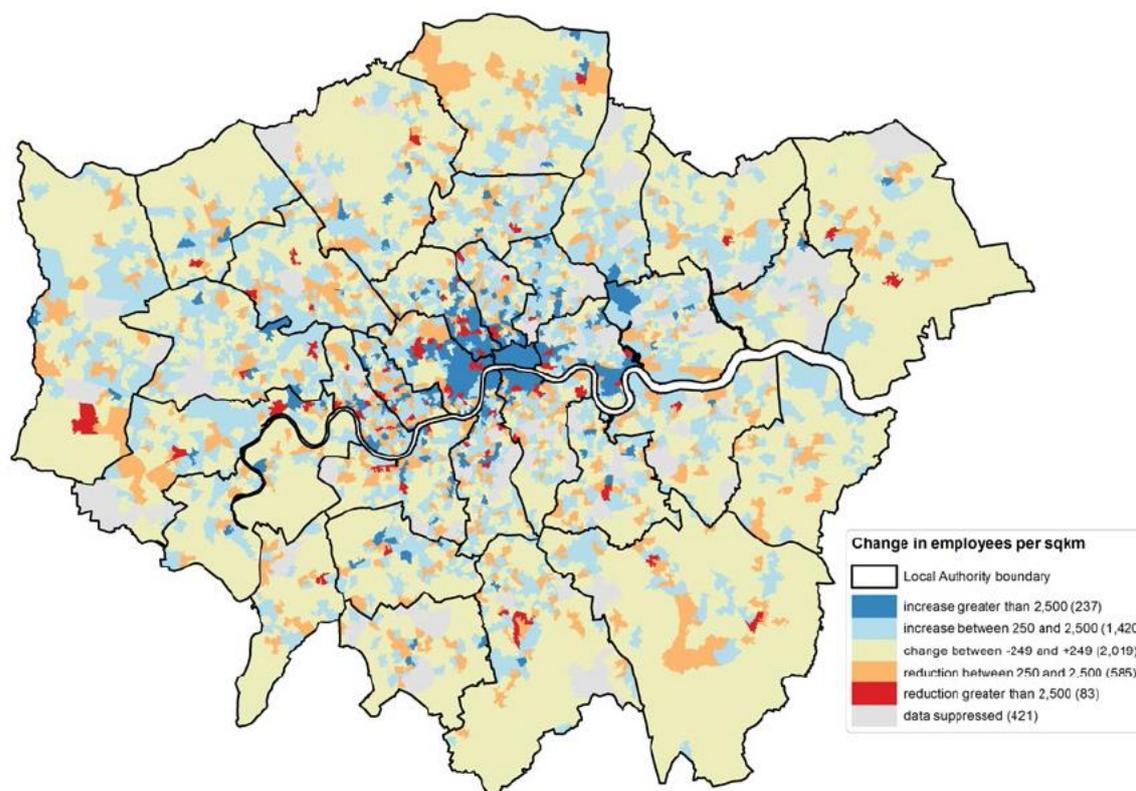
5.2.5 The south London economy is characterised by a strong polycentric network of town centres which function as key centres of employment. In 2011, over a third of all jobs in the sub-region were either within or bordering a town centre – more than any other London sub-region.²⁵

²⁴ <http://landregistry.data.gov.uk/app/ukhpi>; September 2003, September 2018

²⁵ Sub-Regional Transport Plan for South London – 2016 update, TfL, 2016

5.2.6 However, since 2009 employment growth in London has generally been concentrated in central London at the expense of outer London town centres such as Croydon and Bromley (Figure 40).

Figure 40: Change in number of employees per square kilometre in London LSOAs between 2009 and 2014.



Note: LSOA denotes Lower-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2016
Contains Ordnance Survey data © Crown copyright and database right 2016. Ordnance Survey 100032216

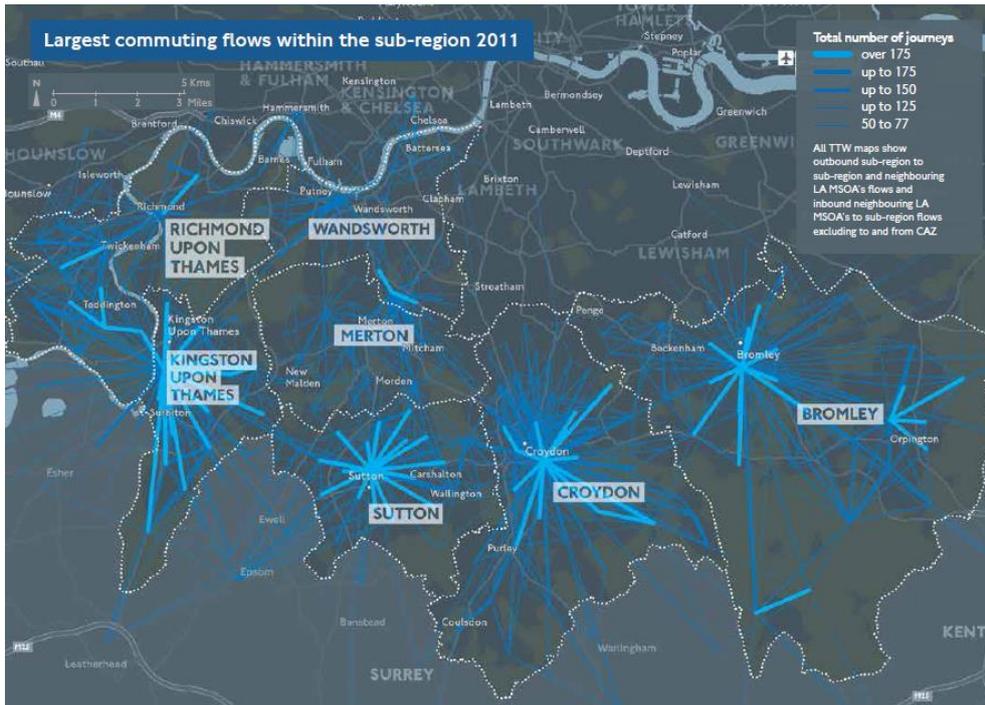
Source: Inter-Departmental Business Register (IDBR)

Source: Economic Evidence Base for London, GLA Economics, 2016

5.2.7 As employment has increased more rapidly within central and inner London than within outer London, there has been an increase in people commuting from south London to more central areas. However, although 22 per cent of south London residents work in central London, with the exception of LB Wandsworth, parts of LB Merton and LB Richmond, the majority of residents in the rest of south London work locally.

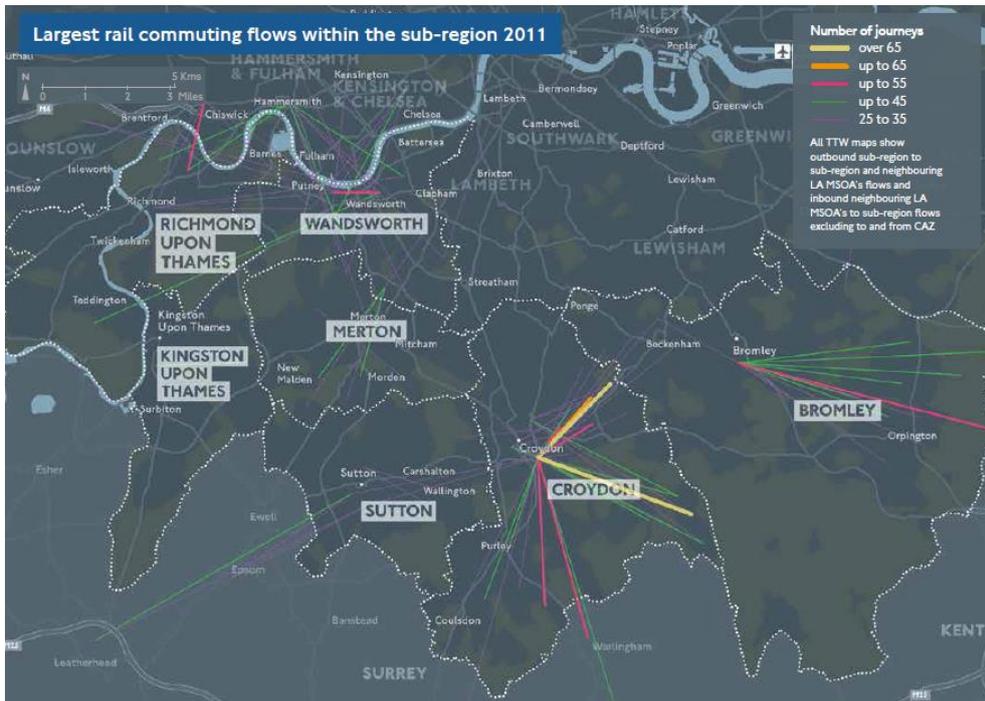
5.2.8 This is where the opportunity for improved rail capacity to maintain the viability of town centres is crucial. Although rail is hugely important for enabling south London residents to commute to central London, it only plays a minor role in supporting commuting trips within the South London sub-region as shown in Figure 41 and Figure 42. Notably, few commuters to Croydon from areas to the north west use the existing rail service, instead using the bus or car.

Figure 41: Largest commuting flows within south London sub-region, all modes, 2011



Source: TfL (2016)

Figure 42: Largest commuting flows within south London sub-region, by rail, 2011



Source: TfL (2016)

5.2.9 Maintaining the capacity and frequency of public transport connections between south London's town centres and central London is important to enable local residents to access the huge range of productive employment opportunities in central London. At the same time, the rail network could be doing more to connect residents to employment, social and leisure opportunities within the sub-region.

5.2.10 Poor connectivity also means London's neighbours are not realising their economic potential. The limitations outlined above do not only affect commuting trips to London - they also limit business' access to clients and markets for towns across the wider South East.

5.3 Summary findings

5.3.1 South and south east London is not realising its full potential to deliver housing or economic growth. Poor connectivity acts as a constraint on housing delivery and threatens the vitality of town centres in south and south east London and towns in the wider South East.

5.3.2 Metroisation provides an opportunity to address these challenges by enabling higher frequencies, which will improve connectivity and support higher growth.

Figure 43: The case for change: Housing and economy

South and south east London is not realising its housing potential

- Since 2001, London-wide dwelling stock has increased by **14 per cent** overall, but **only 6-8 per cent** in outer south and south east boroughs
- Between 2013 and 2017, annual housing completions in Zone 3 were over **60 per cent** higher around London Overground stations than south and south east National Rail stations

South and south east London is not realising its economic potential

- In the period 2000 - 2016, GVA has grown by only **70 per cent** in south and south east London compared to **over 80 per cent** for north and west London, and **over 120 per cent** for central and east London
- Between 2003 and 2017, employment growth in south and south east London was only **12 per cent**, compared to **over 20 per cent** for north and west London, and **over 40 per cent** for central and east London

Poor connectivity means London's neighbours are not realising their economic potential

- Businesses across the wider South East would benefit from better access to clients and markets

6 Why introduce a new metro service in south and south east London?

6.1 The change required

6.1.1 There is a compelling case for change on the rail network in south and south east London:

- A. The south and south east London rail network is not delivering to its full potential (see Section 3)
- B. The south and south east London rail network is failing to provide customers with a good public transport experience (see Section 4)
- C. The south and south east London rail network could do more to unlock housing and economic growth (see Section 5)

6.1.2 Addressing these issues requires a fundamental change to the way the network is planned and run. This means moving from the prevailing industry-focussed approach to a broader, 'whole transport network' view that considers the impact of rail services across the communities they serve alongside the efficient operation of the railway. By transforming the planning and operational approach to suburban rail services, we can deliver more from the network to improve the customer experience, support new housing, and encourage more active and sustainable travel.

6.2 Objectives

6.2.1 We have three objectives for the rail network in south and south east London and neighbouring districts. These objectives align with the national strategic vision for rail²⁶, the MTS, and national and local planning policy (see Section 11).

6.2.2 **Objective A: A more reliable, better connected and expanded public transport network in south London, Surrey and Kent**

6.2.3 As outlined in Section 3, the south and south east London rail network is not delivering to its full potential. This objective aims to address this, by **delivering more from the existing network**, through:

- Enhancing train and station capacity to reduce crowding on trains and platforms
- Delivering more competitive and reliable journey times, to make rail a competitive public transport alternative for more journeys

²⁶ Connecting people: a strategic vision for rail
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/663124/rail-vision-web.pdf

6.2.4 This will support a more reliable railway and expanded network, the achievement of the Mayor's active, efficient and sustainable mode share aims, and the National Planning Policy Framework aim to promote sustainable travel.

Objective B: A good public transport experience for all passengers on the network

6.2.5 As outlined in Section 4, the south and south east London rail network is failing to provide customers with a good public transport experience. This objective aims to address this, by **improving the overall public transport experience**, through:

- Delivering metro frequencies to reduce passenger wait times and overall journey times, as well as delivering more capacity
- Delivering metro trains to enhance the customer experience and reduce congestion disbenefits from crowding
- Enhancing rail connectivity to improve access to employment and leisure opportunities

6.2.6 This will support the achievement of the Mayor's ambition for a good public transport experience, and the DfT's aspiration for a better deal for passengers by improving the customer experience and value for money for both regular and occasional rail passengers on the south and south east London network.

Objective C: A public transport network that supports national and regional housing delivery and economic growth ambitions

6.2.7 As outlined in Section 5, the south and south east London rail network could do more to unlock housing and economic growth. This objective aims to address this, by **unlocking growth potential**, through:

- Delivering rail connectivity to support development of more new, affordable homes
- Improving businesses' connectivity to customers and clients, supporting more vibrant town centres
- Improving integration between south and south east London and wider South East economies

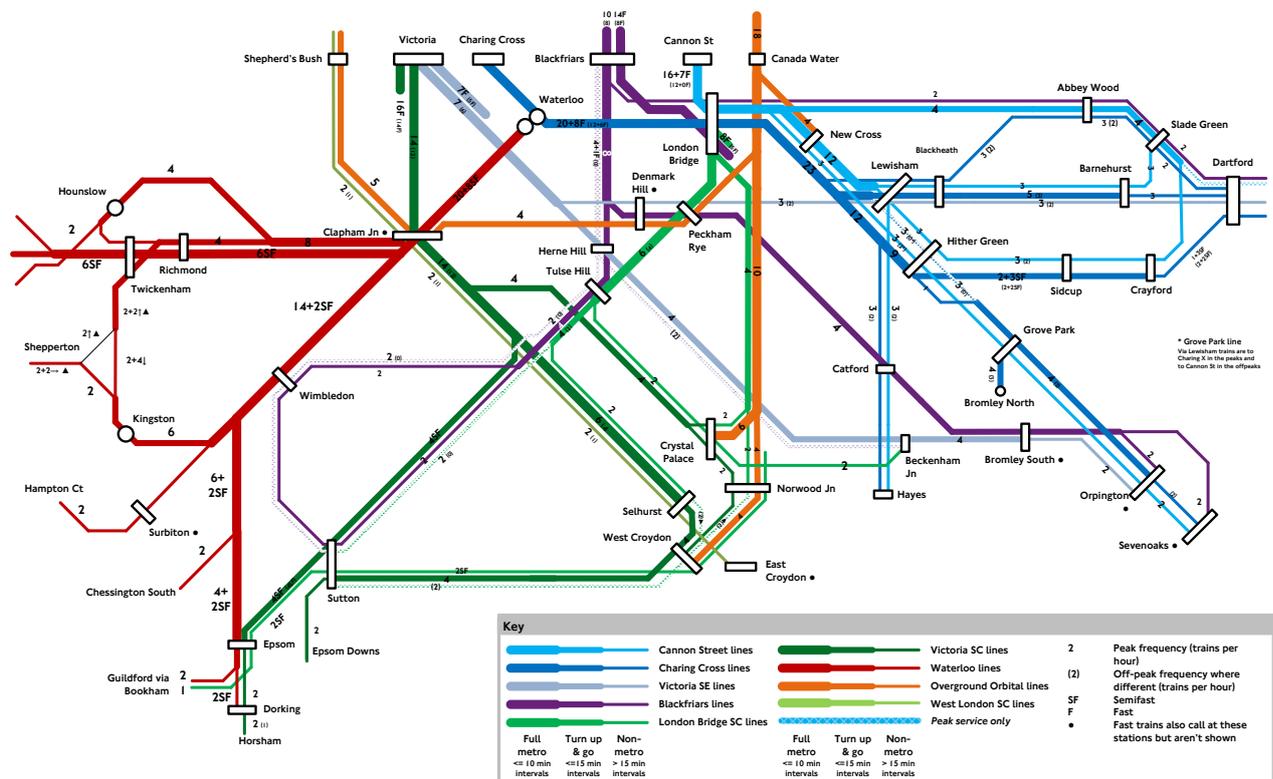
6.2.8 This will support the achievement of the Mayor's ambitions for 'Good Growth', the DfT's aspiration to use the rail network to unlock housing and development, and the National Planning Policy Framework aims of delivering a sufficient supply of homes and competitive economy, by unlocking growth potential in underdeveloped parts of south and south east London and promoting economic growth and integration in south and south east London and the wider South East.

7 Options for metroisation

7.1 Existing arrangements and business needs

7.1.1 The previous chapters have explained how the current situation impacts Londoners and public transport customers. Figure 44 shows what this means spatially – the existing morning peak hour services pattern (or rather, the assumed pattern for December 2019 once the delayed Thameslink Programme timetable changes are completed).

Figure 44: December 2019 ‘base’ service pattern for local National Rail services in south London



7.1.2 As outlined in Sections 3-5, the do-nothing option would mean that the south and south east London public transport network would continue to fall short of delivering its full potential. Tactical investment in standalone capacity and reliability schemes would still fail to tackle the fundamental inefficiency in the way public transport is provided to south Londoners, because it would never be possible to take full advantage of such investment while continuing a piecemeal approach to service planning and delivery. Londoners would still continue to face a choice between an infrequent and unreliable rail service with poor connections, or a slow and potentially congested journey by car or bus on the road network.

7.1.3 This would act as a constraint on the delivery of new homes, and a brake on economic growth in south London town centres and the wider South East. Wider impacts on the transport network, such as congestion and worsening performance of the bus network would in turn exacerbate these negative outcomes.

7.2 Constraints in the wider context

7.2.1 When addressing the objectives outlined in Section 6, it has been assumed that any preferred option must be compliant with the MTS. This means aligning with the MTS principles of Good Growth and the Healthy Streets Approach, while delivering a shift to active, efficient and sustainable modes of transport.

7.2.2 Interventions on the rail network must be designed and operated in a way that avoids adverse impacts on journeys made wholly or partially outside of London. This means ensuring that any proposed solution does not result in disbenefits for customers using the rail network in the wider South East, or between London and stations outside of London, in terms of train stopping patterns or relative priority of services.

7.2.3 Once fully implemented, the strong focus on performance and operational efficiency provided by metroisation, could allow *more* fast services to operate from outside of London, for example by releasing capacity at the terminals through much more efficient use of platforms. This would enhance customer experience for longer distance customers as well as providing them with better options to transfer onto the local metro network.

7.3 The principles and operating approach of metroisation

7.3.1 As outlined in Section 2.7, metroisation is a change in the way that rail services are planned and operated. It has six key principles:

1. **Predictable services**, including identifiable 'lines' with consistent stopping patterns and even intervals between trains
2. **Better connections**, based on higher frequencies and upgraded interchanges
3. **More capacity**, delivered through longer trains and relieving bottlenecks
4. **Shorter journey times**, supported by trains that accelerate and decelerate faster, and have wider doors so that boarding and alighting is more efficient
5. **A more reliable service**, arising from simplified service patterns that reduce conflicts at junctions
6. **Better customer service and experience**, similar to the benefits delivered by transferring services to London Overground

7.3.2 In order to deliver these six principles, a new operating approach is needed, based on the toolkit in Table 12. While most of these tools are universally applicable across the new metro service, the capital interventions (and the extent to which the service pattern is simplified) depend on the specific challenges of any given location.

Table 12: The metro operating approach toolkit

Category	Tool
Service design	Even intervals between services
	Simpler service patterns
	'Every second counts' service planning approach i.e. using to-the-second timetabling, with detailed analysis of performance data, to drive constant incremental improvements in run and dwell times
Contract design	Performance incentives
Staff & platform management	Robust platform train despatch process
	Driver 'stepping back' at terminals
Rolling stock design	Reduced step and gap between train and platform
	More free-flowing train interior layout
	Increased number and width of train doors
	All train lengths using their route's full capability
	Improved train acceleration & braking performance
Capital interventions	Shorter train door cycle times
	Introduction of digital signalling Investment in bottleneck relief schemes

7.3.3 Applying this toolkit in south and south east London would mark a fundamental change in how the National Rail network is planned and run. Currently, the industry focus tends to be more on short-term, incremental change driven by existing railway demand rather than broader social and economic objectives, such as housing, mode shift and city-wide connectivity. This is partly a consequence of the rail network being planned independently of the rest of the public transport network, as ultimate responsibility has historically not been held by the city's strategic transport authority.

7.3.4 Furthermore, the fragmented commercial aspect of the rail industry tends to result in revenue-driven business cases and risk-averse decision-making. This skews investment towards longer-distance services rather than local stopping services, and discourages transformational change that could achieve wider social and economic objectives.

7.3.5 Delivering this change requires determination and collaboration between national, regional and local government, TfL, Network Rail, TOCs, Freight Operating Companies, and everyone who uses the network. Building new alliances will help to unlock creative solutions and realise the rail network's full potential.

7.3.6 Sections 7.4 to 7.8 describe, using case studies, how these tools can deliver the components of a metroised service.

7.4 Service design

Delivers: Predictable services; Better connections

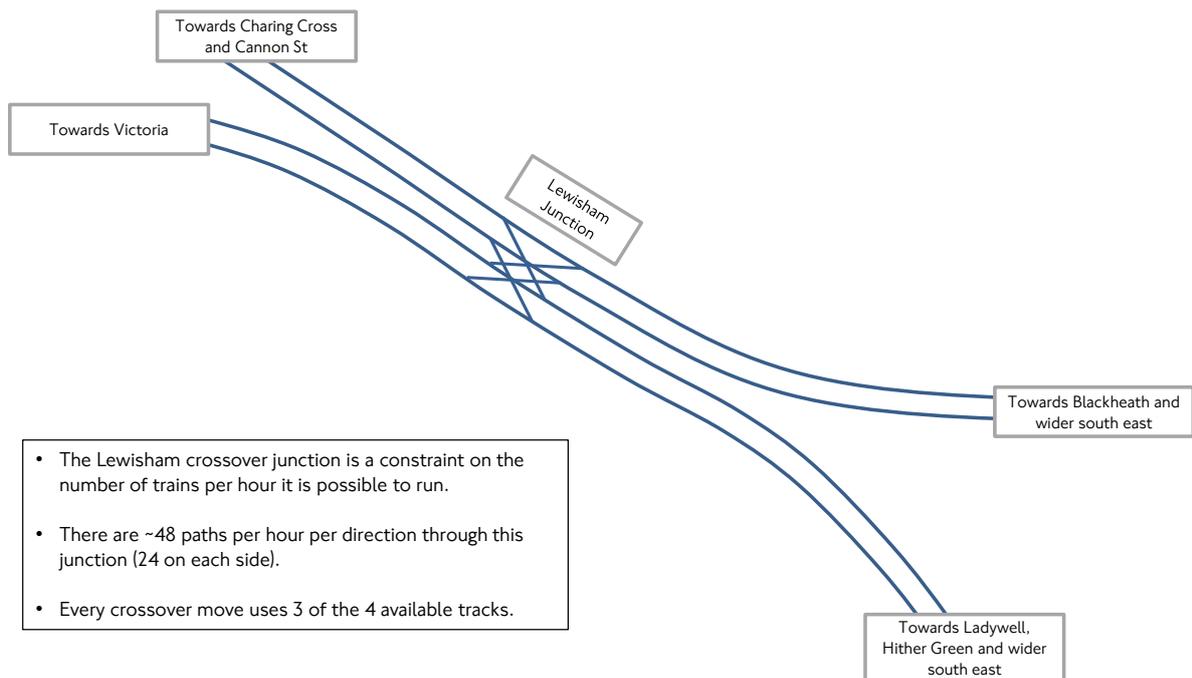
- 7.4.1 Currently, the train service pattern in south London is very complex, with various suburban lines crossing each other, and many south London stations offering services to multiple London termini. By reducing the need for complex crossing patterns (and thus potential conflict at junctions), metroisation would increase the available track capacity and mitigate the cumulative impact of delays.
- 7.4.2 Simpler service patterns will reduce conflict at junctions. Their all-day operation allows staff to become used to the continuous rhythm of the service and thus be more attuned to when it delays begin to occur.
- 7.4.3 Combining this with even interval services means shorter wait times for customers, more predictability and less crowding, as well as making the service more reliable and more resilient if things do go wrong.
- 7.4.4 Finally, the 'every second counts' approach to service planning is crucial. Modern trains and signalling generate fine-grained data that can be used to gain valuable insights into recurring delays from a few seconds to more significant delays. This forensic analysis, when combined with to-the-second timetabling, can be used to drive constant improvements in run times and dwell times, and thus ultimately in frequency and reliability.

Case study: Lewisham crossover

7.4.5 Lewisham provides an example of where a simplified service pattern would enable more to be delivered from the network. At Lewisham, there are services to three London termini (Cannon Street, Charing Cross and Victoria) from various destinations in south London and the wider South East region. To pass this point on the network requires multiple crossing movements over the available four tracks. Each time these movements occur it ‘blocks’ the other tracks, limiting the number of available train paths through this part of the network (Figure 45).

7.4.6 In the current timetable, 29 out of the 37 trains (four out of five trains) that pass through Lewisham in the peak hour cross over from one side to the other, a highly inefficient use of capacity that limits how many trains can run. The core metroisation proposal retains choice but reduces this ratio to one in three trains, releasing some capacity for more services and making services much less prone to delays.

Figure 45: Lewisham Crossover



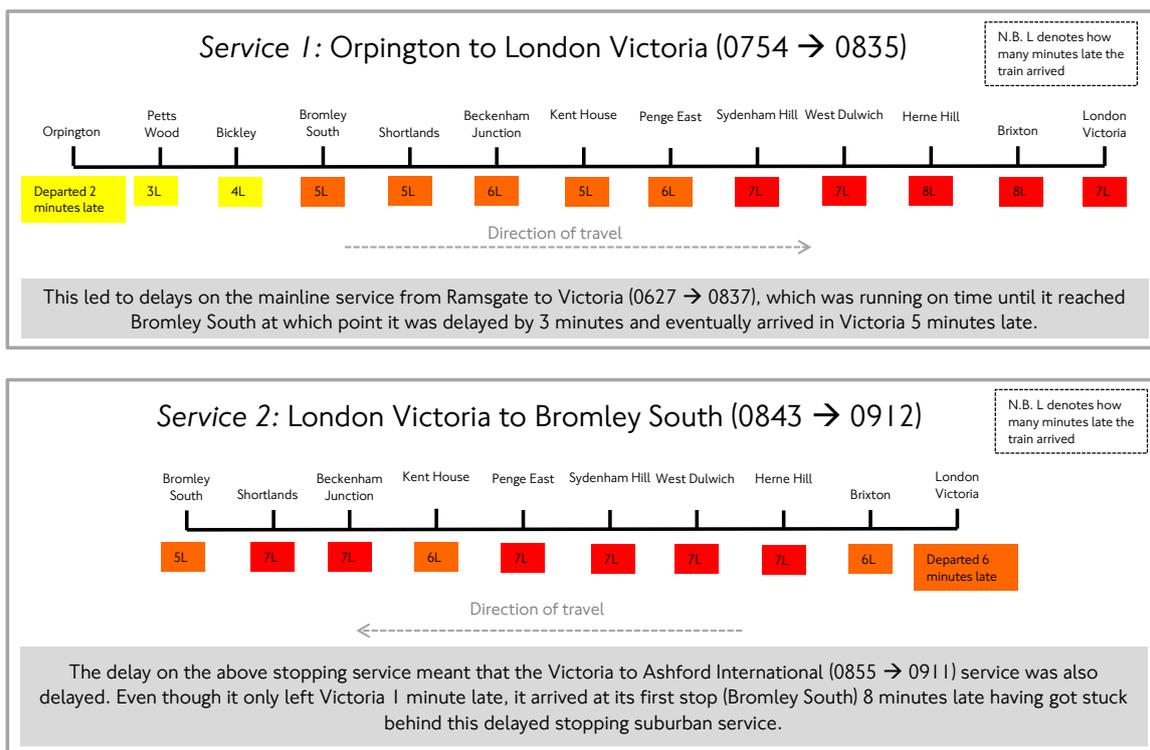
Case study: Every second counts

7.4.7 The effect of the build-up of small delays can be illustrated using an example from the Victoria to Bromley South route. In the example shown in Figure 46, a suburban stopping service left Orpington two minutes late, but this delay accumulated along the length of the route. It eventually arrived in Victoria seven minutes late and this delay was then transferred onto its next service to Bromley South.

7.4.8 This type of delay to metro services is problematic in and of itself, but it also leads to delays on mainline services, as they get stuck behind delayed metro services on the sections of single track between Victoria and Bromley South.

7.4.9 Adopting a metro approach to London’s suburban stopping services would reduce the likelihood and severity of delays, as every second would be counted as important. This would limit the build up of delays over the length of a route. In combination with infrastructure upgrades, this would also lead to fewer delays for mainline services.

Figure 46: Delays along the route between London Victoria and Bromley South: 29 Sept 2018



7.5 Staff & platform management

Delivers: Shorter journey times; More reliable services; Better customer service & experience

7.5.1 The Tube shows that well-trained staff can save valuable seconds from a train's dwell time, improving journey times for customers and allowing more services through challenging locations on the network.

7.5.2 This can be combined with stepping-back, the operating approach that breaks the link between drivers and specific trains, allowing short turnaround times at terminals with limited platform capacity. This would enable frequencies of up to 18 trains per hour to run out of a single platform²⁷.

7.6 Contract design

Delivers: More reliable services; Better customer service & experience

7.6.1 The operators' contracts must include strong performance incentives linked to customer experience, preventing them from simply trading away journey time or frequency for reliability.

7.6.2 Our proposals for transfer of services would achieve this, by adopting the Overground concession model that heavily incentivises performance, including measures to encourage the operator to work with Network Rail by including Network Rail performance penalties. This approach is called 'it's not my fault but it is my problem'.

7.7 Rolling stock design

Delivers: More capacity; Shorter journey times; Better customer service & experience

7.7.1 Introducing metro-like rolling stock (like the Elizabeth line's Class 345) has a big impact on performance and journey times, allowing more to be squeezed out of the infrastructure. The most obvious change is consistent train lengths. This has an operating cost but reducing the need to join and divide trains throughout the week improves reliability. Weekend demand in particular is now high enough to result in uncomfortable levels of crowding when short trains are run.

7.7.2 The acceleration and braking performance of the train has a big impact on the time it takes to call at a station. This is especially noticeable when older heavy rail trains run alongside Tube services. Additionally, the design of the train itself (the number of doors, the standback space around the doors, the time it takes doors to open and close and the height of the step to the platform) makes a big difference to dwell times. Saving seconds from dwell times at every station quickly adds up to better performance for all-stations services.

²⁷ This is the case at Brixton and Walthamstow Central on the Victoria line, but could be applied where frequencies are lower

7.8 Capital interventions

Delivers: Predictable services; Better connections; More reliable services; Shorter journey times; More capacity

7.8.1 While metroisation generally tries to extract as much as possible out of existing assets, in some locations capital investment projects will be required. The most widespread of these would be investment in digital signalling. This has improved capacity and performance on the Tube, and could do similar in the heavy rail network when combined with the other elements of the metro operating approach.

7.8.2 Some locations will require relief schemes to solve capacity and performance bottlenecks. Examples of this might include the addition of tracks or passing loops, grade separation of a junction, or adding a new platform or turnback facility.

Case study: Targeted capital interventions to reduce knock-on delays

7.8.3 Fast and stopping services interact at several junctions, stations and single-track sections across the south and south east London rail network. By reducing conflict points, metroisation could deliver a better service.

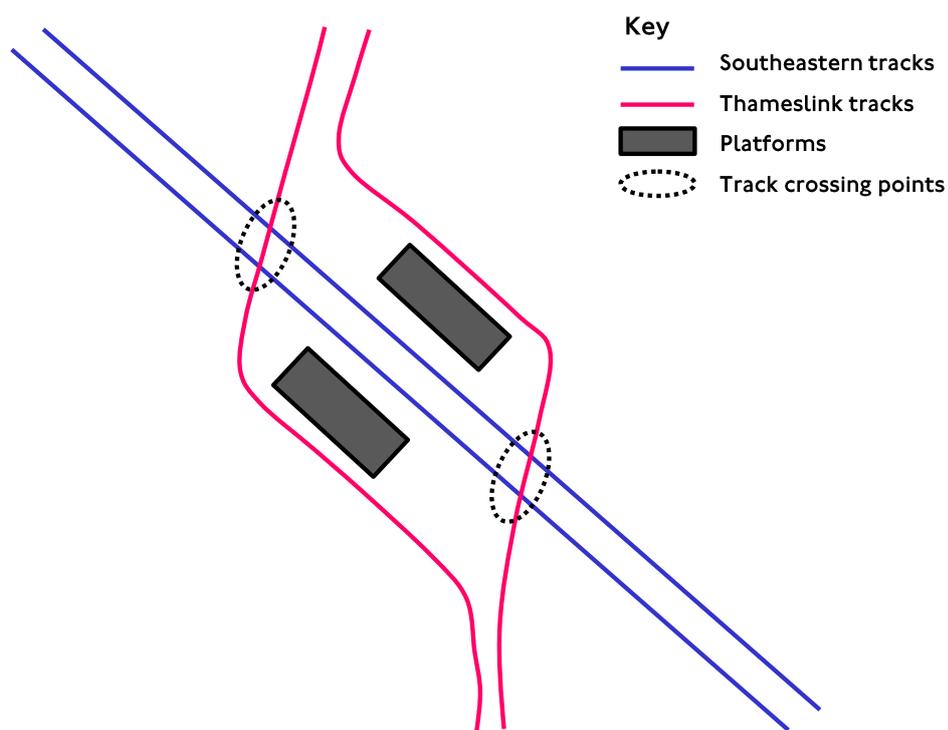
7.8.4 Herne Hill station is an example of when disruption on Southeastern metro services has a negative knock-on impact for multiple other services. Three services run through this station:

- Thameslink trains between Sutton and St Albans (north-south movement)
- Southeastern metro services between Victoria and Orpington/Bromley South (northwest-southeast movement)
- Southeastern mainline services from Victoria to Ramsgate, Canterbury and Ashford International (northwest-southeast movement)

The first two are stopping services, but the Southeastern mainline services run straight through Herne Hill.

7.8.5 As the mainline services have to run through Herne Hill on the same tracks as the stopping metro services, when there are disruptions to the stopping services the mainline services are also affected. Figure 47 shows the flat junction layout.

Figure 47: Flat junction track layout at Herne Hill station



7.8.6 Mainline Southeastern services need to travel through Herne Hill station, but do not stop here. However, because the Thameslink tracks and Southeastern tracks cross each other at a flat junction, it means that only one train can cross the tracks at any one time. If either a stopping Thameslink or Southeastern service should be delayed or disrupted, this will have knock-on implications for the other services, including the Southeastern mainline trains.

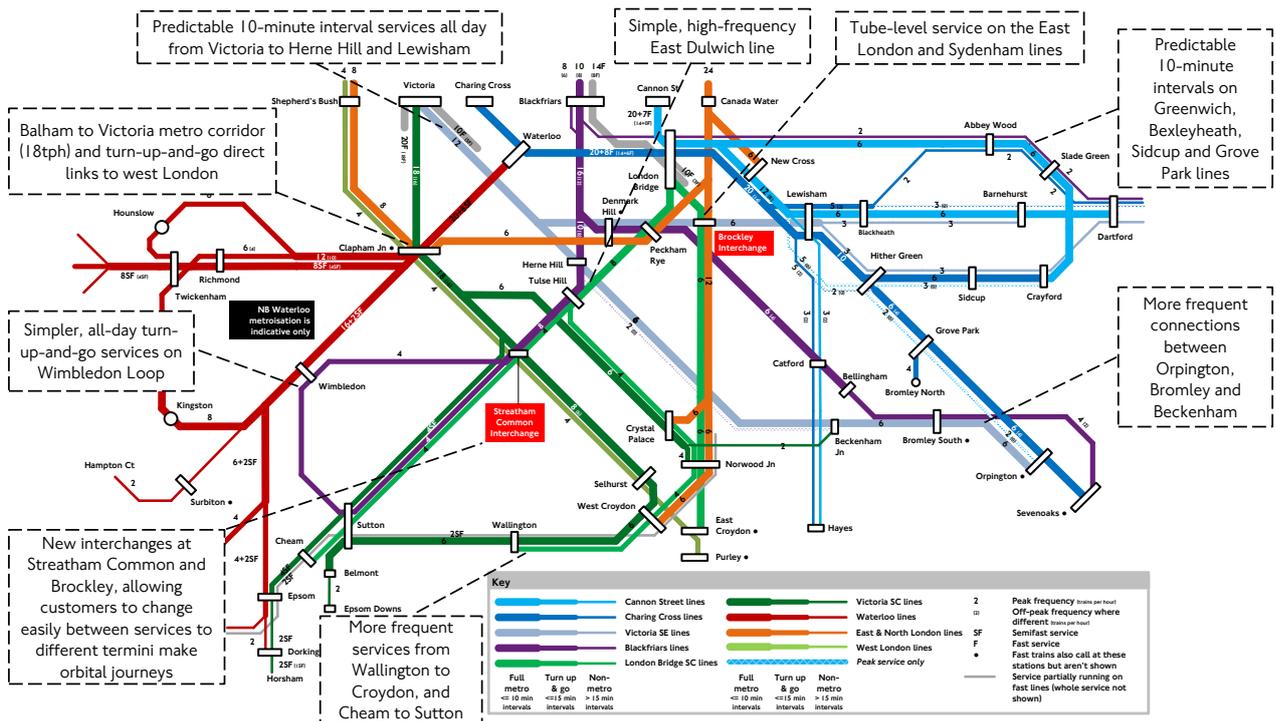
7.8.7 We could make this junction work more effectively through higher-performance trains and digital signalling. Additional tracks in the Kent House area would give fast trains more opportunity to overtake stopping services, and a more punctual network arising from a metro approach would reduce knock-on effects of delays.

7.9 The core metroisation option

7.9.1 All of these tools are included in the indicative, or ‘core’ metroisation proposal. They come together into a new service pattern proposal for south and south east London. These services would integrate with Southwestern services following the start of Crossrail 2.

7.9.2 Figure 48 shows the morning peak hour service pattern in the core metroisation scenario.

Figure 48: ‘Core’ option service pattern (MET01: S5D+K5B) – morning peak hour



7.9.3 The scheme combines reliability improvements and a more metro-like planning and operational approach which will transform public transport connectivity for customers across south and south east London and beyond. Overall this service pattern delivers 39 additional trains in the peak hour and 36 additional trains at off-peak times, as outlined by Table 13 and Table 14.

Table 13: Frequency changes (trains per hour) – Metro & regional services

Terminus	Peak Hour			Off Peak		
	2019 Base	'Core' option	Change	2019 Base	'Core' option	Change
Blackfriars	29	32	+3 tph	20	24	+ 4 tph
Cannon Street (SE Metro)	16	20	+4 tph	12	14	+ 2 tph
Charing Cross (SE Metro)	20	20	=	12	14	+ 2 tph
London Bridge (BML Slow)	4	6	+2 tph	4	6	+ 2 tph
London Bridge (via Peckham Rye)	6	8	+2 tph	4	8	+ 4 tph
Victoria (BML Slow)	14	18	+ 4 tph	12	16	+4 tph
Victoria (SE Metro)	7	12	+ 5 tph	6	12	+ 6 tph
East London Line	18	24	+ 6 tph	18	24	+ 6 tph
West London Line	2	4	+ 2 tph	1	4	+ 3 tph
Bromley North – Grove Park	4	4	=	3	4	+ 1 tph
Cannon Street (Kent Services)	7	7	=	0	0	=
Charing Cross (Kent Services)	8	10	+ 2 tph	6	6	=
London Bridge (BML Fast)	8	10	+ 2 tph	5	3	- 2 tph
Victoria (BML Fast)	16	20	+ 4 tph	14	18	+ 4 tph
Victoria (Kent Services)	7	10	+ 3 tph	5	5	=
Total Change	166	205	+ 39 tph	122	158	+ 36 tph

Table 14: Key features of 'core' metroisation option

Balham metro corridor	A flagship route between Balham and Victoria with up to 18tph, delivering frequent metro services on the Crystal Palace and Selhurst lines; all-day semi-fast services to Sutton and Epsom; turn-up-and-go direct links to West London through Old Oak Opportunity Area; and regular connections to East Croydon for fast services to and from Sussex.
Connectivity to Croydon, Sutton & Bromley	Major improvements in the number of local services from south London into these town centres, with turn-up-and-go services from every branch that serves them. This includes delivering 10-minute interval services between Orpington, Bromley and Beckenham, and much more frequent service from Wallington to Croydon and Cheam to Sutton
Simple high-frequency East Dulwich line	Simplification of services out of London Bridge in order to deliver trains every 7-8 minutes through Peckham to Tulse Hill, and every 15 minutes to the Crystal Palace and Hackbridge lines, enabled by a new interchange at Streatham Common that allows customers to swap easily between frequent services to Victoria, West London, Blackfriars and London Bridge.
East London & Sydenham lines Tube-level service	Increase in service to 24tph on East London Line (with 10min intervals to each branch) and improving headways to London Bridge from the Sydenham line to 10 minutes, we deliver an 18tph metro-level service between New Cross Gate and Sydenham along with frequent and dependable links to Crystal Palace, both Croydon stations and Sutton.
Frequent Victoria links to Beckenham, Peckham and Lewisham	Significant expansion of South Eastern metro service into Victoria, with 10-minute interval services all day on the Herne Hill line and through Peckham to Lewisham; combined with new high-level platforms at Brockley the latter enables vastly improved orbital rail connectivity between south and south east London.

Simple & frequent Southeastern services with a choice of terminals in the peaks	Predictable all-day, all-week, 10-minute interval services on the Greenwich, Bexleyheath, Sidcup and Grove Park lines, supplemented by additional peak trains – meaning peak passengers still have a choice of terminals but also that direct services to Lewisham are available all day from every branch, allowing it to become a proper ‘strategic interchange’ – enabling not only easier links between south east London’s town centres, but also taking advantage of TfL and Government investment in super-frequent DLR links to Canary Wharf and Stratford in east London.
Wimbledon Loop	Simpler all-day turn-up-and-go services.

7.9.4 The capital interventions assumed are outlined in Table 15.

Table 15: Capital interventions for ‘core’ metroisation option

Capital intervention	Locations
New turnback facilities / reversing platforms	Cheam; Wallington; Cannon Street; Dartford
Grade separation	Gloucester Road Junction in Croydon, as part of the Croydon Area Modelling scheme led by Network Rail; Balham Junction; Falcon Junction at Clapham Junction
Smaller-scale junction remodelling	Tulse Hill and West Norwood; Crystal Palace; Norwood Junction
Digital signalling delivering Automatic Train Operation	Victoria to Balham; East London Line core section; Charing Cross and Cannon Street to Greenwich and Lewisham
New platforms or stations	New high-level platforms at Streatham Common, for services between Tooting/Mitcham and Streatham; Major passenger capacity intervention at Lewisham station; New high-level platforms at Brockley, serving metro-frequency services between Peckham and Lewisham
Additional tracks	Penge East to Kent House

7.9.5 Table 16 outlines indicative capital costs for the scheme. The total capital cost was estimated to be around £1.7bn in 2014 prices, including optimism bias.

7.9.6 Rolling stock is treated as an operating cost because most National Rail trains are leased from Rolling Stock Companies (ROSCOs) rather than bought outright. This enables trains to be moved around between different TOCs, as the length of a franchise is typically much shorter than the lifespan of the trains. Other operational costs would include energy use, staff (mostly drivers but also extra station staff), maintenance costs, support services (e.g. cleaning, revenue protection and information provision) and Network Rail access charges.

7.9.7 As these costs are indicative only, future work will be required to refresh the cost of the capital interventions listed, and to consider power and depot costs, and other operational costs where relevant. Some sub-projects may be absorbed by other schemes, particularly the national rollout of digital signalling and the Croydon Area Remodelling scheme.

Table 16: Indicative capital costs for ‘core’ metroisation option

Capital intervention	Locations	£m (2014 / 2015 prices)	Source
New turnback facilities / reversing platforms	Cheam	19	TfL Projects
	Wallington	7	TfL Projects
	West Croydon remodelling	29	TfL Projects
	Belmont	23	TfL Projects
	Cannon Street carriage sidings and Ewer Street siding	11	SDG
	Dartford	10	SDG
Grade separation	Gloucester Road Junction	51*	TfL Projects
	Balham Junction	122	TfL Projects
	Falcon Junction at Clapham Junction	65	TfL Projects
Digital signalling delivering Automatic Train Operation	Victoria to Balham	240**	TfL Service Planning
	East London Line core section	42	TfL Service Planning
	Charing Cross and Cannon Street to Greenwich and Lewisham	300***	SDG
New platforms or stations	New high-level platforms at Streatham Common	21	TfL Projects
	Major passenger capacity intervention at Lewisham station	10****	SDG
	New high-level platforms at Brockley	14	TfL Projects
Additional tracks	Penge East to Kent House	45	SDG
Power	South Eastern (no power assessment made for South Central)	22	SDG
Rolling stock, depot & stabling	Assumed to be leased or contracted, so included in operational costs instead*****	-	SDG / Atkins
Total		1,031	
Optimism bias	66%	680	
Total with optimism bias		1,711	

* This project is expected to be included in Network Rail’s Croydon Area Remodelling Scheme. As the funding arrangements for this are not yet certain the project is included as an incremental cost.

** Network Rail’s present plans envisage this part of the railway being resignalled digitally towards the end of their Digital Railway programme around 2050. We would advocate accelerating this in order to deliver the benefits of metroisation sooner.

*** Network Rail’s present plans envisage this part of the railway being resignalled digitally towards the end of their Digital Railway programme around 2045. We would advocate accelerating this in order to deliver the benefits of metroisation sooner.

**** Network Rail are developing plans for a capacity intervention at Lewisham in the shorter term which has been included here as it may be sufficient to deliver the ‘core’ metroisation option, although we believe a larger intervention will be required at some point in the future.

***** Would include replacing 128 carriages and adding a further 175 carriages for South Central, and adding 300 carriages for South Eastern. A traditional rail industry approach would see these items as leases, last estimated at around £70m/year in 2015. Alternatively this could also be an outright capital purchase more akin to the Underground of around £400m, requiring more cash in the short term but avoiding ongoing costs in the long term. Other operational costs were previously estimated to be around £48m/yr using an industry standard approach, although we believe there is room for further efficiency.

NB: A substantial proportion of these costs are for projects which will be required at some point in the future regardless of the metroisation scheme (e.g. rolling stock replacement and digital signalling), but delivering metroisation may involve accelerating these projects.

7.10 Core option variants

7.10.1 The core option represents a balance between supporting housing growth, enabling better connectivity and mode shift in outer London, improving commuting to central London, and affordability. However, there are many potential variants to the service pattern which could change the spread of these outcomes in different locations.

7.10.2 For example, this variant aims to retain the choice of terminals that south east London peak-time commuters value, while making sure that the regular all-week service is consistent and reliable for the off-peak and irregular users that need to be attracted to rail to achieve mode shift from cars and encourage new housing. However, in a high housing growth scenario, stakeholders might decide that capacity is more important. In this case, the service pattern could be simplified further to deliver more frequency at the expense of terminal choice.

7.10.3 Other variants might include more orbital services to further improve connectivity around outer London. The MTS recognises the potential for a new direct service between Clapham Junction, Peckham and Lewisham, and points beyond at each end in south west and south east London. This would require further substantial investment at places like Lewisham but could enable a wide variety of orbital journeys. This could include new links between Beckenham Junction and Lewisham, or better connections between Woolwich/Abbey Wood and Lewisham to take advantage of the frequent metro connectivity in all directions.

7.10.4 Variants that consider the interaction with other projects in development including, for example, the potential to release train paths through the Bakerloo Line Extension could also be explored.

7.10.5 These options will be appraised further in the next stage of business case development.

8 The benefits of metroisation

8.1 More predictable services build trust and encourage the use of rail

- 8.1.1 Metroisation offers a substantial improvement in the predictability of rail services in south and south east London. Much like the Tube, customers could expect to turn up any day of the week at their station and get frequent trains to consistent destinations.
- 8.1.2 This predictability would build trust, encouraging more customers to use the services. This confidence in public transport could lead weekday commuters to also consider rail for journeys at the weekend which they would otherwise have driven.
- 8.1.3 For example, a Sunday leisure traveller returning from central London to Bexleyheath would no longer need to worry about whether to choose Charing Cross, London Bridge or Cannon Street to head home, knowing that if they time it badly they could miss the train and face a half-hour wait. Instead they would be guaranteed a train every 10 minutes at even intervals from Cannon Street, London Bridge and Lewisham.

8.2 Better connectivity is delivered through frequent services with well-designed interchange between them

- 8.2.1 At present it is difficult to use the south and south east London public transport network to make many orbital journeys, with a choice of interchanging between infrequent rail services with a risk of long wait times, or slower bus services.
- 8.2.2 Metroisation would change this in three fundamental ways.
- Increases in frequency would make interchange much more viable than at present, avoiding the risk of long waits
 - The network would be designed to create and take advantage of the 'hyper-connectivity' of strategic interchanges
 - The introduction or improvement of targeted new local interchanges would allow a whole series of mid-distance journeys that are currently difficult by rail

Frequency enhancements

- 8.2.3 In the core option (see Figure 48), during the high peak hour, local stopping services on the Brighton Mainline to Victoria will see a frequency uplift of 29 per cent, while services on the south east metro network to Victoria will see an uplift of 71 per cent. At London Bridge, services via Peckham Rye will increase by a third (see Table 17).
- 8.2.4 Off-peak frequencies to Victoria would increase by a third for south central metro services and would double for south east metro services. Frequencies on services via Peckham Rye to London Bridge would double. There would also be modest frequency increases at Blackfriars, Charing Cross and Cannon Street. This will dramatically improve connectivity to and between town centres in south and south east London during the day.

Table 17: Frequency changes (trains per hour) – Metro services

Terminus	Peak Hour			Off Peak		
	2019 Base	MET01	Change	2019 Base	MET01	Change
Blackfriars	29	32	+ 3 tph	20	24	+ 4 tph
Cannon Street (SE Metro)	16	20	+ 4 tph	12	14	+ 2 tph
Charing Cross (SE Metro)	20	20	=	12	14	+ 2 tph
London Bridge (BML Slow)	4	6	+ 2 tph	4	6	+ 2 tph
London Bridge (via Peckham Rye)	6	8	+ 2 tph	4	8	+ 4 tph
Victoria (BML Slow)	14	18	+ 4 tph	12	16	+ 4 tph
Victoria (SE Metro)	7	12	+ 5 tph	6	12	+ 6 tph

- 8.2.5 These changes will bring significant improvements to service frequencies during the peak at stations across south and south east London and beyond. This is notable at Lee and Mottingham on the south east network, where peak frequencies increase from 5tph to 12tph, and at Anerley and Waddon on the south central network, where peak frequencies increase from 6tph to 12tph. The largest peak percentage increase is at Belmont, where frequencies rise from 2tph to a metro-level 6tph service.
- 8.2.6 Some of the largest increases in terms of total trains during the peak will be at key centres of growth such as East Croydon (+14tph) and Peckham Rye (+9tph). Several stations, including Catford, Streatham Hill and some stations in North Kent will upgrade to metro-level frequencies of 6-8tph during the peak. Similarly at off-peak times, Mitcham Eastfields and Mitcham Junction would see frequencies increase from 4tph to metro-level 10tph, and Lee and Mottingham would see frequencies increase from 4tph to 9tph.

8.2.7 Some of the largest increases in terms of total trains off-peak will be at outer London town centres such as Sutton (+10tph) and East Croydon (+9tph). 17 stations, including East Dulwich and Sydenham Hill will upgrade from 4tph to metro-level frequencies of 6-10tph. All but three stations within Greater London (Birkbeck, Riddlesdown and Sanderstead) would have a minimum 4tph off-peak service, compared to 16 stations with a lower level of service at present.

Benefits to the wider South East

8.2.8 The benefits of these improvements will be spread across the wider South East, with a 25 per cent increase in peak frequencies on services from Kent to Charing Cross, and a 43 per cent increase in peak frequencies from Kent to Victoria. Brighton Mainline fast services will see frequency increases to both Victoria and London Bridge. The capacity unlocked by the restructuring of local stopping services in London, and targeted infrastructure improvements can unlock additional paths for services on fast lines, spreading the benefits of metroisation to customers across the wider South East.

Table 18: Frequency changes (trains per hour) – WSE services

Terminus	Peak Hour			Off Peak		
	2019 Base	'Core' option	Change	2019 Base	'Core' option	Change
Cannon Street (Kent Services)	7	7	=	0	0	=
Charing Cross (Kent Services)	8	10	+ 2 tph	6	6	=
London Bridge (BML Fast)	8	10	+ 2 tph	5	3	- 2 tph
Victoria (BML Fast)	16	20	+ 4 tph	14	18	+ 4 tph
Victoria (Kent Services)	7	10	+ 3 tph	5	5	=

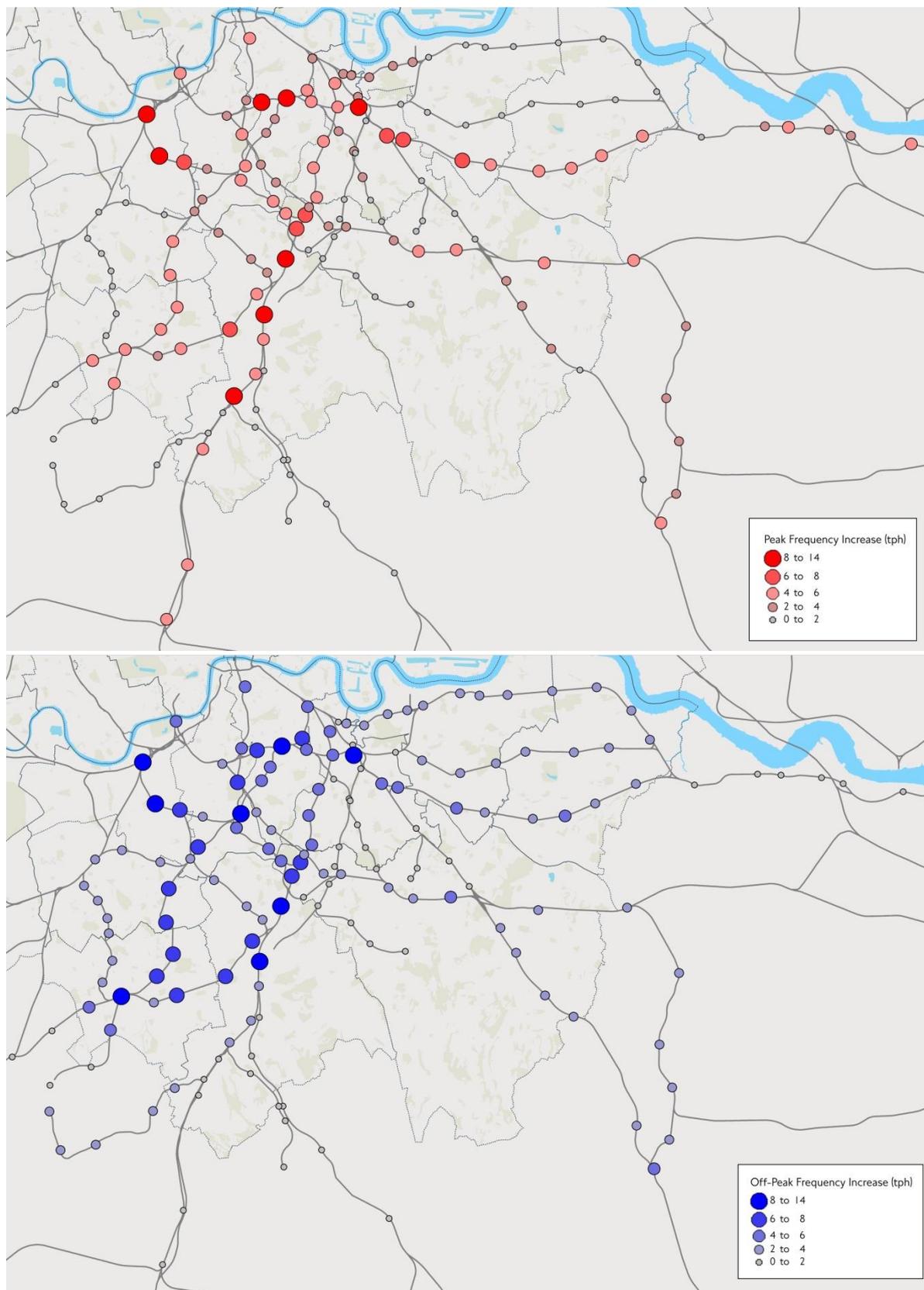
Net change. Includes reallocation of some London Bridge fast services to Victoria

8.2.9 Surrey and Sussex residents would benefit from an additional two services between Victoria and Redhill, and an additional two services between London Bridge and Haywards Heath and Three Bridges.

8.2.10 Towards Kent, additional services to Dover Priory and Maidstone East would be enabled on the south eastern route from Victoria. Sevenoaks would be served by five additional trains in the peak, split between the Thameslink route and Charing Cross, with the Charing Cross trains originating in Tunbridge Wells and Ashford International.

8.2.11 Figure 49 shows peak and off-peak frequency enhancements for stations across south and south east London and neighbouring districts of the wider South East.

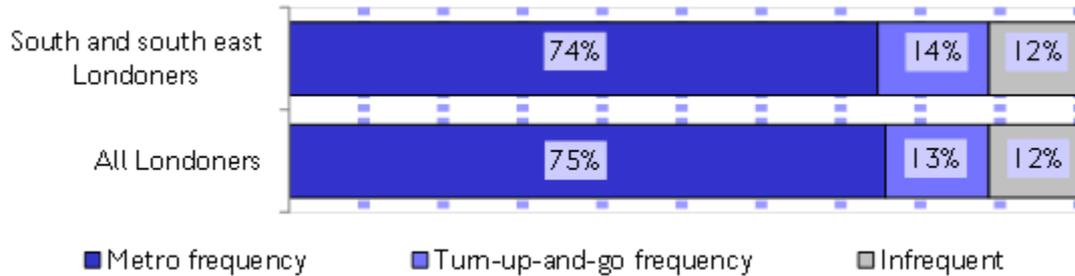
Figure 49: Frequency changes (peak and off-peak)



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8.2.12 The changes outlined above would bring the overall level of service in south and south east London (see Section 4.4) in line with the rest of London, as shown in Figure 50.

Figure 50: Level of service provided to Londoners with a nearby rail service ('core' option)



Metro: Average passenger wait time, taking into account actual departure times, is less than or equal to 5 minutes. This level of service is provided on the Tube and the busiest parts of the London Overground network.

Turn-up-and-go: Average passenger wait time, taking into account actual departure times, is less than or equal to 7.5 minutes. This level of service is provided on most of the London Overground network.

Infrequent: Average passenger wait time, taking into account actual departure times, is greater than 7.5 minutes

Strategic interchanges

8.2.13 The MTS identifies Clapham Junction and Lewisham as strategic interchanges in south and south east London (see Figure 51).

Figure 51: Strategic interchanges



Source: Mayor's Transport Strategy 2018

8.2.14 These are locations where a combination of existing and planned services means that they have the potential to provide multiple high-frequency radial services to central London, high quality orbital services that connect to other parts of London, and high frequency local bus services. This enables public transport to become a competitive alternative to the car for journeys across the sub-region, and between the sub-region and neighbouring sub-regions and the wider South East, without the need to travel via central London.

8.2.15 Metroisation can build on the existing hyper-connectivity of Clapham Junction and Lewisham to improve connectivity to and through south and south east London throughout the day (see Table 19). Frequencies at Clapham Junction would increase from 32tph to 44tph during the peak and from 27tph to 40tph off-peak. At Lewisham, frequencies would increase from 21tph to 30tph during the peak, and 15tph to 26tph off-peak.

Table 19: Frequency changes (trains per hour) – Strategic interchanges

Terminus	Peak Hour			Off Peak		
	2019 Base	MET01	Change	2019 Base	MET01	Change
Clapham Junction	32	44	+12 tph	27	40	+13 tph
Lewisham	21	30	+9 tph	15	26	+11 tph

8.2.16 Together with the existing London Overground, South Western Railway and DLR networks, this will enable easy and reliable journeys to be made by public transport around south London and to destinations further afield without the need to travel via central London.

Local interchanges

8.2.17 The core option includes two new local interchanges, designed to allow the service to be simplified and create new frequent journey opportunities. New high level platforms at Streatham Common would allow the infrequent London Bridge-Selhurst service to be diverted to Sutton, resulting in a new frequent London Bridge-Peckham-Sutton service alongside an increase in frequency between Selhurst and Victoria and Selhurst and West London. The new interchange would allow people to continue to make journeys between the Selhurst line and London Bridge and Blackfriars with an interchange, but at frequencies of every 5 minutes rather than every half hour. It would also enable new or improved connectivity for journeys such as Tooting to Croydon (every 15 minutes) or Balham to Peckham (every 7-8 minutes).

8.2.18 A similar intervention at Brockley would enable interchange between the East London Line and the south east network, improving journey times between town centres in south London such as Croydon and Crystal Palace and destinations in south east London, including Lewisham and Sidcup, while also relieving pressure on Canada Water station and the Jubilee line (which is one of the biggest pinch points on the Tube and London Overground network).

8.3 Quicker and more reliable services will save people time

8.3.1 When services are low frequency, customers have to allow more time for their journey to include an element of contingency to ensure they don't miss their train, particularly if they are connecting from another service. This is even more pronounced with unreliable services. For example, a train cancellation on a half-hourly service could be the difference between catching your plane or not. For these types of journeys, customers may feel compelled to add an extra half an hour to their journeys or more.

8.3.2 Metroisation could save people this time, and more. A trustworthy service means less need to 'pad' your journey and less stress, closing the psychological gap between public transport and driving.

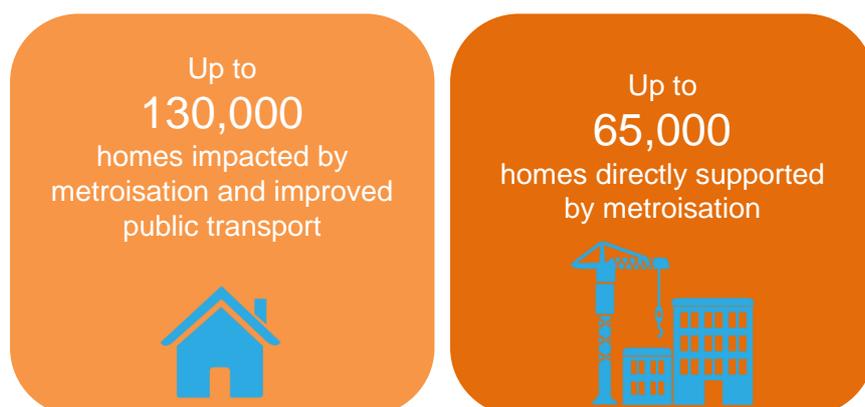
8.3.3 This could be coupled with higher frequencies, so people usually don't have to worry about waiting for more than 10 minutes. Finally, by applying an 'every second counts' approach to the train journey itself, customers would feel that every effort is being made to get them to their destination as quickly as possible.

8.4 Higher capacity and improved connectivity can support the delivery of new homes

8.4.1 Historically, where rail services have been improved on the London Overground and TfL Rail networks, there has been an increase in housing delivery within a 1km catchment area of each station.

8.4.2 The SHLAA has identified the potential for up to 130,000 homes that could come forward within 1km of stations that would benefit from improved service frequencies due to metroisation. This includes all sites identified as Allocated, Potential, or Low Probability in the SHLAA. Initial estimates are that up to half of these (65,000) could be directly supported as a result of metroisation improving services at suburban stations across London and the wider South East as shown in Figure 52.

Figure 52: Housing delivery supported by metroisation



8.4.3 The impact of an improved rail service on housing delivery can be clearly seen on the London Overground network. Since the East London Line was transferred to London Overground, homes within a 1km catchment have been delivered at greater levels than other areas that are served only by the national rail network (see Section 5.1).

8.4.4 Beyond housing, further long-term benefits would arise from the greater integration of transport and land-use planning. This is delivered through:

- A closer link between local rail services and the local communities they serve, leading to greater leverage of external funding for enhancements
- Long term investment by TfL and the GLA, outside of any one franchise period, working with local authorities and economic partnerships to kick start regeneration and create the transport conditions necessary to improve land value and development potential

8.5 A predictable and frequent service with better trains will make travel easier and more accessible

8.5.1 Public transport struggles to compete with the car where it is seen as comparatively inconvenient, slow, tiring and unreliable. Metroisation aims to address these factors, to make journeys easier to make on the rail network, and therefore more pleasant for existing customers and new customers alike.

8.5.2 Predictable services, including identifiable 'lines' with consistent stopping patterns and even intervals, will make the network easier to use. Customers will be able to travel spontaneously and navigate the network easily, even if they are unfamiliar with it. This will help to address the information barrier to travel (see Section 4.3).

- 8.5.3 Higher frequencies and improved reliability will reduce crowding, which can put people off travelling by rail (see Section 4.3). These improvements combined with upgraded interchanges will make multi-stage journeys more viable as interchange is regarded as less of a burden, and less of a risk to timely arrival at one's destination.
- 8.5.4 Progress has been made in recent years to improve the physical accessibility of the rail network, through schemes such as Access for All. However, fixed infrastructure is only part of the solution to make rail accessible.
- 8.5.5 The wider doors and more open internal layout of metro-style trains will make boarding and alighting easier for all customers. This will also improve the on-train experience for wheelchair users.
- 8.5.6 Finally, the 'contingency' elements that customers allow for their journeys (see Section 8.3) are even more pronounced for wheelchair users or others requiring step-free access. Combining high frequencies with London Overground's 'turn up and go' approach to step-free travel (which we hope would be delivered through transfer of services to TfL) and supporting customer campaigns such as 'Please Offer Me a Seat' would unlock step-free travel on the rail network, making much more of the inherently easier adaptability of surface-level stations through Access for All.

8.6 A more attractive service reduces social isolation and improves physical and mental health

- 8.6.1 Improved reliability and service levels could unlock wider public health benefits, as people will be more willing to walk to their local station rather than taking a car to their destination or a bus to a more distant station (see Section 3.8). On average, people will walk 5 to 7 minutes to access a rail mode compared to under 4 minutes to access a bus²⁸.
- 8.6.2 By improving connectivity, metroisation could help address social isolation by enabling more journeys to be made easily. This can have a positive impact on people's mental and physical health²⁹.

²⁸ TfL Walking Action Plan 2018

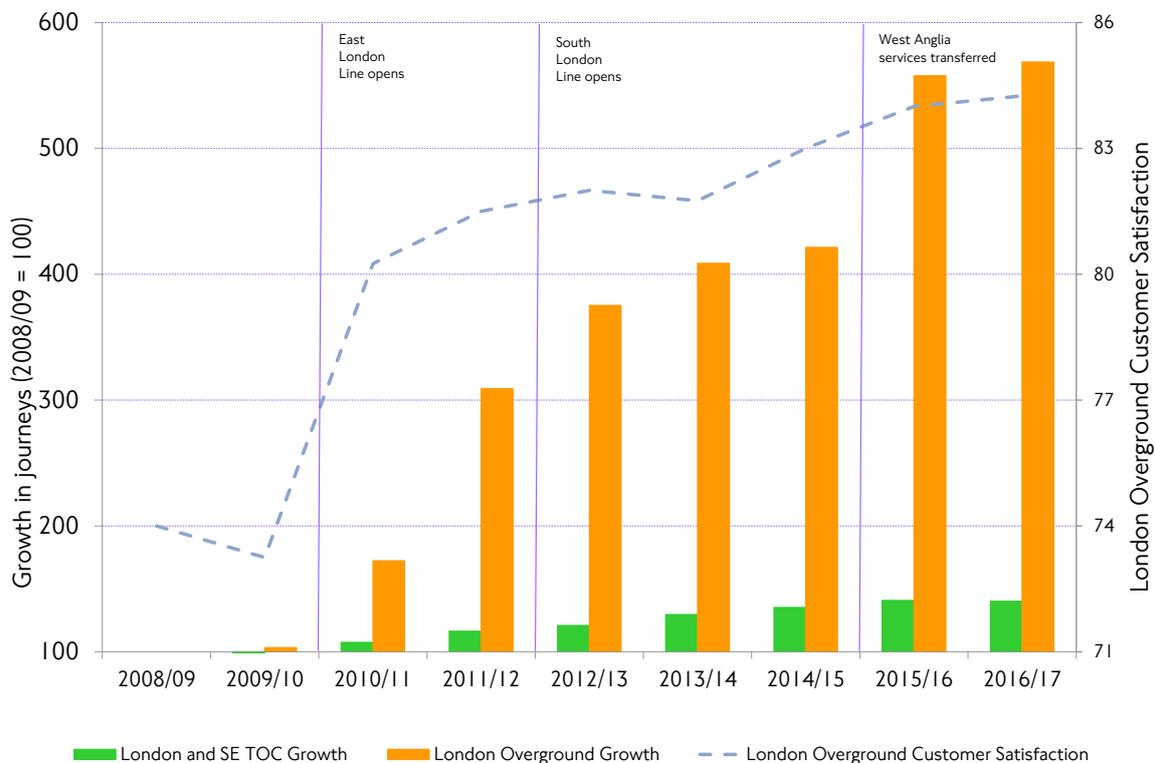
²⁹ Boniface S, Scantlebury R, Watkins SJ, et al. Health implications of transport: evidence of effects of transport on social interactions. Transport and Health Study Group 2014

8.7 A more dependable service supports the viability of town centres and their jobs

8.7.1 Improved public transport connections can play an important role in maintaining town centre viability. Previous analysis by GLA Economics has demonstrated evidence of a strong relationship between employment and population density in areas of low public transport accessibility, concluding that ‘there is reasonable evidence to suggest that land turned over for housing in areas of low transport accessibility could be associated with employment growth in the local economy’³⁰. The results of the study suggest that increasing the resident population of an area by 1,000 could potentially, on average, lead to 171 additional jobs in the local area.

8.7.2 A more dependable service can also encourage usage, which can benefit town centres served along the route. The success of the London Overground provides an instructive example of the value of providing frequent and high quality rail services. As shown in Figure 53, demand for London Overground services continued to grow in line with vastly improved customer satisfaction scores, following each initial step-change when the network was extended.

Figure 53: Growth in London Overground and LSE TOC demand

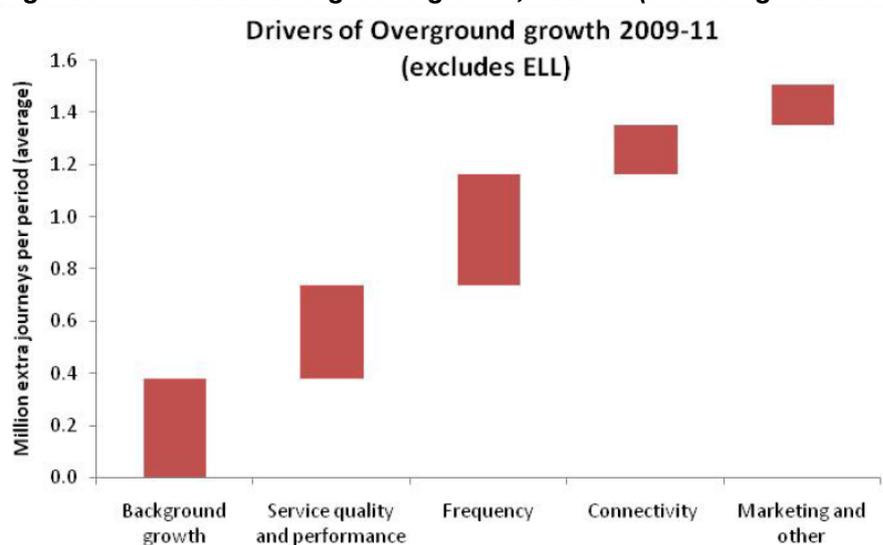


Source: TfL

³⁰ More residents, more jobs? 2015 update: The relationship between population, employment and accessibility in London, GLA Economics, 2015

8.7.3 Furthermore, a 2011 study found that only a quarter of this growth was due to background population and economic growth. Most of the growth in demand was attributable to improved service frequency, service quality, new trains, higher capacity, station upgrades, performance improvements, connectivity, and marketing (Figure 54).

Figure 54: Drivers of Overground growth, 2009-11 (excluding East London Line)



Source: London Overground Impact Study, TfL, 2011

8.8 Metroisation could spread economic benefits to the wider South East

- 8.8.1 Metroisation could also provide significant benefits for towns outside London served by Southern and Southeastern services. The direct transport capacity benefit would result in additional services calling at stations including Redhill, Haywards Heath, Dover, Maidstone, Ashford, and Tunbridge Wells, amongst many other places.
- 8.8.2 Metroisation could also deliver reliability improvements across the entire south central and south eastern networks by reducing the conflict between ‘fast’ and ‘slow’ services, benefitting customers on the rail network across Kent, Surrey and Sussex.
- 8.8.3 These capacity and reliability benefits would in turn benefit the local economies of town centres in Surrey, Sussex and Kent by enabling local firms to access greater numbers of potential workers and customers. Improving the capacity and reliability of the rail network to these town centres would strengthen the commuting, trade and wider economic links in the wider South East.

9 Delivering metroisation

9.1 Delivery mechanisms

9.1.1 Delivering transformational change requires commitment, determination and collaboration between national, regional and local government, TfL, Network Rail, TOCs, Freight Operating Companies, and everyone who uses the network. As noted in Section 6, this will require a fundamental change to the way the network is planned and run. Whilst this could be achieved through existing structures, buy-in from stakeholders responsible for specifying the change is critical.

9.1.2 Three potential routes to delivery of metroisation have been identified:

- a) DfT Rail National Enhancements Pipeline (RNEP)
- b) Franchising process (similar to Chiltern Railways *Evergreen* programme)
- c) Transfer of services to TfL (similar to London Overground North London Line programme)

DfT Rail National Enhancements Pipeline (RNEP)

9.1.3 This approach would use existing processes for major enhancement schemes, with Network Rail specifying the requirement and funding provided by a combination of access charges, commercial rents and fare revenues. Financing would be underwritten by Government.

9.1.4 The RNEP provides a rolling programme of investment from 'Determination' to 'Deployment' with a series of decision gateways. Using this approach, enhancements are funded incrementally by DfT as milestones are achieved. The Pipeline applies to market-led proposals as well as government sponsored schemes.

9.1.5 RNEP replaces the HLOS process for enhancements, which was the most common approach to delivering major enhancement schemes and used to deliver the London Bridge station upgrade. The planned Brighton Main Line upgrade would be delivered using the RNEP approach.

9.1.6 As noted in Sections 6.1 and 7.3, this route to delivery would require a significant change to the prevailing industry approach to prioritisation, planning and running of the network. A strong case needs to be made for London at the national level to deliver using this approach.

Franchising process

9.1.7 DfT could specify metroisation in a franchise contract and instruct the operator to work in partnership with Network Rail to deliver the outcomes. This requires the TOC to take on a greater role in delivery.

- 9.1.8 This approach was used to deliver the Evergreen programme of improvements delivered by Chiltern Railways, in which the TOC took on the political, delivery and revenue risk for delivering infrastructure improvements. It functions on the basis of agreements that the output of the project would be sold to Network Rail at agreed milestones, completed works would then form part of Network Rail's regulated asset base, and the TOC would pay higher track access fees thereafter.
- 9.1.9 To date this approach has mainly been used on networks that are mostly self-contained. The interactions between local stopping services and long distance services across the south central and south east rail networks would significantly increase the complexity of using this approach to deliver metroisation. This approach also places a significant risk on a traditionally franchised TOC.

Transfer of services (as a delivery mechanism)

- 9.1.10 The transfer of services would put TfL in a position to specify the changes required and, as the operator, we would have a stronger influence on the industry Pipeline process.
- 9.1.11 This approach was used to deliver the North London Line improvements on the London Overground network.
- 9.1.12 The transfer of services would make metroisation much more likely and much easier to achieve. The main reasons for this are:
- We see metroisation as a crucial policy tool not only in transport, but in the delivery of objectives relating to economy, health and housing. The DfT franchising process is not designed to take these wider benefits into account in the same way. The oversight of the Mayor of London allows a much broader view of the benefits of service enhancements to be taken, to the benefit of both Londoners and non-Londoners. The Mayor also controls other policy levers (such as fares, road network management, and other public transport modes) which could be used to encourage usage.
 - The contractual incentives for private operators need to be very strong to effectively deliver a metro service where every second counts. London Overground's East London Line shows how this can work even where services work in mixed traffic for part of their route. These incentives are a fundamental part of the TfL concession model employed for London Overground and TfL Rail.
 - Many of the tools proposed are long-established on Tube and the DLR. Our decades-long experience of metro operation, including on complex networks with flat junctions and interaction with other rail operators (e.g. the sub-surface railway of the District, Metropolitan, Circle and Hammersmith & City lines), is needed to bring metroisation to life.

9.1.13 Transfer of services could widen funding options as we are incentivised to deliver economic and social benefits through the Mayor of London. This contrasts with other approaches, which are primarily driven by network and commercial objectives. The economic objective, in particular the Mayor's aims to deliver more housing, strengthens the case for funding via the Housing Infrastructure Fund and supports the inclusion of Mayoral CIL (and potentially Borough CIL) as funding options. Commercial development, including over station development, could supplement these funding streams where appropriate.

9.1.14 A corollary of this approach would include transfer of infrastructure management responsibility. We are already the infrastructure owner and manager for the core East London Line and this approach could be extended. In another example, the Core Valley Lines will transfer to Transport for Wales this year, and a franchise operator has been appointed to operate the services and manage the infrastructure.

9.2 Delivery packages

9.2.1 The total capital cost of the core metroisation scheme has been estimated to be around £1.7bn in 2014/15 prices, including optimism bias. While this compares favourably with other major transport schemes in south and south east London, funding and financing will remain a significant challenge. These could be addressed in part by delivering component packages incrementally. This approach was used in delivering improvements to the London Overground network over the previous decade.

9.2.2 Table 20 breaks down the core metroisation option into seven packages which would each unlock incremental benefits. These packages could be progressed in any order, although the transfer of services in the first instance would make delivery easier. The packages are indicative and some interventions (e.g. Streatham Common Interchange) could in theory be included as part of more than one package. Where services in different packages interact (e.g. Packages A & B), the scope of these package could be refined based on the order of delivery. The scope of each package may also be refined in future iterations of this Strategic Case.

9.2.3 These packages are described in more detail in 9.2.4 to 9.2.29 below. As several packages depend on common interventions (e.g. digital signalling), indicative costs are presented as a range where the lower bound assumes common interventions have already been delivered by another package, and the upper bound assumes no common interventions have been delivered. Packages A, B, C and E all assume Network Rail's Croydon Area Remodelling scheme has already been delivered.

Table 20: Core metroisation option delivery packages

T	Transfer of services	
A	Victoria South Central Metro	D Victoria South East Metro
B	London Bridge/Blackfriars South Central Metro	E East London Line Enhancements
C	West London Line Southern Extension	F Charing Cross/Cannon Street South East Metro

Package T: Transfer of services (as a delivery package)

9.2.4 Transfer of services to TfL would enable some key components of metroisation to be delivered. Increased contractual incentives would improve reliability across the network. Off-peak service levels would be increased to London Overground levels and station staffing increased. Metro-style rolling stock would also be introduced.

9.2.5 Most of these benefits could be realised in the short to medium-term, before major engineering interventions are delivered.

Package A: Victoria South Central Metro

9.2.6 This package would deliver infrastructure enhancements to support metroisation on services from Victoria towards Sutton, Croydon and Crystal Palace (Figure 55).

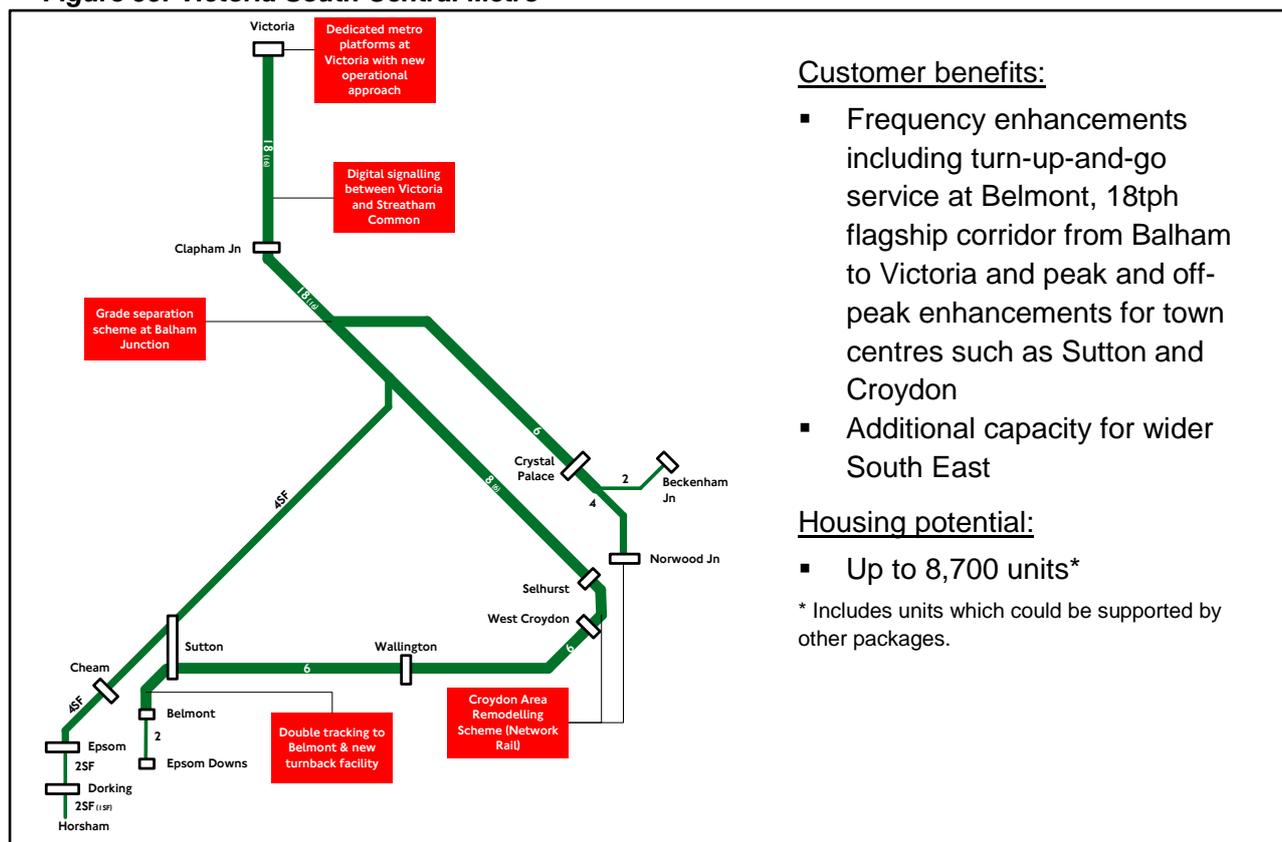
9.2.7 Digital signalling between Victoria and Streatham Common would deliver an additional 4tph between Balham and Victoria, increasing the peak frequency on this link to 18tph. The additional services would be split between the Selhurst branch, providing an additional 2tph to Sutton, and the South London line towards Crystal Palace, providing an additional 2tph to Crystal Palace and Norwood Junction. Double tracking and a new turnback facility at Belmont would enable frequencies to be increased from 2tph to 6tph between Sutton and Belmont.

9.2.8 The package assumes Network Rail’s Croydon Area Remodelling scheme has already been delivered. The additional works needed could be delivered for a capital cost of £640m - £725m³¹.

9.2.9 These improvements would deliver capacity enhancements along some of the busiest sections of the network.

³¹ Assumes new turnback facilities at Belmont, grade separation at Gloucester Road Junction and Balham Junction, and digital signalling Victoria – Balham. The lower estimate assumes Gloucester Road Junction is delivered as part of Network Rail’s Croydon Area Remodelling Scheme. Assumes 66 per cent optimism bias.

Figure 55: Victoria South Central Metro



Customer benefits:

- Frequency enhancements including turn-up-and-go service at Belmont, 18tph flagship corridor from Balham to Victoria and peak and off-peak enhancements for town centres such as Sutton and Croydon
- Additional capacity for wider South East

Housing potential:

- Up to 8,700 units*
- * Includes units which could be supported by other packages.

Package B: London Bridge/Blackfriars South Central Metro

9.2.10 This package would deliver infrastructure enhancements to support metroisation on services from London Bridge and Blackfriars towards Sutton, Croydon and the Wimbledon Loop (Figure 56).

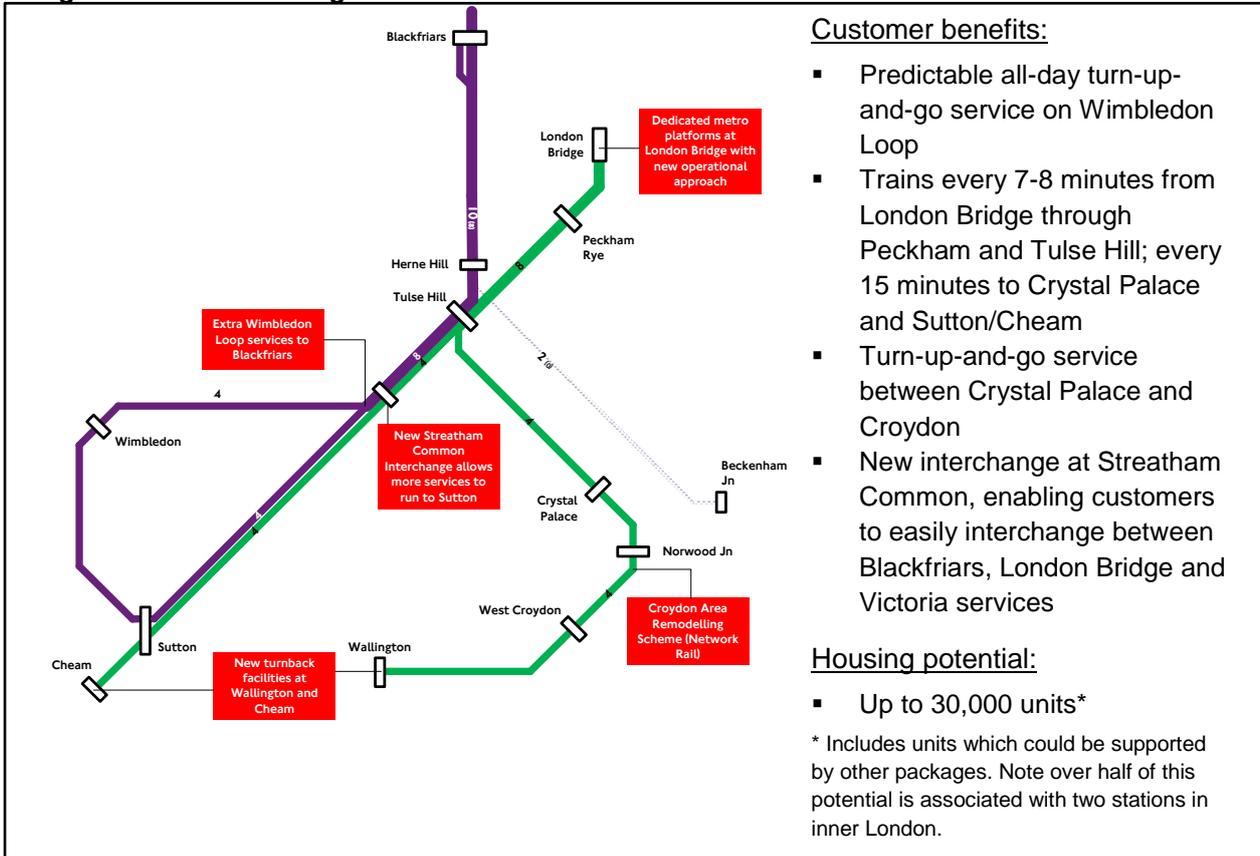
9.2.11 Dedicated metro platforms at London Bridge with a new operational approach combined with new turnback facilities at Wallington and Cheam would enable frequency enhancements on services via Tulse Hill towards Sutton and Croydon. Stations on the Wimbledon Loop would have a consistent all-day 4tph service to Blackfriars or beyond. A new interchange at Streatham Common would allow customers from across south London to easily switch between Blackfriars, London Bridge and Victoria services.

9.2.12 The package assumes Network Rail’s Croydon Area Remodelling scheme has already been delivered. The additional works needed could be delivered for a capital cost of £80m - £165m.³² Given the interaction between services covered by this package and those in Package A, it is likely that this package would need to be refined if it was to be delivered before Package A.

³² Assumes new turnback facilities at Cheam and Wallington, new high-level platforms at Streatham Common, and grade separation at Gloucester Road Junction. The lower estimate assumes Gloucester Road Junction is delivered as part of Network Rail’s Croydon Area Remodelling Scheme or as part of another package. Assumes 66 per cent optimism bias.

9.2.13 These improvements would deliver connectivity benefits across south London by increasing frequencies and enabling customers to easily interchange between Blackfriars, London Bridge and Victoria services at Streatham Common.

Figure 56: London Bridge/Blackfriars South Central Metro



Package C: West London Line Southern Extension

9.2.14 This package would deliver infrastructure enhancements to support metroisation on services to/from the West London line (Figure 57).

9.2.15 Grade separation at Clapham Junction and Balham Junction, combined with digital signalling between Streatham Common and Victoria, would enable an increase in direct services from south London to destinations on the West London line.

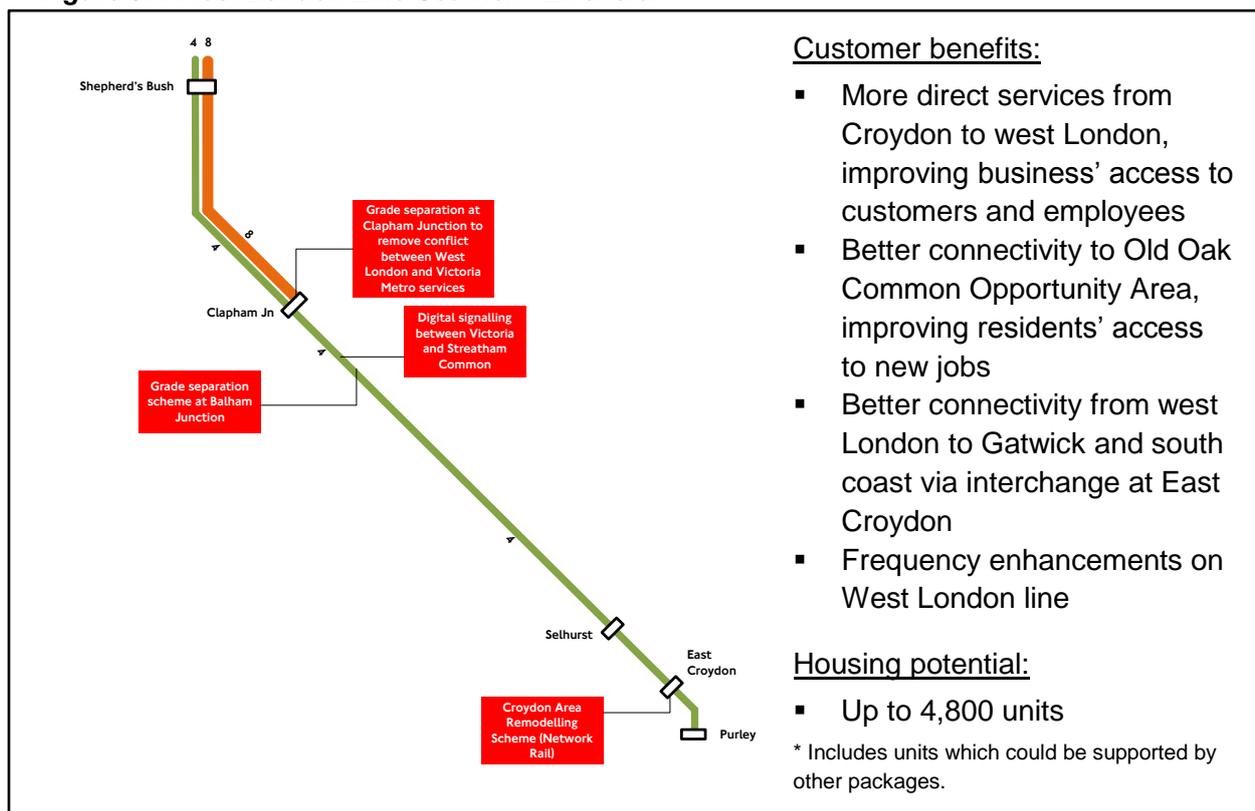
9.2.16 The package assumes Network Rail’s Croydon Area Remodelling scheme has already been delivered and that Hythe Road station in Old Oak Common has already been delivered as part of a separate scheme. The additional works needed could be delivered for a capital cost of £110m - £795m³³. As it

³³ Assumes grade separation at Gloucester Road Junction, Falcon Junction, and Balham Junction, and digital signalling Victoria – Balham. The lower estimate assumes Gloucester Road Junction, Balham Junction, and digital signalling Victoria – Balham are delivered as part of Network Rail’s Croydon Area Remodelling Scheme or as part of another package. Assumes 66 per cent optimism bias. If Hythe Road station not already delivered, the proposed service pattern on the West London line would be different.

is unlikely that this package would be progressed before Package A, incremental cost would be at the lower end of this range.

9.2.17 These improvements would enhance connectivity between south London and the Old Oak/Park Royal Opportunity Area, which is expected to see significant growth in homes and jobs. This additional connectivity would provide a competitive alternative to travelling via central London for journeys between south and west London and beyond.

Figure 57: West London Line Southern Extension



Package D: Victoria South East Metro

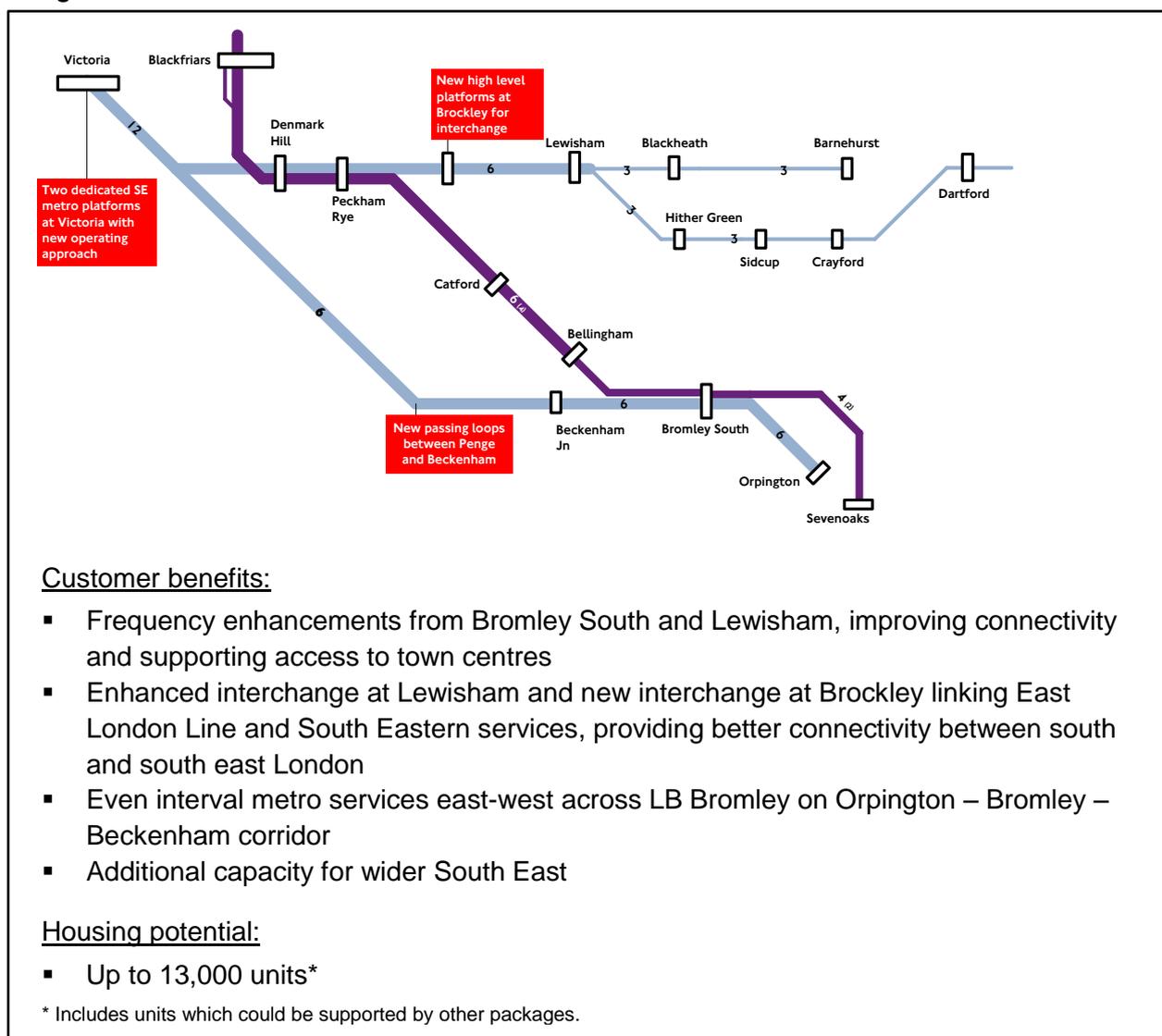
9.2.18 This package would deliver infrastructure enhancements to support metroisation on services from Victoria to the south east (Figure 58).

9.2.19 New passing loops between Penge and Beckenham, two dedicated metro platforms at Victoria with a new operating approach, and interchange improvements at Lewisham would combine to deliver an additional 2tph on services to Bromley South and Orpington, and an additional 3tph on services between Victoria and Lewisham. New platforms at Brockley would enable interchange between South East services and the East London Line.

9.2.20 The additional works needed could be delivered for a capital cost of £100m - £150m.³⁴

9.2.21 These improvements would improve connectivity by enhancing frequencies between Bromley, Lewisham and Victoria, improving interchange at Lewisham and providing a new interchange at Brockley to enable easy interchange to the East London Line.

Figure 58: Victoria South East Metro



Package E: East London Line Enhancements

9.2.22 This package would deliver infrastructure enhancements to support metroisation on services on the East London and Sydenham lines (Figure 59).

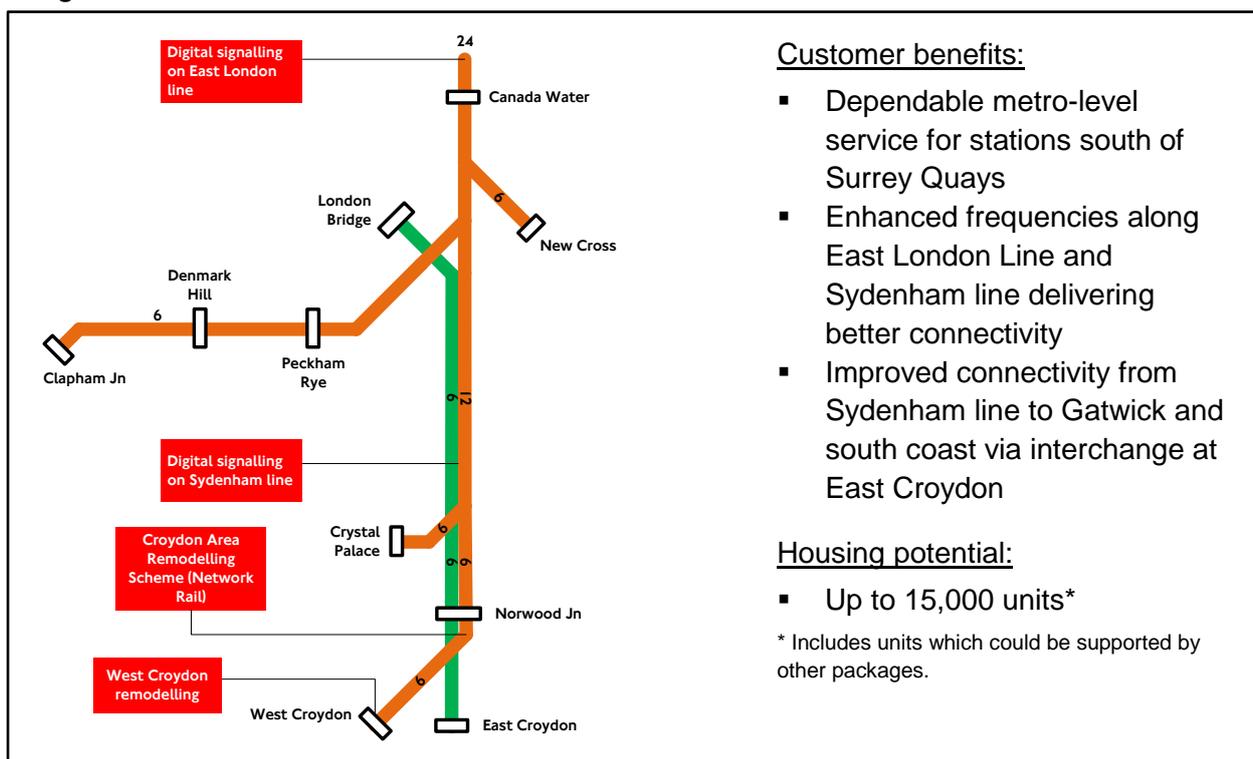
³⁴ Assumes new high-level platforms at Brockley, additional tracks Penge East to Kent House, major passenger capacity intervention at Lewisham station and additional power costs. The lower estimate assumes the Lewisham and power interventions are delivered as part of another package. Assumes 66 per cent optimism bias.

9.2.23 Digital signalling on the East London Line and Sydenham line would enable enhanced frequencies of 24tph along this corridor.

9.2.24 The package assumes Network Rail’s Croydon Area Remodelling scheme has already been delivered. The additional works needed could be delivered for a capital cost of £120m - £205m.³⁵

9.2.25 These improvements would deliver metro-level services between New Cross Gate and Sydenham along with frequent and dependable links to Crystal Palace and Croydon.

Figure 59: East London Line Enhancements



Package F: Charing Cross/Cannon Street Metro

9.2.26 This package would deliver infrastructure enhancements to support metroisation on services from Charing Cross, Cannon Street and London Bridge towards Lewisham, Dartford and Sevenoaks (Figure 60).

9.2.27 Services towards Dartford would be simplified into identifiable lines with consistent levels of service throughout the day. Digital signalling between central London and Lewisham/Greenwich would support enhanced

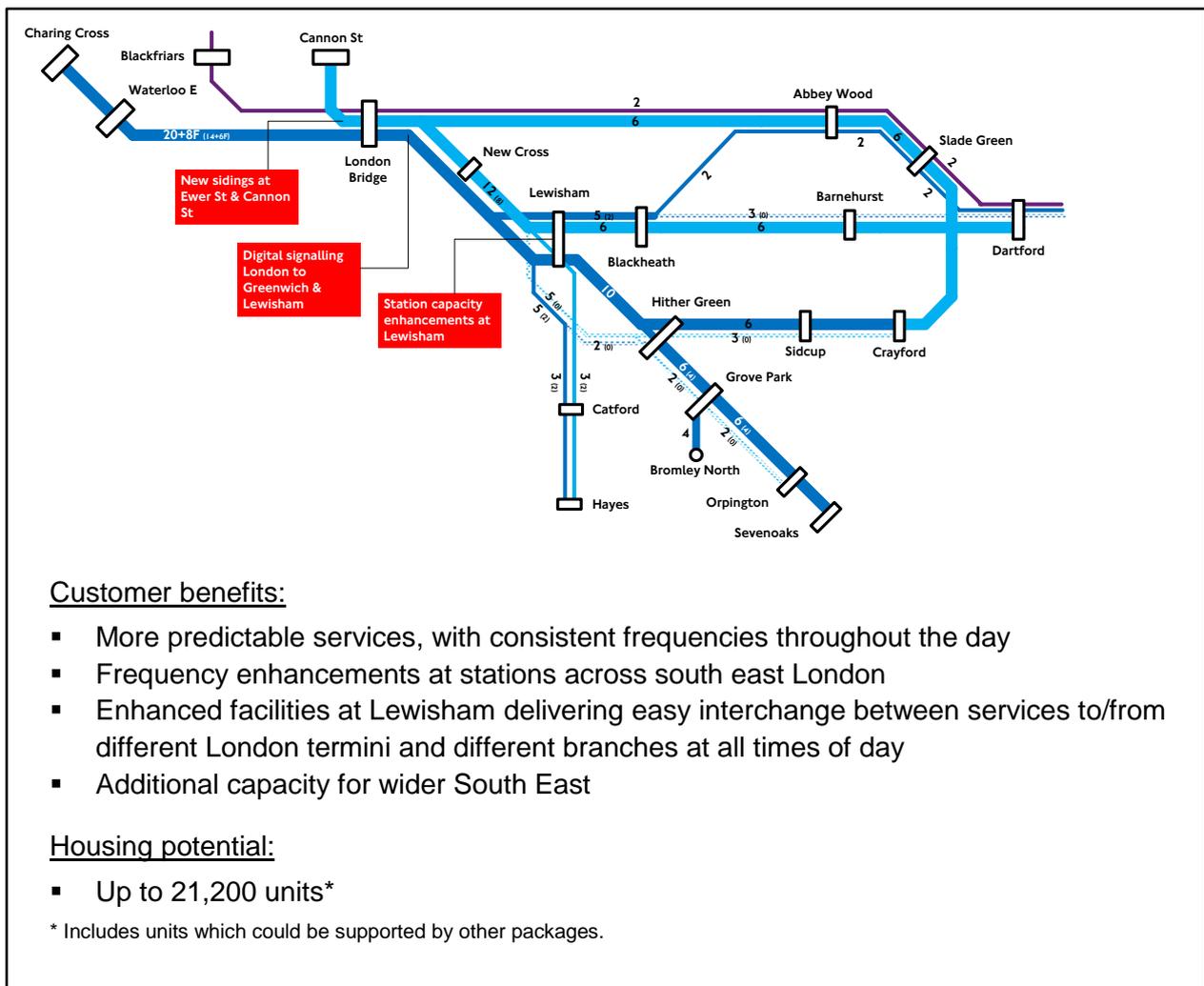
³⁵ Assumes West Croydon remodelling, grade separation at Gloucester Road Junction and digital signalling on the East London Line core section. The lower estimate assumes Gloucester Road Junction is delivered as part of Network Rail’s Croydon Area Remodelling Scheme or as part of another package. Assumes 66 per cent optimism bias.

frequencies and station capacity and facilities would be improved at Lewisham.

9.2.28 The additional works needed could be delivered for a capital cost of £535m - £590m.³⁶

9.2.29 These improvements would make the rail network easier to use by providing more services at even intervals and improving connectivity between different branches and the DLR via interchange at Lewisham.

Figure 60: Charing Cross/Cannon Street Metro



³⁶ Assumes new signs at Cannon Street and Ewer Street, new turnback facilities at Dartford, digital signalling Charing Cross/Cannon Street – Greenwich/Lewisham, major passenger capacity intervention at Lewisham station and power costs. The lower estimate assumes the Lewisham and power interventions are delivered as part of another package. Assumes 66 per cent optimism bias.

10 Constraints and dependencies

10.1 Transfer of services

10.1.1 The transfer of local rail services to TfL is not strictly necessary to deliver metroisation. Most of the tools described in this Strategic Case could theoretically be delivered by operators contracted to the DfT and enshrined through DfT's franchising process. However, as described in Section 9.1, the transfer of services would make metroisation much more likely and much easier to achieve.

10.2 Long-distance services

10.2.1 The proposal has been designed to ensure no adverse impacts on the frequency, journey times or stopping patterns of longer distance services to and from London (recognising that current frequencies will need to grow in line with demand). Beyond these safeguards, the proposals have the potential to bring a range of benefits to users of longer distance services, as outlined in Section 8.

10.3 Franchise schedule

10.3.1 The franchise schedule is important as metroisation would need to be delivered either as a result of transferring services to TfL, or through inclusion within the specification of each franchise (probably over at least two consecutive franchise terms).

10.3.2 The TSGN franchise is renewed in 2021, most likely for up to 7 years. It would be crucial to ensure that at least some of the elements of metroisation were specified as part of the replacement of this franchise, particularly as metroisation takes advantage of the major investment by Network Rail in Croydon Area Remodelling Scheme.

10.3.3 The next South Eastern franchise is due to start in April 2019 and run until April 2027. Whilst the service specification for this franchise did include some important enhancements on the road to a more metro-like service, the next franchise would need to go further, particularly with capital investment in trains and signalling.

10.4 Rail freight

10.4.1 The rail network is shared between passenger and freight services. The MTS sets out three principles to make best use of the capacity of the network:

- Freight is moved at quieter times of day when demand for passenger services is lower
- Non-London freight bypasses London, on routes where more capacity is available and the demand for passenger services is lower

- The provision of additional London-bound rail freight services should not lead to a reduction in passenger services

The proposal has been developed to align with these principles. The service pattern for the core option has been assessed at key junctions to make sure that capacity exists for rail freight in the off peak, particularly at locations like Lewisham.

10.5 Planning policy

10.5.1 The proposal has been developed with regard to the differing planning policies of local authorities across London and the wider South East. Specifically, this proposal supports agreed infrastructure priorities for the wider South East along the Brighton Mainline and at Thames Gateway Kent.

11 Policy alignment

11.1 Metroisation aligns with national, regional and local policy

- 11.1.1 Metroisation can support the achievement of the economic, social and environmental objectives in the National Planning Policy Framework³⁷ by making areas more attractive and viable for development, supporting new homes and enabling more trips to be made by active, efficient and sustainable modes. The scheme supports the DfT's strategic vision for rail³⁸ by delivering a more reliable railway, expanding capacity and improving the experience for customers.
- 11.1.2 By providing a more frequent and reliable service, metroisation would make areas more attractive to live and work in, thus encouraging new development and growth in line with the principles of Good Growth outlined in the London Plan³⁹ and MTS⁴⁰. Furthermore, by improving connectivity and supporting a shift towards active, efficient and sustainable modes, the scheme will support other Mayoral strategies, including the London Environment Strategy⁴¹, London Housing Strategy⁴², Mayor's Economic Development Strategy⁴³ and Mayor's Health Inequality Strategy⁴⁴.
- 11.1.3 The scheme aligns with policy objectives at a sub-regional and local level by supporting the delivery of housing, and the development of strong town centres.
- 11.1.4 The frequency, reliability and connectivity benefits of metroisation will spread across the wider South East, supporting Surrey County Council and Kent County Council ambitions for better journey times and more sustainable travel.
- 11.1.5 Appendix A: Policy review details how metroisation aligns with the above and other national, regional and local policies.

³⁷

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663124/rail-vision-web.pdf

³⁹ https://www.london.gov.uk/sites/default/files/new_london_plan_december_2017.pdf

⁴⁰ <https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf>

⁴¹ https://www.london.gov.uk/sites/default/files/london_environment_strategy-draft_for_public_consultation.pdf

⁴² https://www.london.gov.uk/sites/default/files/2018_lhs_london_housing_strategy.pdf

⁴³ <https://www.london.gov.uk/sites/default/files/economic-development-strategy-for-london-2017.pdf>

⁴⁴ <https://www.london.gov.uk/what-we-do/health/health-inequalities-strategy>

12 Conclusion and next steps

12.1 There is a compelling strategic case for the metroisation of suburban rail services in south and south east London

12.1.1 London and the wider South East face significant transport challenges to support a growing population and maintain a successful economy:

- The south and south east London public transport network is not delivering to its full potential.
- Customers from both London and the wider South East who rely on the south and south east London rail network are not getting a good public transport experience.
- South and south east London is not realising its potential for housing delivery and economic growth.

12.1.2 There is substantial underutilised capacity on the National Rail network that could be released at relatively low capital cost to help address these challenges.

12.1.3 Delivering the core metroisation option, as outlined in this Strategic Case would result in benefits to the network, the customer, and the wider economy in both London and the wider South East.

12.2 Next steps

12.2.1 This Strategic Case provides a compelling argument for change in the planning and operation of rail services in south and south east London. While the transfer of services to TfL would make metroisation much more likely and much easier to achieve, the case for change stands irrespective of the contracting authority. This Strategic Case can form the basis for our conversations with stakeholders in south and south east London to build consensus on the long-term vision for the rail network. It can also be used to inform engagement with the DfT and HM Treasury regarding long-term infrastructure funding in London.

12.2.2 In line with DfT processes, this Strategic Case would in due course form part of a complete Business Case for metroisation, supported by an economic case, including testing the benefits of the core metroisation option and relevant variants, as well as the financial, commercial and management cases.

13 Appendix A: Policy review

Table 21: Policy alignment of metroisation

Strategy or Policy Document	Core Policy Objectives	How metroisation supports these policy objectives
<p>National Planning Policy Framework⁴⁵</p> 	<p>The revised National Planning Policy Framework sets out government's planning policies for England and how these are expected to be applied.</p> <p>The overarching aim of the framework is to achieve sustainable development. There are three strands to this:</p> <ol style="list-style-type: none"> 1) Economic objective – ensuring land is available in the right place at the right time to support growth, innovation and productivity; coordinating the provision of infrastructure. 2) Social objective – ensuring sufficient range and number of homes, safe and well-designed built environment, accessible services and open spaces. 3) Environmental objective – protecting and enhancing the environment, increasing effective use of land, improving biodiversity, using natural resources prudently, minimising waste, mitigating and adapting to climate change, and a move to low carbon. <p>Beyond this, a number of specific objectives relate to transport:</p> <p><i>5 – Delivering a sufficient supply of homes</i> To achieve this it is important that a sufficient amount and variety of land can come forward where it is needed.</p> <p><i>6 – Building a strong, competitive economy</i> As part of this it is important to create conditions in which businesses can invest, expand and adapt. Furthermore, potential barriers to investment, such as inadequate infrastructure, service or housing, should be addressed.</p> <p><i>9 – Promoting sustainable transport</i></p> <p><i>11 – Making effective use of land</i> Promote the effective use of land in meeting the need for homes and other uses.</p>	<p>Metroisation aligns with and helps achieve these objectives in the following ways:</p> <ul style="list-style-type: none"> - By improving the rail service, new areas of land will be more attractive and viable for development. - This unlocking of land will allow for more homes to be built in areas which are well served by public transport and connected to London. - An improved rail service and new homes near these services will encourage a reduction in private vehicle use and therefore reduce energy consumption and mitigate against climate change. - In addition, the improved rail service would enable more people from South London and the wider South East to access central London and the employment opportunities in the city.
<p>DfT 'Connecting People: a strategic vision for rail' (2017)⁴⁶</p> 	<p>Describes the government's strategic vision for the railways, and the actions being taken to make it a reality.</p> <p>This strategy focusses on creating an expanded, modern railway that is dedicated to improving services for the customer. It outlines proposals for dealing with rising demand on an already overcrowded and intensively used network. The plans aim to deliver a more reliable, more competitive, growing railway which offers a better deal to passengers.</p> <p>The five key components of the strategy are:</p> <ol style="list-style-type: none"> 1 – More reliable railway: 2 – An expanded network: through expanding commuter capacity, new routes that unlock housing and economic development or provide strategic links, and schemes to meet the biggest capacity challenges. 3 – A better deal for passengers 4 – A modern workforce 5 – A productive and innovative sector 	<p>The reliability gains that metroisation offers would contribute directly to the first key aim of this strategy, to create a 'More reliable railway'. This is important as it is noted as one of the most important aspects of customer satisfaction.</p> <p>It also helps to achieve an expanded network as it offers more service options from suburban rail stations. In turn this would also help unlock housing as locations become more desirable to developers and homebuyers given the improved transport</p>

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663124/rail-vision-web.pdf

	<p>Metroisation is particularly relevant to the delivery of a more reliable railway and an expanded network, which the strategy states can be achieved through a focus on:</p> <ul style="list-style-type: none"> a) expanding commuter capacity b) new route that unlock housing and economic development or provide strategic links c) schemes to meet biggest capacity challenges 	<p>connections.</p> <p>Metroisation would also ensure that the industry gets the most out of existing assets, as a more frequent and efficient service can be run on existing infrastructure. This meets a particular goal within the strategy to use the existing railway in more effective ways, for example through upgrading trains or changing timetables and service patterns to use existing capacity differently.</p>
<p>Draft London Plan (2017)⁴⁷</p> 	<p>The strategic plan for London, setting out an economic, environmental, transport and social framework for development.</p> <p>The Spatial Development Strategy for London, the London Plan is a mechanism for co-ordinating growth across the London boroughs. It sets out ambitious growth targets for each borough, totalling 65,000 new homes per year. It also seeks to ensure that this growth is both the right kind and in the right locations. This is a step change from the previous growth targets, and requires a change in the form and density of growth in London.</p>	<p>In providing a more frequent and reliable service, metroisation would make areas more attractive to live and work in, thus encouraging new development and growth. The service improvements would also unlock more parts of London for growth, and enable more car-free developments and thus better and more efficient use of space. Ultimately, this will support growth and help meet Londoners' housing needs.</p>
<p>Mayors Transport Strategy⁴⁸</p> 	<p>The MTS sets out the policies and proposals to reshape transport in London by 2041. The three key themes are: 1) Healthy Streets and healthy people, 2) A good public transport experience, and 3) New homes and jobs. More specifically, the targets are for 80 per cent of all trips to be made by active modes or public transport by 2041, and for rail capacity to central London to increase by more than 80 per cent (thus enabling the delivery of more homes).</p> <p>Key policies which relate to metroisation are:</p> <p>Policy 1: The Mayor, through TfL and the boroughs, and working with stakeholders, will reduce Londoners' dependency on cars in favour of active, efficient and sustainable modes of travel, with the central aim for 80 per cent of all trips in London to be made on foot, by cycle or using public transport by 2041.</p> <p>Policy 16: The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to transform London's rail-based services to provide safer, modern, reliable, integrated, accessible and user-friendly services, with improved journey times and an increase in capacity of at least 80 per cent by 2041 to tackle crowding and facilitate mode shift to rail.</p> <p>Policy 18: The Mayor, through TfL and the boroughs, and working with stakeholders, will support improvements to public transport to enhance travel between London, the rest of the UK and international destinations, and will require regional, national, and international transport schemes to be integrated into London's public transport system wherever</p>	<p>Metroisation will contribute to all three of the key themes and help achieve policies 1, 16, 18 and 21 in the following ways:</p> <ul style="list-style-type: none"> - A better rail service will encourage more people to use it, and this could contribute to mode shift away from cars - Improved reliability, frequency, journey times and capacity of rail services would offer a good public transport experience for Londoners - A better rail service will improve effective connectivity and thus make areas more desirable to live and work in; this will help unlock areas for new homes and jobs - Improvements to suburban rail routes will have knock on benefits for longer distance rail services, thus enhancing travel between London and the rest of the

⁴⁷ https://www.london.gov.uk/sites/default/files/new_london_plan_december_2017.pdf

⁴⁸ <https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf>

	<p>possible.</p> <p>Policy 21: The Mayor, through TfL and the boroughs, and working with stakeholders, will ensure that new homes and jobs in London are delivered in line with the transport principles of Good Growth for current and future Londoners by using transport to: a) Create high-density, mixed use places, and b) Unlock growth potential in underdeveloped parts of the city.</p>	<p>UK</p> <p>- More frequent and faster service will make areas around stations more attractive as places to live. This will encourage development around these locations and help achieve the targets for new homes in London in a sustainable way.</p>
<p>Mayor's Economic Development Strategy⁴⁹</p> 	<p>The Economic Development Strategy aims to establish a fairer, more inclusive economy in the capital that creates and supports growth across all London's sectors.</p> <p>The Mayor is striving for London to be, among other things, the world's greatest city for business, more productive and innovative, and the most competitive business environment in the world which is open to the most talented workers in the world. It is important to keep London thriving, because when London grows, so does the rest of the country. In line with achieving this, the key aims of the strategy are: A fairer, more inclusive economy; Creating conditions for growth; Supporting London's sectors; Delivering the Mayor's vision.</p> <p>Transport and infrastructure are key drivers of growth and competitiveness. The rail network is particularly important for the economic success of London as it provides businesses with a pool of skilled labour from Greater London and the wider South East. However, crowding is a growing problem on the rail network at peak times, and there is a need for more sustainable and efficient movement of people and goods across the city. Furthermore, investment in public transport also unlocks homes and jobs, which further strengthens the economic development of London.</p>	<p>Through reliability and service improvements, metroisation will ensure that commuters to London (both from within and outside the city) will have good access to jobs. This will keep London open and attractive to talented workers.</p> <p>By improving the public transport provision in South London new areas will become more attractive to developers and homeowners, and growth can continue in the city.</p>
<p>London Housing Strategy⁵⁰</p> 	<p>The London Housing Strategy sets out the Mayor's plans to tackle the capital's housing crisis and his vision to provide all Londoners with a good quality affordable home</p> <p>To achieve this vision, there needs to be unblocking of stalled housing sites, increased speed of building and diversification of where, how and who is building. There is also a need to build at higher densities, using the available land more intensively.</p> <p>Public investment, particularly in new transport schemes, sustains and supports new housebuilding as it speeds up build rates, unlocks stalled schemes and makes more land available. Furthermore, investment in strategic infrastructure will help to realise the potential of the wider city region to support housing and business.</p> <p>Investment in public transport will help achieve: Policy 3.1 'Increasing the supply of new homes' and Policy 3.2 'Investment to support housing delivery'. This is because it will enable greater intensification and higher densities of new homes as people have the required level and quality of transport connections, particularly to central London where much of the economic activity takes place.</p>	<p>Metroisation would contribute directly towards achieving the goals in policies 3.1 and 3.2 as it would offer a step change in the provision of rail services to suburban areas in South London and could thus help make certain sites more attractive for development.</p> <p>Alongside this the provision of a more regular and reliable service would offer better connectivity and capacity to places near suburban railway stations in South London and thus enable commuting to central London.</p>
<p>Mayor's Health Inequality Strategy⁵¹</p>	<p>The Mayors Health Inequalities Strategy sets out his plans to tackle unfair differences in health to make London a healthier, fairer city.</p>	<p>Metroisation will improve the rail service in South London, which will encourage and</p>

⁴⁹ <https://www.london.gov.uk/sites/default/files/economic-development-strategy-for-london-2017.pdf>

⁵⁰ https://www.london.gov.uk/sites/default/files/2018_lhs_london_housing_strategy.pdf

⁵¹ <https://www.london.gov.uk/what-we-do/health/health-inequalities-strategy>

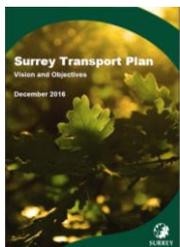
	<p>There is a huge variation in healthy life expectancy in London. The Mayor wants to address this inequality and improve the mental and physical health of all Londoners.</p> <p>Key policies which can be achieved through good planning and transport improvements are:</p> <p>Objective 3.2 – Health inequalities are reduced through good planning and making our streets healthier.</p> <p>Objective 5.1 – All Londoners achieve at least the minimum level of daily activity needed to maintain good health.</p> <p>In addition, planning and transport play a role in Objective 3.6 – ‘Improving housing availability, quality and affordability’, as transport improvements open up new sites for development and densification.</p>	<p>enable more people to use public transport for their journeys instead of private vehicles. This will reduce air pollution as people choose not to drive, and offer health benefits from active travel as people walk or cycle to rail stations. Furthermore, metroisation could help address social isolation by enabling more journeys to be made more easily, which can have a positive impact on people’s mental and physical health.</p> <p>In addition, as the rail service becomes more attractive and viable through metroisation, new sites will be unlocked for housing developments. This will help address the issues of housing availability in London.</p>
<p>London Environment Strategy⁵²</p> 	<p>The strategy outlines the Mayor’s plans for making the city a greener, cleaner and healthier place by targeting London’s toxic air, increasing its green cover and making London a zero-carbon city by 2050 with energy efficient buildings, clean transport and energy and increasing recycling.</p> <p>Two keys aims of the strategy are to improve the air quality in London and reduce the emission of greenhouse gases which contribute to climate change. In part, this can be achieved through mode shift away from private vehicles to public transport and active travel. This is captured in Policy 9.1.1 ‘The Mayor will work with TfL to encourage mode shift to reduce road traffic’. In addition, the Mayor is keen to reduce noise pollution in London.</p>	<p>Metroisation will make rail a more attractive option for journeys in South London. This will encourage mode shift away from private vehicles towards rail. In turn, this will reduce the emission of greenhouse gas (and other pollutants) as fewer journeys are driven, and thus air quality will improve. Fewer private vehicle trips will also go some way to reducing further climate change, and reducing noise pollution.</p>
<p>Mayor’s Culture Strategy⁵³</p> 	<p>The Culture Strategy outlines an ambitious vision to sustain a city that works for everyone. A city that is built on the principle of culture for all Londoners.</p> <p>The strategy aims to ensure that as many as possible can take part in cultural activities and have access to creative jobs in London. The creative industry is vital for London, and one in six jobs in London is in this sector. It is important that this sector remains thriving and competitive, so that London remains a vibrant city and productive city. In order to keep this sector growing and encourage international talent and investment, London needs to remain open and attractive to existing and potential employees.</p>	<p>Metroisation will improve rail connectivity and service frequency in South London. This will enable more people to access more jobs and keep London an attractive place to live and work. As a result, the creative industries that are so important to the city can continue to thrive and grow.</p>
<p>Sub-regional Transport Plans⁵⁴</p>	<p>The sub-regional transport plans outline transport schemes that have been implemented and the additional investment needed for further schemes.</p> <p>Across South London there are specific challenges and</p>	<p>Metroisation would lead to improvements in frequency and quality of rail services, which could enable further</p>

⁵² https://www.london.gov.uk/sites/default/files/london_environment_strategy-draft_for_public_consultation.pdf

⁵³ https://www.london.gov.uk/sites/default/files/2017_draft_strategies_culture_2.0.pdf

⁵⁴ <http://content.tfl.gov.uk/south-london-sub-regional-transport-plans-2016.pdf>
<http://content.tfl.gov.uk/east-and-south-east-london-sub-regional-transport-plans-2016.pdf>

 	<p>targets for transport. These also tie in to specific aims related to population growth, homes and jobs.</p> <p>Transport</p> <ul style="list-style-type: none"> - The share of national rail trips in the South is the highest of any sub-region. Without investment in the rail network, many lines will be at capacity, constraining growth. - Frequency is the key component of overall perception of quality of service, so improved frequency and quality of national rail services will be the key to maximising the potential of the South region. - The way people travel is changing; there is a growing demand for rail and cycling therefore the capacity of the network needs investment. Furthermore, although the car is still the dominant mode for commuting, potential exists for mode shift. - Highway congestion and bus speeds will get worse without more people switching to alternative modes. <p>Population, homes and jobs</p> <ul style="list-style-type: none"> - Population growth requires an increased rate of housing delivery. - There has been an increase in people commuting to central areas, and so maintaining capacity and frequency of PT connections between the South and central London will be important to support employment growth and enable access to employment. - The frequency and quality of national rail services is problematic as it makes the area seem less connected and thus limits the potential for future housing and employment growth. - Enhancing orbital connectivity between key centres will ensure the region remains competitive, supporting future employment growth. 	<p>growth of the region and, as part of that, denser levels of development and house building around national rail stations.</p> <p>In addition, it would improve connections to central London and regional town centres, thus enabling people to reach jobs and other opportunities in these locations.</p> <p>Metroisation would also increase the capacity of the rail network in South London. This would cater to the increasing demand for rail in the area, and ensure that rail remains a popular choice for journeys in the region. It would also encourage mode shift away from private vehicles as public transport becomes a more attractive and viable option. The frequency improvements will also improve the actual and perceived quality of the service and thus encourage additional rail journeys.</p>
<p>Local Plans (London)</p>	<p>Local Plans set out the priorities for the development of boroughs. They set out what is intended to occur in an area over the life of plan, where and when this will occur and how it will be delivered.</p> <p>Across the boroughs there are a number of common goals which are linked to transport planning and provision:</p> <ul style="list-style-type: none"> - To ensure connectivity and accessibility to, from and within the borough - Meet the housing needs of the borough and accommodate population growth - Promote sustainable transport and growth - Enhance orbital connections - Support and improve local town centres, ensuring their accessibility and attractiveness - Encourage mode shift away from private vehicles - Improve public transport options - Increase public transport capacity - Provide jobs and access to jobs both locally and in central London - Have a successful local economy <p>In addition, Croydon have a particular aim to invest in rail infrastructure, and in Greenwich there is a vision to reduce traffic levels and associated air pollution.</p>	<p>Many of the south London borough local plans can be broadly grouped into the following strategic objectives:</p> <ul style="list-style-type: none"> - public transport provision improvements (and associated mode shift away from private vehicle trips) - new housing and densification of housing sites - development of strong town centres - access to employment within borough and in Central London. <p>Metroisation will contribute to achieving all of these goals by:</p> <ul style="list-style-type: none"> - improving the frequency and reliability of rail services in the region, which will in turn unlock areas for housing development - improving the connectivity of town centres making them suitable for regeneration and development, and encouraging more employment growth in these areas

		<p>- providing better links to central London, thus increasing the number of jobs available to local residents.</p>
<p>Surrey County Council Transport Plan⁵⁵</p> 	<p>The Surrey County Council Plans set out the priorities for the development of Surrey. They set out what is intended to occur in an area over the life of plan, where and when this will occur and how it will be delivered.</p> <p>Key aims include:</p> <ul style="list-style-type: none"> - improving air quality (to which road traffic is a major negative contributor) - develop a lower carbon transport system - increase the proportion of travel by sustainable modes, and maintain public transport patronage - reduce road congestion at peak times whilst travel demand increases <p>In addition there is a problem with rail services in the county, many of which are at capacity and suffer from peak time overcrowding.</p>	<p>Metroisation will improve the reliability of suburban services which will have knock on benefits for mainline rail services to Surrey as they will not be delayed or disrupted. As the rail service improves, more people will be willing to use public transport instead of private transport, and this will help improve air quality and reduce traffic congestion. In some cases metroisation will deliver frequency increases for Surrey stations (e.g. Redhill).</p>
<p>Kent County Council⁵⁶</p> 	<p>The Kent County Council Plans set out the priorities for the development of Kent. They set out what is intended to occur in an area over the life of plan, where and when this will occur and how it will be delivered.</p> <p>Key public transport strategy aims include:</p> <ul style="list-style-type: none"> - journey time improvements between East Kent and London - rail improvements and meeting increased demand for rail travel to and from London - promote initiatives to encourage greater use of rail in Kent - prioritisation of transport improvements that will deliver the major commercial and residential developments planned <p>The improvement of transport in the Thames Estuary and wider Kent region is essential to the growth of London and the South East.</p>	<p>Metroisation will improve the reliability and frequency of suburban rail services in South East London. This will have knock on benefits for mainline services to Kent and the wider South East region, as the service pattern is not disrupted by delayed suburban services. In some cases metroisation will deliver frequency increases for Kent stations (e.g. Sevenoaks, stations on the North Kent line).</p>
<p>South London Partnership⁵⁷</p> 	<p>The South London Partnership is a sub-regional collaboration of five London boroughs (Croydon, Kingston, Merton, Richmond and Sutton). They work together and with partners in and beyond the area to champion and build on the many strengths of South London.</p> <p>Improving transport connections across the region is a major priority of the SLP. They are strongly supportive of metroisation as many south Londoners rely on National Rail services and so frequency and reliability improvements would have significant benefits for many people. It will also achieve another aim of the SLP which is to enable residents to access employment opportunities in South London and beyond.</p>	

⁵⁵ https://www.surreycc.gov.uk/_data/assets/pdf_file/0016/109024/STP-Vision-and-Objectives-Dec16.pdf

⁵⁶ https://www.kent.gov.uk/_data/assets/pdf_file/0008/5939/local-transport-plan.pdf

⁵⁷ <http://southlondonpartnership.co.uk/transport/>