INTRODUCTION

An additional two million people are expected to live in London by 2041. Improving the quality, choice and availability of sustainable transport options is necessary to support this, and to achieve the Mayor's vision for 80 per cent of all travel to be made by walking, cycling or public transport. The London bus network will need to carry around 40 per cent more passengers than it currently does. Plans to achieve this are outlined in the Mayor's draft Transport Strategy and set out in more detail in this response. They will play a major part in delivering the Mayor's vision for Healthy Streets, good public transport and sustainable increases in London's homes and jobs.

Following a huge increase since 2000, bus demand has fallen back somewhat in recent years. While some of this is due to increased attractiveness of other modes and social or technological change, the main cause has been the fall in the quality of the service due to the increases in congestion caused by population growth and, especially in inner London, disruption from major highway schemes. Addressing this is one of TfL's top priorities and this is being achieved through a number of congestion-reduction interventions. This is supported by TfL's focus on reducing the volume of motorised traffic by encouraging more people to walk, cycle and use public transport, through measures such as improved road network management and strategic traffic control, protection of bus passenger journey times in roadworks wherever possible, and an expanded and more ambitious bus priority programme. Safety is, of course, of paramount importance and, through Vision Zero, TfL have a target of zero fatalities on the bus network by 2030 and to reduce the number of people killed and seriously injured by 70 per cent by 2022. Our response to the Transport Committee's report on bus safety further outlines TfL's approach to this.

The bus network will be crucial in supporting London's growth, from the densification of inner London and the growth in demand along busy corridors, to embedding sustainable transport choices in new developments. Underpinning the focus on journey times and reliability will be the continued adjustment of network capacity to match changing customer travel patterns, within funding constraints. TfL will also continue to focus on the on-board experience, improving accessibility, information and customer service. At the same time TfL has a world-leading programme to reduce buses' contribution to air quality though ultra- low and zero emission vehicles, to meet the Mayor's target that all buses in London will as a minimum comply with the Euro VI emissions standard by 2020.

The committee recommends a five-point plan of action to address the challenges facing London's bus network:

1. Tackle congestion to halt the decline in passenger numbers.
2. Redistribute bus capacity to outer London

3. Move towards a more efficient network design based on the principles of the feeder/trunk model
4. Reform the bus service tendering process
5. Improve the bus experience to attract new passengers

Response to the Committee's Recommendations

The response in this document is organised around two of the three central themes of the Mayor's draft Transport Strategy:

- Healthy Streets and healthy people – containing our responses on recommendation 1 (congestion) and the parts of recommendation 5 dealing with interchange and accessibility
- A good public transport experience – addressing recommendations 2, 3 and 4 about bus network design and the remaining parts of recommendation 5

The interventions outlined in the 'Healthy Streets' and 'Good Public Transport Experience' sections also contribute to the bus network's already important role in delivering the key strategic outcomes set out in 'New homes and jobs', the third central theme in the draft Transport Strategy.

Figure 1: the MTS themes

HEALTHY STREETS: BUSES

This section addresses the Committee's first recommendation dealing with the impact of congestion on bus usage. It also discusses the parts of the fifth recommendation concerning the physical experience of changing buses and how buses are dealt with in town centre street design.

Recommendation 1

Tackle congestion to halt the decline in passenger numbers. There are several reasons for this decline, and the trend must be addressed in various ways. Primarily, however, the Mayor needs to take radical steps to reduce traffic congestion in London, which is deterring passengers from using buses. Bus priority measures are welcome, but they are only part of the solution. We have set out a series of wider measures to reduce congestion the Mayor can take and urge him to implement our recommendations.

Recommendation 5

Improving the bus experience to attract new passengers. There are a number of ways to improve passenger information, including the colour-coding trial TfL has launched. At bus stops, more countdown displays are required; on-board, richer information about routes and interchanges should be provided. Wi-Fi on board buses should be part of an enhanced service offer. The physical experience of changing buses is also poor in some places, with long distances between stops and no waiting facilities. Where public realm improvements are made, for instance in a town centre, the effect on bus passengers must be considered.

Healthy Streets and bus usage

It is recognised that the underlying cause of the majority of London's congestion problems is an inefficient use of limited street space. The long-term strategy focuses on the promotion of sustainable transport as set out in the draft Transport Strategy in order to achieve real change in congestion reduction, and targets 80 per cent of all travel in London to be by walking, cycling and public transport by 2041. TfL has also commissioned an independent study into congestion which will assist with the evidence base for congestion reduction measures and will in turn further inform the Transport Strategy.

The draft Mayor's Transport Strategy recognises that the bus network is essential to London's growth. To contribute to improving the quality of our overall sustainable

transport modes, it proposes that bus services should be enhanced, and makes clear that a principal task is to improve bus performance.

This also incorporates the enhancement of walking and cycling facilities across schemes around the network. Measures may include bus priority in many forms including bus lanes and bus-only movements at junctions, whilst also being assessed against pedestrian safety and cycling benefits. This approach will be taken forward in partnership with London's boroughs.

In parallel to this work to improve operating conditions for buses, it is also necessary to ensure that bus capacity is in the right places at the right times. The draft MTS sets out that:

- In outer London, buses will often be the primary means of delivering public transport capacity and will be essential to support housing and other growth
- In central London bus services will complement the rail network, walking and cycling

It is envisaged there will be some rebalancing of capacity from central London to suburban areas as part of the continuous updating of the network. All areas will retain a comprehensive network of bus capacity and connections.

Over 50 per cent of walking journeys in London are associated with public transport journeys, and buses represent over half the public transport journeys in the city. Buses are the most efficient use of street space measured in terms of persons moved per unit of road space occupied. A good street experience supports bus usage, as walking to and from stops is a component of all bus journeys and a street network which prioritises the reliable movement of buses assists in maintaining the reliability of waiting times.

The street environment is critical to making bus services more reliable. Encouraging a shift away from cars improves the quality of the local environment and increases overall road safety. "People choose to walk, cycle and use public transport" is therefore one of the ten "Healthy Streets Indicators".

Fig 2: The Healthy Streets Indicators

The evidence for a link between slow bus speeds and reduced bus usage

Bus patronage decline over the past two years is linked to the increase in bus journey time. Reversing the trend of slower bus speeds via the Healthy Streets Approach is critical and will assist in congestion reduction.

It is important to be clear that increasing bus speeds is entirely consistent with increasing safety and reducing bus-related collisions. The objective is to keep buses moving steadily and reliably. Excessive speed is not acceptable. Driver training and new design features such as Intelligent Speed Adaptation will continue to limit excessive speeds.

In 2013, the average bus network speed was around 9.7mph. By 2017, it had declined to below 9.3 mph. There have been much greater proportional falls in central and Inner London. Speed in the inner southeast sector, for example, has deteriorated from over 8.6 mph to around 7.8 mph in three years. Considered from a passengers' perspective, the average journey time in southeast London has therefore increased by 10 per cent.

Recently there has been a marginal recovery in Inner London, with a year-on-year improvement of around one per cent per annum, although this is on a relatively low base, with speeds still significantly lower than three years ago. Outer London remains in decline, at around one per cent per annum.

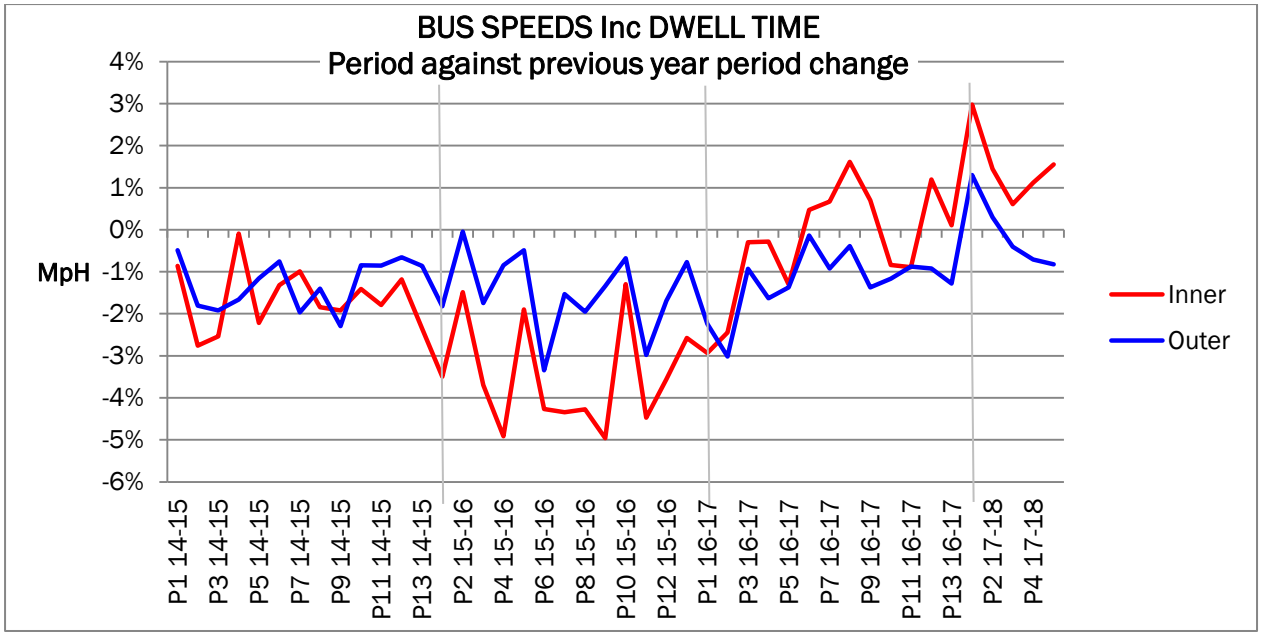
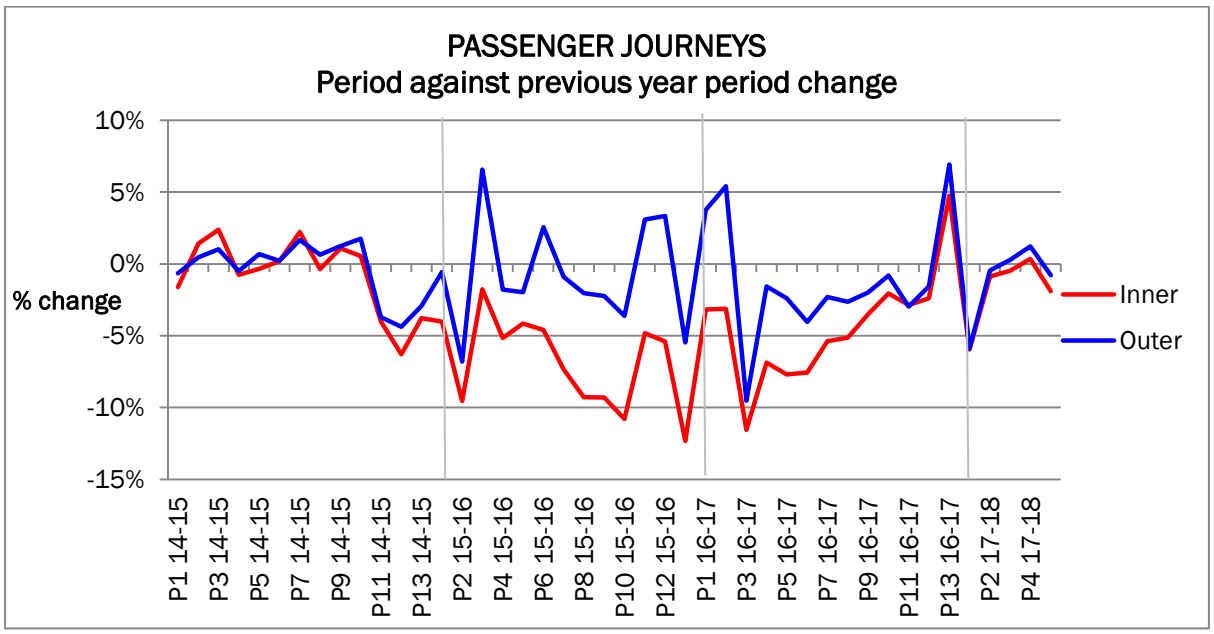


Figure 4: year-on-year change in bus speeds in inner and outer London[1]

Customers have responded by using buses less, with significant implications for TfL's revenue. Modelling carried out in June 2016 for the "Greener Journeys"[2] organisation found that an average speed increase of around 24 per cent would eradicate the need for bus subsidy due to lower operating costs and increased fares revenue following patronage generation. The declining speeds experienced recently have had the opposite effect, driving passengers away, reducing revenue and increasing operational costs.



[1] Classification: Inner routes have a section entering rail fare zone 1, outer routes do not – each route is completely assigned to one sector

[2] Full report available here: http://www.greenerjourneys.com/wp-content/uploads/2016/06/Prof-David-Begg-The-Impact-of-Congestion-on-Bus-Passengers-Digital-FINAL.pdf

Figure 5: year-on-year change in bus passenger journeys in inner and outer London

Slower average speeds are also associated with an increase in the variability of passengers' travel times, meaning they become less predictable. Customers therefore have to allow additional time to arrive at their destination on time.

A passenger's actual journey time has four main components – the scheduled wait (SWT), the "excess" wait (EWT[3]), the in-vehicle time (IVT), plus the allowance they make in trip-planning for expected variability in bus travel times. While it is difficult to measure how passengers plan for this variability, TfL continues work to better understand this, including the monitoring of SWT, EWT and IVT, as illustrated for a section of route 363 in Figure 6.

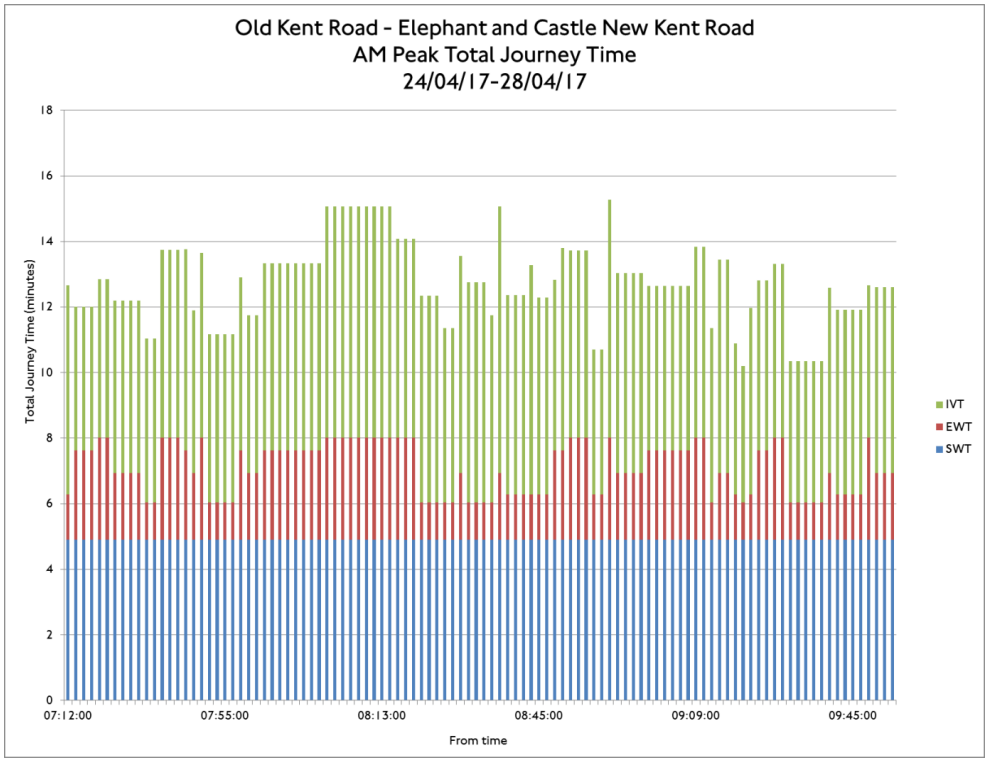


Figure 6: components of passenger travel time on route 363

In consideration of this evidence, TfL's approach to addressing slower bus speeds, and in turn the decline in passenger usage, must be tailored to its causes. Congestion in the Capital and long-term strategic solutions are outlined in detail below.

Initiatives to reduce congestion and increase bus usage

TfL's primary approach to reducing congestion is to encourage a modal shift to walking, cycling and public transport, thus reducing the general level of traffic. Improving the attractiveness of these sustainable modes is therefore fundamental to this.

[3] EWT = the time passengers wait over and above scheduled wait time

The bus network also needs to remain affordable and, therefore, supply has to be varied to match demand, whilst keeping a good service for those who are unable or choose not to travel by other means. In particular, TfL needs to ensure that travelling by car does not become more attractive. This can be tackled through action at all stages of road scheme designs and road network management. This is discussed in further detail below:

- Road scheme development
- The bus priority programme
- Road network operations

Road scheme development

TfL's and the London borough's approach to the development of new road schemes puts pedestrians, cyclists and public transport passengers at the heart of designs. This will result in changes to the road network where priority for bus passengers is considered at the earliest stages of scheme preparation.

Examples of this approach can already be seen in schemes at an advanced state of preparation or actually in place, including Camden Council's proposed West End Project, with two-way operation of buses on Tottenham Court Road.

Of course, trade-offs will continue to be necessary. TfL and the boroughs are developing innovative assessment tools to support the Healthy Streets Approach and to assist in decision-making at all stages of scheme design.

Bus Priority Programme

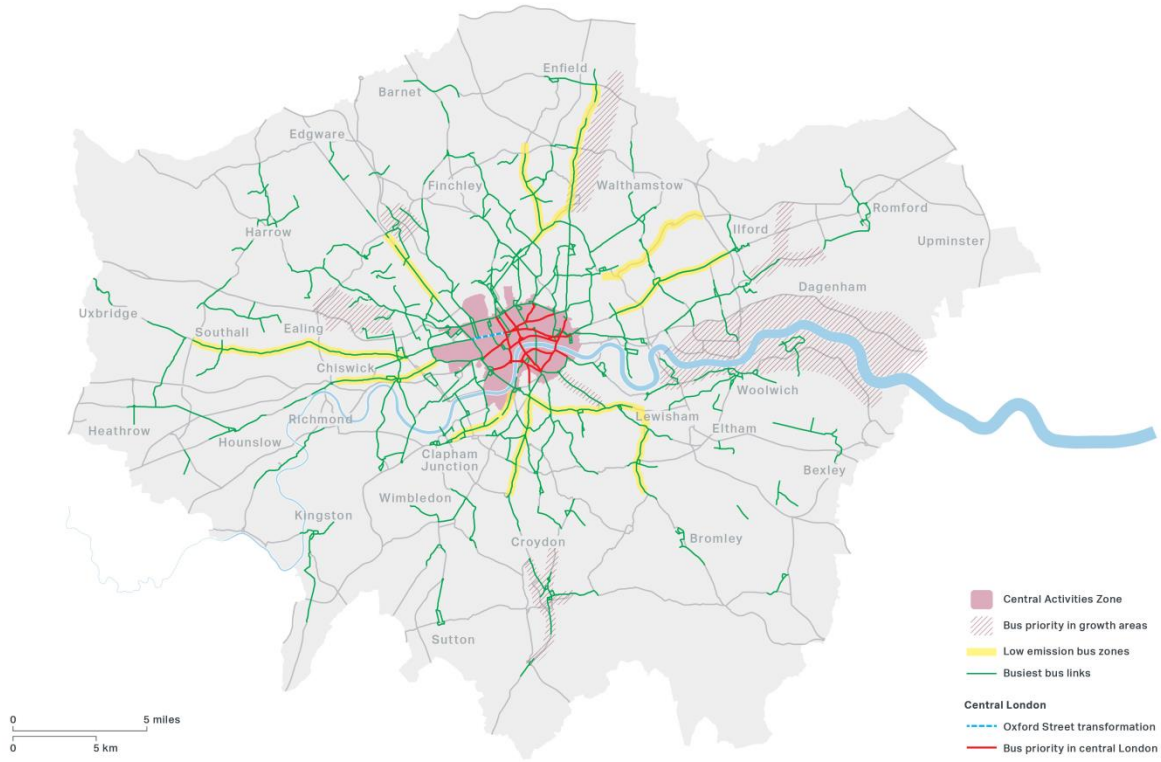
While bus journey times can be protected through well-designed schemes, explicit bus priority measures also have a key role to play in improving reliability. In all cases, these also provide improvements for walking and cycling, and in some cases taxis and motorcyclists. The draft MTS outlines a strategic plan for increasing bus priority in London:

- Developing a core network of reliable bus services in central London, through bus priority and bus and cycle only corridors, accompanied by a strategic rationalisation of services to these corridors (see Chapter 2 of the draft MTS for more detail). This will ensure that the bus services in central London, which are the busiest, are highly reliable and simple to use.
- Delivering bus priority to support the low emission buses being rolled out on the 12 Low Emission Bus Zones. Improvements will include reviewing bus lane hours and signal schemes.
- Delivering provision on the busiest passenger links, including working with London boroughs to undertake a data led review of all bus lane hours and to fill the gaps in bus priority on the busiest bus routes. These bus lanes represent a valuable transport asset and they must be utilised when bus passengers (and cyclists) need them most.

- Delivering bus priority in areas of growth to support changes to the bus network in terms of frequency increases, new developments, targeting mode shift such as orbital movements or new services to rail infrastructure, such as Elizabeth line complementary service.

The MTS also outlines an intention to investigate bus transits to support new homes and jobs in areas where public transport provision is limited and bus transits could provide a cost effective way to encourage sustainable mode share.

Figure 7: draft MTS bus priority map



Road network operations

TfL's strategy to manage congestion through its operational management of the road network has five main themes:

1. *Responding to incidents in real time*: Unplanned incidents such as breakdowns and collisions account for approximately 20 per cent of traffic congestion in London. TfL is improving its ability to identify and resolve issues quickly to reduce disruption.
2. *Strategic traffic control*: Approximately 75 per cent of congestion on the Capital's roads is the result of too much traffic for the road space available. TfL are using all the tools available to manage demand and keep London moving, including use of the traffic signalling system to respond nimbly to incidents and events on the network, and the rolling programme of signal timing reviews to optimise the set-up at each major junction.

3. *Managing roadworks more effectively*: TfL have already introduced a permitting and Lane Rental scheme in London that has significantly reduced the impact of roadworks. However, more can be done through closer collaboration with local authorities, utility companies and developers, including improved long-term planning of major infrastructure works and 'block-closures' to coordinate maintenance and upgrading of infrastructure.
4. *Communicating with road users*: Providing road users with relevant, real-time information will allow them to make decisions about their journeys based on the most up-to-date information, including travel demand management and behavioural change communications to reduce congestion during disruptive events and road-works by encouraging drivers to consider alternatives.
5. *Making highway assets reliable*: For the road network to perform well, the supporting infrastructure must be reliable to ensure that faults are kept to a minimum. Repairs must also be carried out in the fastest time possible to get traffic moving again quickly.

These measures will assist with the day-to-day management of congestion, while contributing to TfL's wider strategy of modal share to walking, cycling and public transport.

Access, interchange and passenger accessibility

A Healthy Street will include good local access to bus services. TfL aims to provide a comprehensive, convenient bus service, seeking to ensure at least 95 per cent of Londoners live within five minute walk of a bus stop (around 400 metres). Similarly, bus stops should ideally be close to key retail, education and employment destinations. Interchange between public transport services should be as convenient as possible within the constraints of the street environment and operational requirements.

Examples of this approach include the East London Transit services, which provide direct access to Barking town centre improving bus access to the shops and reducing journey times for through-passengers to the station and local hospitals. Similarly, Merton Council's 'Rediscover Mitcham' project has introduced a "bus street" through the shopping centre at Fair Green, which is also aligned with improved convenience for pedestrians and cyclists.

In some cases, recent road schemes have led to bus stops being moved further away from destinations such as stations, for example at Archway. It may remain necessary to do this on a case-by-case basis considering interaction between modes. However, the Healthy Streets Approach will ensure that bus passenger needs are considered at the earliest stages of design.

The draft MTS proposes improving the quality of interchange between all public transport modes, including bus services[4].

[4] Policy 11 and proposals 62 and 75

It is also necessary to ensure that bus stops complement the generally excellent physical accessibility of the buses themselves. TfL, working in partnership with the London boroughs, is now close to ensuring that over 95 per cent of bus stops will meet physical accessibility guidelines by the end of 2017. With this in place it will be necessary to ensure that there is full compliance with the associated traffic orders dealing with waiting, loading and parking at or near bus stops.

The Mayor, through TfL and working with other transport operators, will seek to make the public transport network easier and more pleasant to use, enabling customers to enjoy comfortable, confident, safe and secure, informed and stress-free travel.

A GOOD PUBLIC TRANSPORT EXPERIENCE – THE BUS NETWORK

This section addresses recommendations 2, 3 and 4 which deal with bus network design, including regular redistribution of capacity, and the trunk / feeder concepts. This section also discusses the parts of recommendation 5 dealing with passenger information and customer service.

Recommendation 2

Redistribute bus capacity to outer London. In order for Londoners to shift away from private cars toward sustainable transport modes, including buses, an increase in the capacity of the network is needed. There is most potential to do this in outer London, where more frequent services and new orbital routes would increase freedom and choice of travel modes for residents. In reality this change will require some redistribution of capacity from central London. New developments also need to be served by the network, so buses are a viable choice for residents and workers in those areas.

Recommendation 3

Move towards a more efficient network design based on the principles of the feeder/trunk model. While a wholesale and sudden redesign of the network is not feasible, TfL could move toward introducing new types of route, particularly using the feeder/trunk model. This would involve shorter, local bus routes connecting people to faster, high-capacity services on major corridors. With this approach, it would be appropriate for TfL to consider whether articulated buses could be reintroduced on major trunk routes.

Recommendation 4

Reform the bus service tendering process. The current system is a barrier to delivering a new approach to buses. Individual routes are awarded to specific operators every 5-7 years. TfL should consider reform, which could involve multi-route tenders covering all services on a particular corridor.

Recommendation 5

Improving the bus experience to attract new passengers. There are a number of ways to improve passenger information, including the colour-coding trial TfL has launched. At bus stops, more countdown displays are required; on-board, richer information about routes and interchanges should be provided. Wi-Fi on board buses should be part of an enhanced service offer. The physical experience of changing buses is also poor in some places, with long distances between stops and no waiting facilities. Where public realm improvements are made, for instance in a town centre, the effect on bus passengers must be considered.

Designing the bus network

As London grows, increased public transport capacity is required to reduce crowding and support increasing numbers of people travelling more sustainably. The bus network is in turn continually shaped and adjusted to provide convenient, reliable, accessible public transport options where they are needed most. TfL ensures that the bus network is designed across three main areas: reliability, capacity and connectivity.

Reliability is always a priority, as good reliability with buses regularly spaced yields more capacity. In addition, bus reliability is a network planning principle, as schemes proposing extra connections would not be progressed while accepting poor performance on services already provided. The themes already covered in the Healthy Streets section above address reliability directly. Service planning can also contribute by ensuring routes are not too long (which in turn means unacceptable levels of delay) and that their design takes account of local operating conditions.

Bus planning also ensures sufficient capacity is provided to meet demand at the busiest times of day and at the busiest points, while connectivity ensures new links are provided where customers need new public transport opportunities.

Building on these principles, TfL's approach to capacity redistribution is to better match services in central/inner London to demand, reducing supply, while supporting excellent access and complementing wider schemes such as the Oxford Street review. Alongside these reductions, TfL is uplifting capacity in suburban areas, particularly in connection with feeding the Elizabeth Line and supporting housing growth areas, within funding constraints. This general approach, along with an update on the reviews of bus services to London's hospitals and night services, is outlined in more detail below.

1. **Deliver changes in inner-central London to match demand, supporting continued excellent access and complementing wider schemes such as the Oxford Street review;**

Central London will continue to see some fall in demand in the short and medium term as passengers transfer to the new and upgraded rail network, and to cycling and walking.

TfL has implemented schemes to remove excess capacity by redesigning the network, for example by withdrawing sections of route and reducing capacity. Changes to West End and central routes are now mostly implemented, including routes 3, 6, 8, 15, 22, 73, 137, 172, 242, 390 and C2. This has reduced numbers of buses along Oxford Street west by 35 per cent. Changes to route 23 will follow later in 2018, increasing that to 40 per cent.

In addition, a review has been carried out on all corridors leading into central London and frequencies have been adjusted on many routes to better match capacity to demand across the day. Additional reviews of the central London network will be undertaken over the next 12-18 months to ensure the optimal provision of capacity.

Further, perhaps more radical, changes could become possible if slow speeds in the central area could be tackled via the more strategic approach to bus priority proposed in the draft MTS.

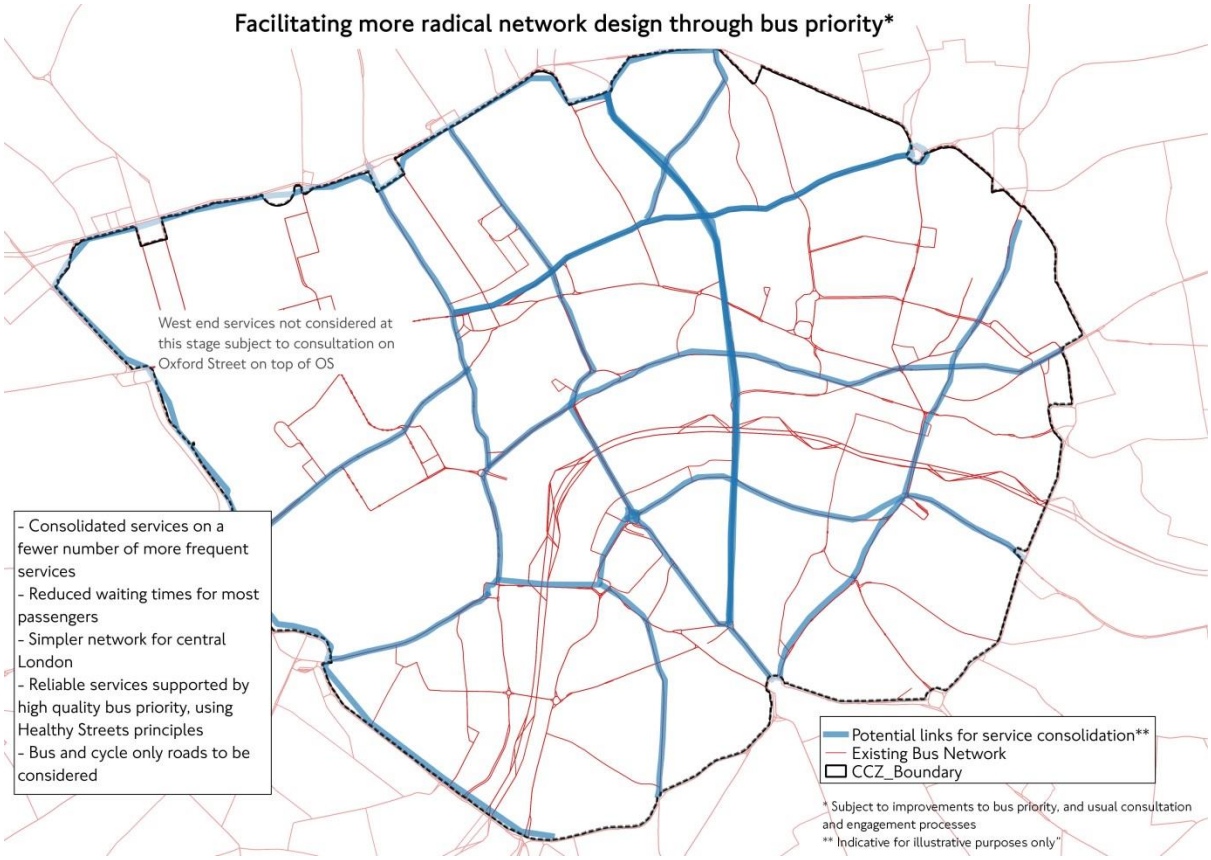


Figure 8: Facilitating a more radical network design through bus priority

Reducing frequencies is a less successful approach than network redesign as it retains a relatively complex bus network, deterring some potential users,

and increases wait times. It also means that if there is still spare capacity, frequencies will need to be reduced further leading to low frequency services in central London. Concentring demand on a fewer number of more frequent services is seen as the way forwards. This will reduce waiting times for most passengers and offer a simpler network for central London.

There are competing demands for road space and delivering high quality bus priority on all roads with bus services is not possible. Therefore, bus priority, and bus services, will be concentrated on key high passenger demand corridors in central London where a high degree of reliability can be assured. The intention is to deliver high quality bus priority on these corridors, using the Healthy Streets design principles. Measures will include bus lanes, retiming of signals, alterations to delivery and parking regimes, and sections of bus and cycle only road. It is planned to increase average speeds on these corridors to 16 – 20 kph.

Some of these corridors would link mainline termini to areas without direct Underground services, such as Victoria - Marble Arch, and others linking places with poorer rail links, such as Old Street – Holborn. The busiest services would be concentrated on these corridors, but some services on other roads would be retained to provide accessibility, particularly for passengers with reduced mobility.

Such service changes might result in higher numbers of passengers needing to interchange, or perhaps walk a little further to their stop, but shorter waits and more reliable speeds would offset this.

This is in line with the thinking in the Committee's third recommended action, about network design.

2. **Capacity uplifts in suburban areas, within funding constraints, particularly in connection with feeding the Elizabeth line and supporting housing growth areas**;

In the last two years a number of enhancements have been made to services outside of central London, for example:

- A major restructuring in south Tower Hamlets, including additional capacity and links on the Isle of Dogs and from the Bow and Stratford areas. Schemes included swapping of line of bus routes for routes 108 and D8 in the Bow area, and restructuring of routes 135, 277 and D3 in the Isle of Dogs.
- The new bus service, route 483, in northwest London was primarily introduced to serve growth areas in Wembley and to allow a more reliable service on the shortened route 83 that it partially replaced. It has also given new direct links to Northwick Park and Ealing Hospitals.

- Extension of route 452 to Vauxhall Station and diversion of the 436 to Battersea to give new links and additional capacity in the Vauxhall - Nine Elms - Battersea growth area.
- Network restructuring in the Orpington area to give new links and additional capacity, including the extension of route R7 to Chislehurst and increases in frequency on routes R7 and R11.
- Introduction of new East London Transit route EL3 to replace route 387 and running direct via Barking town centre. Further extensions of routes EL1 and EL3 into the Barking Riverside area will be implemented as infrastructure becomes available.

Significant growth areas coming forward which will require changes to the bus network include Barking Riverside, Croydon, Royal Docks, Colindale, Vauxhall / Nine Elms/Battersea, and Lea Valley. These have either been recently reviewed or will be reviewed in the next two years. A number of the resulting studies are available at:

https://tfl.gov.uk/corporate/publications-and-reports/bus-network-development-papers

In the short-term, TfL is also reviewing capacity against demand for outer London routes. Despite there being a background of growth in many outer London areas, recently demand has also fallen in places, mainly due to falling traffic speeds. TfL is reducing capacity on some routes to better match it to current demand. As it keeps all routes under review it will look to change frequency again if demand levels also change.

The cumulative effect of the re-distribution on network planning will be a significant shift of bus capacity away from the central area. This process was already underway by 2016/17 as can be seen in the chart showing the level of bus km operated on the routes in each of the eight sectors of London. The chart shows how these have changed proportional to the level in 1999/00. The changes made during this summer in Inner London will have increased this trend, as will the proposed changes to the suburban bus network for 2018 and 2019 in connection with the opening of the Elizabeth line.

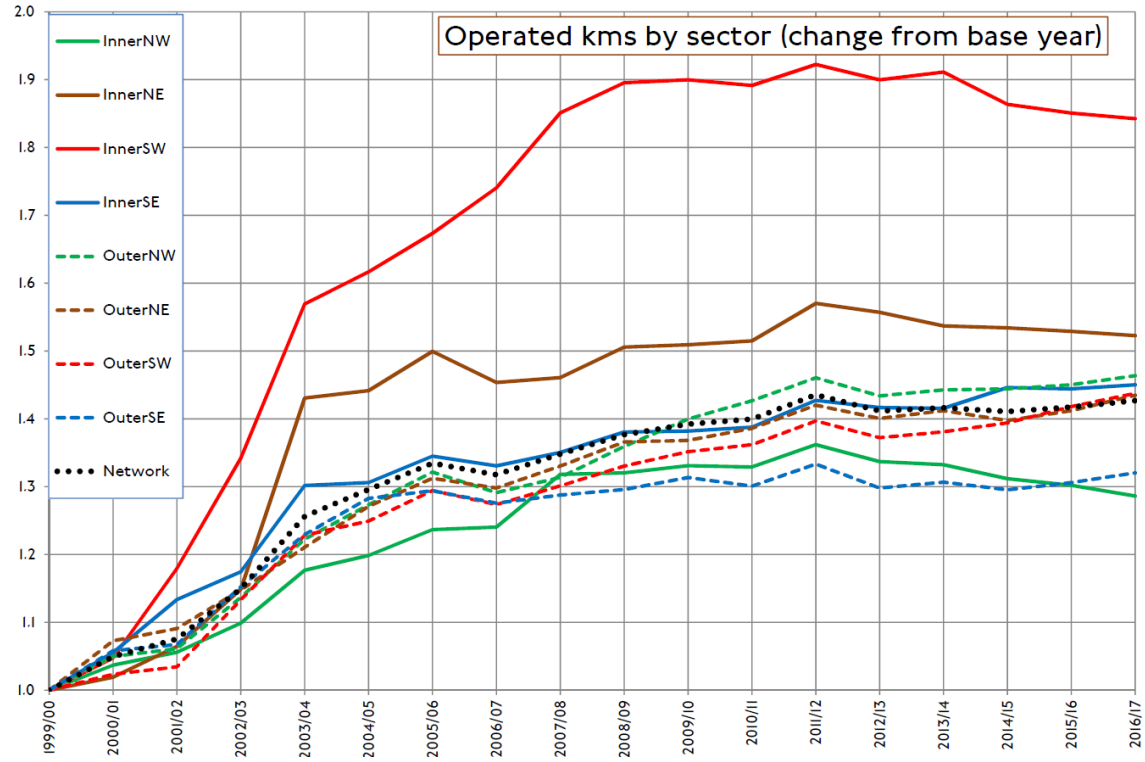


Figure 9: change in operated-km by sector 1999/00 – 2016/17

3. Bus services to London's hospitals

In line with the Mayor's aim of improving access to health services in London, TfL undertook a strategic review of the delivery of bus services to London's hospitals. The review included a detailed analysis of bus links to London's 37 general hospitals[5].

Progress has been made on all seven 'Tier 1' schemes identified in the report, and three of the Tiers '2 and 3' schemes. The table below provides a comprehensive overview of these schemes.

[5] http://content.tfl.gov.uk/csopp-20170713-part-1-item06-review-of-bus-services-to-londons-hospitals.pdf

Tier	Hospital	Action	Est. costs	Update
1	Central Middlesex Hospital (Park Royal)	Provide better direct links to Wembley	£460,000 per year operating costs	This is intended to be an extension of route 440 from Stonebridge Park to the Wembley Park development area along Harrow Road. Likely implementation, subject to consultation, is in May 2019 to tie in with Elizabeth line opening and restructuring of other local routes. Funding is dependent on receipt of Section 106 contributions from Wembley area developments.
1	Darent Valley Hospital (Dartford, Kent)	Divert route 96 to directly serve the hospital	Estimated zero extra operating cost	Awaiting final confirmation of permission to use Fastrack roads from Kent County Council. TfL has completed consultation with a view to implementing in Autumn 2017.
1	Epsom Hospital (Epsom, Surrey)	Direct links to Sutton via route 470; requires new stand at hospital	£16,000 per year operating costs and infrastructure costs	Route test held and discussions continuing with the hospital. Estimated time scale is early 2019, subject to consultation and suitable road access (subject to building works). Sourcing of funding for infrastructure works not yet identified. As operating cost increases are relatively low, funding should be available through general bus service budget assuming routeing through hospital is possible.
1	North Middlesex University Hospital (Edmonton)	Direct new bus links to Winchmore Hill and Enfield	£740,000 per year operating costs	Work is starting on the next stage of joint study with LB Enfield on bus services in the borough. This link will be included in the study. TfL will work with LB Enfield to identify sources of funding from third party developments. Timescales for implementation still to be determined – likely to be 2018/19 or later and would be subject to consultation.
1	Queen's Hospital (Romford)	Provide new links to Barking via route 5	£200,000 per year operating costs (original estimate) Zero – actual cost	A zero cost scheme was negotiated with the new operator with a very slight drop in frequencies in the AM off peak period. This means that the scheme could be implemented quickly. First day of operation was on Saturday 26 August 2017.
1	Queen Mary's Hospital (Sidcup)	Increase R11 frequency and restructuring	£370,000 per year operating costs	This was implemented on 1 April 2017. Funding was included as part of a wider a general restructuring of bus routes in the Orpington area.
1	Whittington Hospital (Highgate)	Extend an existing bus route to the hospital	Infrastructure costs unknown, estimated no extra operating costs	Sources of funding for infrastructure costs still to be identified. Land and highway design issues for turning area in Magdala Avenue still to be resolved. Implementation unlikely before 2019, subject to consultation. Likely to be either route 17 or 390

Figure 10: Tier 1 priority schemes in "Review of Bus Services to London's Hospitals"

Of the tier 2 and 3 schemes, the following are recent updates to the report:

Newham Hospital (Second Priority)

A scheme to introduce a new route 304 linking Manor Park, East Ham and Custom House running via Newham Hospital is currently the subject of consultation as part of the proposed changes to bus services following the opening of the Elizabeth line. This would be implemented in May 2019 if approved.

Queen Elizabeth Hospital, Woolwich (Second Priority)

TfL are intending to implement a scheme in autumn 2017 to reroute the 178 to run via Tudway Road to better serve the areas of the east part of Kidbrooke Village.

Royal London Hospital, Whitechapel (Third Priority)

A scheme to reroute the 115 to run via Whitechapel station (and so serve the hospital) is currently the subject of consultation as part of the proposed changes to bus services following the opening of the Elizabeth line. This would be implemented in December 2018 if approved.

4. **Review of night bus services following experience with Night Tube**

   The introduction of the Night Tube in 2016 has affected how passengers travel at night. New services were introduced including new routes in the suburbs linking Night Tube stations. Service reductions where buses ran parallel to the Night Tube were deferred pending a full review after its introduction. There has also been a more general decline in radial night bus use from central London at weekends, which may be linked to increased use of private hire and taxi services.

   Night bus service frequencies are now being adjusted but in no cases are any frequencies dropping below half-hourly. One or two very lightly used night services may be proposed for withdrawal where there are nearby alternatives but this would be subject to the outcome of consultation

TfL continuously reviews the bus network and implements service changes including modifying bus provision at school times following the start of the new academic year to better match demand. TfL is also reviewing the specification of services being offered for tender and not already covered by the existing work programme.

Design of individual services

<u>Express routes</u>

A number of express routes already exist. However, given that London has a generally comprehensive rail network catering more readily for faster and longer journeys, London's bus network is focused on the market for more local trips as this

delivers the highest passenger benefits. That said, as outer London becomes more densely populated, the case for more express bus operation increases.

Broadly, there are two different types of service which can be considered:

- Pure express or limited-stop routes, with longer distances between all the stops, such as route X26 (West Croydon – Heathrow Airport) and route 607 (White City – Uxbridge); and
- Hybrid express / local routes, where sections of the route operate with long distances between stops, such as route X68 (West Croydon – Russell Square), which runs non-stop between Norwood High Road and Waterloo. Other examples are routes 96, 132, 428 and A10,

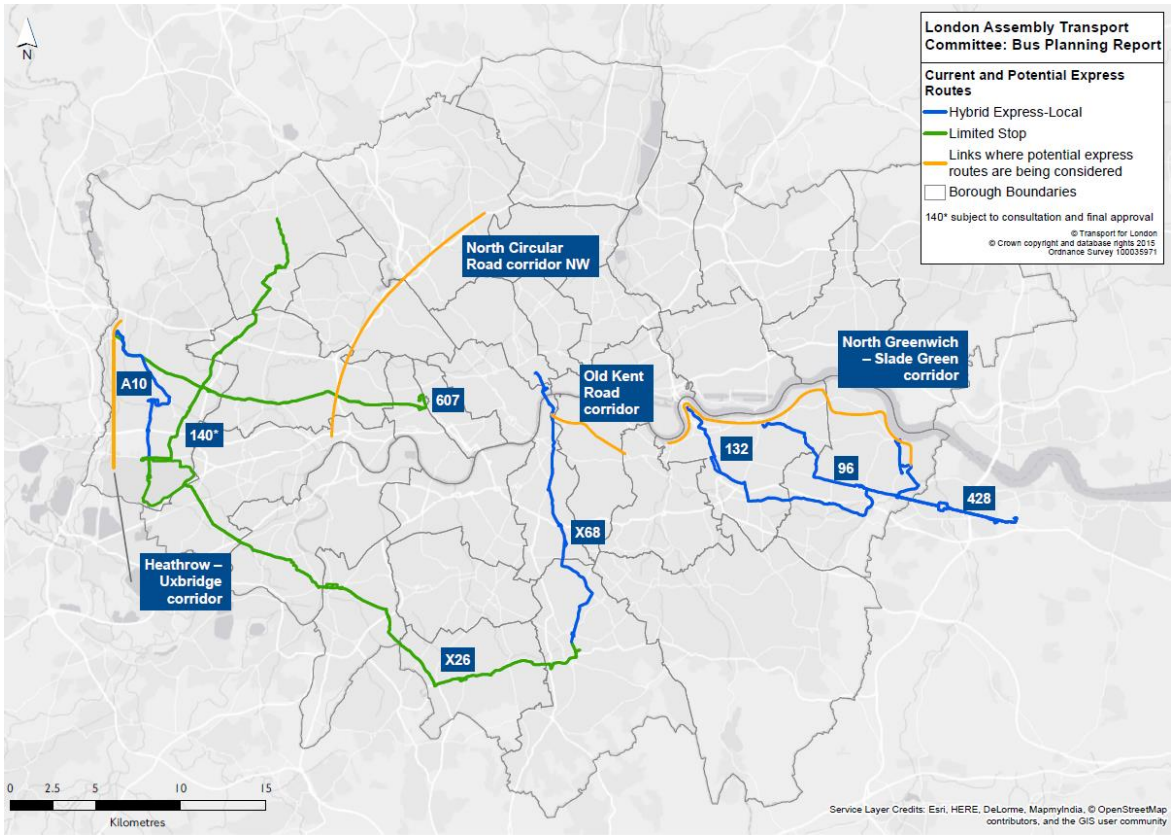


Figure 11: Map of current express routes, and example links where potential express routes are being considered

In addition to the frequency of buses stopping, there are a number of other features of express routes in London.

Passengers make longer trips on these types of services because of the flat fare across all routes, which can lead to lower cost-recoveries than shorter routes.

The length of these services can mean they are challenging to run reliably and extensive bus priority can be difficult to achieve. This has been particularly the case for route X26, which operates across south London.

A parallel local service is usually also required and it is important that this runs at an acceptable frequency as it will usually be catering for a higher number of passengers than the express. Otherwise, most of the on-bus journey time savings would be cancelled out by on-street waiting times.

As demand increases with population growth it will become feasible to split the offer on more corridors into “local” and “express” with both justifying decently high frequency. The other main condition for good express operation is that the road infrastructure should support two-speed operation. For a bus service to maintain a higher speed there needs to be sections of road where bus traffic is free-flowing, for example on a dual carriageway or with lengthy sections of bus priority. In some cases this can be tackled through the bus priority programme and TfL is commencing work with boroughs in northwest London to study the case for such measures to support the proposed route X140 between Harrow and Heathrow.

Case Study

Express route X140 is being proposed as part of changes for the Elizabeth line and would run between Harrow town centre and Heathrow Airport. The case for this route is as follows:

- Strong demand for long distance trips especially between Harrow, Northolt, Hayes and Heathrow.
- No direct rail alternative. Would require travelling into inner or central London to complete journeys by rail.
- Restructuring route 140 would better match capacity to growing demand that would accelerate once the Elizabeth line serves Hayes & Harlington.

Currently route 140 runs between Harrow Weald and Heathrow Central. It is long and restructuring into shorter routes would improve reliability.

The express service would run in parallel with a shorter route 140 between Harrow and Hayes, and new route 278 between Hayes and Heathrow, together serving both local and longer distance demand.

Implementation would proceed only when there is enough demand to achieve and justify a high frequency service on all residual routes.

The numbering of route X140 clearly shows passengers this is an express route. It would also serve all rail stations, town centres (Harrow, South Harrow, Hayes) and interchanges with other high frequency bus routes.

It would use the most direct and fastest alignment between Harrow and Heathrow, including existing and planned bus priority.

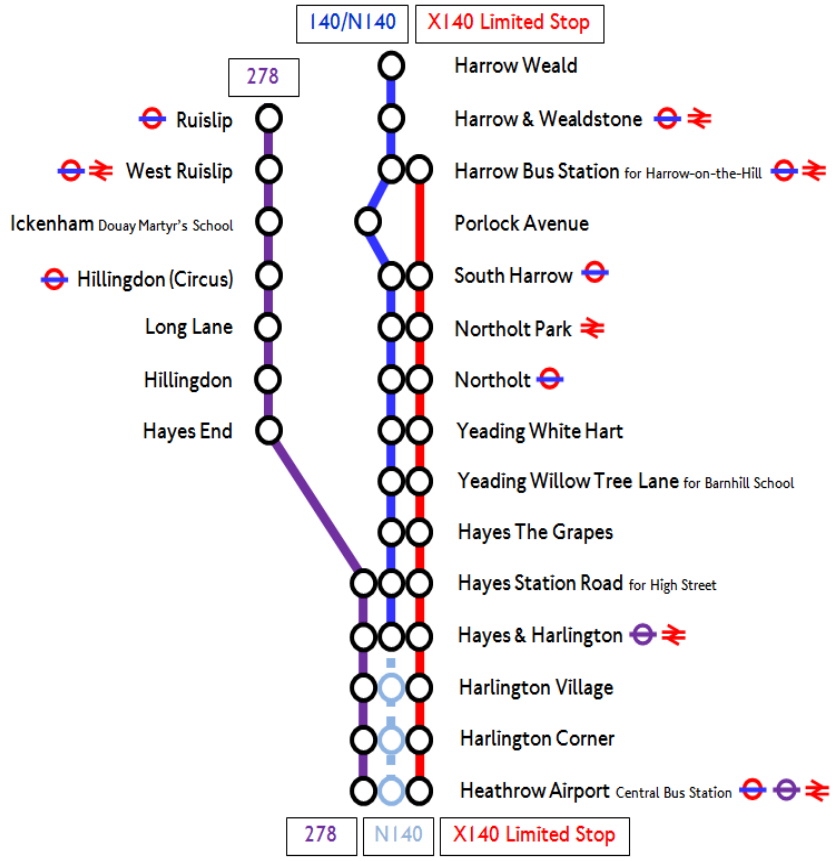


Figure 12: Proposed routes 140, 278, X140 and N140

Other potential express routes could be considered along corridors which meet the following criteria:

Demand	Sufficient demand to justify two high frequency routes, one express and one serving local demand. Consistent demand along the length of the corridor Demand for long distance links especially in absence of direct rail connections.
Physical capability	Sufficient road space to allow overtaking of regular stopping services Adequate bus speeds, to ensure benefits of express services are realised. Preferably supported by bus priority along the majority of the link to protect the route from traffic congestion
Supports wider policy	Provide new or enhanced orbital connectivity Does not overlap existing rail links Support Opportunity Areas or areas of housing development

Links currently being investigated against these criteria include:

- Old Kent Road corridor

- North Greenwich – Woolwich – Thamesmead – Slade Green corridor
- North Circular Road corridor NW (North Finchley - Brent Cross – Ealing - Brentford) Heathrow – Uxbridge corridor

Further links will also be investigated as appropriate.

Trunk and feeder

The trunk and feeder concept works best where interchange is good and it supports a simple network. Many suburban centres have this arrangement to some degree already, for example in Uxbridge with trunk services towards Hounslow (route 222) and Ealing (routes 427 and 607) supported by local services (with "U" prefix). Other examples include Orpington with routes 51 /208 trunk services supported by local services (with "R" prefix).

Further expansion of the concept could be possible at places where interchange facilities are good and there is sufficient bus priority to support expresses like route 607. Similar to the work to developing feeder services to hospitals and the Elizabeth line, as part of the ongoing review and when implementing express services, TfL will be making a greater consideration for feeder services, particularly in areas with limited other public transport provision.

Demand Responsive Transport.

Demand Responsive Transport (DRT) services are those provided by a motor vehicle of any size which follows a flexible route, a flexible timetable or both. These have existed in various forms for several decades. However, in recent years the spread of smartphones, and the introduction of improved route and fare calculation algorithms make it possible to operate such services more efficiently.

The draft MTS specifically commits TfL to a more thorough investigation of the potential of DRT through two proposals:

- 'The Mayor, through TfL, will explore and trial demand-responsive bus services as a possible complement to 'conventional' public transport services in London. [Proposal 99]'
- 'The Mayor, through TfL and the boroughs, will explore the role for demand-responsive bus services to enable further sustainable housing development, particularly in otherwise difficult to serve areas of outer London. [Proposal 87]'

A variety of options are currently being considered to test DRT deliverability and effectiveness, to focus on whether solutions can:

- help deliver modal shift to public transport in areas where car dependence is most embedded (especially in outer London);
- act as a complement to the existing bus network and improve affordable access to essential services, employment, education and retail opportunities in areas with lower service coverage; and

- help entrench a preference for travel by public transport amongst those moving into new residential areas.

Demand responsive services will be covered in more detail in TfL's response to the Transport Committee's call for evidence on 'Future Transport'.

Bus Stations

Bus stations and bus stops are often the gateway to the town centre environment and a key interchange. TfL aims to ensure they are of a high quality, with investments prioritised according to asset condition and current or expected usage. The MTS also recognises the value of the bus in further extending the benefits of railway enhancements, making better use of land and the street environment. TfL is currently working closely with delivery partners to plan convenient, high capacity interchanges between Crossrail 2, bus and other modes. It is supportive of measures to improve the customer experience at bus stations and it is seeking to better understand those improvements which passengers would like to see at bus stations, with the aim of establishing customer service guidelines for TfL's bus stations.

Figure 11: West Croydon Bus Station

Bus route branding and marketing

Bus route-branding trials have been launched in Barkingside to help passengers navigate the local area.

Figure 12: Example route branding on route 150 between Chigwell Row and Becontree Heath

Buses and the associated route information on the stop signs are marked in identifiable colours and the main destinations and Tube/Rail interchanges are listed on the side of the buses. In addition, information on the service frequency for each route is also displayed on the bus exterior. This is supported with enhanced customer information on maps located at bus stops, detailed route information displayed inside buses, and targeted marketing. This approach could be expanded if successful.

Bus design and capacity

TfL regularly reviews the options for providing safe and cost-effective vehicles delivering against a range of objectives including accessibility, comfort, capacity, reliability and environmental performance.

As demand densifies, different fleet options may become more attractive. For larger, higher-capacity vehicles a key trade-off is the interplay between carrying capacity and loading / unloading times. Key to this is the number of doors and the ticketing system. London's buses have now been fully cash-free for some years with major benefits to loading and unloading times. The New Routemasters, and before them, the articulated buses have three sets of doors to further reduce dwell times at stops. This in turn requires that bus stopping places have sufficient capacity for the vehicles to line up and that the street network generally can safely accommodate the longer buses. Vehicle options will be kept under review.

The bus service tendering process

The Committee considers that the tendering process can hinder desirable change to the network of services.

The contracting process in London is mature, relatively simple and comparatively low cost to run, for both the operators and TfL. In practice, TfL operates its service

planning and route tendering as linked but separate processes. Network review is built around the needs of passengers and structured to take account of the way London is growing and changing. The link between this and route tendering has two aspects:

- service specifications are reviewed on a “good housekeeping” basis when a route is to be tendered;
- if delivery timescales for a service change match the tendering cycle then prices for changes to routes will be sought through contract tendering to ensure optimal cost.

A change in tendering to a multi-route, corridor based approach would not lower the cost or frequency of mid-contract changes required, and may even reduce flexibility, if for example, wholesale changes to routes serving a corridor had to be implemented by a single operator.

Examples of the planning and tendering processes working in parallel but with their own timescales where appropriate include:

- the major changes which have been implemented over the summer on routes serving the West End and adjacent parts of inner London
- the proposals to support the Elizabeth line in suburban London which were the subject of consultation this autumn.

In both cases the majority of changes implemented or proposed have been or will be carried out during the term of the operating contract for the routes concerned.

Passenger information

In recent years, TfL has followed a “digital first” strategy for the provision of journey planning and live bus arrival information and has invested in an advanced web-offering that has provided an award winning service for passengers via tfl.gov.uk. This digital experience has been matched with the open data policy that assumes that others may provide information in innovative and complementary ways e.g. Citymapper and Bus Checker.

It is recognised that despite this success, TfL can further improve the information provided and is concentrating on the following areas:

- Bus Occupancy: can passengers (and service controllers) be informed of the load state of the vehicle?
- Wheelchair area: can we let potential passengers know whether the area is already occupied?
- Disruption information and short term route changes: can the iBus system give passengers more timely and relevant information about short-duration temporary changes?

Delivery will depend on the development and in some cases upgrades of the whole iBus system and is subject to funding being prioritised as part of TfL's business planning process.

In 2012, TfL completed the roll-out of 2,500 roadside "Countdown" signs and over a hundred additional signs have been funded over the last five years by London boroughs, largely using S106 funding. This means funding of additional signs is, and will continue to be, an option and the underlying systems that provide this information have been designed to be scalable. However, there are no current allocations in the TfL Business Plan to fund them. The need to provide power to the signs is often a constraint on implementation.

WiFi

Trials on buses showed that levels of use were not as high as expected. Given this, and that it would be expensive to provide across London, there are no current plans to install WiFi across the network. However, if innovators are able to develop lower-cost solutions this could be considered if the costs of provision can be met by sponsorship or advertising revenue.

Bus driver training

The interaction with bus drivers is a key part of the customer experience. TfL's "Hello London" programme will see all 25,000 drivers undertake a two-day training programme on customer service. The programme started in May 2016 and will continue to March 2018. The training has been accredited as part of the formal Certificate of Professional Competence accreditation for bus drivers. The course aims to highlight the key issues from customer feedback and how bus drivers can influence the customer experience in a positive way. It offers drivers opportunities to enhance their skills and confidence. Topics include the issues around many buses using the same stop, encouraging passengers to release space by going upstairs and providing tips and guidance on the effective use of the public address system.

The course has been rated highly with 92 per cent of drivers reporting that the quality is excellent or very good. The impact of the programme is being evaluated via TfL's customer feedback data and customer satisfaction surveys.

SUMMARY

This response has detailed TfL's approach to the Committee's 5 recommendations within the context of the strategic objectives of the MTS, and is summarised below:

1. **Tackle congestion to halt the decline in passenger numbers.**

   TfL is acting on this as reducing overall volumes of motorised traffic and improving the attractiveness of sustainable modes is fundamental in developing London's transport system. As part of this, three significant measures protect the bus network:

   - Putting pedestrians, cyclists and public transport passengers at the heart of road network designs, with bus passengers considered at the earliest stages of scheme design;
   - A bus priority development programme protecting bus journey times and improving reliability through investment in high quality schemes up to and including busway levels
   - Prioritising buses in day-to-day management of disruption on the road network

2. **Redistribute bus capacity to outer London**

   TfL supports this recommendation. They are reducing services somewhat in central/inner London, matching demand while still supporting excellent access and complementing wider schemes such as the Oxford Street review. Capacity in suburban areas is being uplifted, particularly in connection with support for housing growth and the associated travel to work, education, school and for leisure purposes. More radical changes to the bus network in central London could become possible if slow speeds could be tackled via the more strategic approach to bus priority proposed in the draft MTS.

3. **Move towards a more efficient network design based on the principles of the feeder/trunk model**

   TfL consider that the network already has some features of this type and that it could be explored further. Services are designed to best meet the requirements of demand. Where interchange facilities are good and there is sufficient bus priority to support express routes it may be that the best overall network includes increased use of interchange, supported by marketing and other information. A new express route is already proposed between Harrow and Heathrow subject to consultation and funding.

4. **Reform the bus service tendering process**

   TfL considers that the tendering process is not an obstacle to service change. Indeed a change to a multi-route, corridor based approach could reduce flexibility and increase costs, if for example, wholesale changes to routes serving a corridor had to be implemented by a single operator.

5. Improve the bus experience to attract new passengers

TfL supports this and there is a programme of improvements to improve the bus experience, for example through such means as: improved passenger information, including bus occupancy, wheelchair-area use and information during disruption; enhanced bus driver training through the ‘Hello London’ programme for all 25,000 drivers; WiFi where costs are covered by third parties; and improving bus stations. TfL is also considering how best to use demand-responsive techniques in support of strategic objectives.