



What next for London's transport infrastructure?

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London TravelWatch is the official body set up by Parliament to provide a voice for London's travelling public, including the users of all forms of public transport.

Our role is to:

- Speak up for transport users in discussions with policy-makers and the media;
- Consult with the transport industry, its regulators and funders on matters affecting users;
- Investigate complaints users have been unable to resolve with service providers, and;
- Monitor trends in service quality.

Our aim is to press in all that we do for a better travel experience all those living, working or visiting London and its surrounding region. But with the pressures of population growth, demographic change and economic development, the challenge of improving people's travel experience is a constantly demanding one.

With the publicity given to major projects such as Crossrail, extensions to the Northern and Bakerloo Lines and the Cycle Superhighway scheme, it is important not to overlook the potential benefits of smaller or less radical improvements. This paper has been prepared following the consultation on London's transport infrastructure to 2050 invitation to submit ideas for specific improvements – beyond those already in the pipeline - to help address this challenge

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Introduction: Planning for London's future

London faces a growing challenge of finding sufficient capacity on its transport network to cope with increased demand as the capital's population and economy grows, whilst at the same time trying to reduce the environmental impact of transport, and congestion, and to enable economic growth in London and in the rest of the United Kingdom.

Meanwhile, there is a renewed emphasis at national level, following the EU referendum, on developing the infrastructure the country will need to improve its competitiveness. Some of the infrastructure projects under consideration are very large, and will take many years to bring to fruition; but at the same time a strong case can be made for smaller scale projects that can be started relatively quickly and can be completed in years rather than decades. This changing national context provides some significant opportunities to bring much needed benefits to all who travel in the capital.

Current projects such as Crossrail 2, extensions of the Northern line to Battersea, the Bakerloo line beyond Elephant & Castle into South East London and Tramlink to Crystal Palace are already in various planning stages. London TravelWatch has argued strongly in favour of these projects as they bring substantive benefits both to users while also meeting non-transport objectives of the Mayor and Government in terms of planning and regeneration, housing provision, supporting economic growth, enhancing the environment, reducing inequality, improving health (and access to healthcare), improving policing and reducing crime and supporting the arts and culture.

However even with these plans, congestion is still projected to grow on London's roads and railways: so what next?

This paper aims to explore ideas and concepts for projects that go beyond the plans and aspirations set out by the Mayor, Transport for London and the Government. It is based around the proposition that there are many significant improvements that can be achieved through small or medium scale investment. They are not necessarily glamorous or headline-hitting. But if implemented they could significantly improve the travel experiences of many thousands of London's citizens and visitors.

To compile this prospectus, we have drawn on previous work by London TravelWatch on small scale projects and potential regeneration effects of transport initiatives, as well as other sources. We have not sought to cost or prioritise the proposals we have set out. They are merely ideas at this stage, as a basis for further consideration. But they are put forward as a contribution to the fast moving, and extremely important, debate on the future of London's transport infrastructure.

Principles behind concepts for projects

We have used the following principles to develop the ideas for these projects:

- Providing alternative routes for travel and opportunities for interchange that avoid central London
- Joining up current services better, so that more efficient use is made of existing infrastructure and of operating resources.
- Re-using redundant infrastructure for new links
- Generating income through fares and development
- Making services more efficient and therefore generating cost savings
- Improving accessibility and extending the options available for travellers with disabilities
- Anticipating, where possible, likely changes in demand from the travelling public brought about by the development of new housing, hospitals or education institutions

The Deputy Mayor has indicated that schemes should also have the ability to influence wider Mayoral priorities other than transport, such as regeneration, reduction in crime, community cohesion and increasing employment.

Organisation of this report

We have grouped the possible candidates for investment into 10 main headings.

1. Larger scale projects with potential high impact and significant potential to stimulate growth and regeneration
 - Chiltern Metro
 - West Hampstead Interchange
 - Providing more cross London links and services
 - Re-signalling major National Rail routes to enable high frequency Metro services to operate
2. Improving orbital public transport
 - North Downs electrification
 - Tramlink extension to Orpington via Biggin Hill
 - Barking to Gospel Oak electrification
 - Developing London's outer rail hubs
 - West Ealing - Greenford electrification

- Reopening of Southall – Brentford freight line to passengers (plans being considered for Great West Road regeneration area)
3. Providing additional capacity at central London rail and underground stations
- New entrance to Covent Garden station near to the Royal Opera House / Aldwych / Temple station
 - New entrance to Waterloo East station from The Cut / Hatfields
 - New passageway on 'paid' side linking City Thameslink and St.Paul's stations
 - New entrances at Embankment end of Charing Cross National Rail station to give access to Embankment underground station and pier
 - New passageway on 'paid' side linking Camden Town underground and Camden Road national rail stations.
 - Step free access and new passageway on 'paid' side linking the two Edgware Road underground stations
 - Step free access and new passageway on 'paid' side linking Regents Park and Great Portland Street underground stations
4. Re-using redundant infrastructure for public transport and/or cycling
- Bow Church to Hackney
 - Finsbury Park to Muswell Hill
 - Mill Hill East to Edgware
 - Belmont to Harrow & Wealdstone
 - Croydon to Canary Wharf cycle route using redundant railway alignments between Crystal Palace and Nunhead, and through public parks between Croydon and Crystal Palace
5. Connecting London's inner orbital and radial rail routes – a 'string of pearls'
- Junction Road – Tufnell Park
 - Maiden Lane station for Kings Cross (North)
 - Brixton station High Level platforms
 - Brockley station High Level platforms
6. Connecting West London and increasing capacity to Heathrow Airport:-
- West Drayton to Uxbridge and Denham
 - Southern access route to Heathrow
 - Taxi and private hire vehicle co-ordination at Heathrow Airport
 - Cross boundary bus integration at Heathrow Airport
 - Extension of Oyster / Contactless fares and ticketing to rail station in the Spelthorne and Elmbridge areas of Surrey
7. Regenerating road corridor routes from central London

8. Cross River Light Rail transit
9. Smaller schemes with wider and bigger impact:
 - Ticket gates at major inner and outer London stations
 - The 10 minute interchange challenge
 - Small scale step-free access at underused stations
 - Tackling transport deserts – advance guard planning
 - Greater pedestrian connectivity at out of town retail outlets
 - Tackling 100+ barriers to completing the London cycle network
 - Rebuilding Seven Sisters station
 - Rebuilding Silver Street station.
 - Reinstating the westbound link to the Angerstein Wharf branch for rail freight at Angerstein Junction.
 - Developing freight consolidation centres
10. Schemes with potential to stimulate regeneration through tourism
 - Cannon Street to Southwark footbridge alongside the Cannon Street rail bridge
 - Reopening part of the King William Street to Borough underground railway tunnel as a pedestrian route.

The details of these projects and their potential impacts are set out below.

1. Large scale projects with potential for directing and leading growth and regeneration, but with passenger benefits

1.1 Chiltern Metro

- 1.1.2 By the 2020s almost all of London's rail routes will have no spare capacity to accommodate additional infrastructure without substantive demolition of adjacent properties or tunnelling. The one exception to this is the Chiltern route which in the 1960s and 1970s was reduced from a four track railway to a two track one. The route will be the only non-electrified main line passenger route within London, upon completion of the Barking – Gospel Oak electrification
- 1.1.3 The route is characterised by the use of shorter length trains compared to other London rail routes and very poor levels of service to the London area stations along its route such as Northolt Park, Sudbury Hill Harrow, Sudbury and Harrow Road, and Wembley Stadium because of the limitations of the two-track railway.
- 1.1.4 However, reinstatement of a four track infrastructure and electrification would unlock significant opportunities to improve passenger services both within London and further afield in terms of journey numbers and journey times, as well as provide overcrowding relief on other National Rail and London Underground lines across west and north west London. It would also unlock significant regeneration and development opportunities at points along the route.
- 1.1.5 An alternative to four tracking the existing infrastructure would be to work with HS2 and Network Rail on reviving the use of the former Great Western Birmingham Main Line that runs between South Ruislip and Old Oak Common. It was originally intended this stretch would have been taken over by HS2. However, since the decision by HS2 to not use this alignment it would be possible to restore a conventional two track railway for local use between these two points.
- 1.1.6 East of Old Oak Common there would be two alternative options, the first of which is for Chiltern services to feed into Crossrail. Alternatively trains could use the alignment of the former Great Western North Acton freight route alongside the Central Line to White City and the West London Line that has not been reused since its closure in 1964. The land which the line formerly occupied is owned by the British Rail Residuary Body and so has not been substantially developed since closure. It would therefore be important to safeguard this route for future transport development. Access to the West London Line north of Shepherds Bush would then mean services from the Chiltern route could serve the redeveloped areas around Earls Court, the Nine Elms Battersea Vauxhall opportunity area and Waterloo International station.

- 1.1.7 The close interworking with the London Underground Metropolitan Line means that the Metropolitan line would also have the potential to benefit from an upgrade, by for example increasing line speeds and improving signalling and pathing of trains.
- 1.1.8 Replacement of diesel traction with electric would also lead to significant improvements in air quality along the line of the route.
- 1.1.9 A substantial proportion of the current Chiltern route diesel fleet would require replacement at around the same time as the South West Trains diesel fleet that operates from Waterloo to the West of England. This latter fleet could potentially be replaced by electric units if electrification of the Basingstoke – Exeter and Bristol – Southampton lines were to take place.
- 1.1.10 There could be potential cost savings from procuring and operating a common fleet of electric trains for the West of England and Chiltern routes, both of which potentially would need dual voltage capability to operate either over the Metropolitan line or the South Western lines from London to Hampshire.
- 1.1.11 This project can significantly contribute towards the Mayor’s transport objectives, and address other Mayoral priorities. These include improved air quality; better access to jobs and services from areas of deprivation: opening up land for housing around the areas of Park Royal, Shepherds Bush, Earls Court, Wembley, Vauxhall and Waterloo; better connectivity of businesses within London and to key markets outside; better and more efficient connectivity to Wembley national stadium and arena complexes and better access to healthcare services at stations en route.

1.2 West Hampstead Chiltern & Metropolitan Line platforms

- 1.2.1 New platforms at this location on the Chiltern and Metropolitan lines would significantly enhance the connectivity of most of North London and surrounding counties by providing an interchange with the Thameslink, North London and Jubilee lines. This interchange could significantly cut journey times between North West London, Buckinghamshire and major destinations for jobs and services such as Stratford, Canary Wharf, London Bridge, Kings Cross, Elephant & Castle and Croydon as well as to Gatwick and Luton Airports.
- 1.2.2 The scheme would potentially need to use ‘air rights’ above the current railway lines, but would also facilitate regeneration within the local area, including providing additional housing units in and around the site.
- 1.2.3 Even greater benefit would be derived from this scheme if it were to be delivered as part of a Chiltern ‘Metro’ local service within London as above.
- 1.2.4 This project can significantly contribute towards the Mayor’s transport objectives, and address issues such as improved air quality; better access to jobs and services from areas of deprivation; providing additional housing in the

West Hampstead area and also elsewhere as a result of reduced journey times; better connectivity of businesses over a massive area within London and to key markets outside, especially by reducing journey times to key destinations between business and higher education areas, airports and over a dozen specialist and teaching hospitals.

1.3 Providing more cross London links and services

- 1.3.1 Since the 1980's it has been recognised that the use of terminating stations in central London can be very inefficient in terms of rolling stock and staff utilisation, and that the operation of cross London services makes for more efficient use of scarce capacity. The development of routes such as Thameslink and the Elizabeth Line/Crossrail 1 can also be expected to generate significant additional demand from the new links they provide by satisfying current suppressed demand and by stimulating economic growth. In addition they offer the scope to relieve congested routes of London Underground and pedestrian flows in and around main line terminal stations.
- 1.3.2 In addition to Thameslink and the Elizabeth Line, there are two routes with potential to be linked together which would provide an important cross London service. These are the Great Northern routes trains to Moorgate and Southern trains from the Tulse Hill route that terminate at London Bridge. These both have similar frequencies and current turn around times of 7-8 minutes at each terminus.
- 1.3.3 The Finsbury Park – Moorgate route is currently operated by GTR as part of the Thameslink Southern Great Northern (TSGN) franchise. Originally it was a 'tube' (part of the Northern line), but in the 1970s it was converted to a British Rail operation. However, no investment has been made in the route since the 1970s so stations and trains are in something of a 'time warp'. Despite recent improvements in accordance with the TSGN franchise commitments, as from late 2015, there is still substantial scope to increase the level of service (which is based normally on 15 or 20 minute intervals). There has been major regeneration of sites along the route: Emirates Arsenal stadium at Drayton Park; the development of 'tech city' around Old Street and Stratford City which is accessible by connection onto London Overground at Highbury & Islington.
- 1.3.4 In particular, recent developments leave the stations without the benefit of any major investment and their continuation unchanged since the previous modernisation in the 1970's. Investment in these would support the growth of 'tech city' firms and small enterprises that have grown up in this area in recent years and would realise the benefits of agglomeration.
- 1.3.5 Southern services from the Tulse Hill route have always terminated at London Bridge in separate terminating platforms. Even when the Thameslink programme is complete, with the accelerated growth in usage of these and other routes into London Bridge continuing major capacity constraints can be expected.

- 1.3.6 A constraint on both the Great Northern and Southern Tulse Hill routes is that the Northern underground line City branch is fed by both of these services at points which are already crowding hotspots.
- 1.3.7 Connecting the two services would however give the opportunity to relieve these constraints, capture efficiencies from cutting out cumulative terminus turn around times of 15 minutes from retaining two separate services and replacing them with a three minute journey from Moorgate to London Bridge.
- 1.3.8 A suggested route might be in tunnel from Moorgate to a station connected to the Bank/Monument complex or Mansion House/Cannon Street then to London Bridge, then a station in the Bricklayers Arms area (currently not served by rail) and emerging at a portal near South Bermondsey station to rejoin the main rail network.
- 1.3.9 This project would significantly contribute towards the Mayor's transport objectives: supporting the development of 'Tech City' around Old Street station; it would give better access to jobs and services from areas of deprivation, contributing to regeneration and housing provision along the Finsbury Park – Old Street corridor and around South Bermondsey and Peckham; providing better connectivity of businesses within London and to key markets outside; providing better connectivity to the creative areas in the Old Street / Hoxton area and better access to healthcare services such as Moorfields Eye Hospital at Moorgate.
- 1.3.10 There would be potential for significant relief to the congested parts of the Northern and Victoria lines - South of Finsbury Park, the Bank branch and between Balham and London Bridge.

1.4 Re-signalling major National Rail routes to enable high frequency Metro services to operate

- 1.4.1 London's National Rail network differs from the London Underground in that train frequencies are much lower on account of the signalling and other systems used. Upgrading National Rail signalling to similar standards to London Underground would enable a much greater volume of train service to be operated thereby creating additional capacity. This would allow much more efficient use of existing scarce capacity. It need not, of course, be carried out on all lines at once – it would be possible to prioritise on the basis of existing use and overcrowding levels.

2. Improving London's orbital public transport

2.1 Development of the Overground

2.1.1 Development of the London Overground has created an outer orbital route of sorts, on the basis of connections between Clapham Junction, Willesden Junction, Highbury and Islington and Dalston Junction. But London remains far short of an equivalent rail route to the M25 motorway, allowing travel between its major suburbs and wider economic area without the need to travel into inner or central London. However, many of the schemes outlined above have the potential to provide parts of an equivalent orbital rail network. These would need to be supplemented by schemes using new infrastructure or upgrades to existing lines as follows.

2.2 North Downs electrification

2.2.1 The route between Reading and Gatwick Airport is one of the few rail routes that does not have continuous electrification. There are significant gaps (Wokingham to Ash and Guildford to Reigate) that if filled would enable major improvements to outer orbital journeys in and between South West London, Surrey, Sussex, West Kent, Berkshire and Oxfordshire. Combined with the reopening of the Milton Keynes to Oxford route (East West rail) already agreed or a potential Airtrack type scheme from Heathrow Airport to Staines, this would enable significant numbers of rail journeys that currently require travel via central London or road journeys via the M25 and radial roads to be made by an outer orbital rail route. An additional enhancement would be to create additional track 'bypasses' at selected stations along the route, to allow a mix of stopping and express services – the journey from Gatwick to Reading is currently slow (1 hour 15 minutes on the fastest trains for a journey of about 60 miles).

2.2.2 A bi-product of such an electrification scheme would be greater resilience of electricity supply to all Southern and South West Trains routes into London from Surrey and Berkshire.

2.2.3 Even though this scheme is entirely outside the Greater London area there would be significant benefits arising to Greater London as a result of reduced congestion on London's roads and the M25, and in crowding on radial rail routes into London.

2.2.4 Providing a competitive rail alternative to the southern and south western sections of the M25 and associated radial roads would bring benefits in terms of improved air quality, especially in outer London. It would also free up capacity within the London transport system to accommodate growth. Improving access to London's airports, especially for travellers from the South-West, West and Midlands, would also have a benefit in terms of London's economic competitiveness.

2.3 New Addington to Orpington via Biggin Hill

- 2.3.1 New Addington has benefitted significantly from Tramlink over the years, but links eastward are relatively poor. Biggin Hill is one of the largest and fastest growing settlements within Greater London that has no rail-based links at all. An extension to Tramlink eastward from New Addington toward Biggin Hill and Orpington would open up a significant number of job opportunities for this relatively isolated and (in parts) deprived area, and would reduce journey times between Biggin Hill and central London, as well as other major employment/growth centres such as Croydon and Lewisham.
- 2.3.2 As noted above this proposal would help meet Mayoral priorities in reducing inequality and promoting access to jobs and services. In New Addington there would also be opportunities to promote regeneration in association with such a scheme.

2.4 Barking – Gospel Oak rail line electrification, train and platform lengthening

- 2.4.1 Following strong support from London TravelWatch, work is now under way to electrify this route. However, there is potential to widen benefit further by extending the services beyond their current terminals at either end toward West Hampstead (for interchange with Thameslink, the Metropolitan and Jubilee lines, and potentially the Chiltern route) or towards the Thames Gateway development area (Dagenham Dock, Rainham, Purfleet and Tilbury), and by reopening the station at Junction Road which would provide an interchange with the Northern line at Tufnell Park. Building works at stations in connection with electrification works could also be combined with works to improve accessibility.
- 2.4.2 Non-passenger transport benefits should also include the ability to replace diesel haulage of freight trains with electric. But these benefits would be extended much further if there is electrification of access lines to and from Thamesport, connections to the Midland Main Line, the Dudden Hill freight line, the Kew 'curves' lines and the line between Nuneaton and Birmingham (with associated freight terminal connections). Replacement of diesel with electric traction would bring improvements in performance of freight on a wide range of lines radiating from London with associated benefits for passengers on these routes.
- 2.4.3 Similarly, the non-transport benefits of electrification – in terms of town centre regeneration and access to jobs – have scope to be significantly augmented beyond those currently in prospect. The prime need is to extend services beyond Gospel Oak to the interchange at West Hampstead (see also section 1.2 for Chiltern line proposals). Extension of the service in this way would also improve the prospects for regeneration and development in the Thames Gateway area, and improve access to healthcare facilities such as the Royal Free Hospital at Hampstead Heath.

Potential future transport projects in London

- 2.4.4 A further possibility is an extension via either the Willesden – Acton Main Line link (proposed for electrification by Network Rail) or the Kew curves and a southern rail access link to Heathrow Airport (see section 6.2). This would provide a very large area of north and east London with a direct link to Heathrow Airport by public transport.

2.5 Developing London's outer rail hubs

- 2.5.1 London has a number of inner and outer suburban stations that already perform a 'hub' function distributing passengers within the London area, reducing the pressure on central London interchanges. These hubs could be developed further, and their good accessibility makes them attractive locations for commercial development. The stations included in this category would be Ealing Broadway, Willesden Junction, Wembley Central, West Hampstead, Finsbury Park, Tottenham Hale, Stratford, Barking, Woolwich Arsenal, Lewisham, Peckham Rye, Brixton (see below), Herne Hill, Bromley South, East Croydon, Clapham Junction, Wimbledon, Sutton and Richmond.
- 2.5.2 Improving these interchanges would act as a stimulus to economic growth and regeneration across a wide range of centres in inner and outer London. Reduced journey times and increased journey opportunities arising from developing these, would increase access to jobs, services and housing without necessarily increasing congestion on the roads or crowding on the public transport network. This idea is explored in more depth in the report 'Interchange matters; Passenger Priorities for Improvement'¹

2.6 Electrifying the rail route between West Ealing and Greenford

- 2.6.1 Currently there is a half-hourly diesel train service between London Paddington and Greenford provided by Great Western Railway. This service will be replaced in January 2017, with an electric train service between London Paddington and Hayes & Harlington, with a shuttle service between West Ealing and Greenford.
- 2.6.2 The journey time between West Ealing and Greenford is 12 minutes. This is not sufficiently robust to allow a 30 minute interval service to be provided using one train and crew, which would be commensurate with the current usage of the service. This would mean that a second train and crew would be required to maintain the current level of service or to increase this to a 20 minute interval service. In addition the retention of this service within the Great Western franchise means that this will be an isolated local service, that will need to be serviced from the nearest diesel depot 30 miles away or be reallocated to Chiltern Railways as the nearest other diesel operator at this time.

¹ http://www.londontravelwatch.org.uk/documents/get_lob?id=4040&field=file

- 2.6.3 For the above reasons this makes the service to be provided after 2017 likely to be very inefficient in terms of rolling stock provision and staffing. It is also likely to suffer from loss of patronage because the majority of passengers using the service at present travel to Ealing Broadway, Acton Main Line and London Paddington, and the introduction of an additional interchange will reduce the attractiveness of the route. This means that the cost of providing the shuttle service will be very high, compared to the potential revenue generated from it. Finding a way of reducing the operating costs of this service and retaining at least some of the current travel demand on this route are therefore important considerations.
- 2.6.4 Providing a more attractive, lower cost service on this route could be done by several means. One would be for the service to be provided by a tram or other light rail technology that would not require full scale rail electrification. However, even using these technologies might be as costly as electrification because of the necessary cost of providing dedicated 'spare' rolling stock. A more practical alternative would be full rail electrification which would allow the cost of providing a train fleet and crew to be absorbed into a much larger operation, thus taking advantage of economies of scale and allowing the potential of a through service beyond West Ealing to more popular destinations.
- 2.6.5 Even this would require some modification to service patterns. Studies of the Great Western main line have indicated that retaining a through service between the Greenford branch and Ealing Broadway/London Paddington is not feasible after the introduction of Crossrail because of lack of capacity between Old Oak Common and London Paddington. However, capacity might be available to run a service beyond West Ealing at least to a point in the Old Oak Common area. This could be achieved through electrification between West Ealing and Greenford plus a suitable turn back facility at Old Oak Common in conjunction with the provision of the proposed HS2 station. This through service could be added to the London Overground concession, with the prospect of a much better, lower cost service than provided by the currently planned diesel shuttle.

2.7 Reopening to passengers of Brentford to Southall freight railway

- 2.7.1 A single track branch railway links the Great Western Main Line at Southall to a waste transfer station next to the A4 Great West Road and a business park occupied by Sky TV.
- 2.7.2 This rail route is currently used as a freight route serving the aggregates and waste transfer industries. It is a single line branch that links into a freight yard at Southall. Freight services to this yard often use up significant amounts of capacity on the Great Western route to access this yard because they need to cross the main 'fast' lines before or after Southall. Extending this branch line to meet the South Western line at Brentford and redoubling it to its original two track layout has the potential to offer an alternative route for freight trains to the yard at Southall without the need to use the Great Western main line. This

would release extra capacity for passenger services on this route. It would also enable passengers to travel between the Great Western and South Western rail routes.

- 2.7.3 Local authorities and businesses in the area² have proposed reopening this line to passengers because it would offer significant journey time reductions into central London and beyond as a result of interchange with Crossrail at Southall.
- 2.7.4 Ideally this line should also be electrified for passenger train use and also for the use of freight trains to and from Bristol and Oxford that would benefit from the electrification currently being installed on the Great Western Main Line.

² [http://www.goldenmilegroup.org.uk/wla/goldenmile.nsf/Files/WTA-209/\\$file/BSUPS_GRIP1-2_GoldenMileTransportForum280415+\(2\)+Julie+Gregory.pdf](http://www.goldenmilegroup.org.uk/wla/goldenmile.nsf/Files/WTA-209/$file/BSUPS_GRIP1-2_GoldenMileTransportForum280415+(2)+Julie+Gregory.pdf)

3. Providing additional capacity at central London rail and underground stations

3.1 Introduction

3.1.1 London's population has been growing at a significantly faster rate in recent years than had previously been predicted. In parallel with this the numbers of passengers using the London Underground and national rail networks in and around central London has been increasing rapidly. Overcrowding issues now a major issue and likely to remain so. The advent of new projects such as Thameslink and Crossrail, and major upgrade programmes such as at Victoria and Bank stations will provide significant relief at existing pinch points. However, there are many locations that will not benefit from these projects, many of which already have crowding problems.

3.2 New entrance to Covent Garden station near to the Royal Opera House/Aldwych/Temple station

3.2.1 Covent Garden station is a very busy station that has a significant shortfall in capacity. In order to manage this, the station often has to operate in 'exit only' mode. Distances to nearby London Underground stations allow crowding issues to be managed by directing passengers to Leicester Square, Charing Cross and Holborn. Temple station is also within the catchment area for Covent Garden, though the walking route is not as obvious or as well signed as routes to other stations. Temple station has much lower usage than other stations in the area, and could be used more extensively for passengers wanting to access the Covent Garden area.

3.2.2 Also nearby is the former Aldwych London Underground station, terminus of the closed branch of the Piccadilly Line from Holborn. The geographic distance between this former station and Covent Garden station is of the same order as other underground passageway links such as between Bank and Monument, or between South Kensington station and the Science Museum. This building could be used as potential site for an entrance/exit.

3.2.3 Construction of an entrance or entrances to Covent Garden station with linking passageways in the Temple/Aldwych area would have the potential to relieve existing congestion at the existing station entrance and also provide improved accessibility, with benefits to the Aldwych area theatres and restaurants, University of London Kings College, the London School of Economics, and the Royal Courts of Justice.

3.3 New entrance to Waterloo East station from The Cut/Hatfields

3.3.1 The area to the east of Waterloo station has developed significantly since the opening of Southwark London Underground station as part of the Jubilee line extension in 2000. Southwark station has a direct connection to Waterloo East

National Rail station. Passengers with Travelcards and Freedom Passes can exit Waterloo East station via Southwark station at no extra cost. However, holders of other National Rail paper tickets and Oyster Pay As You Go customers are subject to a small charge for this facility.

- 3.3.2 Over the years various attempts have been made to find a mechanism to get rid of this charge or to provide an additional National Rail entrance into The Cut/Hatfields to allow better access to Waterloo East station. However, these have foundered due to commercial objections from London Underground over potential revenue loss and from opposition from local residents to a new entrance on the grounds of noise and disturbance. However, the widespread introduction of Oyster/Contactless payment ticketing technology in recent years has substantially reduced the risk of revenue loss to London Underground. The objections of residents could be mitigated by various measures especially in the late evenings and night times, such as closing the entrance at these times or making it exit only, although this would reduce the level of increased of passive surveillance and security that would result from an increased footfall. Residents would benefit from reduced walking times to access the station during the daytimes.

3.4 New passageway on 'paid' side linking City Thameslink and St Paul's stations

- 3.4.1 These two stations have no direct connection at present but are relatively close to each other. City Thameslink currently has no tube interchange at all. An underground passageway linking it to St Paul's would provide a strategically important interchange between the Central line and the Thameslink National Rail route. In particular it would make it much easier for passengers using the Central Line to get access to services to Gatwick and Luton Airports, as well as to other destinations due to be opened up when the Thameslink upgrade project is completed.

3.5 New permanent entrances at Embankment end of Charing Cross National Rail station to give access to Embankment underground station and pier

- 3.5.1 Charing Cross national rail station has a number of emergency exits from its platforms at the Victoria Embankment end of the station. Making a permanent set of exits at this point – similar to the southern exits now provided at Blackfriars national rail station – would reduce the walking route between Charing Cross station and Embankment London Underground station, thus creating a more effective interchange between the two. This would potentially provide some relief for the Jubilee line between London Bridge and Westminster.

Potential future transport projects in London

3.6 New passageway on 'paid' side linking Camden Town underground and Camden Road national rail stations

3.6.1 Camden Town is one of the most congested stations on the London Underground network, and has been so for many years. Various schemes over the years have been put forward but have not come to fruition.

3.6.2 Camden Road station on the London Overground is a relatively short distance (about 500 metres) from Camden Town station. The latter has developed significantly in recent years as a result of the expansion of the Overground service. The proximity to Camden Town station has meant that there is now a significant flow of passengers who interchange between the two stations. Providing a passageway between the two stations would reduce the flow of passengers into the most congested areas of Camden Town station and provide a much easier interchange between the Northern Line and the Richmond/Willesden Junction/Highbury and Islington service of the Overground.

3.7 Step free access and new passageway on 'paid' side linking the two Edgware Road underground stations

3.7.1 Edgware Road is in fact two stations rather than one, as there is no physical connection between the Bakerloo station and the station served by the Circle, District and Hammersmith and City lines. But the two stations are very close together and often passengers are confused by the fact that they bear the same name. Providing full step-free platform access to either station would be costly and potentially quite difficult to achieve. However, it would be possible to create a new entrance that would be step free and linked to both stations. As well as facilitating access for passengers with mobility problems or heavy luggage, this enhancement would enable providing direct interchange between the Bakerloo and Circle /District/ Hammersmith and City. This could provide significant relief for stations such as Baker Street and Paddington.

3.8 Step free access and new passageway on 'paid' side linking Regents Park and Great Portland Street underground stations

3.8.1 These two London Underground stations are very close together (about 200 metres) and also amongst the least used stations in central London. Providing step-free platform access to either station would be costly and potentially quite difficult to achieve. However, their proximity to one another might lend itself to the idea of providing a new entrance that could be step free but linked to both stations. There would be an additional advantage of providing a direct interchange between the Bakerloo and Circle/Hammersmith and City/Metropolitan lines. This would provide relief for stations such as Baker Street and Paddington.

4. Reusing redundant infrastructure for public transport and/or cycling

4.1 Introduction

4.1.1 Many former railways in London have already been redeveloped for other uses in recent years. Major progress in facilitating cycling has also been made with the completion of the first Cycle Super Highways. However, there are still a number of former routes that could have potential new transport uses, either for new cycle routes or for public transport links, so enabling regeneration of significant areas of London, by reducing journey times and overcrowding on routes to major centres of employment.

4.1.2 It is possible that four of the suggestions below could converge into a single project covering a route from Canary Wharf – Hackney – Finsbury Mark – Highgate / Muswell Hill – Finchley Central – Mill Hill East – Edgware – Belmont – Harrow & Wealdstone/Harrow-on-the-Hill. [Additionally a link could be made between Heathrow and Harrow-on-the-Hill.] The sum of the connectivity, regeneration and capacity enhancement parts of this would be considerably greater than the individual constituent parts.

4.2 Bow Church to Hackney

4.2.1 This former rail route to the London Docks could form part of an extension of the Docklands Light Railway linking Hackney directly to major employment areas of Canary Wharf. There are no direct rail links on this axis, with users reliant on long bus journeys and congested roads over a relatively short distance. Hackney has a historic deficit in rail transport provision. Despite close proximity to the City of London and recent development of the London Overground Network the area continues to suffer from poor links to adjacent areas. The route also could assist in improving cross river transport links if a service pattern of Hackney – Bow Church – Canary Wharf – Greenwich – Lewisham were adopted.

4.2.2 Non-transport benefits could be further regeneration in Hackney and Bow, and enabling areas of Hackney and Tower Hamlets to have greater access to the jobs market.

4.2.3 This route could provide an alternative for passengers using a combination of the East London Line of the Overground network and the Jubilee line to reach Canary Wharf, and for users of the Blackwall Tunnel road route – with a potential capacity release on these links to accommodate further growth or in the case of the roads to improve air quality by a reduction in road traffic.

Potential future transport projects in London

4.3 Finsbury Park to Muswell Hill

- 4.3.1 This former rail route is converted mainly into a 'Parkland Walk' using rough footpaths and acting as a nature corridor. However, there is significant potential to upgrade this route for cycling and/or a new public transport route whilst maintaining the Parkland Walk character of the route. The gentle gradient of the former rail route has the potential to help encourage and increase cycling in this hilly area of North London, and act as a parallel cycling route to the A1. This route has the advantage of being substantially owned by Transport for London because of the presence of the Northern Line depot at Highgate.

4.4 Mill Hill East to Edgware

- 4.4.1 This former rail route has significant potential to increase the accessibility of development and regeneration areas of the former Mill Hill barracks site and areas of Colindale, either through upgraded walking and cycling facilities and/or a new Underground route that would in effect extend the Mill Hill East – Finchley Central branch of the Northern line. This would simplify Northern line operations and allow resources to be redirected to other parts of this line. It would also help to relieve pressure on the northern section of Thameslink.

4.5 Belmont to Harrow & Wealdstone

- 4.5.1 This former rail route could provide upgraded cycling and walking routes in the area or it could be used for a new public transport route.
- 4.5.2 Taken together, these four individual projects (Bow Church to Hackney, Finsbury Park to Muswell Hill, Mill Hill East to Edgware and Belmont to Harrow and Wealdstone) would make a substantial contribution toward both the Mayor's transport and other priorities, especially in terms of regeneration, improving access to jobs and air quality, stimulating the economy, providing better connectivity between businesses, reducing inequality and improving access to healthcare and to open spaces. If they were all used for cycle routes, they could help significantly to promote the attractions of cycling across north and north-east London.
- 4.5.3 The individual elements of the routes would still be worthwhile in pursuing and would still meet Mayoral objectives but the total benefits would be much less.

4.6 Croydon to Canary Wharf cycle route using redundant railway alignments

- 4.6.1 A key barrier to taking up cycling is the need to go up hills of significant gradient and length. Providing routes where gradients are manageable has the potential to encourage modal shift into cycling from non-cycling groups and also to encourage irregular cyclists to become more frequent in their use of cycling as a principle means of transport.

- 4.6.2 The former Crystal Palace (High Level) rail route from Nunhead has the potential to encourage and increase cycling in this hilly area of South London, as part of a longer cycle route say from Croydon to Canary Wharf, using existing 'quiet roads' and designated cycle routes. There are three major engineering obstacles to achieving such a major new piece of cycling and walking infrastructure.
- 4.6.3 The two tunnels near Crystal Palace are still extant and studies by Sustrans for Southwark Council have concluded that they are suitable for reopening for use as a cycle/pedestrian route. However, these could follow the example of the 'two tunnels' cycling project in Bath. There is an element of housing that was built on the route after its closure in 1954. However, a cycle route using parts of the former railway and quieter residential roads where this is not feasible would mean that this proposal could be easily realised.
- 4.6.4 A bridge across the A205 South Circular Road at Lordship Lane – Horniman Museum and Gardens would need to be reinstated so as to give cyclists and pedestrians uninterrupted transit across this busy road.
- 4.6.5 This idea would usefully complement the GLA's other objectives for the rejuvenation of Crystal Palace Park, and regeneration of surrounding areas such as Upper Norwood, Thornton Heath and Penge. The benefits of such a scheme would include improved air quality, improved access to health services and health outcomes (where active travel modes were made more attractive), regeneration and potential for additional housing, better access to jobs and services, and better business to business connectivity.

5. Connecting London's inner orbital and radial rail routes

5.1.1 In a separate section we have described a number of projects to improve existing suburban rail hubs, such as the scope for a much better interchange at West Hampstead. These could be complemented by the development of stations and platforms at a number of other locations using existing stations or lines that could be adapted to meet a wider range of passenger needs

5.2 Junction Road – Tufnell Park

5.2.1 Tufnell Park Northern Line station is located quite close (about 200 metres) to where the Barking – Gospel Oak line crosses it at the surface. Prior to 1943 there was a station here (Junction Road), but this was closed for wartime economy reasons and never reopened. At the time the national rail services calling at this station ran to Kentish Town where there was easy interchange with the Northern Line. Today however services run to Gospel Oak and there is no easy interchange with the Northern Line. Electrification of the Barking-Gospel Oak line can be expected to increase use of this route very significantly. Providing a station at Junction Road would provide such an easy interchange and facilitate a very wide range of local journeys across North London e.g. Barking to Barnet or Walthamstow to Finchley.

5.3 Maiden Lane – Kings Cross (North)

5.3.1 A station at this location would close a 'long' gap in station spacing on the North London line (NLL), and enable access to the Kings Cross Railway Land's development with its large scale residential, university, leisure and business areas from the NLL. This has the potential to ease congestion on lines serving Kings Cross St Pancras.

5.3.2 A station at this location would assist the regeneration process in this area, and meet Mayoral priorities for improved access to healthcare and higher education, and improving the competitiveness of businesses locating in this area.

5.4 Brixton station high level platforms

5.4.1 The 'Atlantic' national rail lines used by London Overground and Southeastern Victoria – Dartford services run right through the centre of Brixton, very close to the Brixton national rail station (served by Southeastern trains between Bromley South and Victoria) and only about 200 metres from the Victoria line Underground station. Opening up platforms on these lines would significantly enhance the connectivity of Brixton with inner South and West London, Surrey via Clapham Junction and North West Kent. It would also enhance Brixton's role as a major bus interchange. It would enable Brixton to be connected to other local centres such as Peckham, Lewisham and Clapham Junction which

are currently only accessible by lengthy bus journeys despite relatively short geographical distance.

- 5.4.2 This scheme has significant non transport benefits in terms of regeneration within Brixton, but also would substantially improve access to jobs and services and reduce inequality from areas of deprivation around Brixton which benefit from its excellent bus network but have limited rail access. Benefits to health would accrue from the reduced journey time to Denmark Hill (Kings College Hospital) of around 2-3 minutes compared to the much longer journey times by bus or road at present. There is likely to be an environmental benefit and improved air quality from reduced private vehicle traffic making local journeys in the area.

5.5 Brockley station high level platforms

- 5.5.1 Southeastern Victoria to Dartford via Lewisham trains pass directly over the platforms at Brockley station served by Southern and London Overground services to London Bridge, the East London Line, Croydon and Clapham Junction. There was a station at this point on the Southeastern line called Brockley Lane, which closed to passengers in 1917.
- 5.5.2 The provision of platforms and an appropriate interchange would facilitate a significant number of orbital journeys within South East London, and between North West Kent and North East Surrey, for example from Dartford and Lewisham to East Croydon, that are either not possible by rail at present or require travel via Zone 1 stations such as London Bridge.
- 5.5.3 The benefits would include potential reduction in car traffic on roads such as the A205 South Circular, freeing up capacity on rail routes into zone 1, and enabling rail travel from Brockley to local centres such as Peckham Rye, Denmark Hill, Lewisham, Blackheath, Bexleyheath and Dartford which currently require travel to other stations.
- 5.5.4 There is also potential for redevelopment on adjacent sites that could contribute towards its cost. However, the presence of the existing station means that ongoing operation costs of such platforms, once the interchange is built, are likely to be minimal.
- 5.5.5 The benefits of this scheme accrue through the potential reduction in road traffic elsewhere in South London in terms of air quality, providing better connectivity between businesses in the wider area, reducing journey times for local journeys to Kings College and Maudslay Hospitals, and providing wider access to jobs and services within South East London. On adjacent sites, there is also potential for additional housing to be created.
- 5.5.6 This proposal is now included in the TfL business case for rail devolution.

6. Connecting West London and providing additional capacity to Heathrow Airport

6.1 West Drayton to Uxbridge and Uxbridge to Denham

- 6.1.1 These two former rail routes could be reinstated to provide better links to Uxbridge and to Heathrow Airport. Two Elizabeth Line trains an hour are scheduled to terminate at West Drayton. These could be extended to Uxbridge and Denham if the former rail route is reinstated. This would improve connectivity of Uxbridge (adjacent centres such as Brunel University and Hillingdon Hospital) to central London, Ealing, and Southall and by connection at West Drayton to Slough, Maidenhead, Reading and the Thames Valley. A connection at Denham would allow onward travel to the Chiltern route and has potential to attract significant traffic from private cars, and reduce congestion on adjacent road routes such as the A40, M4, M25 and M40.
- 6.1.2 This scheme has significant benefits in terms of improved air quality, improved connectivity for businesses in the Heathrow area, improving access to higher education (at Brunel University) and improving access to jobs and services in the Elizabeth Line corridor.

6.2 Southern access to Heathrow Airport

- 6.2.1 Public transport access to Heathrow Airport from the south remains a significant concern, the more so as previous attempts to solve the problem have reached an impasse. London TravelWatch has previously supported the construction of the Airtrack route from Staines to Heathrow Airport Terminal 5. This would provide connectivity from South West London and Surrey by rail to Heathrow Airport, whereas currently a bus link from Woking or Feltham is required for public transport users or access is made by private car or taxi.
- 6.2.2 This proposal has been revived by London Borough of Wandsworth, after the failure of the original scheme proposed by BAA plc and Surrey County Council, as Airtrack Lite. Airtrack would support and enhance current regeneration activity around Nine Elms, Battersea and Waterloo by providing greatly enhanced connectivity to Heathrow Airport.
- 6.2.3 A potential variation on Airtrack Lite could be an additional loop from Brentford to Heathrow Airport using the Brentford – Southall freight line (see above) and additional tracks alongside the Great Western Main Line between Southall and Airport Junction. This would give greater flexibility in train service operation and potentially encourage significant regeneration around some large industrial and warehousing sites in Brentford, Hayes and Southall. Alternatively, London Borough of Hounslow have identified a separate scheme for a link to Heathrow Airport via Bedfont that would also enable the development of significant areas of housing and job creation, contributing towards the cost of the link.

6.2.4 This scheme would complement existing proposals for a western access line to Heathrow Airport from the Great Western main line. It has considerable scope for improving air quality in the Heathrow area and corridors leading to it. There is considerable scope for regeneration and provision of new homes around Brentford, Southall and Hayes & Harlington stations. It would also significantly improve access to jobs and services from a number of deprived communities, and therefore be a catalyst for reducing inequality. Business connectivity would be significantly improved by the better links between west, south west and south central London. As noted in sections 2.4.2 and 2.4.4 above there also the possibility of an extended Barking – Gospel Oak service that would also serve a large area of north and east London that does not currently

6.3 Taxi and private hire vehicle co-ordination at Heathrow Airport

6.3.1 London TravelWatch in its submission to the Airports Commission³ noted that a significant proportion of road traffic to, from and nearby to Heathrow Airport is made up of taxi and private hire vehicles, often making empty journeys to and from the airport to pick up or set down passengers. This contributes to road traffic congestion and poor air quality in and around the airport and also makes passengers journeys less predictable in terms of journey time and requiring the provision of more parking areas as a result. The reason for this is because the licensing regime for taxis and private hire vehicles at the airport effectively dictates this. Reform of this and the provision of a co-ordination function would enable a much more efficient use of vehicles, drivers and road space, with benefits in reduced costs to consumers, reduced congestion and improved air quality.

6.4 Cross boundary bus integration at Heathrow Airport

6.4.1 Heathrow Airport because of its geographic location is served by both TfL and non-London bus services. This in theory should provide easy connectional cross-boundary journey opportunities. However, the differences in operation such as the lack of Contactless bank card payment on non-London bus services can be a barrier to their usage, as many passengers may not carry cash or be uncertain of the fares charged. Upgrading the ticketing system on these buses to accept payment by Contactless bank card would overcome this barrier.

6.4.2 Similarly improving the frequency and capacity of non-London services could also have a significant benefit in terms of road congestion and air quality.

³ http://www.londontravelwatch.org.uk/documents/get_lob?id=3894&field=file

6.5 Extension of Oyster/Contactless fares and ticketing to rail stations in the Spelthorne, Elmbridge and Epsom areas of Surrey

- 6.5.1 Spelthorne and Elmbridge district council areas of Surrey form part of the contiguous urban area of Greater London and are very closely tied to Heathrow Airport in terms of jobs and accessibility. There are significant numbers of cross-boundary bus services operated by TfL with Oyster and Contactless payment systems. As a result, most of the population of the area will have access to these means of payment. However, most of their rail stations are located outside of the Oyster / Contactless / Travelcard area and do not accept Oyster / Contactless payment for fares. This 'disconnect' means that for convenience many passengers from these areas will drive to stations inside the Oyster / Contactless / Travelcard area e.g. Osterley, Feltham, Surbiton or Ewell East / West stations, rather than using their local stations or train service. This then adds to road traffic congestion and poor air quality. Therefore, extension of Oyster / Contactless to these stations (Staines, Shepperton and Epsom) would be a significant incentive for passengers from these areas to change their behaviour and use rail for a greater proportion of their journey.

7. Regenerating road corridor routes from central London

- 7.1.1 London has a number of historic road corridors that radiate from the centre, which formerly were major arterial routes, but whose character has changed over recent decades to be more focused on local journeys.
- 7.1.2 A corridor-based approach to regeneration would enable these routes to become more focused on the needs of local traffic, cycling, buses and pedestrians. In particular improving the reliability of bus services through bus priority measures would have the potential to significantly reduce bus operating costs. Similarly, improving the safety of cyclists on these routes would be beneficial. Potential routes could include Ermine Street (A10), Harrow Road (A404), Edgware Road (A5), Uxbridge Road (A4020) and the A23 route between Kennington and Croydon via Brixton.
- 7.1.3 This series of projects would bring major benefits in terms of improved air quality, improved access to health services and health outcomes (where active travel modes were made more attractive), regeneration and potential for additional housing, better access to jobs and services, and better business to business connectivity.

8. Cross River Light Rail transit

- 8.1.1 The corridor between Kings Cross and Euston to Waterloo, Elephant & Castle, Brixton and Peckham is one of the most densely trafficked corridors for buses and cyclists in London.
- 8.1.2 This previously planned project was shown to have major non-transport benefits from improved air quality, improved access to health services, facilitating regeneration schemes at various places en route, improving access to jobs and services in areas of severe deprivation, and better business to business connectivity.

9. Smaller schemes or policies with wider and bigger impacts

9.1.1 Smaller schemes can often have a larger and wider impact than bigger projects, and can also make a significant contribution to transport services either by making them more efficient or enabling a greater number of users to access existing services.

9.2 Installation of ticket gates at major inner and outer London stations

9.2.1 There are 26 stations operated by national rail operators and London Underground in the Greater London area that have over one million users per year that either do not have ticket gates or are only partially gated. This affords considerable opportunity for fare evasion and other forms of fraudulent travel. This also reduces the revenue available to transport operators and authorities to invest in both transport operations and improved facilities for passengers. There is thus also an opportunity cost to these stations remaining ungated, regardless of the ownership or form of operation whether it be direct operation by TfL-London Underground, a rail concession agreement operated for TfL or a DfT franchised arrangement.

9.2.2 Gating of these stations could be potentially self-financing but would as with previous such schemes considerably help reduce the incidence of crime, disorder and fare evasion on the transport network and in their immediate vicinities. All of these 26 stations are interchanges with other rail routes, trams or buses, and so such schemes could form part of plans to enhance the interchange function of these stations. In some cases – such as Elephant & Castle National Rail station it could also help unlock regeneration in the adjacent areas. The 26 stations are listed in the Appendix and are mixed between inner and outer London.

9.3 The ten minute interchange challenge

9.3.1 London TravelWatch has identified a number of locations within London where stations and tram stops are within approximately 10 minutes or less walk of each other or could be made within 10 minutes or less walk with appropriate physical interventions. Much more could be made of these interchanges if they were treated to appropriate promotion, signage and in some cases physical works to reduce the distance and time between them. These interchanges are mainly outside of the zone 1 Travelcard area, and could have the ability to free up an amount of capacity on routes subject to overcrowding for very modest costs. There will be other benefits as well in terms of local areas, and so these schemes are likely to be extremely worthwhile pursuing.

9.3.2 The benefits of such schemes, in terms of meeting other Mayoral priorities, would include improved air quality, improved access to health services and health outcomes (where active travel modes were made more attractive),

regeneration and potential for additional housing, better access to jobs and services, and better business to business connectivity.

9.4 Small scale step-free access at underused stations

- 9.4.1 There are a number of small scale schemes at stations such as Penge West, Sudbury Hill Harrow, Ravensbourne, Bellingham, Maze Hill and Haydons Road where step free access could be provided by ramp rather than lifts. These stations have lower footfall, but could play a more significant role in their local communities if better access were provided. There is potential for encouraging regeneration at Penge West and Sudbury Hill Harrow for adjacent town centres. Penge West as well as serving Penge High Street, is used as a southern access to Crystal Palace Park. Bellingham station also serves a significant social housing area and has some adjacent brownfield land that could be released for development. London TravelWatch research on passenger attitudes to value for money shows that improving accessibility for mobility impaired people also has the effect of improving the overall satisfaction of all transport users.
- 9.4.2 West Brompton London Underground station has no step-free access to the southbound District line platform, whereas the other platforms have full lift access. Providing a lift here would significantly improve the accessibility of the station and the interchange capability.
- 9.4.3 Kilburn High Road and Alexandra Palace stations having been rebuilt recently have space available for the installation of lifts to all platforms.
- 9.4.4 These schemes would have significant benefits in their localities in terms of reducing inequality and improving access to jobs and services from disadvantaged groups. Access to healthcare would be improved where services to these stations operate to existing accessible stations near to healthcare facilities. There would also be opportunities for local regeneration and small scale housing schemes associated with these schemes.

9.5 Tackling transport deserts – advance guard planning

- 9.5.1 Some areas of Greater London have significant potential for development but are remote from the rail and underground network as it now operates, although they have the potential for new schemes at a later date. However, the lack of transport links may have a deterrent effect on development. The solution to this issue may be to repeat the successful strategy adopted in the 1990s in advance of the opening of the Jubilee Line extension and the Beckton branch of the DLR, of providing express bus links that would mimic the eventual rail link.
- 9.5.2 Other areas may lack transport links and have no realistic prospect of additional rail links, but might justify the provision of additional and better bus

links to provide connections to areas of employment. An example like this might be an express bus service from outer areas of Bexley to Canary Wharf.

- 9.5.3 The benefits of such schemes would include improved air quality, improved access to health services and health outcomes (where active travel modes were made more attractive), regeneration and potential for additional housing, better access to jobs and services, and better business to business connectivity.

9.6 Greater pedestrian connectivity between out of town retail outlets

- 9.6.1 Congestion often occurs on major roads where out of town retail outlets have developed incrementally in a linear fashion, as a result of car users driving from one store car park to another, which may be located on opposite sides of the road. Examples of this are the A23 Purley Way, A206 Woolwich Road, A224 Sevenoaks Way and A406 Friern Bridge retail areas. Providing skywalks, subways or other pedestrian links between shops and outlets could reduce the number of unnecessary short linked journeys which need to be accommodated on otherwise trunk roads. Such links could also enhance connectivity to local communities and to public transport facilities, such as Waddon station from the A23 Purley Way or New Southgate from Friern Bridge retail park.
- 9.6.2 Potentially this project could also be linked to a road freight and parcels strategy which would look to improve the efficiency of freight delivery services, and encourage shoppers to use retailer home delivery services rather than driving to retail parks to collect the goods themselves. There is some evidence of consumers in areas of lower car ownership in inner London already adopting this model. Examples include IKEA stores in Northumberland Park and Croydon where significant numbers of shoppers access these stores by public transport to examine and choose goods in a showroom type way and then order items for delivery from company websites.
- 9.6.3 The benefits of these schemes would include improved air quality, better business to business connectivity, and also potential local environmental improvements.

9.7 Encouraging short distance cycling in outer London

- 9.7.1 Cycling has developed significantly in recent years in London, particularly in inner London. However, there is still significant scope to encourage its development, particularly in outer London and for shorter distance journeys where cycling could enable easier and affordable access to the public transport network. Experience from outside London shows that providing good cycle storage, access and other incentives at stations is a very effective way of encouraging cycling for journeys of up to 2-3 miles or ten to 15 minutes ride from the station. It has encouraged modal shift at stations but also for other more local journeys.

- 9.7.2 For people on low incomes in outer London, the ability to cycle to a station also improves the range of employment and educational choices available to them. For example by cycling to a station in a different Travelcard zone costs could be reduced; or being able to reach a different line the range of job opportunities could be increased.

9.8 Seven Sisters station rebuild

- 9.8.1 This station forms a key interchange between the Victoria Line and the West Anglia route of Greater Anglia, and is also a major access to Tottenham town centre (including for bus routes that call there) and Tottenham Hotspur Football Club. However, it lacks modern facilities and is used by considerably more passengers than originally intended when the Victoria Line was opened in 1968. It is also used on a frequent basis as a diversionary call on the Stansted Express airport route.
- 9.8.2 Rebuilding could significantly improve the accessibility and ambience of the station, facilitate regeneration in Tottenham town centre and around the Tottenham Hotspur football ground, and allow for better interchange with buses and South Tottenham station on the Barking – Gospel Oak line.
- 9.8.3 Seven Sisters station is a principal gateway to the area around Tottenham High Road and redevelopment would enhance existing regeneration schemes in the area, assist with business connectivity, improve the access to healthcare, jobs, and help reduce inequality in the areas of deprivation that are located close to this station.

9.9 Silver Street station rebuild

- 9.9.1 This station provides good public transport access to North Middlesex University Hospital. Improvements to the walking route to and from the Hospital and reorganisation of healthcare in North London and Hertfordshire have enabled considerable growth in usage of the station. However, surveys as part of the hospital travel plan indicate that there is still considerable scope for modal shift from private car usage to public transport in the corridor served by train services to this station. The station is not accessible with many stairs to and from the platforms, and other facilities do not reflect the increased usage of the station. This, plus the nature of the walking route between the station and the hospital, is a significant barrier to staff, patients and visitors using rail as part of their journey to and from the hospital.
- 9.9.2 Rebuilding could significantly improve the accessibility and ambience of the station as well as assist or open regeneration adjacent to the station, which is also on the main A406 North Circular Road. This could include potential improvements to walking and cycling in the area, and improve community cohesion where the A406 motorway standard road has separated local communities.

9.9.3 This scheme would improve access to health care services, and also air quality. There are also significant opportunities locally for regeneration, and assisting in reducing inequality.

9.10 Reinstating the westbound link to the Angerstein Wharf branch for rail freight at Angerstein Junction

9.10.1 This freight branch railway at present carries aggregates from the Angerstein Wharf on the River Thames. The current arrangement of its junction with the Southeastern route from Blackheath to Charlton is orientated towards the east with a very sharp curve. Freight trains heading toward or coming from the South London Line and the rest of the UK have to negotiate a very circuitous route via Woolwich, Bexleyheath or Sidcup to access the branch. This is a significant use of capacity as it requires a number of 'conflicting' moves across a number of flat junctions. This could be reused by passenger services. In addition the tight curvature of Angerstein Junction has resulted in a number of derailments of freight wagons in a recent years with considerable disruption to passenger services.

9.10.2 Providing a direct straight junction at Angerstein Junction toward Blackheath would overcome the shortcomings of the existing junction and free up capacity for passenger services.

9.10.3 The Angerstein Wharf branch is located next to the A102 Blackwall Tunnel approach road. This raises the possibility that rail freight could be expanded at this location through the use of a terminal from which freight could be distributed by rail.

9.11 Developing freight consolidation centres

9.11.1 A feature of the changing nature of London's traffic in recent years has been the growth of small van traffic making deliveries of goods ordered via the internet. This growth has had an impact on other modes of transport such as buses and cycles through increased congestion.

9.11.2 During the 2012 London Olympics TfL piloted the use of freight consolidation centres. These were successful in producing some significant reductions in trip rates of vehicles carrying freight.

9.11.3 In 2012 for the duration of the games, the London Lorry Ban was relaxed to allow night time deliveries. This resulted in fewer freight movements at peak hours leading to reduced congestion, and better reliability of delivery times for freight receivers.

9.11.4 In 2014 a number of supermarkets and on-line retailers began arrangements with London Underground and Network Rail whereby passengers could arrange for their shopping to be delivered to stations rather to individuals' homes and offices. These are in effect freight consolidation centres. They are a

welcome development as they will reduce the number of journeys made by small vans and cars to homes, offices and other places of business. They also restore rail stations to their original multi functional status of handling goods and passengers together. It also opens the possibility of goods being delivered locally by low energy use vehicles such as cargo bikes. As yet however, goods are not delivered to the stations by rail.

- 9.11.5 A different initiative was the Colas Rail and TNT Express trial freight train from Rugby to London Euston, carrying overnight express parcels and perishable products for distribution in central London, with goods being delivered before 0600.
- 9.11.6 For larger volume and bulk deliveries of freight consolidation in a similar vein to that employed during the 2012 Olympic Games offers the opportunity for reducing the impact of freight traffic on London's road network. Ideally such consolidation centres should be capable of being served by both road and rail. Potential sites might include Angerstein Wharf (as noted above), Barking, Harlesden, Old Oak Common, Temple Mills, Feltham or the Lea Valley.

10. Regeneration through tourism – transport schemes with tourist potential

10.1.1 Worldwide there are many examples of how transport schemes with tourist potential have been instrumental in stimulating economic regeneration. In London, examples of such initiatives include the 'Millennium Bridge' from St Pauls to the Tate Modern, the use of vintage routemaster buses on the central section of route 15, and the RV1 'RiVerside Bus' that links Covent Garden, The South Bank, Tower Bridge and Tower Hill which initially conceived as a tourist service, is now a well established route used by commuters to reach areas of central London previously not well served.

10.1.2 There could also be other projects which might have similar benefits.

10.2 Routes paralleling London Bridge

10.2.1 London Bridge is a very busy road and pedestrian crossing point of the River Thames. Its proximity to major tourist sites such as Southwark Cathedral, Borough Market, The Golden Hind and the Monument, and its use as a major pedestrian thoroughfare for commuters means that at times it can be very congested for pedestrians.

10.2.2 Two alternative schemes could provide some relief to London Bridge by creating routes with greater tourist interest.

10.2.3 The Cannon Footbridge (<http://www.cannonfootbridge.com/>) would provide a footbridge attached to the side of Cannon Street railway bridge. This would connect the north and south walking routes alongside the Thames and would reduce walking times between Cannon Street District Line station and points in SE1 such as Borough Market.

10.2.4 Close by to this is the route of the former King William Street tube line – which was the original route of the Northern Line, abandoned in the early 20th Century. The tunnels for this could be opened up for a pedestrian route, based on the theme of a disused Underground railway.

10.3 Developing a heritage railway in the London vicinity

10.3.1 Heritage railways are a well established feature of the tourist market in the UK with a variety of different business models based on scenic routes, use of heritage or novelty rolling stock, use of different gauges of track and high levels of customer service to make travel on them an enjoyable experience.

10.3.2 However, the London area has very few if any such heritage railways. The nearest examples being the Epping – Ongar railway on the former Central line route east of Epping. Access to this currently require a bus link from Epping Station. However, this railway could have a platform provided adjacent to the

Potential future transport projects in London

London Underground Epping station providing a seamless interchange and reducing the dependence on a bus link or private cars to get to this attraction.

Appendix

Stations recommended to be included in a programme of ticket barrier provision:

London Underground

Finchley Central, West Ruislip (Chiltern platforms)

National Rail

Barnehurst, Barnes, Beckenham Junction, Blackheath, Catford, Catford Bridge, Chessington South, Crofton Park, Elephant & Castle, Greenwich, Grove Park, Hayes & Harlington, Herne Hill, Hither Green, Mortlake, Nunhead, Petts Wood, Teddington, Tottenham Hale, and Worcester Park.