

Kentish Town Planning Framework Future Transport Context

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EVERY JOURNEY MATTERS

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Executive Summary

Context

The London Borough of Camden (LBC) is developing a planning framework for Kentish Town. The area has the potential for a new neighbourhood with a mix of employment, residential and community uses alongside new parks and open spaces. The site is located between Gospel Oak and Kentish Town stations. This report explores the current and future transport context of the development and surrounding area.

In terms of current mode share, Camden residents have a high walking mode share when compared to the rest of Inner London, indicating that the majority of trips made from Camden are on foot. Underground/DLR is the second most popular mode, followed by Bus/Tram and Car/Motorcycle. The sustainable, active and efficient mode share (walking, cycling and public transport) for Camden residents is 84.2 per cent. Camden council has set a target in their Local Implementation Plan to increase this to 88 per cent by 2021.

The highest Mayoral Transport Strategy priorities for the site are Inclusive, Green, Active and Quality.

Walking and Cycling Connections

Pedestrian density is highest around Kentish Town and Kentish Town West stations, leading South down Kentish Town Road, indicating that there is a high level of walking around the stations. This pedestrian density is among the highest in London. There is a relatively low current pedestrian density around Gospel Oak station. Walking potential is higher in the places where pedestrian density is currently low, including around Gospel Oak station and Tufnell Park station. This indicates that there are trips in the proximity of these stations that are using motorised transport but could feasibly be walked.

There is high cycling potential on Kentish Town Road and Fortess Road, potentially to connect people to Kentish Town and Kentish Town West stations. There is much lower potential in the residential regions to the West of the development. The actual cycling flow around the development is forecast to increase around the development in 2031, in particular along Kentish Town Road and Fortess Road.

Kentish Town Road is a hotspot for casualties on all transport modes. Given the Mayoral aspiration within Vision Zero, this is a significant safety issue in the proximity of the development.

Public Transport

The development area has a high access level to public transport. In particular, the east of the development has a very high PTAL due to its proximity to Kentish Town station. The west of the development has a lower PTAL rating.

The development area is served by 8 buses per hour to the north, and 16 buses per hour to the east. Kentish Town Road to the south east of the development is the highest served road in the area with 34 southbound buses per hour. The south west of the development contains smaller residential roads that are less well served by the bus network.

Crowding levels on Northern Line trains stopping at Tufnell Park and Kentish Town Stations is at the highest level across the underground, with over five people standing per meter squared. This shows that there is no extra capacity on the Northern Line at these stations. This crowding is forecast at the same levels in 2031.

Trains on the Overground network stopping at Gospel Oak and Kentish Town West stations are moderately busy, with two to three people standing per metre squared. The Kentish Town Overground Line has slightly more standing capacity, with current crowding levels at one person standing per meter squared. In 2031, these crowding levels are forecast to decrease slightly for the Overground coming into Gospel Oak, and remain at the same levels for Kentish Town and Kentish Town West stations.

Highway

The highway network surrounding the development is a highly congested area, with high delays on Gordon House Road, Highgate Road, Kentish Town Road and Prince of Wales Road, this delay is amongst the highest in London.

Introduction

This Future Transport Context report has been produced to provide the strategic context for the Kentish Town Planning Framework in the London Borough of Camden.

The proposed development, comprises an employment led mixed use neighbourhood, with a mix of employment, residential and community users alongside new parks and open spaces.

This report sets out the strategic transport and development context for the Kentish Town Planning Framework. It is not intended to replace the developer's Transport Assessment, but rather enhance their submission by providing a strategic picture of current and forecast conditions on the local transport network against which the development and associated travel demand can be viewed. It is also not intended to replace any advice or requirement given by the local transport authority in the area.

This report uses datasets captured at a strategic London-wide, not local level, and therefore this must be considered during interpretation.

This report has been prepared by Transport for London (TfL) officers on a 'without prejudice' basis only. It should not be interpreted as indicating any subsequent Mayoral decision on any planning application based on the proposed scheme.

This report contains an array of datasets and forecasting models. Further information on all methods used can be found within the appendices or via the TfL website. In particular this report makes use of the City Planner Tool. The City Planner Tool provides access to a library of spatial data sets relevant to transport planning and delivery at TfL and is available to all Local Authorities.

Context

Growth Potential

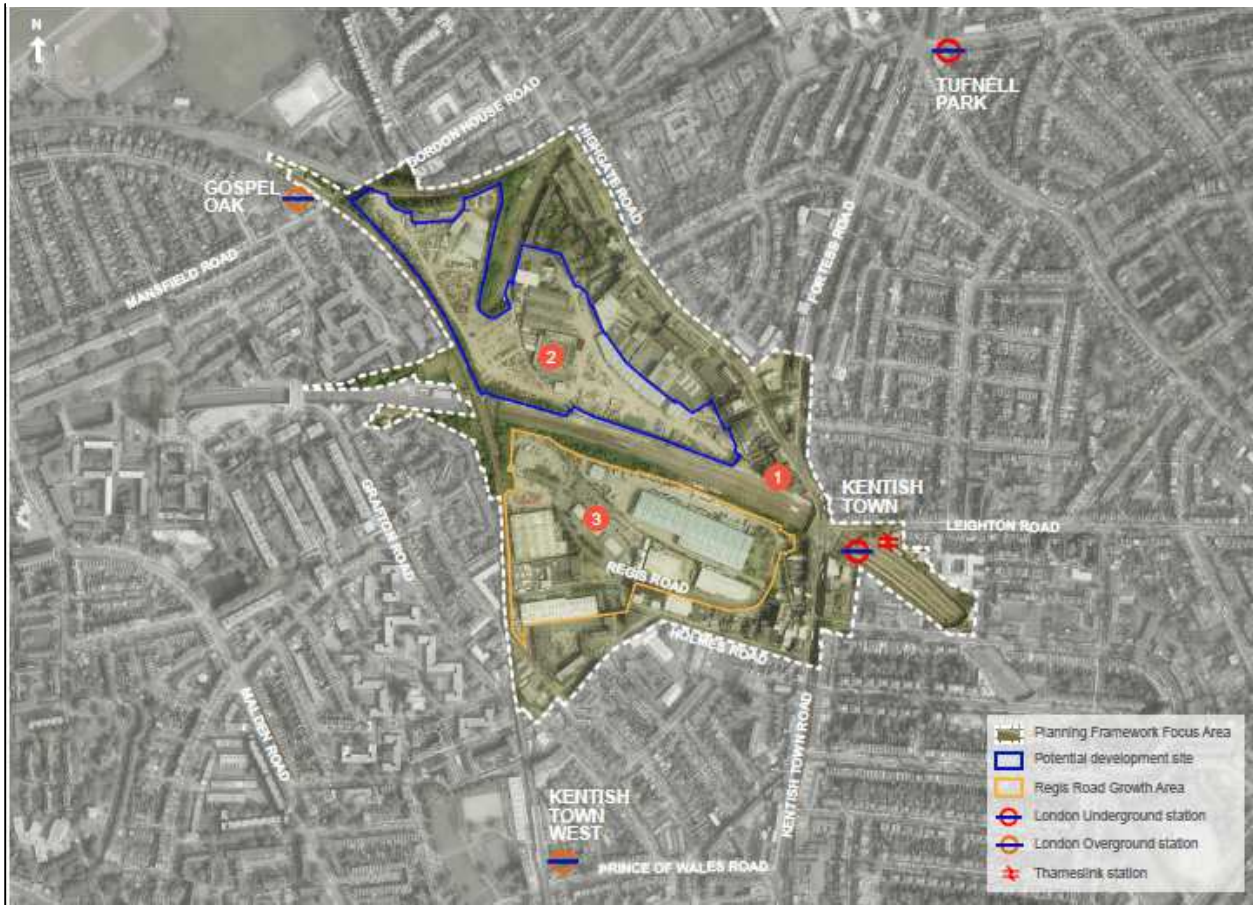
The London Borough of Camden (LBC) is proposing the development of a new neighbourhood in Kentish Town with a mix of employment, residential and community uses alongside new parks and open spaces. Figure 1 below shows the proposed area of the development.

There are two areas for development within the framework area: The Regis Road Site (shown in orange in Figure 1) and what is known locally as The Murphy Site (shown in blue in figure 1). The policy requirement for the development of each site is for it to be comprehensive, employment led and coordinated.

The Council's policy requires a comprehensive approach to redevelopment in this area: This could mean increased housing numbers, the development of more affordable housing, an increase in jobs, higher quality public realm and social and physical infrastructure. The Regis Road site is allocated for residential and commercial development in the Local Plan and further guidance is provided in the current planning framework. The Murphy's site is protected for industrial use with a potential scope for intensified mixed use.

LBC is aiming for a single masterplan and delivery approach for the whole area, however it may be possible for two coordinated development plans: one for Murphy's and one for the Regis Road site. Plot by plot or piecemeal redevelopment proposals will be resisted as a comprehensive approach allows greater flexibility to support business retention, continuity and holistic construction management.

Figure 1. Proposed development area



The development plan states that it will be delivered by 2028, therefore for the purposes of this report, the standard TfL forecasting year of 2031 has been used where appropriate as the nearest approximate.

Local Context

The site is located within the London Borough of Camden. The site has good public transport links, as Gospel Oak station is to the North West, Tufnell Park station to the North East, and Kentish Town West station to the South. Kentish Town station is contained within the East of the site area. The Murphy Site (highlighted in blue in figure 1) is bound to the North, West and Southern sides by railway lines, this restricts access to the site to the North and East. The tip of the Northern end of the site borders Hampstead Heath Park.

The Regis Road site (highlighted in orange in figure 1) is bound by the overground railway line to the West and the National Railway line to the North. Access to this site is also currently limited due to these rail lines.

Currently this area comprises Kentish Town Business Park. Murphy established its headquarters in 1984, in the Murphy site, and still remains on the site to this day. The Regis Road site includes logistics, light manufacturing and media companies, as well as a mix of other businesses.

The local area surrounding the development is predominantly residential. There are a number of small retail high streets also located around the development; Queens Crescent, Fortress Road and Kentish Town Road. Within a 20 minute walk of the development area are two nurseries, seven primary schools and six secondary schools.

Trip Patterns

The current area trip share by mode made by residents is shown below in Table 1.²

Table 1. Londoners' trips by borough of residence, and % shares by main mode, average day (7 day week), 2015/16 to 2017/18.¹

	National Rail/Overground	Underground/DLR	Bus/Tram	Taxi/Other	Car/Motorcycle	Cycle	Walk	All modes
Camden	3.3	16.8	12.9	3.0	12.7	3.2	48.0	100.0
Inner London	5.7	12.9	16.0	2.4	20.9	3.8	38.3	100.0

Table 1 shows the trips per day completed by Camden residents, broken down by how they travel. The same information for the residents of Inner London is also shown for comparison. The sustainable, active and efficient mode share (walking, cycling and public transport) for residents of Camden Council is 84.2 per cent. The target for Camden council is to increase this to 88 per cent by 2021. Camden residents have a much higher walking mode share than the inner London total, indicating that the majority of trips made from Camden are on foot. Underground/DLR is the second most popular mode, followed by Bus/Tram and Car/Motorcycle.

Given that this development is likely to be in part residential, the number of trips per day can be expected to increase. If they follow a similar pattern to the existing mode share, approximately half of the residents from the development are likely to be walking to their destinations.

¹ Source: LTDS 2016/17 Strategic Analysis, TfL City Planning

² Source: LTDS 2016/17 Strategic Analysis, TfL City Planning

Healthy Streets and Vision Zero

Healthy Streets Approach

TfL and the Mayor have launched the Healthy Streets Approach³, which aims to improve air quality, reduce congestion and make attractive places to live, work and do business. There are 10 Healthy Streets indicators,⁴ which put people and their health at the heart of decision making, and aim to result in a more inclusive city where people choose to walk, cycle and use public transport. TfL expects all developments to deliver improvements that support the 10 Healthy Streets indicators, in line with draft new London Plan Policy T2.⁵

TfL will expect all elements of this scheme, including land use, density, layout, public realm, vehicular circulation, infrastructure for walking and cycling – to contribute positively to modal shift and minimise car dependency. A significant element of Healthy Streets is about people spending time in streets and other public space, and how that space functions for them, as well as the experience of moving through a street. The Healthy Streets approach should be considered in any masterplanning, as such, resources for planning and construction can be found on the TfL website.⁶

Vision Zero

Vision Zero is the Mayor's assertion that no death or serious injury on London's transport networks is acceptable or inevitable. TfL has a target to eliminate all deaths and serious injuries from London's transport by 2041. The Vision Zero plan takes an internationally recognised approach to road danger reduction, based on the principle that life and health should not be compromised by the need to travel.⁷ The goal is to ensure that a collision doesn't happen in the first place, or, if it does occur, it is sufficiently controlled to not cause death or serious injury.

The approach will focus around the following five areas of action:

- Safer speeds – encouraging speeds appropriate to the streets of a busy and populated city
- Safer streets - designing an environment that is forgiving of mistakes
- Safer vehicles – reducing risk posed by the most dangerous vehicles
- Safer behaviours – reducing the likelihood of making mistakes or behaving in a way that is risky for yourself and other people
- Post-collision response – learning from collisions and improving

³ <http://content.tfl.gov.uk/healthy-streets-for-london.pdf>

⁴ <http://content.tfl.gov.uk/guide-to-the-healthy-streets-indicators.pdf>

⁵ <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/>

⁶ <https://tfl.gov.uk/info-for/urban-planning-and-construction/urban-planning-and-construction-resources>

⁷ <http://content.tfl.gov.uk/vision-zero-action-plan.pdf>

Mayor's Transport Strategy Indicators

The Mayor's Transport Strategy (MTS)⁸ sets out the Mayor's policies and proposals to reshape transport in London over the next two decades. The MTS outcome indicators are a measure of how a particular area is currently performing against these priorities. They are created by combining scored datasets determined to be representative of each outcome. The indicators can be used to explore the outcome spatially and compare areas. The indicators are a representation only. A higher score represents a higher relative priority location for that indicator, so if an area scores highly in the Active indicator, this indicates that it is a priority to increase the level of active travel.

London has been divided into 350m diameter hexagons to show the average score for an area. Indicators are calculated by averaging the scores of the contributing datasets over these 0.11 km² hexagons. Scores are assigned (from 0 to 5) from London wide percentile ranks, therefore the scores represent relative priorities with 5 being the highest priority and 0 being the lowest priority.

MTS indicators have been calculated for the area and include:

- Active – Walking and cycling current levels and potential
- Safe – Casualty rates and reported crime risk
- Green - NO2 and PM10 levels
- Efficient – Freight levels and car dependency
- Connected - Public Transport Access Levels (PTALs) and 45 minute employment catchments
- Inclusive – Step free accessibility differential
- Quality – Bus demand, provision and performance
- Sustainable – Car dependency and Public Transport Access Levels (PTALs)
- Unlocking Development – Projected population and employment growth (2041)

⁸ <https://tfl.gov.uk/corporate/about-tfl/the-mayors-transport-strategy>

MTS Indicators have been calculated for the site, borough and sub-region and are tabulated in Table 2 below. Details of the datasets used for the indicators can be found in Appendix I.

Table 2. MTS Outcome Indicator scores for the proposed development site, The London borough of Camden, and the central sub region within London.

Priority scores from 0-5

Where 5 is the highest priority and 0 is the lowest priority

MTS Outcomes Indicators	Area		
	Central Sub-Region	Camden	Site ⁹
Active	3.5	3.5	3.8
Safe	1.6	1.4	1.5
Green	4.4	4.3	4.3
Efficient	2.2	2.2	1.7
Connected	0.7	0.7	0.4
Inclusive	3.8	4.3	4.8
Quality	3.2	3.1	3.4
Sustainable	1.4	1.6	1
Unlocking Development	2.9	2.8	1.8

As shown in Table 2, the highest priorities for the site are Inclusive, Green, Active and Quality.

⁹ The site here is defined as the area surrounding the development as shown in Figure 2

The Active indicator demonstrates the current levels of walking and cycling, given that this is shown as a high priority for the borough and the site, this means that more walking and cycling can be encouraged. As mentioned above, the cycling mode share in the area is relatively low for Inner London, therefore this presents an opportunity to encourage more cycling.

Although the car/motorcycle mode share in Table I is relatively low, the Green indicator shows that the air quality in the area is a high priority.

The Inclusive outcome indicator shows the difference in travel time and accessible jobs from step free and not step free routes. This has been shown to be a high priority in the area.

The Quality indicator shows the level of bus service in the area. Given its industrial background, this development is likely not currently sufficiently served by the bus network. More detail on the bus service is detailed in the Public Transport section of this report.

Walking and Cycling Connections

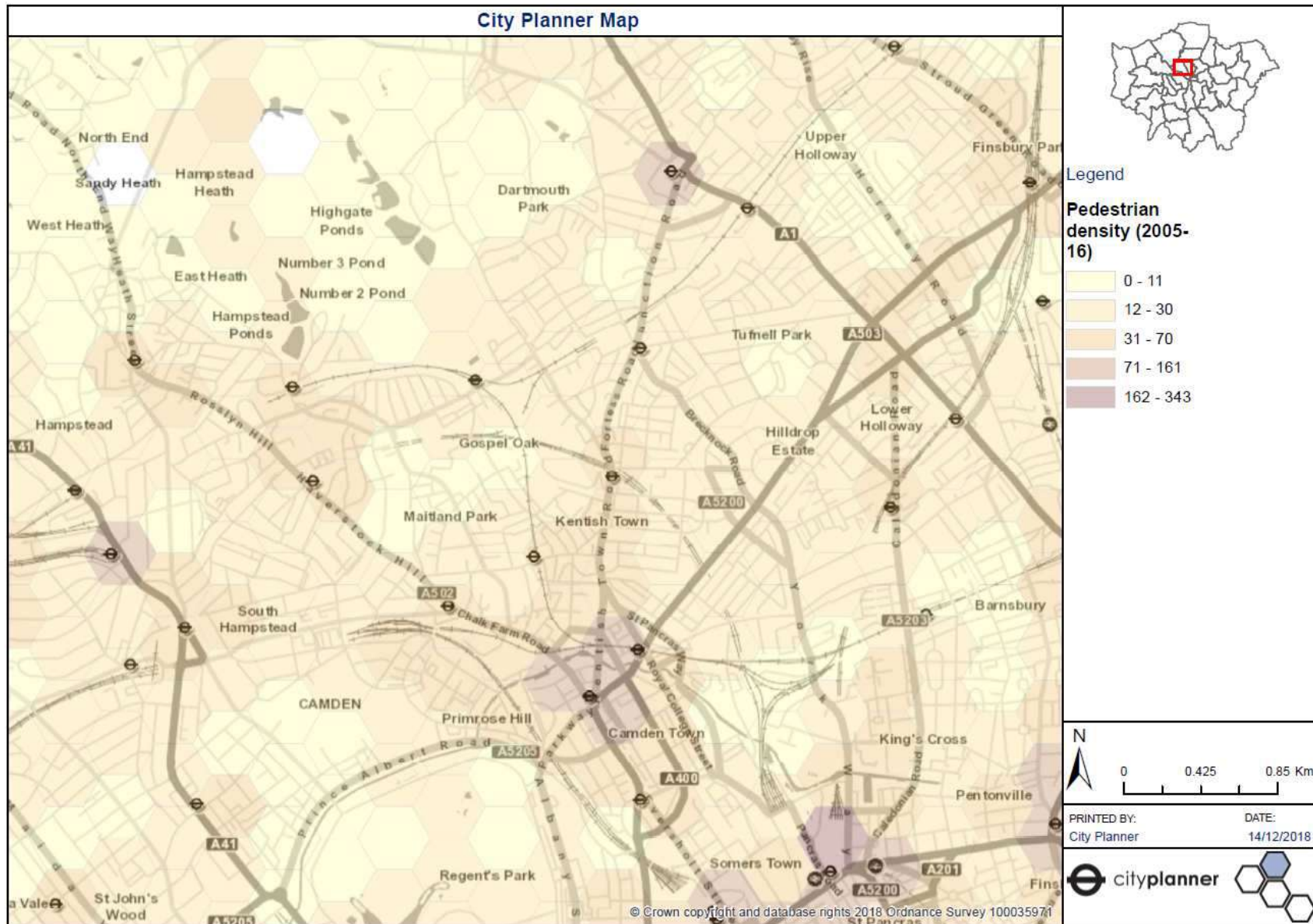
Walking

Pedestrian Density

Pedestrian density is derived from the London Travel Demand Survey (LTDS). The walking trips and stages recorded in the LTDS can be used to estimate the amount of walking undertaken by London residents. The pedestrian density represents the total distance walked per hexagon cell per day. Figure 2 shows the pedestrian density surrounding the development area at hex level. A higher pedestrian density indicates that there has been a higher level of walking in that area.

Pedestrian density is highest around Kentish Town and Kentish Town West stations, leading South down Kentish Town Road, indicating that there is a high level of walking around the stations. This pedestrian density is among the highest in London. Kentish Town station would likely serve the development area, therefore this density is likely to increase. There is a relatively low current pedestrian density around Gospel Oak station.

Figure 2. Pedestrian density per day

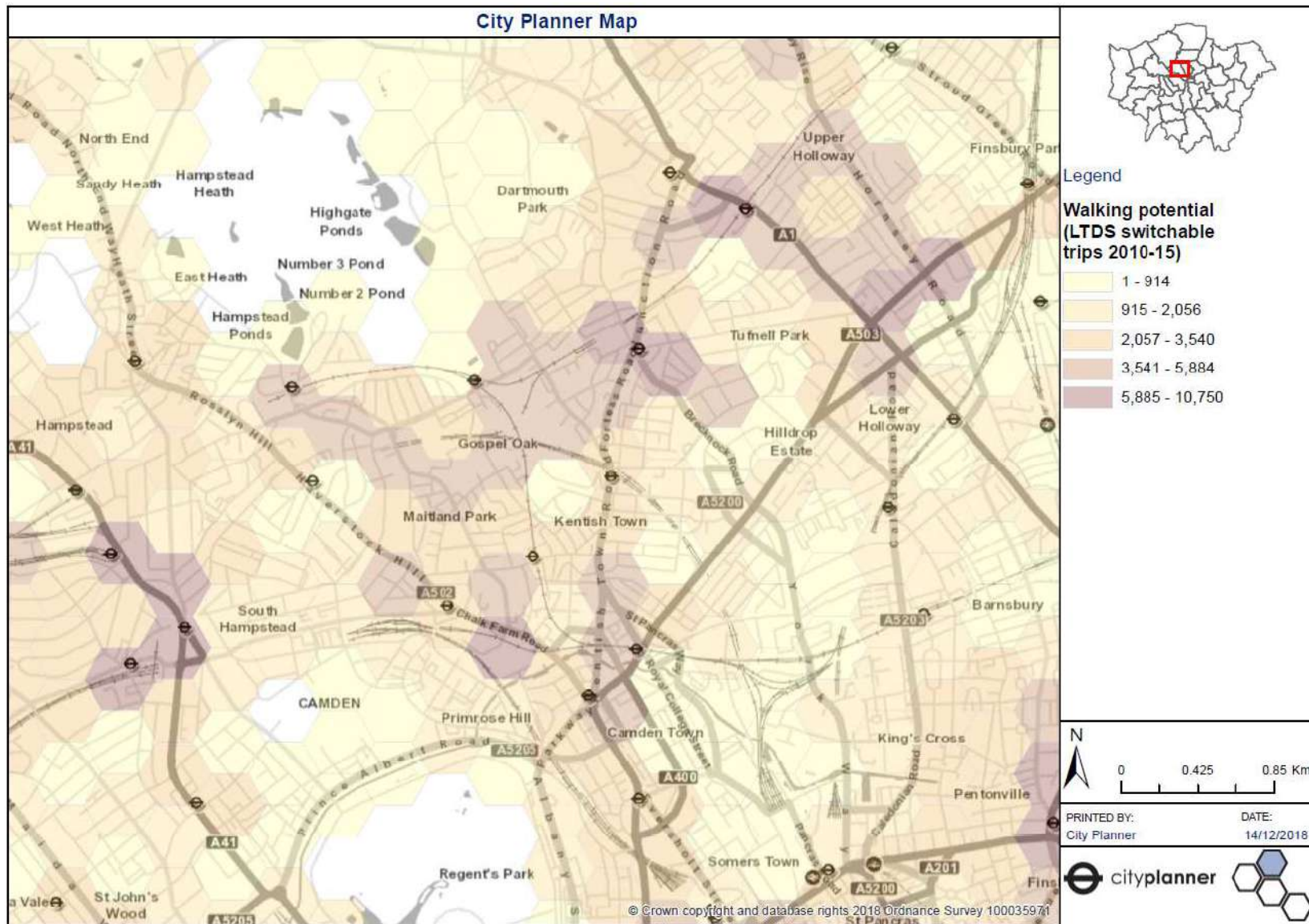


Walking potential

Walking potential is also derived from the London Travel Demand Survey (LTDS). The data represents trips made by London residents which could reasonably be walked all the way, but are not walked at present. The walking potential surrounding the development area is shown in figure 3.

Walking potential is higher in the places where pedestrian density is currently low, including around Gospel Oak station and Tufnell Park station. This indicates that there are trips in the proximity of these stations that are using motorised transport but could feasibly be walked. This walking potential is amongst the highest in London.

Figure 3. Walking Potential per day

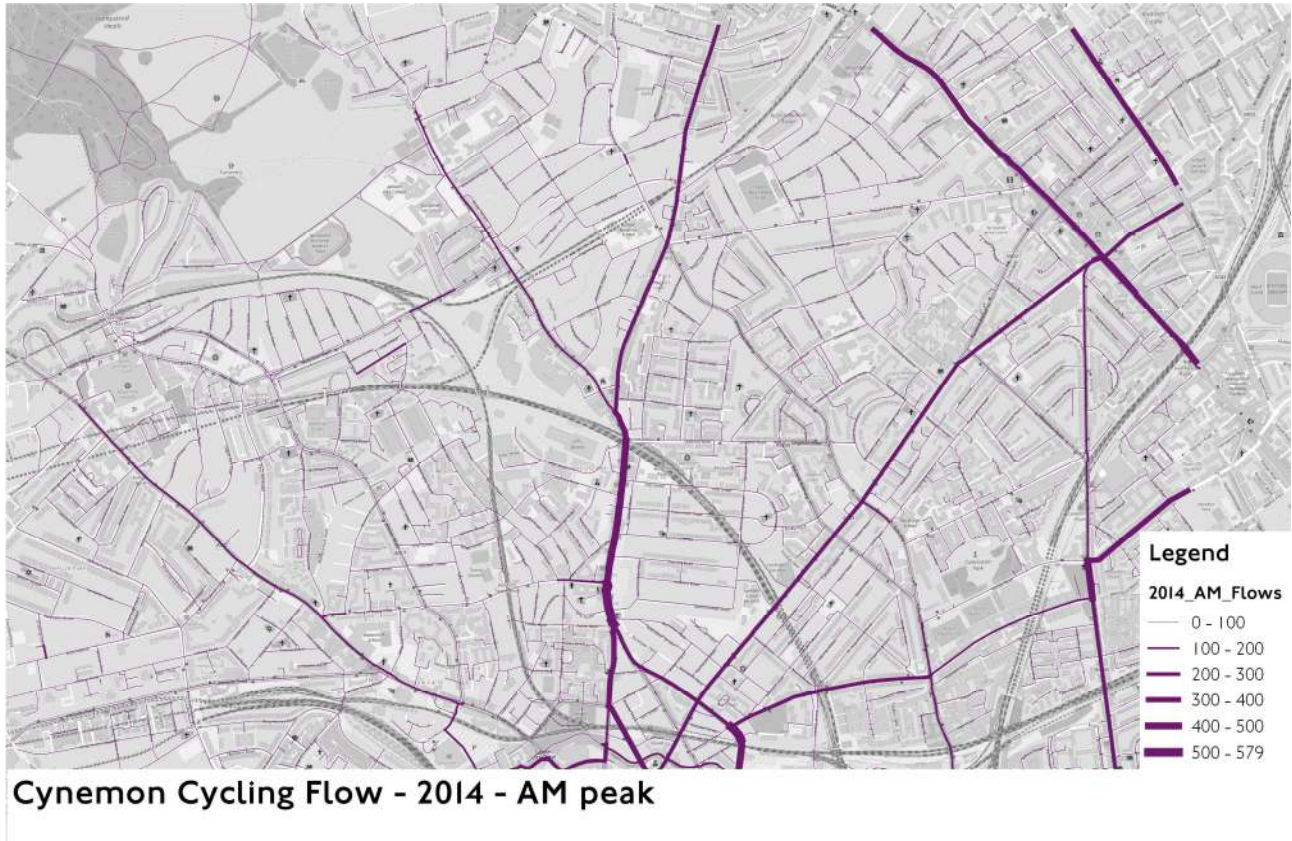


Cycling

Current Cycle flows

Current cycle flows are modelled by TfL’s strategic model; Cynemon, using a sample of count data. More information on Cynemon can be found in appendix III. Figure 4 below shows the cycling flow for the development area. From this diagram it is clear that there are a large number of cycle trips made around the development area, particularly along Kentish Town road. Within the context of London these flows are at a medium to high level.

Figure 4. Cycle flow 2014 – AM peak



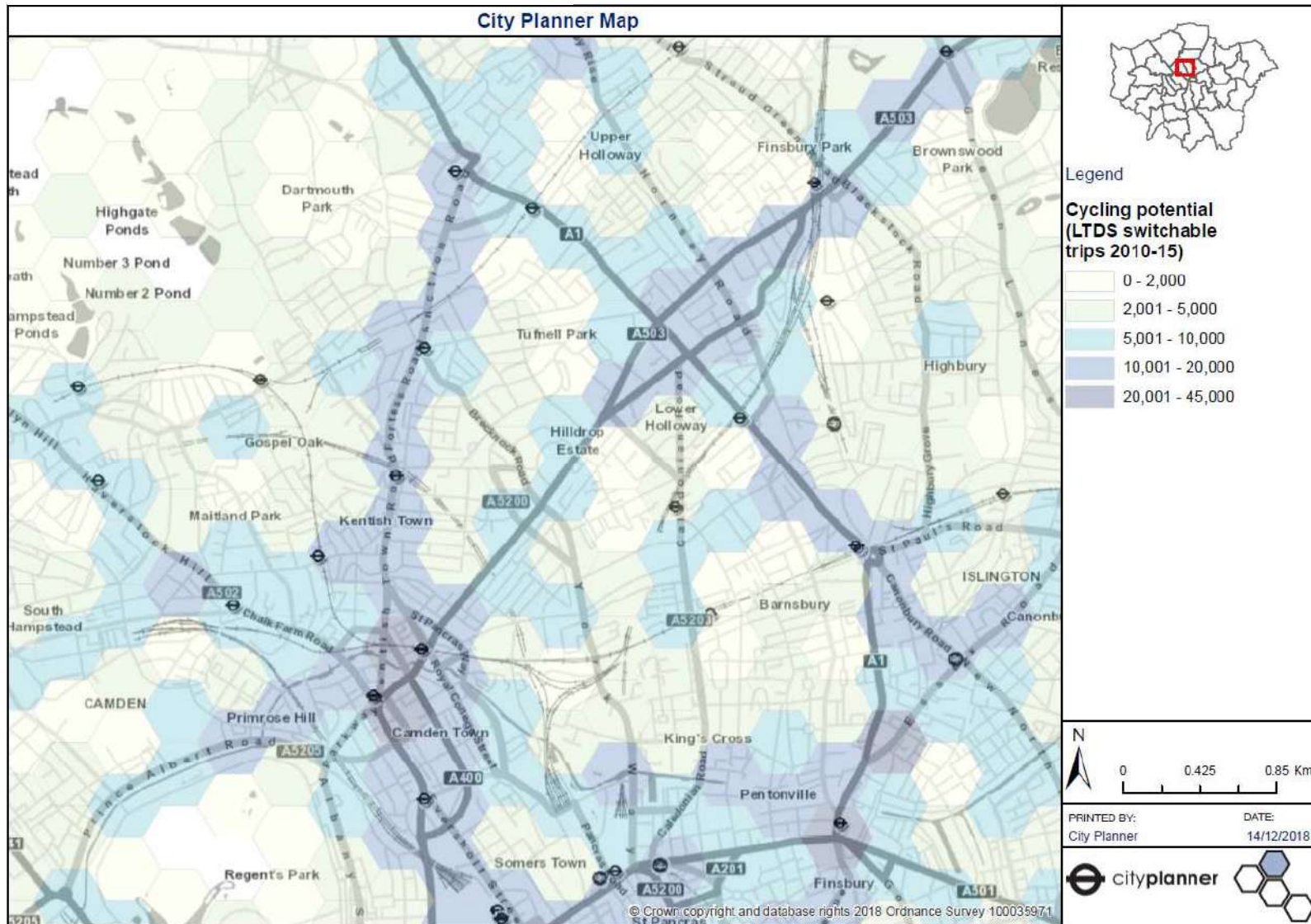
Cycling Potential

Cycling potential is derived from the London Travel Demand Survey (LTDS) and the routes are assigned to the network using Cynemon. More information can be found in Appendix III.

Figure 5 shows a map of the cycling potential around the proposed development. Cycling potential represent trips made by London residents which could reasonably be cycled but are not cycled at present.

There is high cycling potential on Kentish Town Road and Fortess Road, potentially to connect people to Kentish Town and Kentish Town West stations. This cycling potential is amongst the highest in London. There is much lower potential in the residential regions to the West of the development.

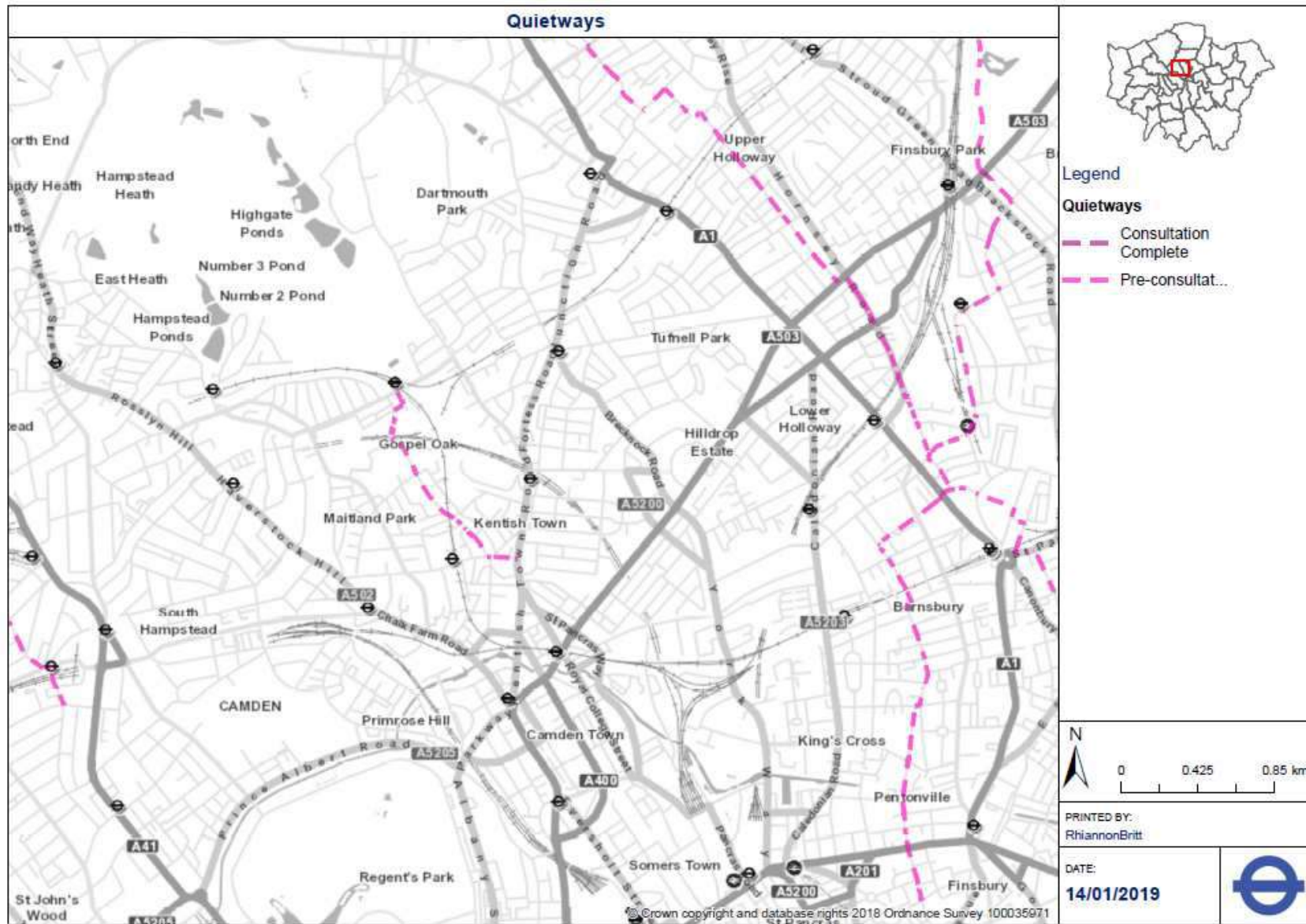
Figure 5. Cycling Potential per day



Future Changes to the network

TfL maintains a dataset of proposed and committed strategic transport schemes that will make changes to the network. Figure 6 below shows that one of these schemes is a proposed Cycle Quietway, shown in pink. This route is planned to run between Kentish Town station and Gospel Oak station; a public consultation of this scheme is expected in early 2020. If approved, it is likely that work will commence in 2021.

Figure 6. Proposed future cycle schemes

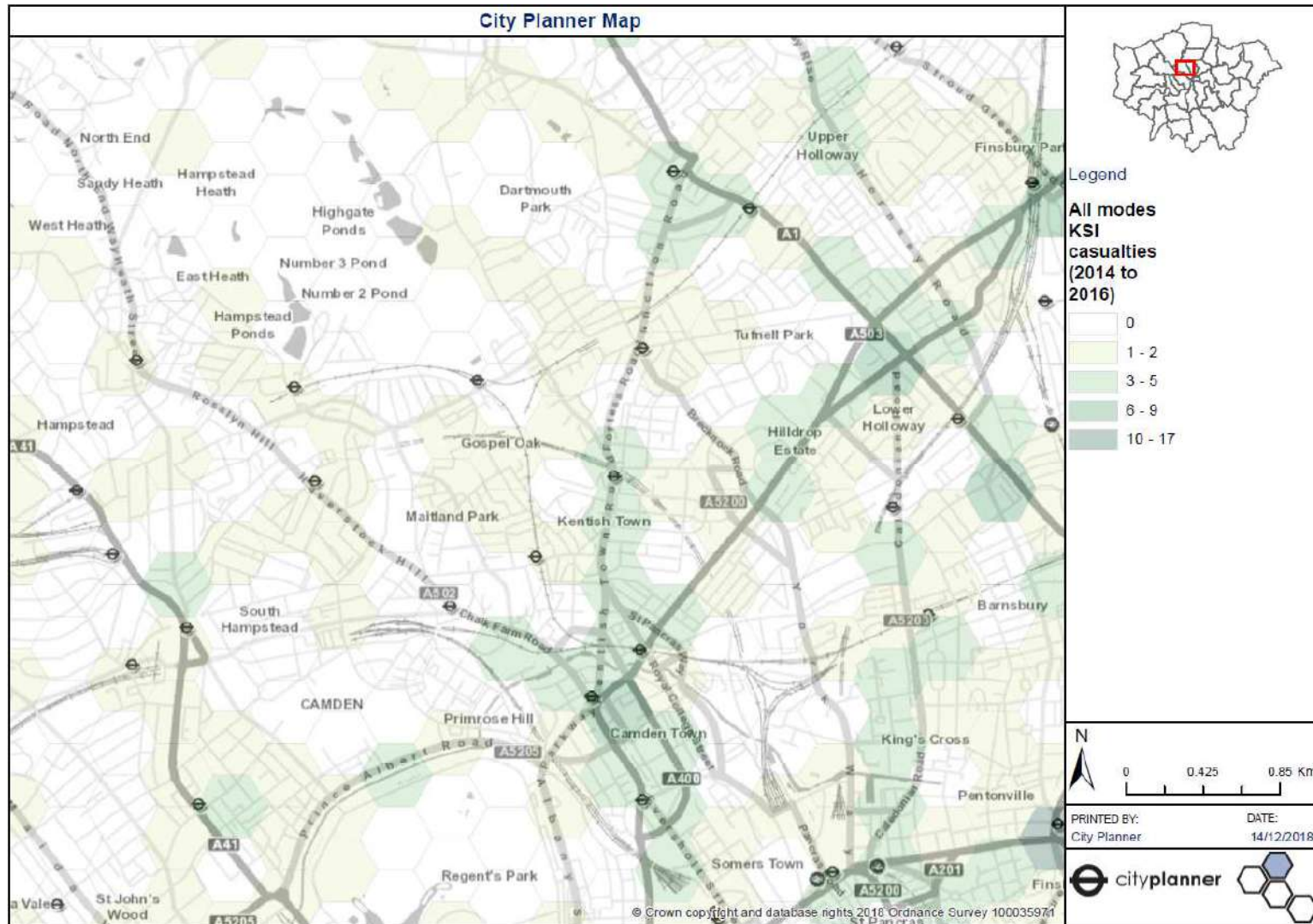


Safety and Vision Zero

When considering walking and cycling connections, it is also important to consider the safety of the area in question. TfL collects all modal casualty data, Figure 7 below shows the total count of killed or seriously injured (KSI) casualties from 2014 to 2016.

From this map, it is clear that Kentish Town Road is a hotspot for casualties. This figure follows a similar pattern to the pedestrian density shown in Figure 2. Given the Mayoral aspiration within Vision Zero, this is a significant safety issue in the proximity of the development.

Figure 7. All modes KSI casualties



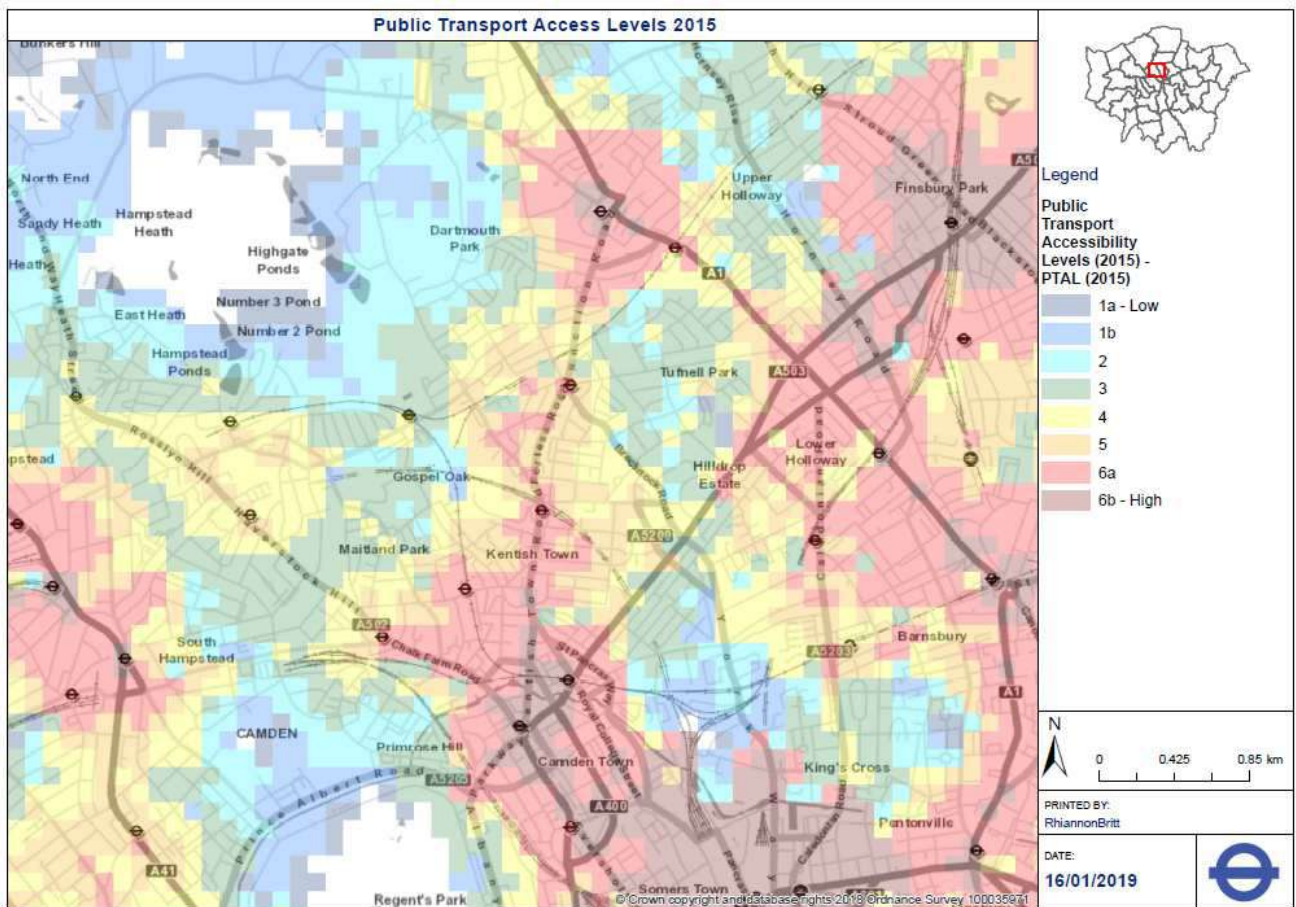
Public Transport

Public Transport Access Levels

Public Transport Access Level (PTAL) is a measure of the connectivity of an area to public transport. The Public Transport Access Index (PTAI) is the calculated index behind categorised PTAL values. Figure 8 below shows the PTAL values for the development and surrounding area.

The development area itself has a high access level to public transport. In particular, the east of the development has a very high PTAL due to its proximity to Kentish Town station. The west of the development has a lower PTAL rating.

Figure 8. Public Transport Access Levels (2015)



Buses

Bus Services

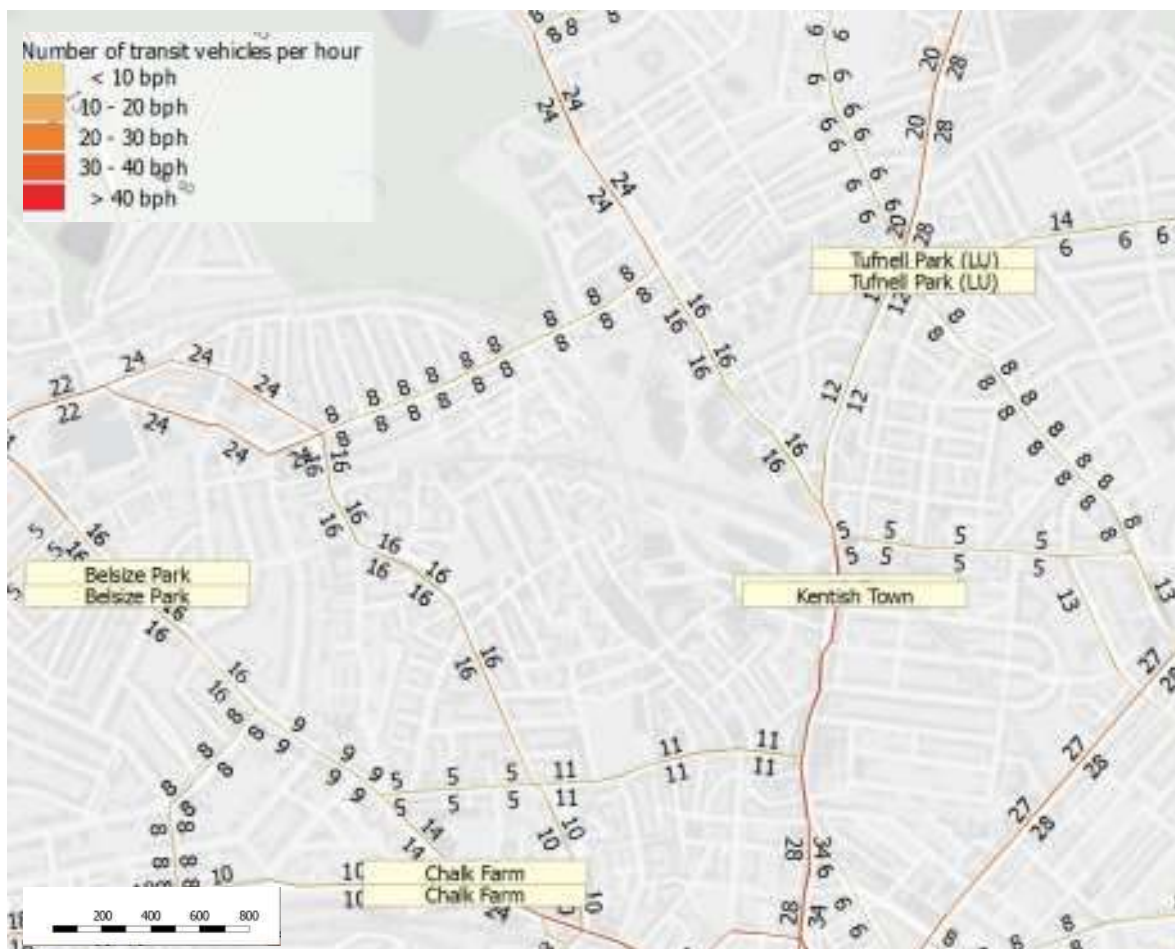
The mode share shown for trips in Table I shows that buses are an important mode for Camden residents. Therefore, it is important to understand the current bus service to the development.

Figure 9 below shows the bus frequency map for the area during the morning peak.

Gordon House Road, Highgate Road and Kentish Town Road border the north east of the development and are well served by the bus network. The south west of the development contains smaller residential roads that are less well served by the bus network.

The development area is served by 8 buses per hour to the north, and 16 buses per hour to the east. Kentish Town Road to the south east of the development is the highest served road in the area with 34 southbound buses per hour.

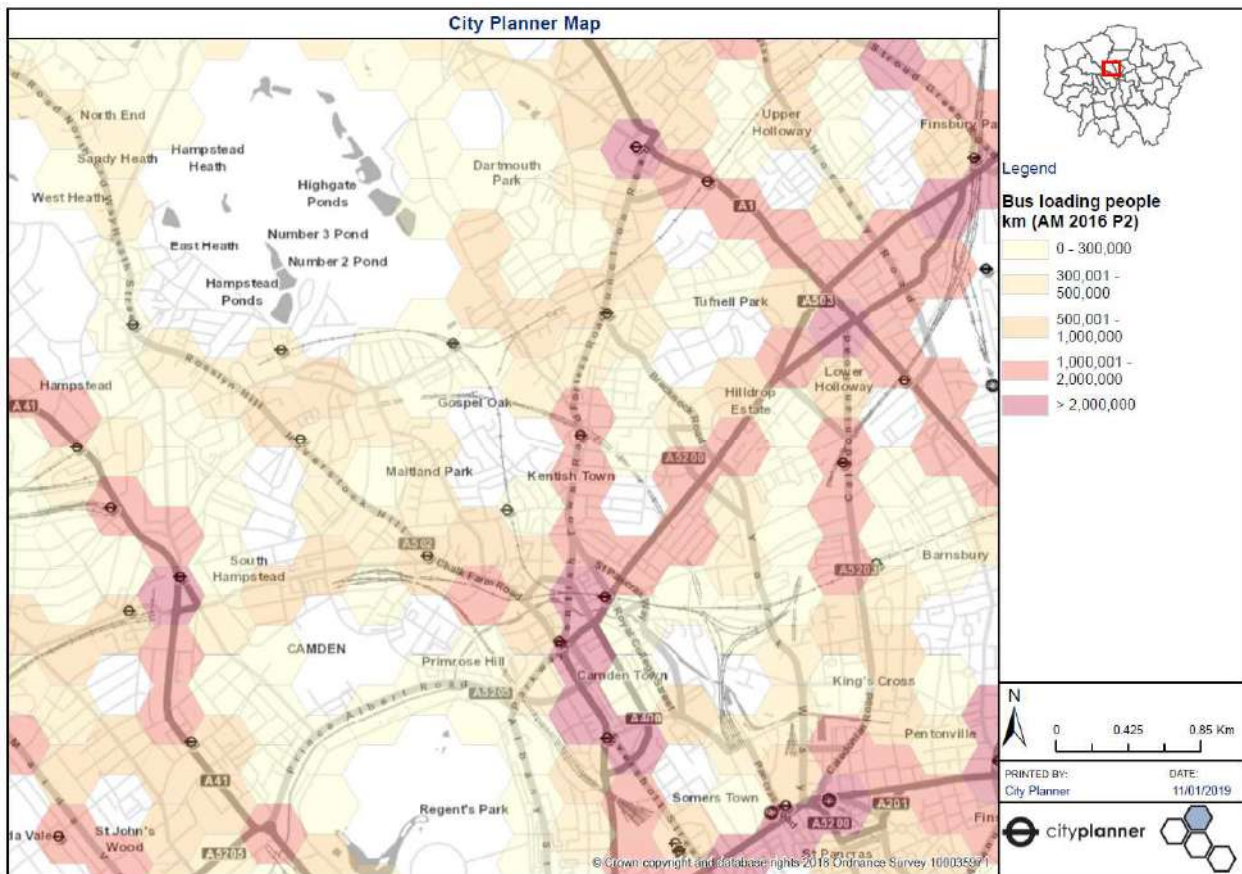
Figure 9. Map showing bus frequencies per hour during the morning peak (07:00 – 10:00).



Bus Demand

Along with the bus frequency, it is important to consider the volume of people using these routes. Bus loadings in the AM peak, shown in figure 10 below, show how many people kilometres are travelled. People kilometres are calculated by summing the bus passenger loading (number of people) multiplied by the route length to calculate total people km on the bus network for the hex cell. The corridor along Kentish Town Road from Kentish Town Station has a high number of boardings, amongst the top 7% in Central and Inner London.

Figure 10. People kilometres by bus AM peak 2016 (07:00 – 10:00).



Underground and Rail

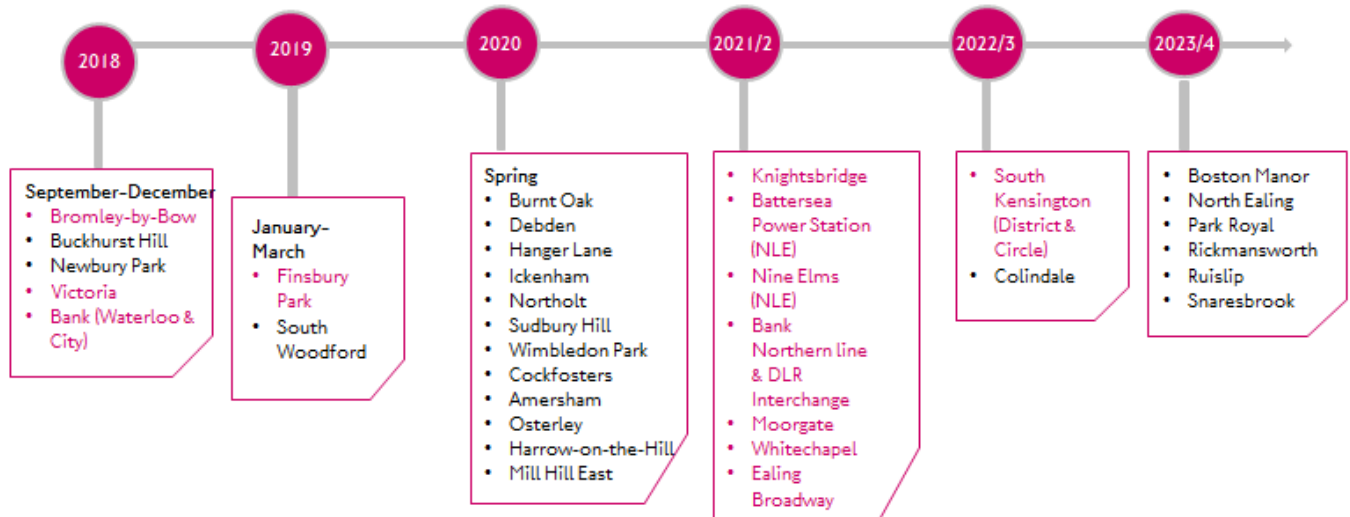
The Planning Framework area includes four stations:

- Gospel Oak – served by the Overground Network
- Tufnell Park – served by the Northern Line
- Kentish Town – served by the Northern Line and Thameslink
- Kentish Town West – served by the Overground Network

Step-free access

A full step-free tube map can be accessed from TfL's website.¹⁰ Of the four stations surrounding the development, Gospel Oak is the only station to have step-free access. Trains from this station are able to be accessed by a manual boarding ramp. The other stations surrounding the development are currently not on the step-free network. Transport for London are working on a programme of improvements to the network as shown in figure 11.

Figure 11. TfL programme of improvements to step-free network. (July 2019)



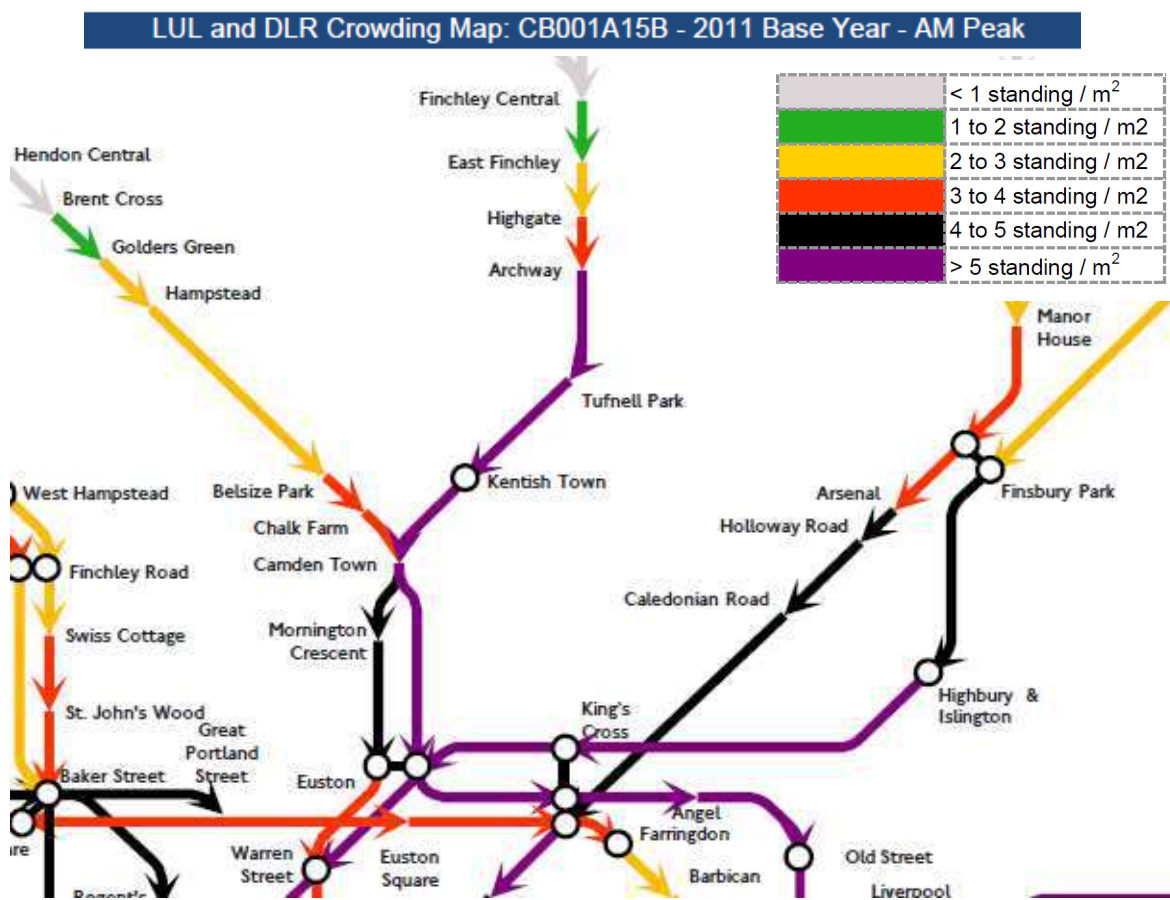
¹⁰ <https://tfl.gov.uk/transport-accessibility/wheelchair-access-and-avoiding-stairs>

Underground

The Northern line Underground Stations; Tufnell Park and Kentish Town serve the development area. As the underground network makes up a large proportion of the mode share for Camden residents, it is vital to understand current crowding on the line, and how a development might impact this. Figure 12 below shows the crowding map for the AM peak.

As shown below, the crowding on trains stopping at Tufnell Park and Kentish Town Stations is at the highest level across the underground, with over five people standing per meter squared. This shows that there is no extra capacity on the Northern Line at these stations.

Figure 12. Underground and DLR Crowding map in the AM peak 2011 (07:00 – 10:00).



National Rail

Kentish Town, Kentish Town West and Gospel Oak Stations are all served by National Rail. The crowding map for rail lines is shown in figure 13 below.

Figure 13. National Rail and Tram Crowding map in the AM peak 2011 (07:00 – 10:00).

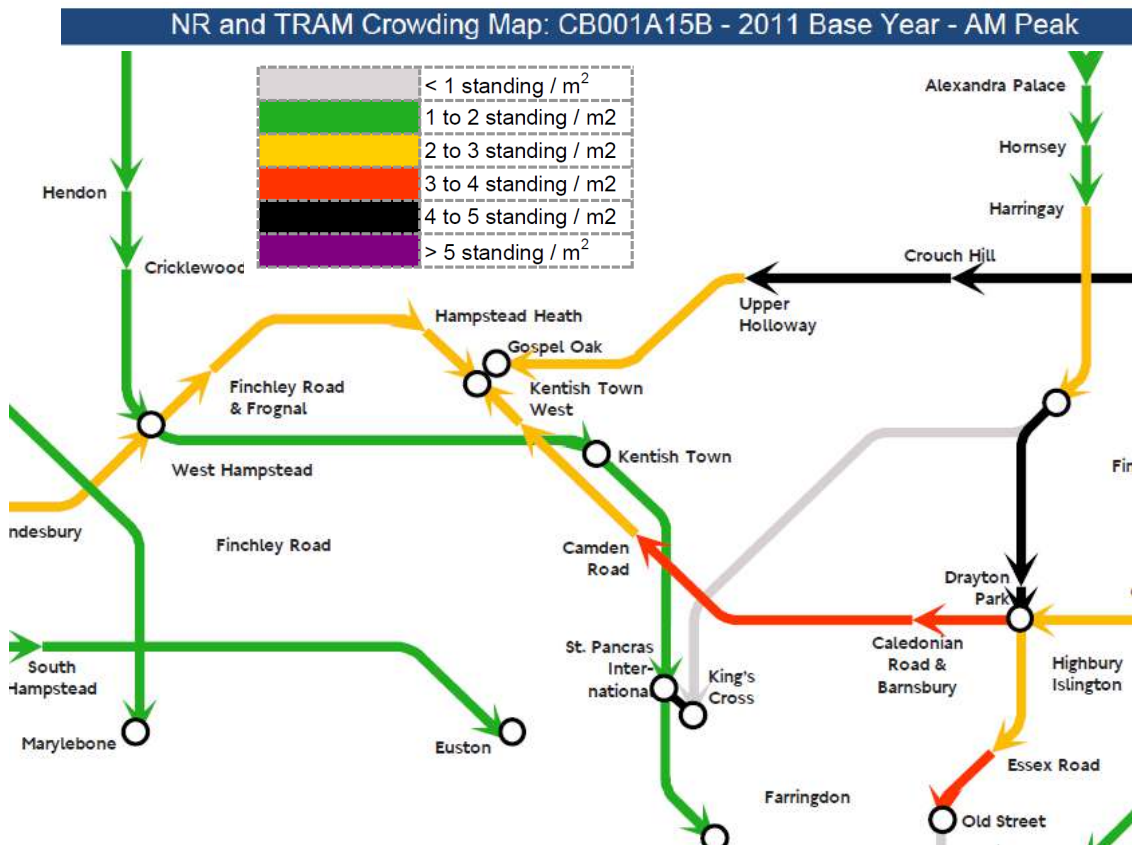


Figure 13 shows that in the morning peak, trains stopping at Gospel Oak and Kentish Town West stations are moderately busy, with some standing capacity available. The Kentish Town Overground Line has slightly more standing capacity, in sharp contrast to the Underground counterpart.

Table 3 shows the origin destination data for trips boarding and alighting at Kentish Town West and Gospel Oak stations. This table shows that the majority of trips from both stations are to destinations on the North London Overground Line. Similarly most trips to both stations are made by trips starting elsewhere on the North London Line.

Table 3. 2013 Weekday AM Peak matrix output, Overground trips. Covers time period from 07:00 to 09:59

Boards	Alights								Totals
	Sub Total - East London Line	Sub Total - West London Line	GospelOak	KentishTownWest	Sub Total - North London Line	Sub Total - Gospel Oak to Barking	Sub Total - Watford DC		
Sub Total - East London Line	49,032	2,422	87	55	3,441	27	14	54,936	
Sub Total - West London Line	2,439	11,916	198	75	3,012	61	1,007	18,434	
GospelOak	83	125	0	103	1,219	135	27	1,589	
KentishTownWest	54	49	107	0	679	33	11	826	
Sub Total - North London Line	9,792	4,430	2,244	1,191	41,662	825	1,009	57,718	
Sub Total - Gospel Oak to Barking	92	138	487	114	1,835	5,422	29	7,517	
Sub Total - Watford DC	35	1,948	97	37	1,521	30	7,131	10,665	
Totals	61,390	20,854	3,114	1,474	51,471	6,365	9,190	149,270	

The same data are not available for rail services at Kentish Town Station, however, entry and exit to and from the station by mode is available in Table 4. The vast majority of trips to and from Tufnell Park and Kentish Town stations are walked, again highlighting the importance of walking to this development.

Table 4. Transfers into and out of Kentish Town and Tufnell Park Stations based on survey data up to 2017

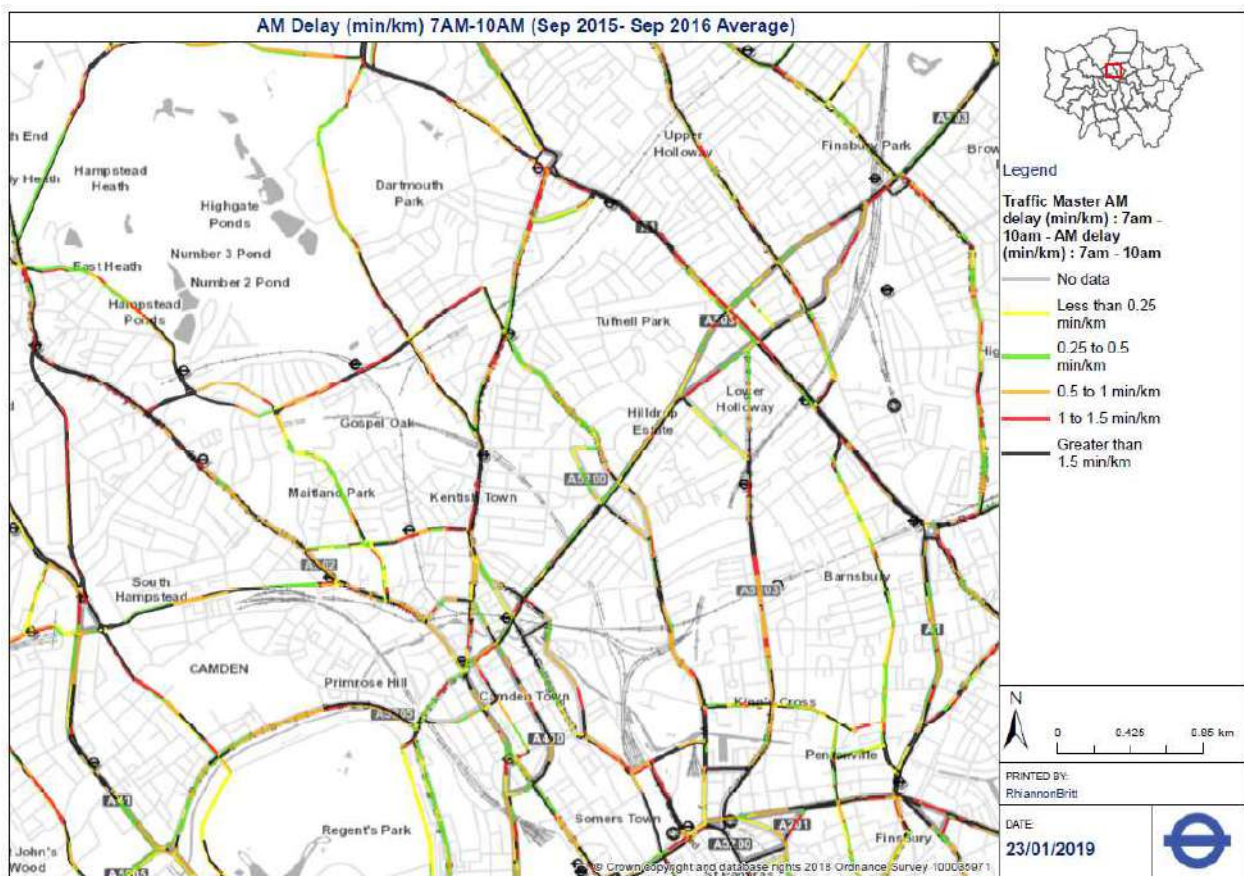
Entry/Exit from	NR/DLR/Tram	Bus/Coach	Bicycle	Motorcycle	Car/Van Parked	Car/Van driven away	Walked	Taxi/Minicab	Not Stated	Total all modes
Kentish Town Entry	822	471	20	0	7	31	2508	0	83	3942
Kentish Town Exit	1231	214	0	0	0	0	2521	0	17	3983
Tufnell Park Entry	0	8	0	0	0	3	211	0	0	222
Tufnell Park Exit	0	3	0	0	0	0	637	0	0	640

Highway

Average Vehicle delay

The delay on the Integrated Road Network (ITN) surrounding the development is shown below in figure 14. The ITN is a detailed geographic link and node representation of the road network in Great Britain maintained by the Ordnance Survey. This delay measurement is based on the peak time speed compared to the night time speed, measured in minutes per kilometre.

Figure 14. AM Peak Delay on the ITN Network 2015-2016 (07:00 – 10:00).



There is a high delay on Gordon House Road, Highgate Road, Kentish Town Road and Prince of Wales Road, this delay is amongst the highest in London.

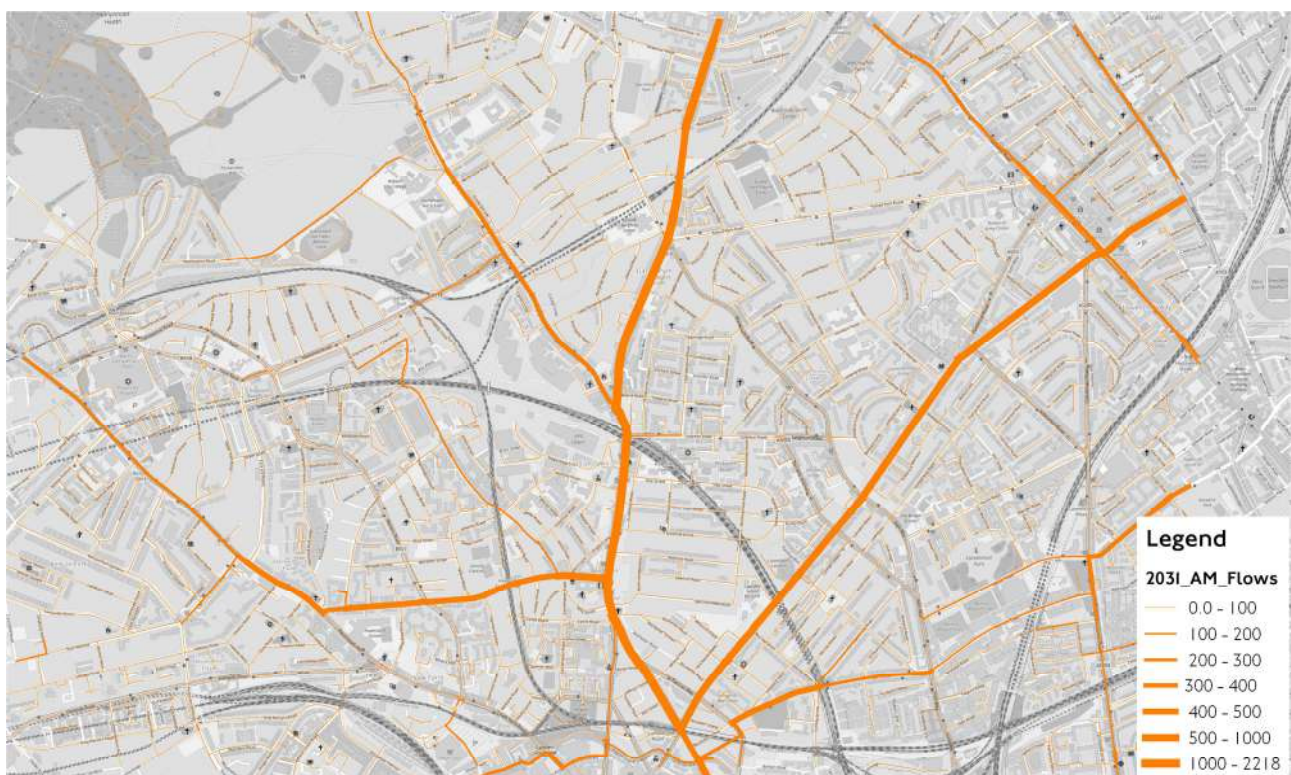
Future Years

Any development must look ahead to future years to understand how the transport pattern may change. TfL's suite of forecasting models provides strategic insight into these key changes in transport. The London Transport Studies (LTS) model is Transport for London's strategic transport demand framework. This model is used to forecast demand patterns across the capital in response to changing socio-economic conditions as well as supply side assumptions. The model has been employed here to produce transport demand estimates for a 2031 future year based on London Plan levels of population and employment growth as well as funded commitments for the transport network. Details of the assumptions that are included in these forecasts are outlined in Appendices III, IV and V.

Cycling forecast

TfL's Cynemon model is a strategic cycling model which estimates the number of cyclists, their routes and journey times across London. Figure 16 shows the predicted change in cyclist flow from 2014 to 2031. As indicated by the blue lines, cycle flows are predicted to increase almost without exception around the development. In particular, Kentish Town Road and Fortress Road have the highest increase in cycle trips over the time period.

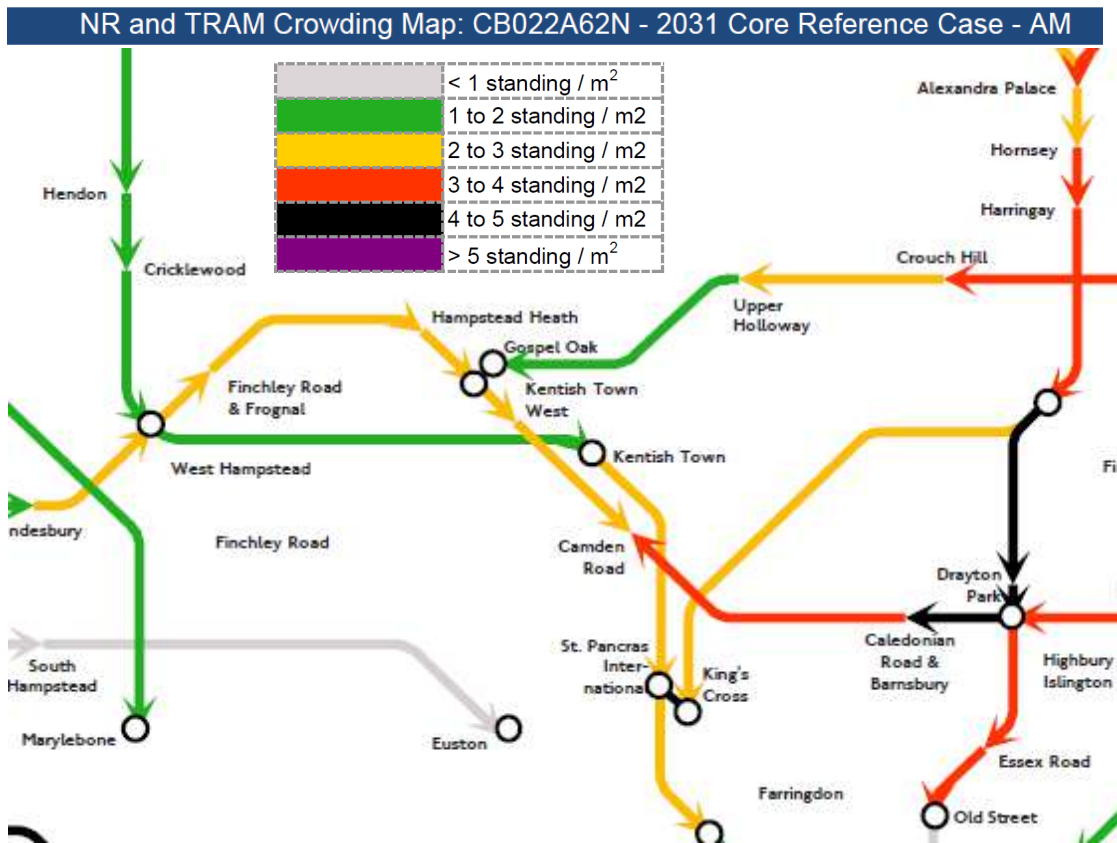
Figure 16. Cycle flows 2031



Cynemon Cycling Flow - 2031 - AM peak

The National Rail crowding map shown in figure 18 forecasts that there will be a slight decrease in crowding on trains moving in to Gospel Oak station, freeing up one to two standing spaces per metre squared. This is most likely due to the line upgrades described in the following section. Crowding on trains passing through Kentish Town West remain moderately crowded in line with 2011 levels. There is an increase in crowding from Kentish Town into Central London.

Figure 18. Forecast National Rail and Tram Crowding map in the AM Peak 2031



Future changes to the network

Rail Services

A number of upgrades to the Northern Line and London Overground services are scheduled to be in place by 2031. These are taken into account in the above forecasts and shown in Table 5.

Table 5. Upgrades to Northern and Overground lines expected between 2011 and 2031

Line	Description	Status
Northern	PPP Upgrade Phase 1 (Signalling upgrades)	Complete
Northern	PPP Upgrade Phase 2 (revised service patterns)	Not complete
London Overground	Gospel Oak – Barking Electrification and Longer Trains (4 car)	Partially complete
London Overground	Overground – extent all Class 378's to 5 car	Complete
London Overground	Overground SLC3 – East London Line Phase 2b to Clapham Junction	Complete

The Northern Line service changes include signalling upgrades and revised service patterns, however these will not have an impact on the capacity of the Northern Line. Therefore, as mentioned previously, shifts to other modes, particularly active travel, will be essential.

The Overground (North London Line) upgrades however, will increase the frequency to 10 trains per hour through Gospel Oak and Kentish Town West stations. This will be an increase of two trains per hour on current levels. This will have an impact on capacity, allowing for an additional 4,200 passengers.

Stations

Kentish Town, Gospel Oak and Kentish Town West Overground stations appear to have no significant capacity issues, and there has been no congestion relief schemes developed in the recent past. There are no current plans to upgrade infrastructure or capacity of these stations.

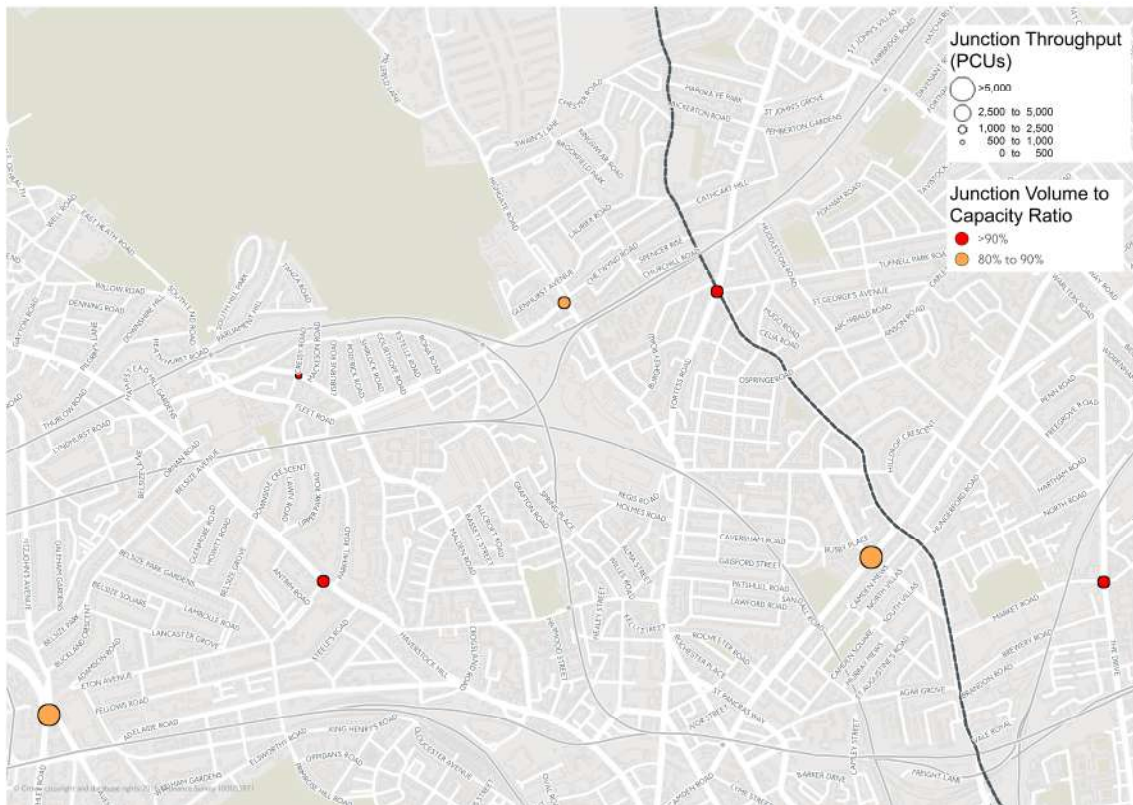
It is worth noting that Network Rail's Anglia Route Study¹¹ stated the following:
Kentish Town West – "Very narrow steps, new steps could be provided relatively easily."
Gospel Oak – "Interchange between Overground services is the key issue. New steps have recently been provided to give extra capacity."

¹¹ <https://cdn.networkrail.co.uk/wp-content/uploads/2016/11/Anglia-Route-Study-UPDATED-1.pdf>

Highways forecast:

A Junction volume to capacity ratio plot can also be forecast for year 2031, shown here in Figure 19. This shows a slight increase in congestion in junctions around the area, with the Gordon House Road and Highgate Road junction remaining congested.

Figure 19. Forecast Junction Volume to Capacity ratio AM Peak 2031



Conclusion

Report Summary			
MTS Outcomes Indicators	Area Priority	Current context	Conclusion
Active	High	Pedestrian density in the surrounding area is high to the east but lower to the west. Walking Potential is high where current pedestrian density is low. Current cycling levels are relatively low, but are forecast to increase	Walking and cycling should be encouraged through provision of infrastructure
Safe	High	There is a small hotspot of KSI incidents around Kentish Town station	Actively design to avoid incidents
Green	Very High	There very high levels of air pollution surrounding the development, some of the highest levels in London	Development should reduce current levels
Efficient	Medium	There is high congestion in the area, it is not clear how much this is due to freight levels, and how much this is due to private car ownership	Discourage the use of cars and promote active modes. Take into account where freight routes may pass close to the development
Connected	Very Low	Area is very well connected due to the bus, tube and rail links. However the Northern line is at full capacity, therefore more demand will increase waiting times at stations	Development should seek to encourage the use of other modes, particularly active modes, in line with the MTS
Inclusive	Very High	There is a lack of step free access in this area	Development should have step free access
Quality	High	Bus frequency to the area means that bus loading is often high	Where possible encourage shift to active travel
Sustainable	Very Low	The development area has high PTAL levels, particularly to the East of the development. There is not a high dependency on cars from Camden residents	Discourage the use of cars and promote active modes
Unlocking Development	Medium	Projected population and employment growth is relatively low compared to the rest of London, but a high priority for the Council	Pedestrian and cycle enhancement is key to unlocking the development given the public transport constraints

Appendices

Appendix I: Data descriptions of the MTS indicators

Mayoral Transport Strategy (MTS) outcome indicators are created by combining scored datasets determined to be representative of each outcome. The indicators can be used to explore the outcome spatially and compare areas. The indicators are a representation only. A higher score represents a higher relative priority location. Indicators are calculated by averaging the scores of the contributing datasets for each hex cell. Scores are assigned (from 0 to 5) from GLA wide percentile ranks. When multiple hex cells are combined the scores of the contributing datasets are averaged for the selection. Table Ia below shows how each of the indicators is calculated.

Table Ia. MTS Indicator description

MTS Indicator	Data description
MTS Active Outcome	The Active outcome indicator is the combination of scored Modelled cycle flow (AM 2014), Cycling potential (LTDS switchable trips 2010-15), Pedestrian density (2005-16), Walking potential (LTDS switchable trips 2010-15), Residents completing 2 x 10 min active travel trips (average day 2005/06 to 2015/16).
MTS Safe Outcome	The Safe outcome indicator is the combination of scored All modes total casualties (2014 to 2016) and Street Crime Rate (2014-15).
MTS Green Outcome	The Green outcome indicator is the combination of scored N02 levels ($\mu\text{g}/\text{m}^3$, 2020) and PM10 levels ($\mu\text{g}/\text{m}^3$, 2020).
MTS Efficient Outcome	The Efficient outcome indicator is the combination of scored Modelled freight flow (AM 2012), Car/van accessibility per household (ONS Census 2011) and Modelled car/taxi flow (AM 2012).
MTS Connected PT Outcome	The Connected PT outcome indicator is the combination of scored Average PTAI 2015, Jobs accessible in a 45 min journey 2011 (Jobs 2011 PT 2011), Population accessible in a 45 min journey 2011 (Popn. 2011 PT 2011) and Households accessible in a 45 min journey 2011 (HH2011, PT 2011).
MTS Inclusive PT Outcome	The Inclusive PT outcome indicator is the combination of scored Average travel time 2015 step free vs. not step free % diff, Jobs accessible 2015 step free vs. not step free % diff and Population accessible 2015 step free vs. not step free % diff.
MTS Quality PT Outcome	The Quality PT outcome indicator is the combination of scored Bus oyster boardings (15/16), Bus scheduled km (AM 11/11/2016) and Bus speed change % (AM 14/15-16/17).
MTS Sustainable Travel Outcome	The Sustainable Travel outcome indicator is the combination of scored Car/van accessibility per household (ONS Census 2011), Modelled car/taxi flow (AM 2012) and Average PTAI 2015.
MTS Unlocking Development Outcome	The Unlocking Development outcome indicator is the combination of scored Population change 2011 to 2041 (LTS v7.1) and Employment change 2011 to 2041 (LTS v7.1).

Appendix II: Data Dictionary

Table IIa below shows

Pedestrian Density	The LTDS collects travel pattern data from ~17,000 persons a year including details of all trips undertaken the day before the interview. Pedestrian stages from survey years 2005 to 2016 have been included in this dataset. The data is aggregated by summing stage lengths per cell, is weighted to represent all Londoners, and uplifted for route wiggle and non-residents. When multiple hex cells are combined the data is averaged. The data is sorted descending with highest rank (1) and highest percentile (1) assigned to the cell with the greatest pedestrian density.
Walking Potential	Walking potential is derived from the London Travel Demand Survey (LTDS). The data represents trips made by London residents which could reasonably be walked all the way but are not walked at present. The LTDS collects travel pattern data from ~17,000 persons a year including details of all trips undertaken the day before the interview. Pedestrian stages from survey years 2010 to 2015 have been included in this dataset. The data is aggregated by plotting walking trips along the road network (ITN) and summing the length of these trips per cell. The trips have been weighted to represent all of London. When multiple hex cells are combined the data is summed. The data is sorted descending with the highest rank (1) and highest percentile (1) assigned to the cell with the greatest walking potential.
Cycling potential	The LTDS collects travel pattern data from ~17,000 persons a year including details of all trips undertaken the day before the interview. Cycle stages from survey years 2010 to 2015 have been included in this dataset. The trips have been weighted to represent all of London. The Cynemon assigned link data is aggregated by summing the total distance cycled per cell (cyclists x distance). When multiple hex cells are combined the data is summed. The data is sorted descending with the highest rank (1) and highest percentile (1) assigned to the cell with the greatest cycling potential
KSI Casualties	The data is collected for the whole of London. Further information about casualty data can be found at: https://tfl.gov.uk/corporate/safety-and-security/road-safety/london-collision . Data has been aggregated by summing the number of casualties per hex cell. When multiple hex cells are combined the data is summed. The data is sorted descending with the highest rank (1) and highest percentile (1) assigned to the cell with the greatest casualty count. The dataset has 15,041 cells (whole of GLA).
PTAL	The Public Transport Access Index (PTAI) is the calculated index behind categorised PTAL values. For any selected place, PTAI suggests how well the place is connected to public transport services. A location will have a higher PTAI if; It is at a short walking distance to the nearest stations or stops, waiting times at the nearest stations or stops are short, more services pass at the nearest stations or stops, there are major rail stations nearby, or any combination of these. For this dataset overall PTAI is aggregated by averaging (area weighted) PTAI values within each hex cell. When multiple cells are combined the data is averaged. The data is sorted ascending with the highest rank (1) and highest percentile (1) assigned to the cell with the lowest PTAI.
Average vehicle delay	Network of Interest ITN links for London showing average speed, delay and journey time stats for the AM, Inter and PM Peak periods. The data is based on weekday TrafficMaster GPS journey time data for the 2015-16 annualised data. The delay measurement is the peak speed compared to the night time speed (10pm to 6am free flow) measured in minutes per km. Where a link has no night time observations the speed limit has been used as a measure of free flow.

Appendix III: Cynemon forecasting assumptions

TfL's Cynemon model is a strategic cycling model which estimates the number of cyclists, their routes and journey times across London. Its development was based on TfL count and travel diary data sources combined with mobile phone app data and bespoke research.

Cynemon is a strategic model, and therefore has been developed to represent strategic movements of cyclists and journey times at a total route level. The model should not be expected to validate well in every area at a very local level and whenever Cynemon is used for a new project, the model should be reviewed and refined to ensure it is fit for the purposes required. The reasonable level of expectation from Cynemon is that it is able to estimate the likely route choices of cyclists, and journey time from an origin to a destination. Due to the uncertainty associated with model outputs, it is advisable that ranges are reported rather than point values based on an understanding of the confidence associated with the various input assumptions.

The development of the base year cycling demand made use of various observed data, such as London Travel Demand Survey (LTDS), 2011 census journey to work, cycle hire data, and other origin-destination datasets. In order to forecast the growth in cycling demand, there are three main contributing aspects:

- Background growth due to increases in population and employment
- Policy impacts:
 - Route-based schemes, eg Cycle Superhighways, cycle lanes, Quietways
 - Trip-end-based (or an area-based) schemes, eg cycle parking
- Growth due to other factors:
 - The 'push' factors from increased cost and/or journey time in other modes
 - Unexplained factor, such as general trend, that are not directly observed

The estimation of new trips due to policy impacts made use of the information from the Analysis of Cycling Potential . The analysis looked at trips that are currently made by other modes (eg cars, public transport) but have the potential to be cycled in the future, termed as 'Potentially Cyclable Trips' (PCT).

The cycling growth due to the 'push' from the increased cost/journey time in public transport and car use was estimated using the cycling demand elasticities derived from the initial development of the New Demand Model (NDM).

The growth as a result of some factors that currently cannot easily be explained by detailed observed data was estimated using the 'backcasting' methodology. This method used the known data and cycling growth between 2004 and 2014 and estimated cycling growth due to 'unexplained' factors.

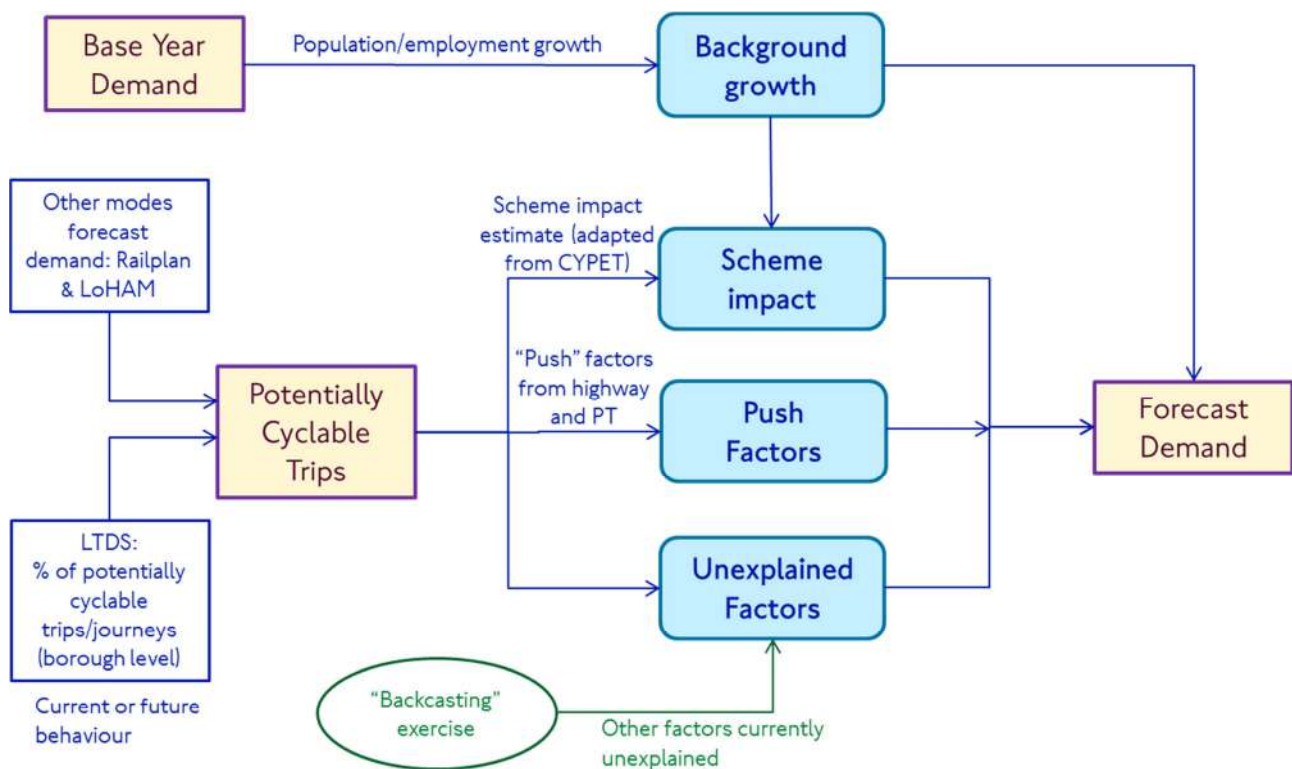


Figure A Cynemon Forecast Demand Development Process

The following steps concisely explain the development of the forecast demand:

- The base year demand (2014) was factored up to the forecast year (eg 2021) using increases in population (by age) and employment
- The demand for Potentially Cyclable Trips (PCT) were developed using public transport and cars forecast demand from Railplan and London Highway Assignment Model (LoHAM) respectively, as well as the PCT information derived from London Travel Demand Survey (LTDS) data. These trips become the 'pool' of potential trips that can be cycled
- Scheme impacts from cycling infrastructure were estimated using a methodology adapted from CYPET. New trips generated by the schemes were extracted from the PCT demand
- Estimation of new cycling trips due to 'push' factors from increases in public transport and highway cost and journey time. These new trips were also extracted from the PCT demand
- The backcasting exercise was carried out to determine the likely cycling growth due to unexplainable factors
- The growth due to unexplained factors was applied and added to the overall cycling growth

Appendix IV: LoHAM Network

TfL's suite of forecasting models includes a highway model; LoHAM. This model is able to predict future traffic flow in London. Figure A below shows the road network that is included in this modelling.

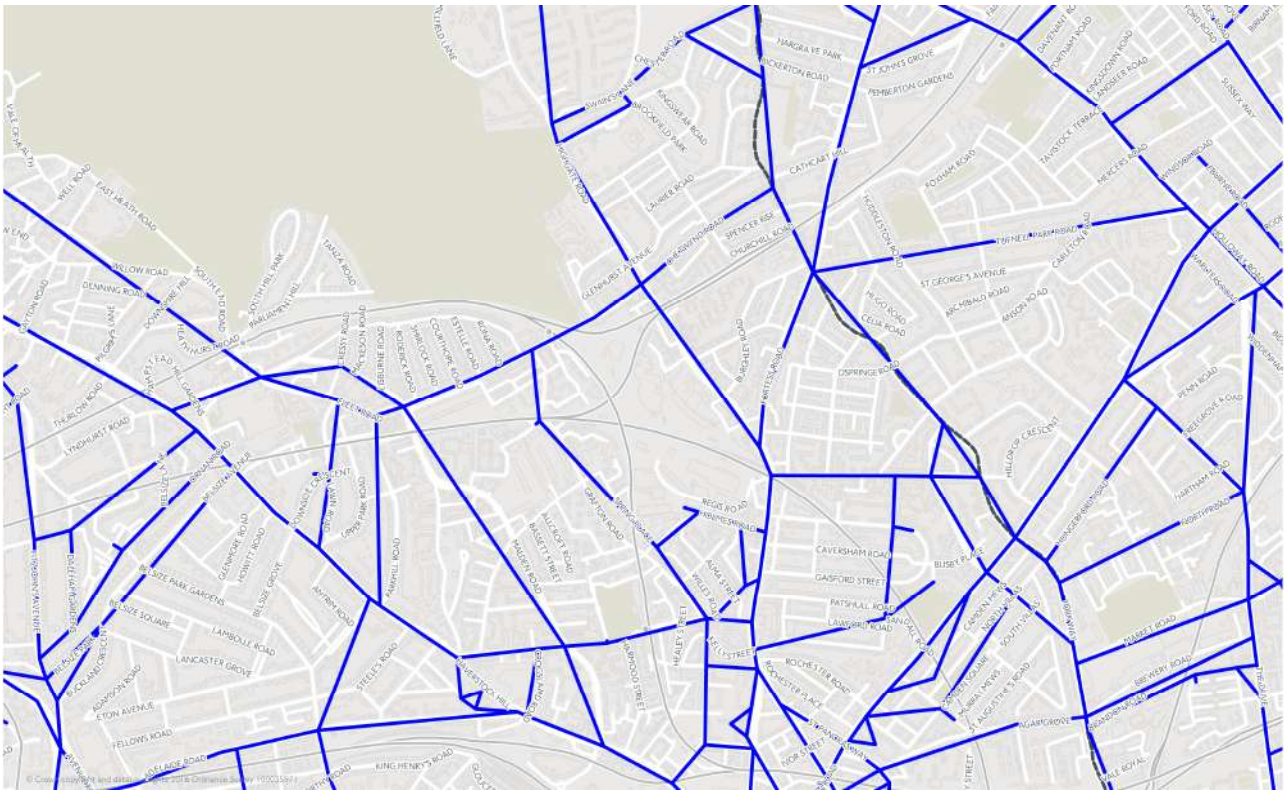


Figure B Road network included in LoHAM modelling

Appendix V: Forecasting assumptions for Strategic Model Suite

Forecasting Assumptions

The following summarises the forecasting assumptions for the LTS model, which underpins public transport and highway modelling.

Network and economic forecasting assumptions

The London Plan core reference case includes funded public transport and highway schemes consistent with the 2017 TfL Business Plan¹². A summary of key schemes is provided below:

- Current view of funded National Rail schemes, HLOS programme, Thameslink programme, HS2, West Anglia and Great Western improvements.
- The opening of the Elizabeth Line in 2019, the Northern Line Extension, and Tube upgrades to the Victoria Line and Four-Line Modernisation programme.
- DLR, Trams, London Overground and bus service improvements.
- TfL's Healthy Streets portfolio including cycling infrastructure schemes and the introduction by 2019 of the Central London Ultra Low Emission Zone (ULEZ).

Wider assumptions have been made about policies relating to aspects such as fares, fuel costs and car parking, and they key economic assumptions are detailed in Table B1.

Table B1 Key forecasting assumptions

Assumption	Comments	Source
Parking supply and charges	Work place parking supply is expected to decrease from 2015 to 2041 and parking charges are expected to increase significantly reflecting recent trends and expected continued pressure on parking	TfL
Car ownership	Car ownership is expected to decrease in line with increasing population densities to an average of 0.29 cars per person in 2041	TfL
Economic assumptions	Highway and public transport economic assumptions are taken from WebTAG December 2015 guidance	DfT
Public Transport fares	The Mayor's Fares Freeze applies to TfL fares, with other fares assumed to increase with inflation until 2020. An inflation-linked increase is assumed from 2021.	TfL

¹² <http://content.tfl.gov.uk/tfl-business-plan-december-2017-.pdf>

Planning data forecasting assumptions

The core reference case included the latest GLA projections¹³ with a spatial distribution that reflects the 2017 Strategic Housing Land Availability Assessment (SHLAA)¹⁴ and a 2017 long term labour market projection¹⁵. These GLA projections form the basis of the draft London Plan, and the core reference case has been updated to include these projections of population and employment forming the London Plan core reference case.

Table B2 provides detail on the new GLA population and employment projections and comparison to the previous projections included in the core reference case for the draft MTS Outcomes Summary report.

Employment projections are provided for the Central Activities Zone (CAZ) and the North Isle of Dogs (NIOD), the remainder of inner London, and outer London. Population projections are provided for inner and outer London.

Table B2
Population and
employment
distribution and
forecast growth

	Previous GLA projection			London Plan GLA projection		
	Population (millions)					
	2015	2041	2015-2041 (% growth)	2015	2041	2015-2041 (% growth)
Inner	3.4	4.3	24%	3.5	4.4	25%
Outer	5.2	6.2	20%	5.2	6.4	23%
Total	8.6	10.5	22%	8.7	10.8	24%
	Employment (millions)					
	2015	2041	2015-2041 (% growth)	2015	2041	2015-2041 (% growth)
CAZ and NIOD	2	2.5	24%	2.1	2.7	28%
Inner (rest of)	1.3	1.7	27%	1.4	1.8	29%
Outer	2.1	2.5	16%	2.1	2.5	16%
Total	5.5	6.7	22%	5.6	6.9	24%

¹³ <https://data.london.gov.uk/dataset/projections>

¹⁴ <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/evidence-base>

¹⁵ <https://data.london.gov.uk/dataset/long-term-labour-market-projections>

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