Transport for London

TC.009.3005081 Tulse Hill Gyratory

Healthy Streets £1m-£5m scheme

Business Case Narrative

		Signature	Date
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Approved by	I confirm that this deliverable meets the requirements of the relevant Pathway Product Description and that all consultation comments have been addressed to the satisfaction of consultees. <Name> Sponsor		
Distributed to	<Name>	Project/Programme/Delivery Portfolio Board	

Document History / Business Case Version Information

Pathway Stage	Five Case Version	Date	Link to file
1	Strategic Outline Case (Pathway 1)	13.04.2015	M:\03 - Network Sponsorship\03.03 Central 2\02. Lambeth\Healthy Streets £1-5m schemes\TC.009.3005081 - A205 Tulse Hill Gyratory\Seed Funding\130415_TulseHillGyratory_SeedFundingApp_Signed.pdf
2	Outline Business Case (Pathway 2)	01.04.2019	M:\03 - Network Sponsorship\03.03 Central 2\02. Lambeth\Healthy Streets £1-5m schemes\TC.009.3005081 - A205 Tulse Hill Gyratory\Business Case\f5802 Tulse Hill Business Case narrative v00a.doc
3		dd.mm.yyyy	Insert Hyperlink
4	Full Business Case (Pathway 4)	dd.mm.yyyy	Insert Hyperlink
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6		dd.mm.yyyy	Insert Hyperlink
Outturn		dd.mm.yyyy	Insert Hyperlink

Glossary of Terms

Abbreviation	Term
BODS	Bus Origin Destination Survey
Capex	Capital Expenditure
KSIs	Killed and Seriously Injured (collisions)
LoHAC	London Highway's Alliance Contract
MTS	Mayor's Transport Strategy
Opex	Operational Expenditure
TDE	Traffic Design Engineering
ULEZ	Ultra Low Emission Zone

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1 Executive Summary

Tulse Hill Gyratory is a traffic dominated environment at the junction of the strategic A205 South Circular Road (Thurlow Park Road/Christchurch Road) with A215 Norwood Road and A214 Tulse Hill in the London Borough of Lambeth (LB Lambeth). The existing gyratory has a negative impact on the environment, housing, and local economy. It is within close proximity to the rail station for Thameslink and Southern services at Tulse Hill and pedestrian movement to and from the station. A high volume of fast moving traffic and wide roads results in severance of the community for making short walking and cycling trips. Concerns over safety were reflected in a 200 signature petition calling for improvements co-ordinated by Cllr Ann Kingsbury and presented to the London Assembly by Val Shawcross AM in October 2013.

Tulse Hill Gyratory is to the north of the Norwood Road rail bridge. To the south of here, a LIP Major Schemes bid for Norwood Road was successful in 2015 to improve the urban realm to encourage greater walking and cycling trips; this scheme has been substantially completed aside for some carriageway resurfacing delayed by Thames Water mains enhancements.

The proposal is to review the existing gyratory and develop Healthy Streets improvements, particularly for walking and cycling and continue the improvement in connectivity adding to what has already been achieved by the Norwood Road scheme. It is currently at the feasibility stage of the project lifecycle. LB Lambeth and the local community are keen to understand alternative layouts to a gyratory that will assist further local regeneration and placemaking. The project is referred to in the LB Lambeth final LIP3 submission dated February 2019 to the Mayor.

Since 2015 TfL and LB Lambeth have worked with the local community, following on from the Norwood Road LIP Major Scheme, to pioneer a different approach to consultation and engagement through early working with the local community, as opposed to the more traditional method of developing a design first and then consulting which can often lead to delays at the consultation stage from competing road user interests that increase overall time and cost. The results of this will be of interest to other projects. The key feature is the re-routing of the westbound South Circular Road via Tulse Hill and Hardel Rise to allow placemaking improvements in Norwood Road where a bus interchange will be maintained with the rail station, facilities improved for cyclists, and wider footways for pedestrians and greater ambiance from the reduction of traffic and associated noise, air quality, and severance.

The initial amount budgeted for the scheme was [redacted]. Seed funding of [redacted] was approved in April 2015 as part of the Transforming Streets and Places programme (which is now the Healthy Streets £1m-£5m programme) to develop a feasible design. A DRAFT cost estimate in March 2019 has indicated an EFC of [redacted] (likely case).

In June 2016 following a series of workshops attended by TfL, the local community published a Vision statement with the goal being to remove the gyratory.

Since the project commenced delays have been encountered with the original schedule due to funding availability in TfL's business plan and available modelling resource. In December 2017 a fatal collision involving a pedestrian at the gyratory occurred resulting in an interim scheme to reposition a controlled crossing. In December 2018, further revisions to TfL's business plan resulted in funding being available to complete the feasibility design but not the build funding in the current Business Plan covering 2019/20 to 2023/24.

Traffic modelling remains outstanding in order to finalise the business case, and see if healthy streets benefits particularly for walking and cycling can outweigh dis-benefits to general traffic, but there is a commitment to complete the feasibility up to Stage Gate 2.

The business case suggests there are a number of strategic benefits that can be realised through proposal contributing to the Mayor's Healthy Streets and Vision Zero objectives, subject to both modelling to inform whether the revised traffic arrangement is operationally viable (and complete calculation of an overall benefit to Cost ratio) and the availability of funding.

2 Strategic Case

2.1 Description

The project entails early and continued community engagement to develop a preferred viable option for the design and build of a Transformative scheme at Tulse Hill Gyratory, This will improve walking and cycling facilities, reduce the perception of road danger through reducing speeds and conflict, maintain bus interchange, enable regeneration, and create two-way traffic for the South Circular Road through removal of the gyratory.

The preferred option is to re-route the South Circular Road via Tulse Hill and Hardel Rise to link Thurlow Park Road in the east to Christchurch Road in the west. The section of Norwood Road between Tulse Hill and Christchurch Road which has ground floor retail land use would be improved for pedestrians and cyclists and maintained for buses. Traffic to and from A215 Norwood Road would be redirected via Christchurch Road to join the South Circular at a modified junction with Hardel Rise. Junctions at either end of Hardel Rise would be converted to signal control with 'green person' pedestrian facilities replacing zebra crossings. The entire gyratory would be subject to a (reduced) 20mph speed limit.

There has been relatively little investment in local transport infrastructure aside from a contra-flow bus lane to assist Route 68 as part of the London Bus Initiative (2000-2005), and minor works to reduce road danger following separate incidents at Christchurch Road/Hardel Rise (chevron signs) and realignment of a controlled crossing at Norwood Road/Christchurch Road.

2.2 Strategic Context

TfL aim to create Healthier Streets where people are encourage to walk, cycle and use public transport – frequently accessed by walking, and where people feel safe and secure. In the last 20 years or so there have been several traffic dominated gyratories which have been investigated for removal to make better environments for walking and cycling, improve bus reliability, and provide regeneration opportunities including better places to live, do business in, and spend time. These include completed schemes at Trafalgar Square, Tottenham Hale, Elephant & Castle, Baker Street/Gloucester Place, Shoreditch High Street, Piccadilly, Stratford High Street, Aldgate, Archway and schemes now in construction at Tottenham Court Road/Gower Street and Highbury Corner.

In 2018 the Mayor published a Vision Zero Action Plan to rid London's Roads of serious injury and death by 2041, through 4 main pillars; safe speeds, safe streets, safe behaviours and safe vehicles. A 20mph speed limit is proposed for Tulse Hill Gyratory by 2024 under this scheme (Figure 10, item 35, in the Vision Zero Action Plan).

2.3 Objectives and Benefits Criteria

Key objectives for this project are;

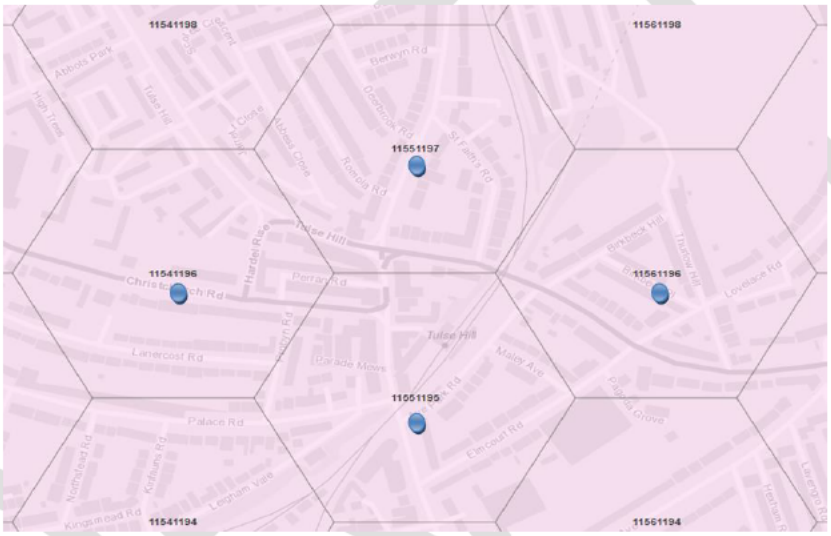
- To review, and through successful local community engagement remove, the Tulse Hill Gyratory by re-introducing two-way working for the South Circular Road via Tulse Hill and Hardel Rise
- Improve the pedestrian and cycling experience of Norwood Road between Tulse Hill and Christchurch Road and strengthen community links for local residents and visitors in conjunction with an LB Lambeth 'Healthy Routes' corridor
- To assist regeneration and economic sustainability for local businesses by improving the urban realm and reducing the island feel of the gyratory
- To maintain and improve local bus interchange with National Rail services for passengers, and reduce disorientation for bus passengers
- To reduce road danger and perception that the gyratory is unsafe particularly for vulnerable road users, including an adoption of a 20mph speed limit

These were arrived at though the initial requests by the Assembly Member for Lambeth and Southwark to improve safety at the gyratory following a 200 signature petition in

2013 presented to the London Assembly, and a series of discussions facilitated by LB Lambeth with the local community resulting in two focussed workshops in February 2016 and the publication of a Vision in July 2016.

Strategic Appraisal Framework (SAF)

In May 2017, TfL City Planning reported a Strategic Appraisal Framework for the area represented by Tulse Hill Gyratory according to underlying Hex cell data. This is shown in alignment to MTS Outcomes in the rows below and the High Level Outcome Alignment shown at the foot of Table 1.



Hex cells

- **11551195** (Tulse Hill Gyratory South)
- **11551197** (Tulse Hill Gyratory North)
- **11561196** (Tulse Hill Gyratory East)
- **11541196** (Tulse Hill Gyratory West)

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Area Appraisal Summary

How much of a priority is each outcome for each neighbourhood (hex)? (1=low, 5=high)
What is the overall 'average' priority score for each outcome for the whole study area? (1=low, 5=high)

	HEX Description	Tulse Hill Gyratory South	Tulse Hill Gyratory North	Tulse Hill Gyratory East	Tulse Hill Gyratory West		
	HEX ID	11551195	11551197	11561196	11541196	Study Avg	Description
S1	TfL1 Active	4.8	4.5	4.0	3.5	4.2	Are current and potential cycling and walking levels high?
S2	TfL2 Safe	4.8	3.8	3.6	4.6	4.2	Are KSI and crime levels high?
S4	TfL3 Green	5.0	5.0	5.0	5.0	5.0	Is air quality poor in the area?
S3	TfL4 Efficient	3.5	3.8	3.0	4.0	3.6	Are freight and servicing flow levels high and is there high car dependency in the area?
S7	TfL5 Connected	1.0	1.0	1.0	1.0	1.0	Is transport connectivity low in the area?
S6	TfL6 Quality	3.8	3.7	2.2	4.0	3.4	Is bus demand and provision currently high and are we anticipating increased demand? Is bus performance deteriorating in the area?
S5	TfL7 Accessible	x	x	x	x	x	Are accessibility levels low in the area?
S8	TfL8 New Homes and New Jobs	4.3	4.0	3.3	3.5	3.8	Does the area have high population and employment levels and are we anticipating high levels of growth in the area?

High Level Outcome Alignment						
Healthy Streets Healthy People	18.1	17.1	15.6	17.1	17.0	Healthy Streets Healthy People Total - How much of a priority is this area for delivering Healthy Streets? (1 = lowest , 20 = highest)
A Good PT Experience	4.8	4.7	3.2	5.0	4.4	Public Transport Total - How much of a priority is this area for addressing PT challenges ? (1 = lowest , 10 = highest)
New Homes and New Jobs	4.3	4.0	3.3	3.5	3.8	New Homes New Jobs Total - Does the area have high population and employment levels and are we anticipating high levels of growth in the area? (1 = lowest, 5 = highest)

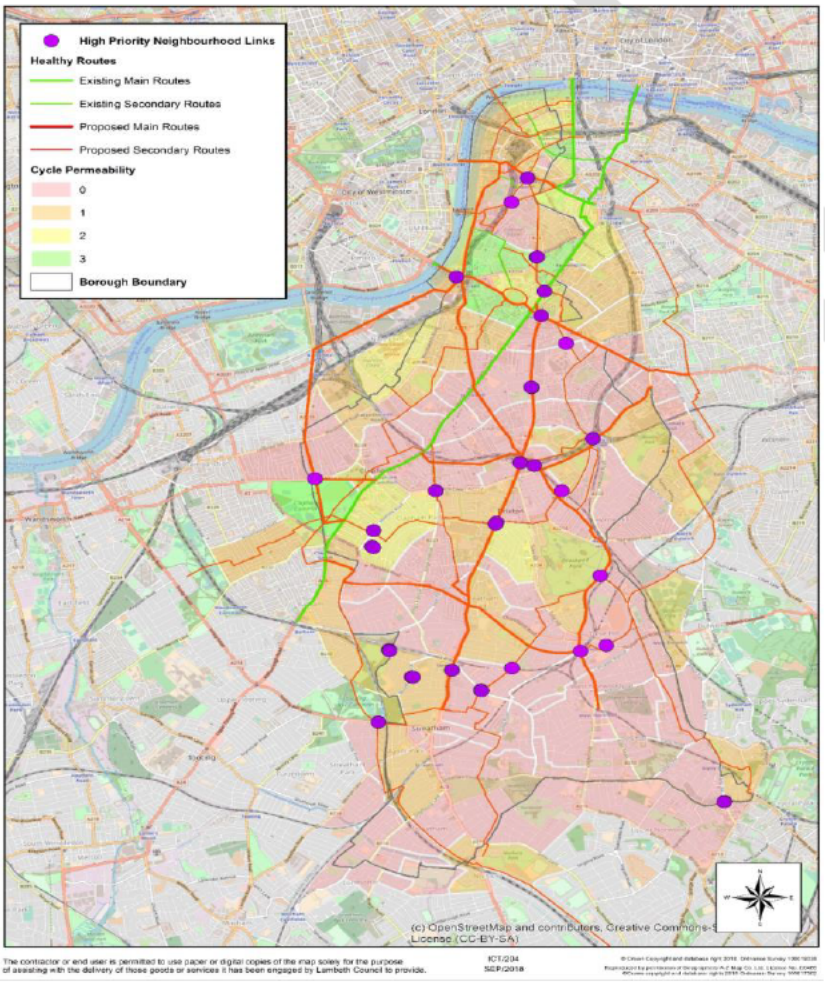
The high level outcome alignment shows that it is a high priority location for delivering a Healthy Streets outcome, a medium priority for addressing the experience of using pedestrian transport (as bus stops for services to Brixton are split), and there is higher potential for new homes and jobs in the area particularly in the Hex cells Tulse Hill Gyratory North and Tulse Hill Gyratory South.

Strategic Networks

The Strategic Cycling Analysis identified a *high potential connection* between West Norwood and Brixton and to Clapham Junction. The analysis also identified a need to connect Tulse Hill and West Norwood to nearby planned Quietways which avoid Tulse Hill Gyratory. The nearest Quietway network interfaces are as follows;

- Rosendale Road to the Q7 Elephant & Castle to Crystal Palace Quietway
- Tulse Hill/Upper Tulse Hill and Christchurch Road/Hillside Road to the Streatham to Peckham Quietway

In the draft LIP 3 submission dated February 2019 to the Mayor, the London Borough of Lambeth have identified Norwood Road as part of it's Healthy Routes Network to improve local walking and cycling forming a north-south connection between Brixton and West Norwood.



Reproduced from Figure 4, LB Lambeth LIP3 submission (February 2019) Heathy Route Network – Norwood Road is a Healthy Route, Proposed Main Route

For buses, Tulse Hill gyratory, Norwood Road (north and south of the gyratory) and the A204 Tulse Hill are identified strategically as busiest passenger links for buses

Key findings from the Hex analysis in terms of key MTS objectives from this study are;

Area Appraisal Summary: Tulse Hill Gyratory
• **Healthy Streets and Healthy People –** In terms of the challenges and opportunities for delivering more people-friendly places where people choose to walk or cycle, the key challenges in the area include poor air quality and specific locations with high KSIs, particularly pedestrian KSIs (2011 – 2015). The data shows current and potential cycle demand in the area is high, which highlights the potential to encourage more cycling. The southern section of the study area has the highest pedestrian density and walking potential, along with a concentration of retail land use which reflects the P2 place function Norwood Road. The study area has low levels of cars / vans per household, which indicates there is low car dependency in the area. There is medium to high modelled flow (HAM 2012 UC 1, 2, 3, OGV and LGV), therefore future schemes should consider how to encourage less traffic and more efficient freight and loading. • **A Good Public Transport Experience –** the area has a good level of connectivity (based on Access Index data) and the bus speed data (14/15 – 15/16 % change) indicates that bus performance is not a particular challenge in the area because there has been no decline in bus speeds. Bus provision and demand is high in most locations (excluding cell 11561196 which has low to medium score), therefore buses are important in the study area. • **New Homes and Jobs –** The population is forecast to increase around 11% (2011 – 2031) and employment is forecast to increase around 10% over the same period. Existing employment density and retail land use (UK Map, m2) is particularly high in cell 11551195 (south). Any future scheme should therefore support the forecast population and employment growth.

Healthy Streets and Healthy People
Active – *London's streets will be healthy and more Londoners will travel actively*
Are current and potential cycling and walking levels high? (5=high, 1=low) **Tulse Hill Gyratory Average Score: 4.2**
• Current cycle demand is high in all cells, and the area average is higher than the inner London average but lower than the borough average. Cycle potential is medium to high, and the area average is higher than the borough and inner London averages. • Pedestrian density is high in the northern and southern cells, but low to medium in the other cells. Walking potential is low to medium in the area, and the study area average is lower than the borough and inner London averages.
Safe - *London's streets will be safe and secure*
Are KSI and Street Crime Scores and Rates high? (5=high, 1=low) **Average Score: 4.2**
• KSIs are generally high in the study area, and the area averages for fatal, serious and slight collisions are higher than the borough and inner London averages. Cells 11551195 (south) and 11541196 (west) each had one fatal collision between 2011 and 2015. • Pedestrian KSIs are highest in cells 11551195 (south) and 11541196 (west), and the area average is a lot higher than the borough and inner London averages. Cell 11541196 in particular has low to medium levels of existing pedestrian density and so the higher levels of KSIs in this cell indicate pedestrian safety is a particularly important consideration.
Green - *London's streets will be clean and green*
Is air quality poor in the area? (5=poorest, 1=better) **Tulse Hill Gyratory Average Score: 5.0**
• Air quality in the area is poor, with a high score in all cells for modelled 2010 and 2020 PM10 and N02 levels. The area averages are in line with the borough averages, but are higher than the inner London averages.
Efficient - *Making more efficient use of our street network*
Are freight and servicing flow levels high and is there high car dependency in the area? (5=high, 1=low) **Tulse Hill Gyratory Average Score: 3.6**
• Cars / vans per household are low in the area, and the area average is lower than

the borough and inner London averages. This indicates that car ownership and dependency in the study area is generally low. • Modelled flow (HAM 2012, UC 1, 2, 3 and OGV, HGV) is medium to high in the study area, and the area averages are higher than the borough and inner London averages. Cell 11541196 (west) has the highest modelled HAM flow. This reflects the strategic movement function of the gyratory. Retail land use is also particularly high in cell 11551195 (south), and so indicates that freight and servicing is particularly important in this location.

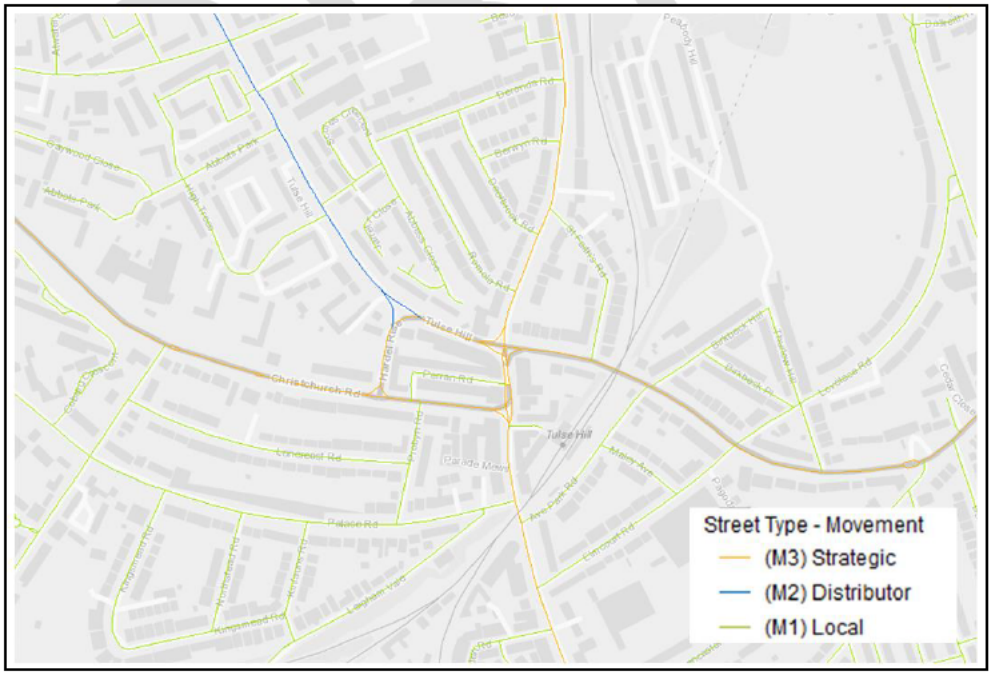
A Good Public Transport Experience
Connected – *More people will travel on an expanded public transport network*
Is transport connectivity low in the area? (5=low connectivity, 1=high connectivity) **Tulse Hill Gyratory Average Score: 1.0**
• The area is well connected (based on the Access Index data), and it has a higher average score than the borough and inner London.
Quality PT – *Journeys by public transport will be fast, comfortable and reliable*
Is bus demand and provision currently high and are we anticipating increased demand? Is bus performance deteriorating in the area (5=high future demand / deteriorating performance, 1= low future demand / good performance) **Tulse Hill Gyratory Average Score: 3.4**
• Bus speeds (14/15 – 15/16 % change) have increased in the study area, which indicates that bus performance is not deteriorating and so is not a particular challenge to address. The southern, northern and western sections of the study area all have a medium to high scores for bus boardings and alightings and bus serviced kms, which indicates current provision and demand in the area is high. Cell 11561196 (east) has a low to medium score for existing bus provision and demand. • There is variation in the study area for modelled bus boardings growth (2011 – 2031, Rail Plan). Cells 11551195 (south) and 11551197 (north) have medium growth forecast of between 5% and 14%. Cell 11561196 (east) has a forecast decline in boardings of 13% (this cell has the lowest existing bus provision and demand), and cell 11541196 (west) has the highest forecast increase of 25%.
Accessible PT - *London's transport will be affordable and accessible to all*
N/A – data to be added

New Homes and New Jobs
Growth - *Support the delivery of homes and provide better access to jobs, customers and suppliers*
Does the area have high population and employment levels, and are we anticipating high levels of growth in the area? (5=high, 1=low) **Tulse Hill Gyratory Average Score: 3.8**
• Population density (2011) is medium to high in the area, and the area average is also higher than the borough and inner London averages. Population change (2011 – 2031) is around 11% in all cells. • Employment density (2011) is highest in cell 11551195 (south), which also reflects the high retail land use in this cell (UK Map, m2). Employment change (2011 – 2031) is medium to high in the study area, with forecast growth of between 9% and 10%.

Street Types

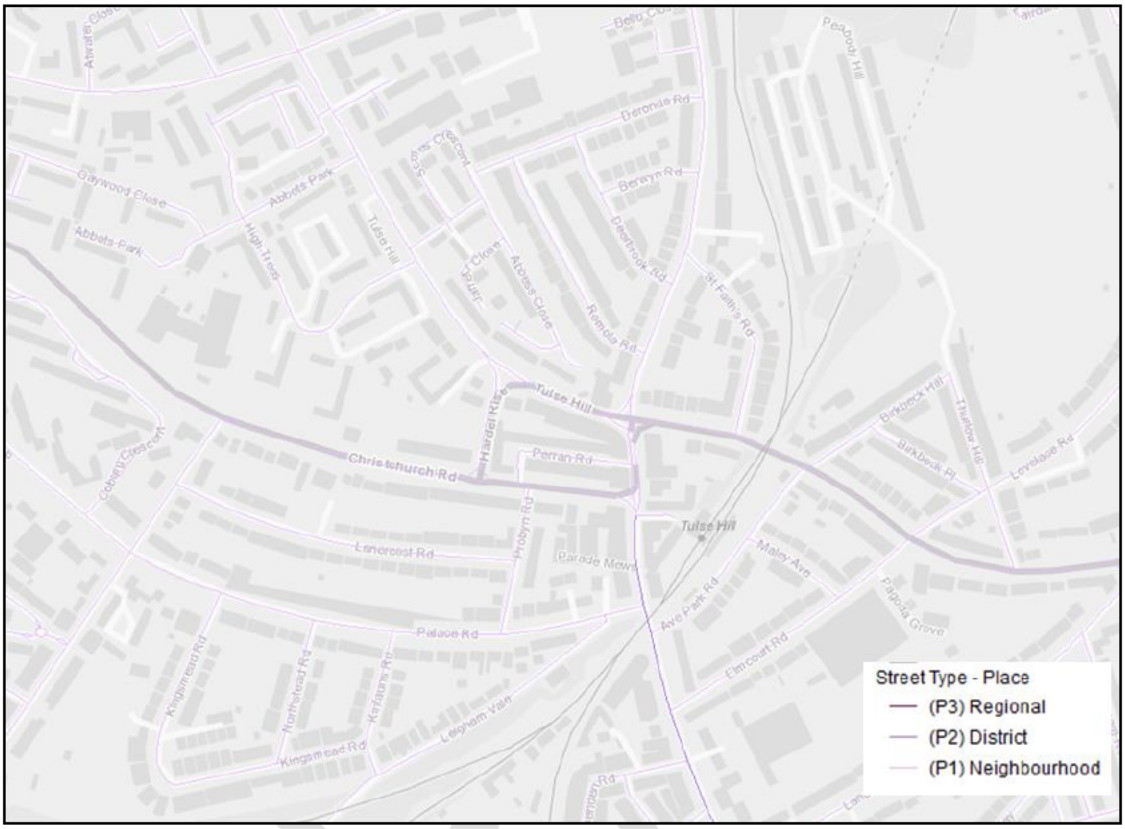
Movement function

Norwood Road and the South Circular Road, including Tulse Hill Gyratory, are classified as an M3 strategic street. The A204 Tulse Hill is classified as an M2 distributor street.



Place Function

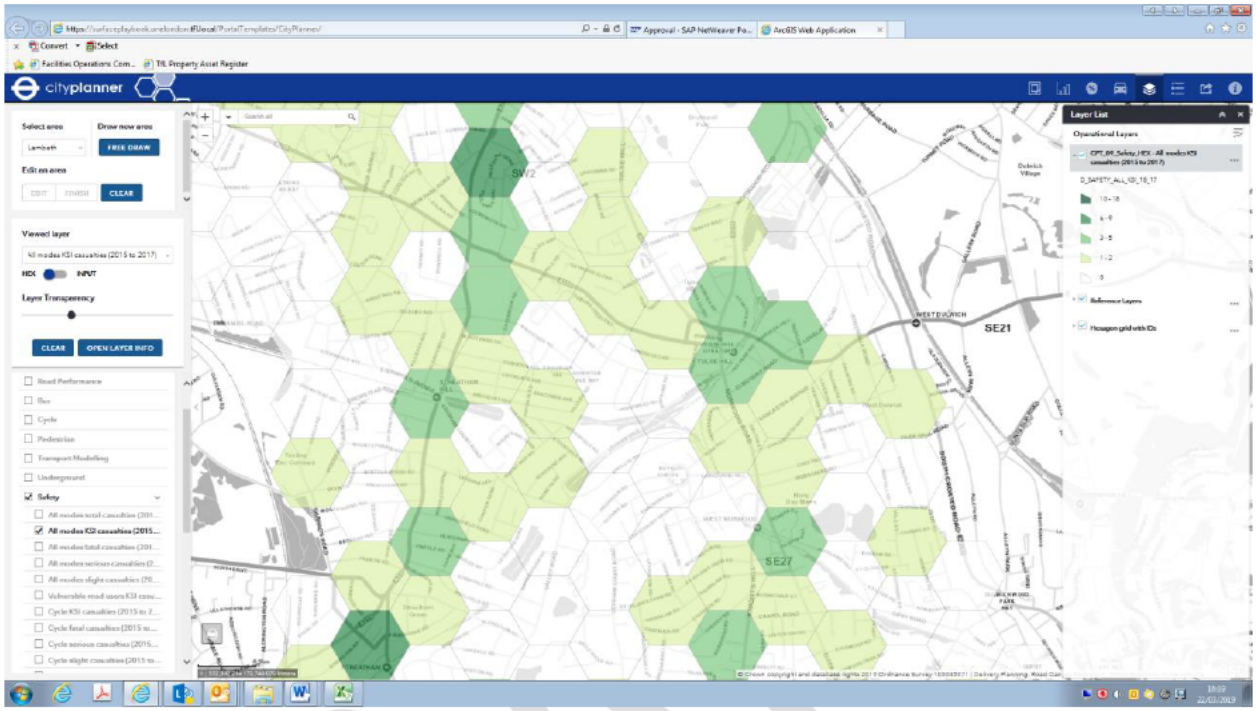
Norwood Road to the south of Tulse Hill gyratory is classified as a P2 district place.



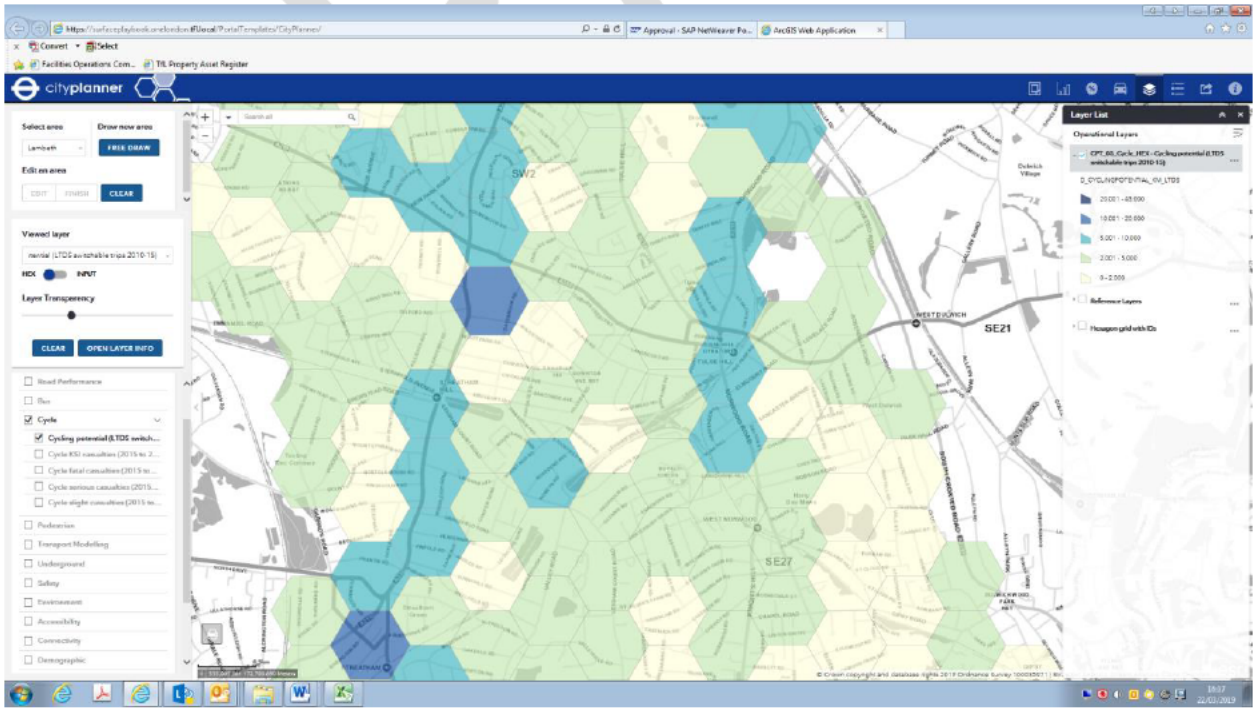
City Planner Tool

Data in TfL's City Planner Tool is extracted and illustrated below for the Hex cells representing Tulse Hill Gyratory to support the findings from SAF.

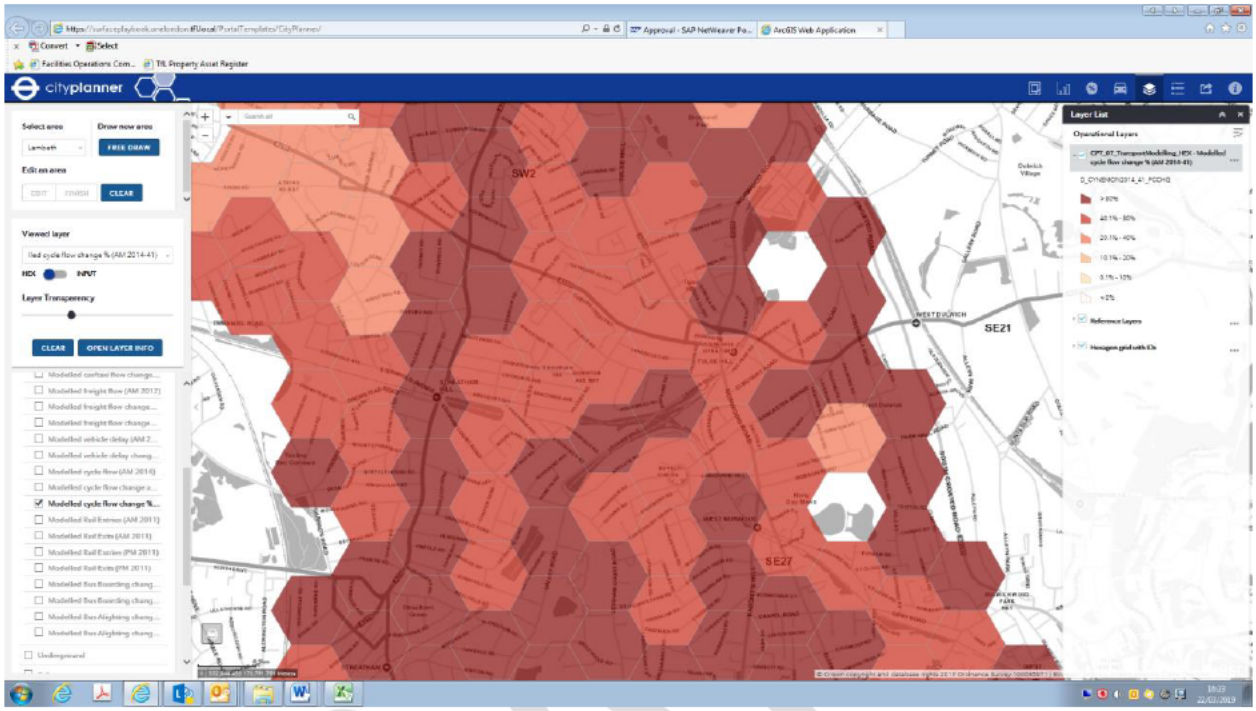
All Mode KSIs (2015-2018)



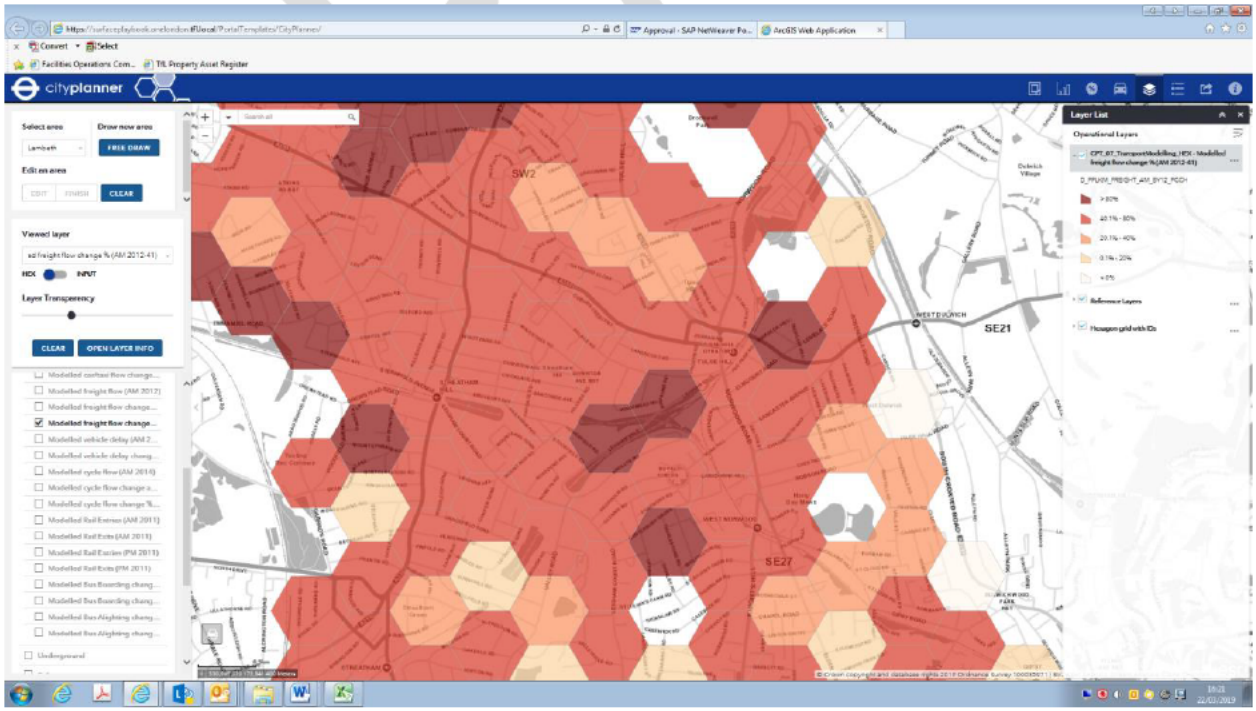
Cycle Potential Switchable Trips (2010-2015)



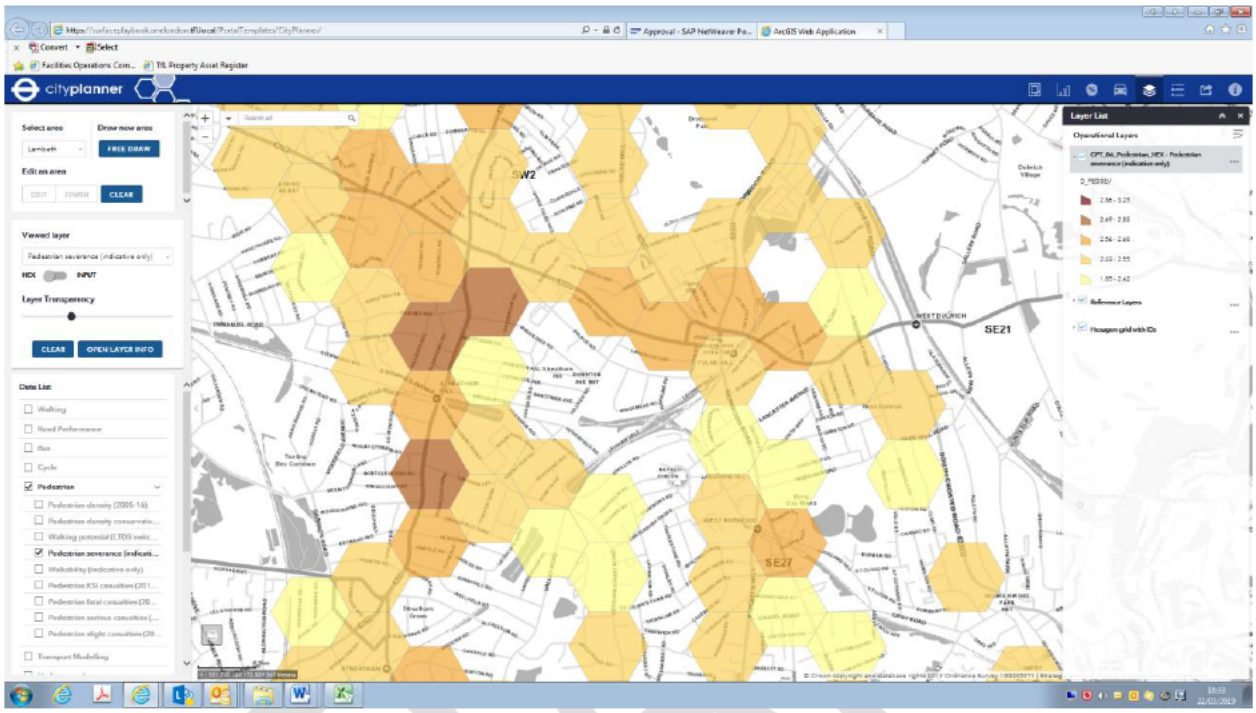
Modelled AM peak cycle flow change 2012-2041



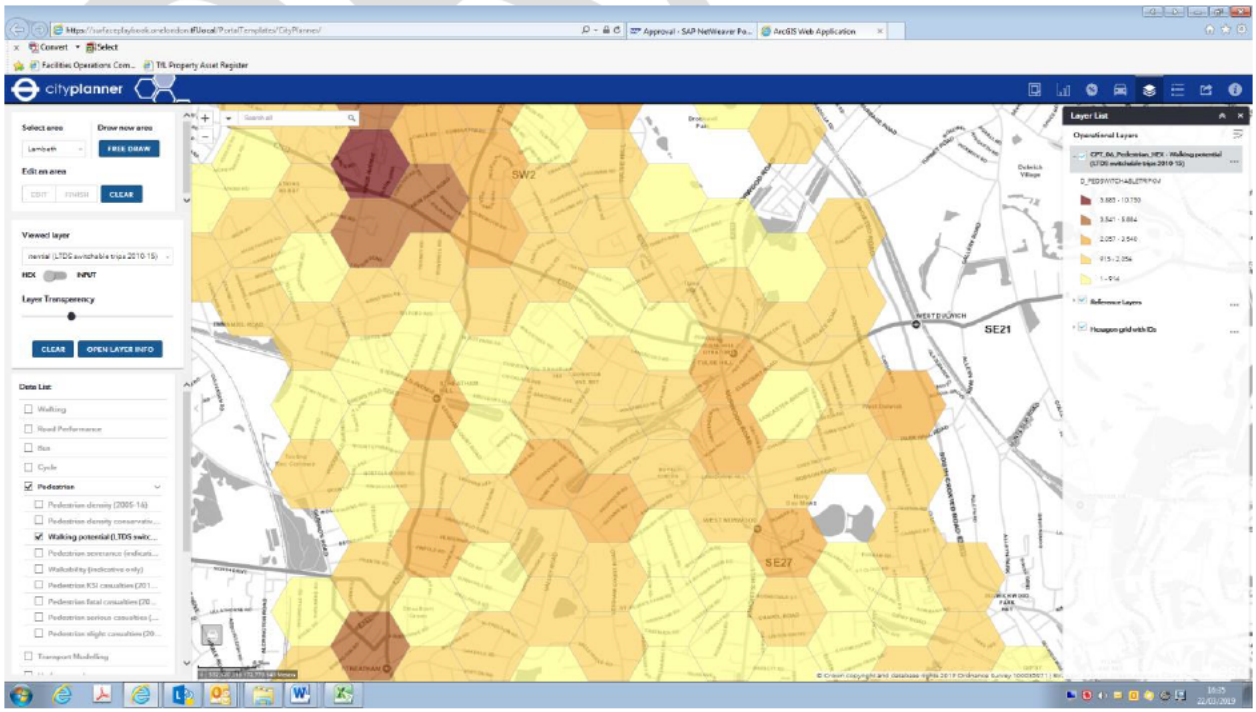
Strategic Modelled Freight flow AM peak 2012-2041



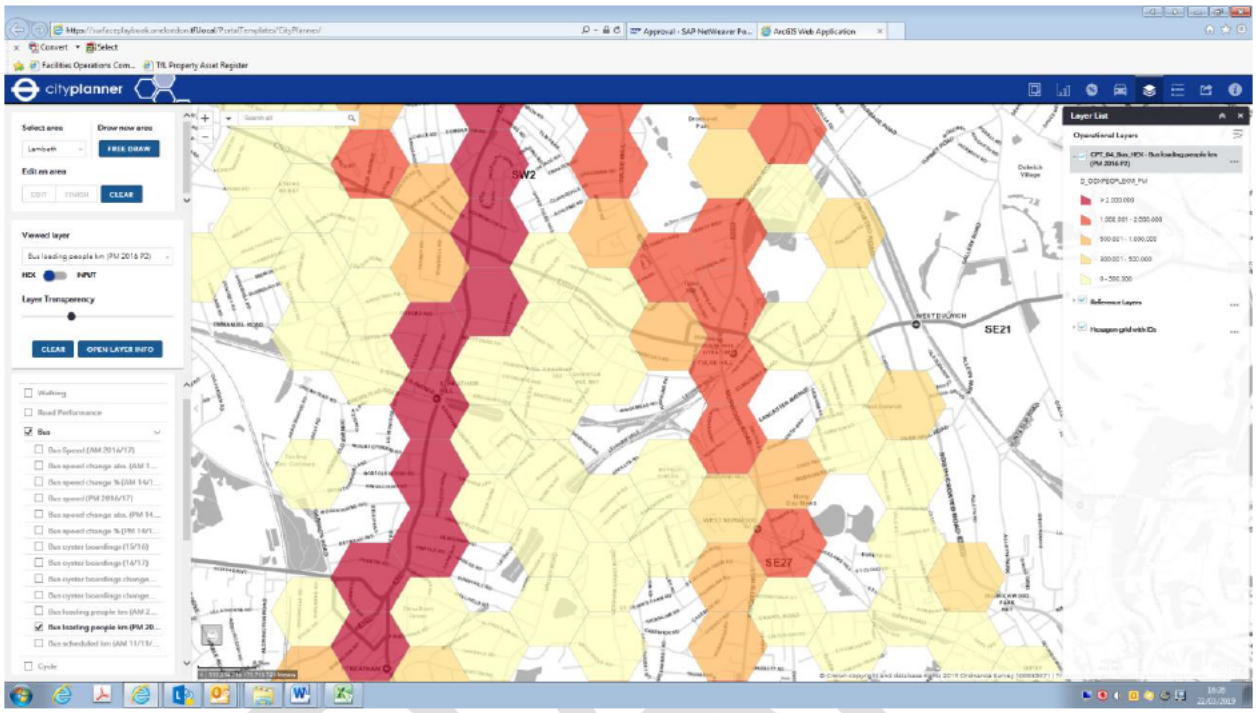
Pedestrian Severance - indicative



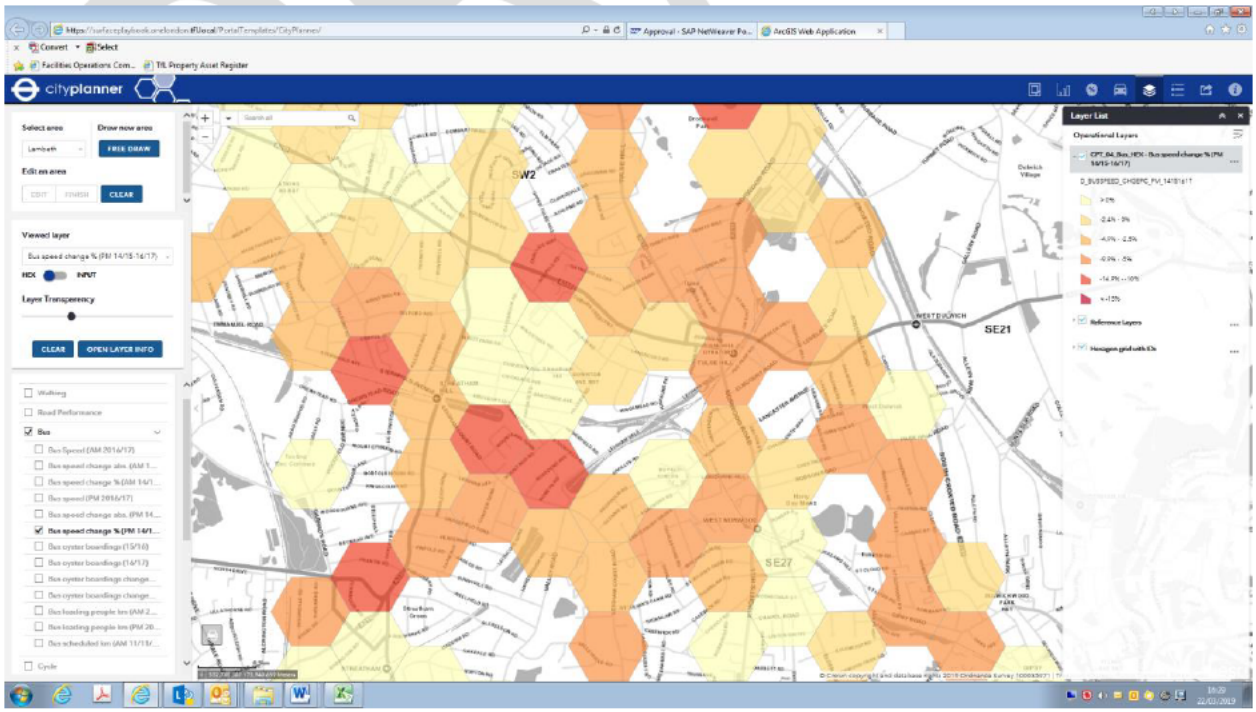
Walking Potential Switchable Trips (2010-2015)



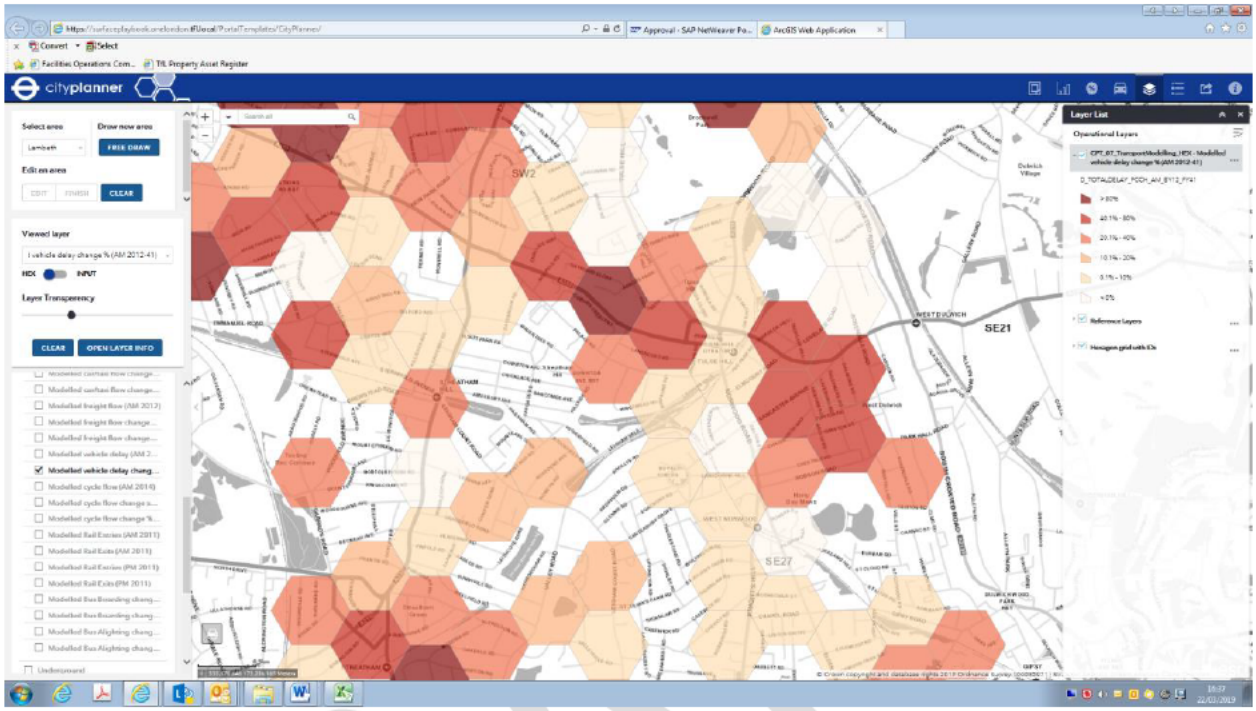
Bus Loading PM peak, 2016 Period 2 (May 2016)



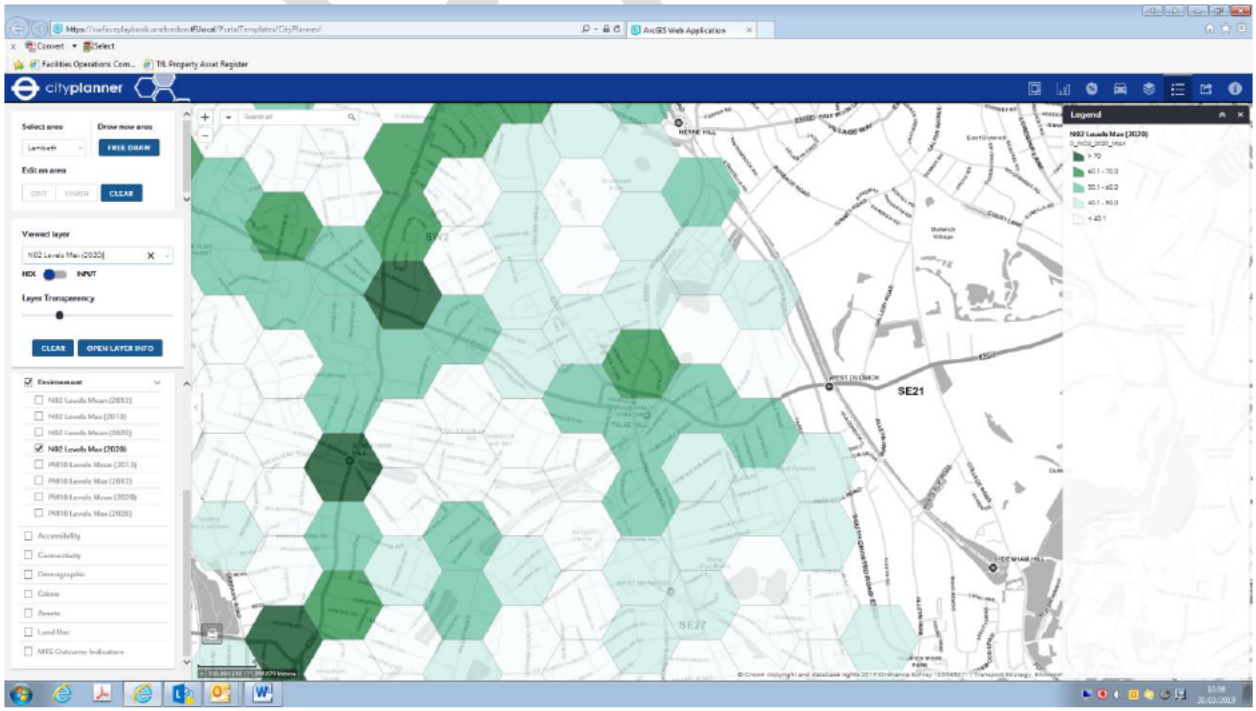
Bus Speed change % PM peak, 2014/15 to 2016/17



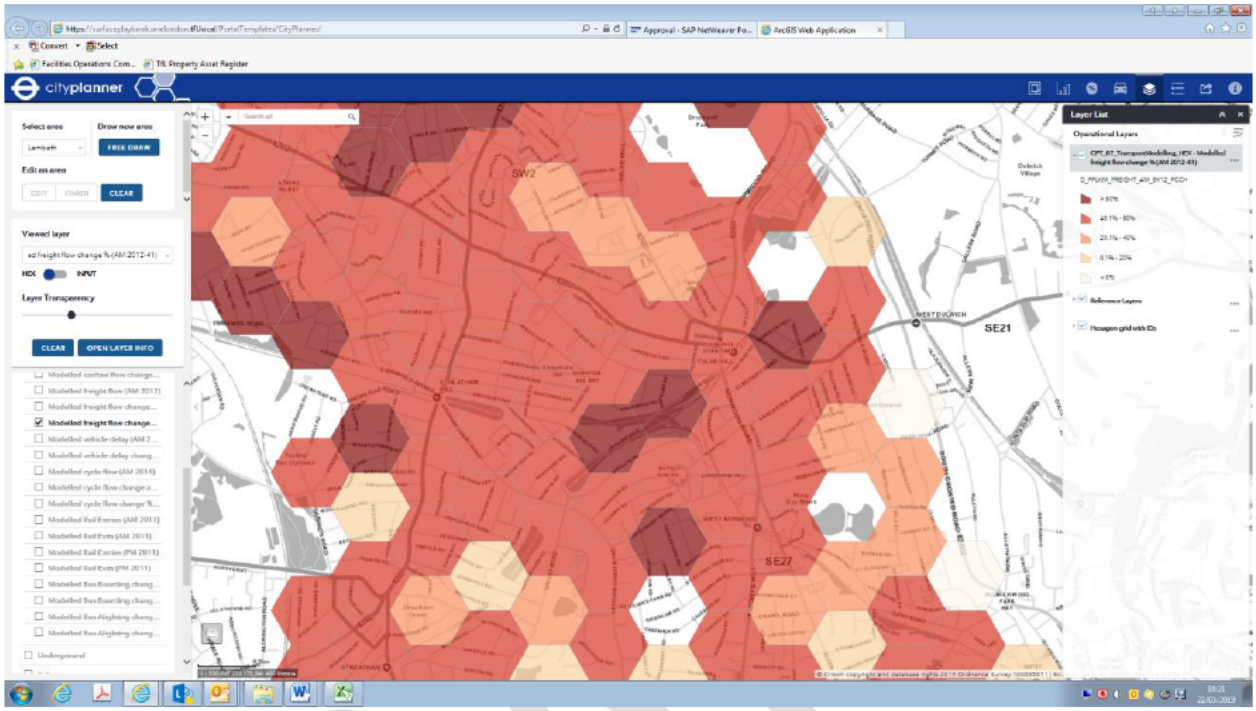
Modelled vehicle delay % change 2012-2041 AM peak



Air Quality – Nitrogen Dioxide Maximum Level, 2020



Strategic Modelled Freight flow AM peak 2012-2041



Observations and Comments – City Planner Tool Hex data

- Collision data shows a cluster of KSIs at Tulse Hill and hence there is an opportunity to reduce road danger – this is covered further in the next section
- The north-south Norwood Road corridor shows potential cycle switchable trips, although this is less evident for the east-west corridor
- Long term modelling of cycle trips shows a high percentage change along the Norwood Road corridor either side of the gyratory
- Pedestrian severance data appears to be a greater issue on the northern alignment of the gyratory despite the existing zebra crossings in Hardel Rise, and is less severe at Norwood Road/Christchurch Road
- Norwood Road has the greater potential for more walking trips
- Norwood Road has the highest PM peak bus loadings, reflecting interchange
- PM peak bus speeds have recently deteriorated in Norwood Road

- Long term modelling indicates the percentage change in delay in the AM peak is greater on the approaches to the gyratory possibly because there is less available capacity to accommodate more private car trips on the gyratory
- The percentage of freight through Tulse Hill is expected to increase in the AM peak according to long term strategic modelling to 2041
- Air Quality modelled forecast for Nitrogen Dioxide (prior to the proposed introduction of ULEZ phase 1 (central London) or phase 2 (South Circular/North Circular boundary roads) for 2020 shows a concentration in the HEX cells around Tulse Hill associated with road traffic emissions

Existing Arrangements

The existing arrangement is a gyratory layout for the South Circular Road (Christchurch Road/Hardel Rise/Tulse Hill/Thurlow Park Road eastbound and Thurlow Park Road/Norwood Road/Christchurch Road westbound) with a northbound contra-flow bus and cycle lane in Norwood Road and signalised crossings at two of the four main junctions with the other two at either end of Hardel Rise being zebra crossings. There is a 30mph speed limit throughout the gyratory.

The gyratory is a traffic dominated environment which acts as a barrier to walking and cycling movements. It has a high movement function, with the place function being limited to Norwood Road (shops both sides) and the shops on the south side of Tulse Hill – all are mainly local shops, dependent on on-street servicing, with some residential above the shops. The rear gardens on Perran Road back onto Christchurch Road, and few residential properties back directly onto Hardel Rise. Consequently, it acts as a form of local severance between adjacent local communities. Norwood Road towards West Norwood station has recently undergone improvement in the form of a LIP Major Scheme to seek regeneration of the high street. There are no current developments planned directly on Tulse Hill Gyratory.

There are no Quietways planned through the gyratory – there are two proposed Quietway routes that are planned to use alternative alignments in order to avoid the gyratory. Quietway 7 is proposed to cross the A205 South Circular Road at Rosendale Road, whilst the Streatham to Peckham Quietway is routed via Upper Tulse Hill to the north-east of the Gyratory. Norwood Road forms part of the London Cycle Network with intermittent advisory cycle lanes. LB Lambeth have designated this as part of their Healthy Streets network proposed in the Lambeth LIP submission to the Mayor in February 2018. Cycle count data reveals that most cycle movements are north-south along Norwood Road, but there is a smaller movement east-west along the South Circular Road alignment in terms of demand.

The overall collision record of the gyratory in the latest 36 month period for which data is available for to 30th June 2018 (containing provisional data for 2018) shows the gyratory as a whole has some junctions (nodes) and links (between nodes) that exceed the London wide mean. An overview is shown below. There has though been one pedestrian fatality in December 2017 that led to an interim scheme to realign a crossing outside Ladbrokes being completed under the Healthy Streets Local Schemes programme.

The overall collision record indicates that although there are some sections which are above the London wide mean, there are other locations on both the TLRN and Borough roads which are a higher priority for investment based on the collision record. However, the gyratory does contain significant risks – mainly associated with speeding, a lack of facilities for cyclists and pedestrians intimated to use the existing zebra crossings due to drivers not giving way. The adoption of Vision Zero means that no collision should be regarded as being inevitable.

Table 1 - collision data for the 36 month period to July 2018

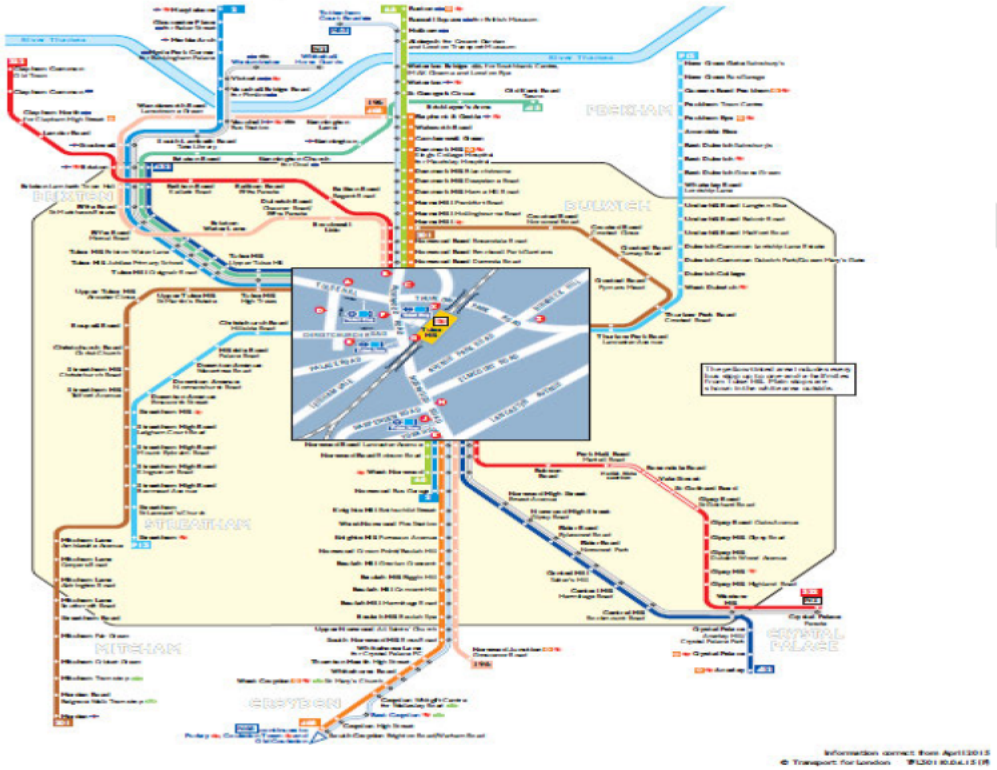
Node or Link	Ref	Description	36 months to December 2016	36 months to December 2016	36 months to December 2016	36 months to 31st July 2018*
			No of injury collisions	Priority rating	London wide rank	No of injury collisions
Link	9_98_102	Tulse Hill	0	0	-	0
Link	9_101_102	Norwood Road	1	0	-	0
Link	9_97_101	Christchurch Road	3	0	-	6
Link	9_97_98	Hardel Rise	2	0	-	4
Node	9_98	Tulse Hill j/w Hardel Rise	5	0	1151	5
Node	9_102	Tulse Hill j/w Norwood Road	13	3	634	5
Node	9_101	Norwood Road j/w Christchurch Road	6	3	850	10
Node	9_97	Christchurch Road j/w Hardel Rise	7	0	1151	5

Notes – the latest London Wide Priority List was published for the 36 months to December 2016. Where the Priority is rated '0' this means the link or node is less than the London wide mean; Priority '3' means it is greater than the mean but less than the first standard deviation. The highest ranked is Priority 1 where the site is more than twice the second standard deviation above the mean. * latest date for which Accstats data is available.

Tulse Hill forms and interchange between two rail corridors and local bus routes. There have recently been improvements in capacity on the Thameslink services through Tulse Hill and a separate project to improve Station Rise between Network Rail and LB

Lambeth. Bus routes in the area are shown in Figure 1 below. Bus stops are within walking distance of the station but the presence of the South Circular Road acts as a form of severance. Bus Priority facilities are provided in the northbound direction of Norwood Road in the form of a bus contra-flow developed as part of the London Bus Initiative Route 68 project (2000-2003). It's introduction led to journey time savings for northbound Routes 68, 196, and 468 avoiding three sides of the gyratory and reduction in unnecessary mileage.

Figure 1 – Tulse Hill Bus Map



Tulse Hill Gyratory is proposed to form the southern boundary of an expansion of the Ultra Low Emission Zone (ULEZ) planned for introduction in 2021, seeking to reduce the number of vehicles that are not compliant with Euro VI or better emission standards. This is likely to involve amended signage being installed to advise motorists. The ULEZ expansion project is separate from this scheme. It may have some influence on traffic patterns the extent of which is currently unknown.

2.4 Potential Scope and Service Requirements

Local Community Vision Statement, July 2016 – Preferred Option

The scheme boundaries are 50m to the west of the junction of Christchuch Road with Hardel Rise, 50m to the north-west of the junction of Tulse Hill with Hardel Rise, 50m to the north in Norwood Road of the junction with Tulse Hill and Thurlow Park Road, 50m in Thurlow Park Road to the east of the junction with Tulse Hill and Norwood Road and 50m in Norwood Road to the south of the junction with Christchurch Road, and including the junction with Station Place. The scheme will need to include Perran Road which is a Borough Road. The justification for 50m offsets on the main TLRN network is the extents required for resurfacing on the approaches to junctions to reflect breaking distances. Subject to the outcome of traffic modelling, the scheme extents may need to be adjusted further in order to protect and mitigate buses from overall journey time increases.

The essential items of scope in the preferred option are;

- Re-routing of the South Circular Road in the westbound direction to use the same alignment as the eastbound direction; i.e. both Hardel Rise and Tulse Hill to become two-way

- The section of Norwood Road between Tulse Hill and Christchurch Road to be used by Buses, Cyclists and Pedestrians only between 7am-7pm (note – no decision has yet been made on an overnight restriction, or details as to how servicing for retailers will be arranged). This section of Norwood Road will have wider footways, amendments to drainage new or refurbished footway materials, opportunities for seating, tree planting, cycle parking, lighting, and public art to focus on 'placemaking'

- A two-way segregated track for cyclist is proposed in Tulse Hill between Norwood Road and Hardel Rise for the desire line towards Brixton

- A 20mph speed limit is proposed to be introduced on all roads covered by the scheme

- Conversion of Christchurch Road/Hardel Rise and Tulse Hill/Hardel Rise to signal control including pedestrian stages, from zebra crossings with give-way markings

- Carriageway resurfacing (40mm depth of wearing course sufficient to plane out former road markings on safety grounds)

{Healthy Streets Check to go in this section}

2.5 Constraints and Dependencies

The scheme needs to have an improvement of at least 10 per cent between the before and after Healthy Streets Check Assessment scores.

The scheme did have a proposed [redacted] capital budget under the Healthy Streets £1m-£5m budget but it is currently not included in the most recent business plan, following revisions in December 2018. It did not include a revenue budget in terms of any impacts on ongoing costs, particularly bus operating costs and highway asset maintenance including traffic signals. As a result the proposals aim to be bus neutral in terms of impact on operating costs.

There are no dependencies with other projects, and it can be progressed as a stand alone project.

For the scheme to be a success it needs to demonstrate overall support by the local community and key stakeholders at consultation

3 Economic Case

3.1 Options

The Option considered in this business case is the do-nothing option against the local community's preferred vision arising from early engagement in 2016.

At a workshop with the local community in March 2016 four options were considered, with output including details presented in Appendix 2 extracted from the July 2016 Vision Document.

- Option 1 – partial closure of the northern arm of the gyratory
- Option 2 – partial closure of the east arm of the gyratory
- Option 3 – partial closure of the south arm of the gyratory
- Option 4 – partial closure of the west arm of the gyratory

The July 2016 Vision Document from the local community considered 3 options, with the above options 1 and 4 ruled out from the March 2016 workshop;

- Option one entailed modification and retention of the one way system but withtraffic calming and cycle priority measures particular on the approach to the gyratory to the west
- The second option proposed conversion to two-way working with southern arm of the gyratory, Christchurch Road, restricted to pedestrian, cycle and bus movement (Option 3 above)
- The third option also proposed conversion to two-way working but restricted vehicular movement on the east arm (Norwood Road) to pedestrians, cyclists and buses (Option 2 above)

The conclusion from the March 2016 workshop was to take Option 2 – partial closure of the east arm (Norwood Road) as the preferred option by the local Community, for investigation as to whether it was feasible. As a result of this early engagement no further work in terms of design, modelling or appraisal (quantification) was done on the other options identified at that stage.

Further reasoning for the selection of this option and rejection of other options is documented in the Vision Document, July 2016, pages 12-19.

The cost implications of the rejected options would have been similar to that costed in March 2019, but the benefit profiles would have been different. Option 3 was selected as the preferred option because in the view of the community it[1]:

[1] Extract from Page 12 of Vision Document, July 2016

- Creates a transport hub for the buses and train station.
- Easier access between bus and station.
- Improves pedestrian experience
- Less impact on neighbouring roads

- Many shops on the east arm
- Easy access from trains to buses, traffic free link from trains to buses
- "Heart of community" would be created around existing shops.
- Maintains vehicular access to Tulse hill hotel and carpark.
- Greatest potential to improve the nature of the shops and retail premises
- East arm is narrowest road therefore best one to partially close
- Creates interconnectivity between shops, station, buses
- Potential for a market in partially closed arm
- Buses continuing through the partially closed arm may improve footfall

- Enhances the village
- Opens access to the station
- The maintained roads are the widest, so this would be the bests option for HGVs
- Assists pedestrians
- An opportunity to revive the heart of Tulse hill, improve community cohesion.

3.2 Explanation of Costs, Cost Savings and Revenues

The Seed Funding paper submission that was approved in April 2015 included an overall cost of [redacted] for the project, but this was not based on a design and was an approximation of the likely cost to design and implement the project.

TfL commercial in March 2019 produced a DRAFT outline cost estimate showing a likely cost of [redacted] based on a TDE feasibility drawing which itself is still being worked on.

The business case at this stage does not include any confirmed Third Party contributions, as none to date have been identified.

The project will create upgraded or new assets, particularly in terms of traffic signals and carriageway resurfacing. There should be cost savings in terms of preventative maintenance for carriageways at the two existing signal controlled junctions at Norwood Road/Tulse Hill (site 09/045) and Norwood Road/Christchurch Road (site 09/306).

There is no TfL owned property in the area that is likely to generate increased income for higher rents reflecting increased attractiveness to the market due to the urban realm improvement.

The scheme is not expected to increase TfL advertising income. The main opportunity in the area is from existing bus shelters which is already being utilised.

Traffic modelling needs to be completed to inform a detailed assessment on the impact on bus services and associated revenue changes arising from journey times.

The project is delivered from within existing headcount in terms of Sponsorship, Engineering, Network Management, Local Community Partnerships, and Bus directorate staff resource. The project has no staff working exclusively in this project, accommodation (including workstations), HR recruitment, Finance, specialist IM or Legal overheads.

3.2.1 Overview

Suggest an overview table here. The figures set out here should also show how outturn costs discussed relate to the discounted present value costs in the appraisal.

{Inset table here}

3.2.2 Capital Costs

The cost estimate in the Seed Funding paper in April was [redacted] based on judgement of similar schemes.

In March 2019 a DRAFT cost estimate was provided by TfL Commercial based on an outline feasibility drawing provided by TDE that itself is still in development. This shows the scheme extents.

This shows a likely outturn estimate of [redacted]. A range of estimates is produced using a three-point estimating process where the minimum was [redacted] and the maximum was [redacted]. Quite a large range ([redacted]) is normal for a project at this level of maturity with -15%/+30% variation used in the estimate based at Q1 2019 construction prices.

The estimate has assumed the scope of works to include site clearance, carriageway, earthworks, kerbs, footways, tactile paving, pedestrian crossings and traffic islands, entry treatments and raised tables, lighting columns, traffic signs and road markings, civils works for signal infrastructure and utility diversions, drainage, service ducts, and street furniture.

Assumption's made;

1. All material specifications and construction depths, for each one of the tasks and elements, were assumed based on the LoHAC typical sections or similar.
2. Duration of the Construction works assumed to be of **6 months**, as advised by the Sponsorship team.
3. LoHAC rates have been based on the "Central" Contractor ("CVU) which is assumed to be the preferred option for this scheme as advised by the Project team and the Sponsorship. Regarding the Direct Works Bill, the "Night Works" uplift (10%) was applied to the tasks to be executed on the carriageway and the "Sensitive route" (7%) and "Sunday" (5% x 52 Sundays / 52*7 Total days) uplifts were applied to the entire bill.
4. Additional Preliminaries costs, besides the percentage of cost which is already included in the LoHAC rates, of [redacted] month were assumed (inclusive of staff Management, site maintenance and site compound, civil assistance, attendance at "Utilities works", etc.).
5. "Utilities" costs included based on the average cost in the Surface Transport Estimating Book_January2019 - RWI300.100: Junction Remodelling
6. Traffic signals costs based on the Traffic Signal Cost Model, which includes design and the installation of the new signals (civil works included in the "Direct works" Bill and ducting on the Series 500 benchmark allowance) under the assumption of SCOOT system installation.
7. Additional Traffic management costs, besides the percentage of cost which is already included in the LoHAC rates, of [redacted]/month were assumed (inclusive of staff Management, site maintenance and site compound, civil assistance, attendance at "Utilities works", etc.).
8. "TfL Management Costs" assumed based on a benchmark allowance
9. "Design" allowance assumed ([redacted], for the development of the concept design, as advised by the Project team.
10. "Design" allowance for additional design work assumed to be of 4.6% (LoHAC schedule of rates) of the task order/construction cost (Base construction costs + Preliminaries + Traffic management), inclusive of: "Detailed Design", "As built" drawings and "Principal Designer" fee.
11. "Surveys" allowance assumed 5% of the Direct Cost, for upcoming and remaining surveys works, as advised by the Project team.
12. Lane Rental Cost included for a Low Charge Zone for the duration of the 6 month construction programme as advised by Surface Playbook.
13. "Bus compensation" costs allowance assumes the following bus routes are affected during the 6 month construction programme Bus 2, 68, 196, 201, 322, 415, 432, 468, 690, P13. Based on the calculation of [redacted] compensation per annum per route.
14. Benchmark low end range rate, from the ST Estimating book (Junction Remodelling - RWI Type), was assumed for an additional "Other Charges" costs.
15. Anticipated Const. Mid point 2Q2025, as advised by the Project team and the Sponsorship. Inflation calculation

accordingly to the "TfL Inflation model" (January 2019 - 17.62% uplift
16. All sunk costs accordingly to the provided Cost Plan, as advised by the Sponsor Team.

3.2.3 Operating Costs

Traffic Modelling is needed to inform the impact on bus operating costs.

The scheme will modify two existing signal controlled junctions, and create two new signal controlled junctions (which are currently zebra crossings). Initially the new and upgraded signal controller and associated electrical assets should result in an operating cost saving. Additional operating costs (including power and maintenance) will be incurred for the two new signal controlled junctions in Hardel Rise.

{need to discuss overall effects on maintenance with Asset Sponsorship}

3.2.4 Impact on Revenue

Traffic Modelling is needed to inform the expected impact on bus revenue associated with changes in journey times.

3.3 Explanation of Social / Strategic Benefits

Benefits have been quantified where possible using the Business Case Development Manual, and are reflected in the Journey Time Calculator and Ambiance Calculator spreadsheets.

3.3.1.1 Monetised Benefits

Journey Time Calculator

- This will be informed by the results of modelling using the traffic counts collected for the schemes in June 2016
- Bus Origin Destination Survey (BODS) data has been obtained for scheduled bus routes together with details of current frequencies to calculate overall impacts on passenger value of time in conjunction with the traffic modelling
- For private vehicles a car occupancy factor of 1.2 has been assumed

Journey Time Benefits

10,553 No. of trips[1] in 3-hour a.m. peak	X	xx.x min Journey time saving[2] between locations xxxx and xxxx	X	£0.2585 Value of time per min	X	1.2 Average crowding penalty applied[3]	X	305 Annualisation factor (from a.m. peak to a year)	=	£xxxK Annual benefit

[1] Source of estimate: Traffic Counts, 22nd June 2016

[2] Estimate derived by: VISSIM modelling

[3] Estimate derived by: Standard assumption of car occupancy factors

Ambiance Calculator

TfL's Business Case Ambiance Calculator has been used to quantify the monetary benefits for pedestrians, cyclists, bus passengers and car passengers (including Freight) where applicable. The sheets for Underground, DLR, Trams, Rail and Cycle Hire are not applicable for this project.

The total monetary value shown in the Ambiance Calculator is currently **£594,660 per annum** based at 2020 prices.

No analysis has at this stage been done on the impacts of the scheme on different population groups. An Equality Impact Assessment will need to be undertaken separately in due course prior to Stage Gate 2 approval. This will also be informed by a formal public consultation exercise prior to Stage Gate 3 at the end of Concept Design.

Pedestrian Benefits

The Ambiance Calculator has used benefits for pedestrians for the following features, with a current benefit of **£339.4k per annum**;

- Footway widening in Norwood Road. There are sections of the pavement where it is too narrow to allow two people to walk side by side in the before case to Pavement is wide and two people can always walk side by side. It is assume this benefit is for one minute of journey time, and applies to 3,672 pedestrians per day (7am-7pm) for 332 days per year

  This pedestrian flow came from bus BODS data for boarders and alighters in Norwood Road and routes redirected to use Norwood Road including Route 2. It may be an underestimate – more pedestrian data is needed to complete this

- Convert zebra crossings at Christchurch Road/Hardel Rise and Tulse Hill/Hardel Rise to a direct green man crossing with pedestrian countdown

Both junctions had pedestrian counts undertaken on Tuesday 21 June 2016, Wednesday 22 June 2016 (both 7am-10am and 4pm-7pm) and on Saturday 25 June 2017 (11am-5pm). The weekday peaks have been averaged, and the weekday inter-peak assumed to equal the Saturday inter-peak. The counts also included cyclists using the zebra crossings

- A reduction in the speed limit throughout the gyratory from 30mph to 20mph, as per the Mayor's Vision Zero Action Plan (2018), benefiting at least 4,513 pedestrians per day

  This figure came from BODS data boarding and alighting counts for all bus routes in the Tulse Hill gyratory between 7am-7pm on a weekday. It may be an underestimate of total pedestrian flows

- Provide Seating in Norwood Road. This is assumed to benefit at least 3,672 pedestrians per day

  This figure came from BODS data boarding and alighting counts for routes in Norwood Road and routes re-directed to use Norwood Road between 7am-7pm on a weekday. It may be an underestimate of total pedestrian flows

- Provide Street Signs (Legible London). This is assumed to benefit 4,513 pedestrians per day, upgrading signs from those to public transport to local area maps, information boards, and signed routes

  This figure came from BODS data boarding and alighting counts for all bus routes in the Tulse Hill gyratory between 7am-7pm on a weekday. It may be an underestimate of total pedestrian flows

- *Plants and Public Art in Norwood Road to benefit 3,672 pedestrians per day. This changes from no plants to plants in well chosen locations*

  This figure came from BODS data boarding and alighting counts for routes in Norwood Road and routes re-directed to use Norwood Road between 7am-7pm on a weekday. It may be an underestimate of total pedestrian flows

It is assumed these benefits will last for 30 years. At this stage the ambiance benefits for pedestrians is assumed to grow at 2% per annum to reflect wider policy and population change.

There are the following pedestrian benefits identified but where survey data is needed to quantify this and planned to be undertaken before the end of feasibility in 2019/20 financial year.

- Footway widening in Tulse Hill (south side). No pedestrian count data is currently available and there are no bus stops in this location
- Pedestrian Countdown installed at Norwood Road/Tulse Hill and Norwood Road/Christchurch Road. No pedestrian count data is currently available for either of these junctions
- Pedestrian crossing improvements at Norwood Road/Tulse Hill and Norwood Road/Christchurch Road. No pedestrian count data is currently available either of these junctions. Currently pedestrians have to cross in two or three stages, rather than a single stage
- Completion of these surveys will also enable the above calculations for a reduced speed limit, seating provision, and public art to be revised

Cycling Benefits

The Ambiance Calculator has used benefits for cyclists for the following features, with a current benefit of **£70.38k per annum**;

- Segregation of a northbound cycle track in Norwood Road (from buses) of 72m in length used by 463 cyclists per day, wide enough for two side by side cyclists
- Segregation of a southbound cycle track in Norwood Road (from all traffic) of 72m in length used by 183 cyclists per day, wide enough for two side by side cyclists
- Segregation of a westbound cycle track in Tulse Hill (from all traffic) of 133m in length on the north side to reduce conflict with parked cars and provide a direct route towards Brixton via Tulse Hill, used by 146 cyclists per day
- Segregation on an eastbound cycle track in Tulse Hill (from traffic) of 133m in length used by 95 cyclists per day
- Routes to avoid a roundabout offering no priority to cyclists, to where traffic signals have been adapted for cyclists, for 780 cyclist per day (adjusted from total cycling journeys counted on Wednesday 22nd June 2016, minus those cyclists already using the northbound contra-flow bus lane)
- Signage – a change from no specific signage for cyclists to cycle route with branding and maps for 1202 cyclists per day for the whole gyratory

- 40mm carriageway resurfacing to improve smoothness of ride for 1202 cyclists per day using the gyratory
- Cycle parking provision. An assumption has been made that if provided on street, cycle parking would be used by 50 cyclists per day. There is currently limited parking provision and no data has been collected indicating the potential demand for cycle parking

It is assumed this benefit will last for 30 years.

Further work is needed to see how the provision of segregated cycle facilities may induce additional demand as some existing trips avoiding the gyratory may re-route upon the improvement of infrastructure, and some new trips may be generated. At this stage, the Business Case assumes an increase of 5% per annum in the value of ambiance benefits for cyclists reflecting demand growth.

Cycle count data for the gyratory was undertaken on Tuesday 21st June, Wednesday 22nd June 2016 and Saturday 25th June as part of wider traffic surveys. For the weekday peak periods (07.00-10.00 and 16.00-19.00) data for the Tuesday and Wednesday was averaged across both days, whilst the weekday inter-peak has assumed the same level as counted on a Saturday between 11.00-17.00. The number of days included in the aggregation to a full year is 305.

Bus Passenger Benefits

The Ambiance Calculator has used benefits for bus passengers for following features, with a current benefit of **£8.45k per annum**;

- 40mm of carriageway resurfacing to improve smoothness of ride throughout the extents of scheme for 21,173 bus passengers per day based on BODS counts done on bus routes between 7am-7pm at various times according to when routes were resurveyed for tendering purposes. This excludes passengers on Route 415 as no data was provided.
- An upgrade in seating for 4153 boarding passengers per day (7am-7pm) in Norwood Road assuming changing seating from bench style seats to seated seats with little cushioning.

It is assumed this benefit will last for 15 years.

No growth or reduction in bus passenger ambiance benefits has been assumed.

Car Passenger Benefits

The Ambiance Calculator has used benefits to car passengers for the following features with a current benefit of **£106.91k per annum (peak period)**;

- 40mm of carriageway resurfacing to improve smoothness of ride throughout the extents of the gyratory, applied for 21,530 known vehicles during 6 hour weekday peak periods (07.00-10.00 and 16.00-19.00) as counted on Wednesday 22 June 2016[2], per weekday, for 340 days per year, and

It is assumed this benefit will last for 15 years until the asset is life expired and needs to be resurfaced.

No growth or reduction in car passenger ambiance benefits has been assumed.

This benefit may reduce if traffic flows reduce on in association with policies set out in the MTS.

HEAT Tool

The benefits to health from existing levels of Walking and Cycling are captured through v2.4 of the World Health Organisation's HEAT tool.

Pedestrian and cycle counts have been undertaken at specific crossings, although there is further work to do on crossings in Norwood Road. This data does not through reflect journey origins and destinations and there is a risk of double counting,

BODS bus passenger boarding and alighting data shows that each weekday there are 4,513 movements between 7am and 7pm. This does not include all pedestrians who may be making journeys to the rail station, local shops or passing through, and this data does not record the average walk length. Using this value and an assumed walk length of 10 minutes for each pedestrian (at a speed of 1.2m/s covering 0.72km), and an average age profile, and assuming the scheme generates a compound growth rate increase in the number of walking trips per annum of 2 per cent per year, over 30 years, the number of daily walking trips increases to 8,174 per day. Assuming a 305 day year, the current value of the additional walking trips (growth of 3,661 daily trips) is £322,000 per annum.

From cycle count data, a weekday 7am to 7pm flow of 1,202 cyclists is recorded in 2016. Using this flow and an assumed cycle trip length through the scheme area of 200m per cyclist (approximately the extents covered in Norwood Road as the main cycle corridor), 305 days per year (assuming half the weekday value at weekends), a

[2] Saved in M:\03 - Network Sponsorship\03.03 Central 2\02. Lambeth\Healthy Streets £1-5m schemes\TC.009.3005081 - A205 Tulse Hill Gyratory\Traffic Data

younger cycle age population profile (25-44), and a growth rate of 5 per cent per annum (compound growth), the current value of additional cycle trips over 30 years is **£9k per annum.**

Table XX - HEAT Summary

Mode	Current daily trips	Growth Rate per annum	No. of trips after 30 years	Growth in daily trips	Average Distance or duration per trip	Age profile assumed	Current value of Health benefits per annum
Walking	4513	2%	8,174	3,662	10mins	Average adult (25-76)	£322,000
Cycling	1202	5%	5,195	3,993	200m	Younger adult (25-44)	£9,000

SART Tool

Cyclists are shown to have 1.3 days working days less absence. It is assumed that 65% of cyclists are in employment, and they earn an average of £133.68 per day.

The SART tool calculates that by saving 1.3 days per year through cyclists being off sick from work. If the scheme generates 3,993 additional daily trips from people who are currently not cycling and assuming 65% of new cycling trips are by people in employment the value of sickness absence is **£451,048** at current values.

{Needs checking}

Safety Benefits

The safety performance of the existing gyratory for the 36 month period to the end of July 2018 is shown in Table 1. The total number of collisions in this period was 35.

At this stage, the business case has assumed a reduction of XX slight personal injury collisions of the 35 over a 3 year period, at a benefit of **£XX** per annum.

This needs to be validated through a detailed analysis of recent collision history to see if this assumption in the business case is realistic.

It is assumed this value of saving inflates with value of time.

3.3.1.2 Quantified (But Not Monetised) Benefits

Benefits that can be quantified but not necessarily monetised at this stage include;

- A reduction in air pollution in Norwood Road and Christchurch Road arising from a reduction in the amount of traffic based on the traffic count data in June 2016. This cannot be monetarised as the ambiance calculator does not have a monetary value for this. Traffic modelling and air quality modelling based on the traffic modelling may be able to monetarise this
- The scheme may increase the economic performance of local businesses. This could be quantified by looking at the amount of footfall, number of vacancies, and customer satisfaction surveys. The benefit cannot easily be monetarised as the data is likely to be commercially confidential. The public consultation will indicate whether the proposals are supported

3.3.1.3 Non-Quantified Benefits

Benefits that cannot be quantified include;

- The overall increase in pedestrain ambiance in Norwood Road arising from the significant reduction in vehicular traffic – this is because TfL BCDM has no overall values for this based on other gyratory removals in London, which are limited in number
- The reputational benefit of building relationships and fostering a different way of working with local communities

- Benefits to Third Parties who may experience a change in the value of land or property, or local govnernment in form of taxes on businesses and housing. This is because these values cannot be accuratly forecast by TfL and is outside TfL's remit, and such factors are also determined by wider economic and social variables
- Changes in the level of car parking; again because TfL does not hold values for car parking or has modelled the demand for parking
- The likely reduction in road traffic capacity arising from the removal of the gyratory has a benefit in contributing to the Mayor's target to reduce the volume of traffic in London
- Benefits outside 7am-7pm where count data is unavailable

3.4 Key Assumptions

Key assumptions have been made that the scheme's benefits are valued at a rate consistent with the London wide values of time, and values per ambiance benefits – i.e. no bespoke 'willingness to pay' exercises have been undertaken where benefits are valued at a rate which differs from London-wide values.

A Key assumption is that Walking will grow by 2 per cent per annum and Cycling will grow at 5 per cent per annum. The overall level of traffic is assumed to reduce by 2 per cent per annum – these all reflect policies in the Mayor's Transport Strategy (2018) and local planning policies.

3.5 Feasibility, Risk

There have been no previous feasibility studies to investigate the removal of Tulse Hill Gyratory.

Traffic Modelling to inform the viability of the proposals is based on traffic count data collected in June 2016 and the emerging design informed by the local Community's Vision. Traffic Modelling will conform to TfL Modelling Guidelines.

The proposals are considered to be deliverable at this stage, although implementation will require temporary traffic management and be disruptive. A Buildability assessment would be commissioned within PPD beyond Stage Gate 2 as part of the concept design.

At this stage standard commercial risk has been applied 'top down' of 30% on estimated base cost.

The main risks identified are;

- Funding is not available to progress the scheme to a timescale expected by stakeholders
- Staff Resource for design, project management and delivery is not available to progress the scheme to a timescale expected by stakeholders
- Traffic modelling indicates that traffic re-routes to alternative corridors and either the scheme is opposed by local residents or additional mitigation measures (and hence costs are incurred) on Borough roads
- Cost estimates change as the design evolves, placing additional pressures on available budgets
- There are insufficient opportunities to identify Third Party Contributions
- There are insufficient benefits versus the outturn costs
- Benefit assumptions – such as collision savings – are not realised due to behavioural factors, and changes in demographic trends (e.g. greater online shopping affecting traditional high street retail) affect levels of walking, cycling and public transport use

3.6 Outcome of Quantified Analysis

{Awaiting Traffic Modelling to complete analysis}

- The calculated Benefit:cost ratio is XX/ extent to which financially positive
- The proposal is forecast to become positive in XX years/months.
- Sensitivity to disregarding any third party contributions to cost, i.e. using only net cost to TfL

There are no third party contributions modelled in the business case.

- Sensitivity to assumptions associated with the most uncertainty
- Break even analysis – sensitivity tests testing most uncertain elements to show how these would need to change to make the net financial effect zero (or for social business cases show what would need to change to make the benefit to cost ratio 1.5:1).
- How representative is the quantified analysis of the project's value, given any benefits not included?

Table 1: Economic Appraisal, Net Present values (NPV)

	Option 1 Preferred	Option 2	Option 3	Option 4	Option 5
Project Management					
Feasibility					
Concept Designs					
Detailed Designs					
Main Works					
Project EFC (Discounted)					
Other Capital Costs					
Operating Costs					
Revenue					
Secondary Income					
Savings					
Net Financial Effect (NFE)					
Payback Period (years)					
Time Benefits Mode 1					
Time Benefits Mode 2					
Time Benefits Mode 3					
Ambience Benefits					
Safety Benefits					
Health Benefits					
Other Monetised Benefits					
Benefit to Cost Ratio					
Sensitivity Test 1					
Sensitivity Test 2					
Sensitivity Test 3					

3.7 Economic Case Conclusion

The Table below is a suggested way of illustrating option selection where the benefit to cost ratio is too narrow to express the full benefits of the scheme. To enable decision makers to decide whether the proposal is value for money, quantified evidence should be presented and the question posed: "are these benefits worth this financial impact?" If the answer is yes, then this is considered value for money.

New statistics such as the Management of Value Value Ratio should be explained in all cases to ensure that there is no misunderstanding as to what it actually represents.

{Need to apply Management of Value}

Table 2: Appraisal Summary Table

Statistic	Option 1 (preferred)	Option 2	Option 3
MTS Outcome: Reducing the numbers of road traffic casualties	33% collision reduction (41 collisions avoided)	25% reduction (31 collisions avoided)	10% reduction (12 collisions avoided)
MTS Outcome: Facilitating an increase in walking and Cycling per day	25% increase cycling (+183 cyclists) 20% increase in walking (+2342)	18% increase in cycling (+131 cyclists) 18% increase in walking (+1686)	2% increase in cycling (+14 cyclists) 2% increase in walking (+187)
MTS Outcome: Enhancing streetscape, improving perception of urban realm and developing 'better streets' initiatives	£220k pa ambience benefits	£186k pa ambience benefits	£33k pa ambience benefits
Bus / General Traffic disbenefits	£3,889k pa	£3,165k pa	£1,243k pa
Other Social Benefits	£2,704k pa	£2,064k pa	£945k pa
Total Social Benefits	-£1,186k pa	-£1,101k pa	-£298k pa
Lifecycle Benefits	-£75.9m	-£70.5m	-£19.0m
Lifecycle Cost	£24.4m	£30.7m	£20.6m
Benefit to Cost Ratio	Not appropriate as both top and bottom are negative.		
Land Value Uplift (private benefit pa)	£12m	£10m	£6m

Third Party contributions	£10m	£6m	£1m
Lifecycle Cost net of third party contributions	£14.4m	£24.7m	£19.6m
GLA, LB Southwark, Local Community Support	Preferred	2nd Preferred	Least preferred
Management of Value Ratio. Fit against strategic objectives per pound spent[3].	9.4:1	4.6:1	0.8:1
Interpretation: The BCR is not applicable in this instance because both the top and bottom are negative i.e. there are social disbenefits and a cost. This is as a result of the significant disbenefits to bus and other road users due to the reallocation of space to cycling, walking and urban realm. The preferred option 1 maximises the strategic objectives of improving safety, encouraging active travel and improving the public realm. This option is strongly supported by City Hall, LB Southwark and the local community and maximises development potential – raising Land Values by £12m and extracting £10m of third party contributions to offset project costs. The Value Ratio of 9.4:1 also shows that this option best fulfils the strategic objectives per pound spent. This project contributes to the wider city strategy of regenerating local communities with poor quality public realm to enhance housing provision and job opportunities. This will allow London to expand in a sustainable and life enhancing way to cater for an additional 2m people by 2030. Because of the overall negative social benefits, which do not fully reflect wider benefits, value for money is a judgement call that creating a nice place, encouraging active travel and addressing safety concerns but putting up with additional bus and other road user delays is worth the £24.4m cost. Removing third party contributions (which is maximised with the preferred option) reduces the cost to TfL to £14.4m.			

4 Commercial Case

Detailed Design and Implementation for the scheme will be through the successor to the current LoHAC contract, and the contracts covering traffic signals and bus shelters.

Currently no commercial discussions have taken place because the project has not matured to that stage where contracts to external suppliers are being placed and is still in feasibility design. A procurement strategy in due course will be developed to reflect the method of delivery. It is likely that a [redacted] will be used where commercial risk will be transferred to LoHAC's successor, but it will be necessary for TfL to budget for contingencies including site compensation events.

[3] A Management of Value Ratio is a metric that represents the extent to which a project or activity contributes to a defined set of objectives or criteria. It provides a structured way of assessing the volume of benefit or benefits generated per pound of spend. It can not asses absolute value for money because it does not compare monetised benefits and costs however it can demonstrate relative value for money i.e. that one option is better than another at contributing to a common strategy.

A consideration to be determined will be how bus contacts are compensated during the implementation phase if mitigations are unsuccessful in maintaining journey time reliability within existing resource levels.

5 Financial Case

The project was not included in the December 2018 Business Plan covering 2019/20 to 2023/24 but was in superseded Business Plans. The main reason this was revised was due to overall funding constraints arising from the delay to the opening of Crossrail, increasing cost pressures for that project and delaying income to fund other projects. The project currently has no Third Party Contributions identified, unlike other projects that have remained in the December 2018 Business Plan.

It is intended that feasibility will be completed and the project further reviewed when Stage Gate 2 is met against any available funding that may arise if other projects are delayed in a future business planning round.

5.1 Financial Impact

Table 2: Financial Impact – Outturn project and opex costs, revenues, and savings.

UIP / ST-PJ477	Spend to date (to Pxx)	2015/16 (remainder)	2016/17	2017/18	2018/19	2019/20	Future Years	TOTAL
Feasibility	[redacted]							
Preliminary & Detailed Design Fees								
Advanced Works/Utilities							[redacted]	
Main Works							[redacted]	
TFL Staff costs (Salary/Pension/NI)								
TFL Support Services Costs (IM)								0
TFL Support Services Costs (Accom)								0
TFL Support Services Costs (HR)								0
Total Base Cost								[redacted]
Risk								[redacted]
Total Estimated Final Costs								[redacted]
Opex Cost / Revenue Area 1								
Opex Cost / Revenue Area 2								
Suport Services Costs Ongoing								
Savings								

5.2 Funding

Table 3: Funding

UIP / ST-PJ477	Spend to date (to Pxx)	2015/16 (remainder)	2016/17	2017/18	2018/19	2019/20	Future Years	TOTAL
External contributions								£0m
Total External Funding								£0m
UIP / ST-PJ477								
Total Funding in Budget / Business Plan (1)								[redacted]
Plan Surplus / (Shortfall)							[redacted]	[redacted]
Current Authority	[redacted]							
This Authority (2)								
Future Requests							[redacted]	

(1) TfL Budget / Plan is the approved budget. If you wish to also show a phased comparison to the latest forecast this should be done in a separate table.
(2) For the request (if any) that this version of the business case is supporting.

5.3 Expected Final Cost History Comparison

Table 4: EFC History

UIP / ST-PJ477	Current Business case	Gate 1	Gate 2	Gate X	Gate X
Date	Mar 2019	Apr 2015			
Feasibility		[redacted]			
Preliminary & Detailed Design Fees	[redacted]				
Advanced Works/Utilities	[redacted]				
Main Works	[redacted]				
TFL Staff costs	[redacted]				
Other costs					

Total Base Cost	[redacted]	[redacted]			
Inflation	[redacted]				
Risk	[redacted]				
Total Estimated Final Costs	[redacted]	[redacted]			

Since the Gate 1 (Seed Funding) estimate, more accurate costs have been calculated by the Commercial team relative to the initial estimate by Sponsorship. This has included uplifts for buses in construction, and Sunday and night time working, and inflation to 2025 reflecting a delay in the build due to funding availability, which was not foreseen when the project started.

6 Management Case

The project is not currently available in terms of Business Plan allocation but this is subject to change if other schemes are subsequently delayed and if modelling indicates a viable scheme and if public consultation is supportive.

6.1 Project Milestones And Timescales

UIP / ST-PJ477	Current Forecast	Gate 1	Gate 2	Gate 3	Gate 4
Date	Apr 2019	Apr 2015			
Complete Feasibility	Sep 2019	Oct 2017			
Single Option Selection	Sep 2019	Oct 2017			
Public Consultation	Tbc*				
TMA submission	Tbc*	Oct 2018			
Start Detailed Design	Tbc*	Dec 2018			
Traffic Orders	Tbc*				
Commence works	Tbc*	Mar 2020			
Practical Completion	Tbc*	Mar 2021			

Tbc* - subject to funding availability

6.2 Measures of Success / Benefit Realisation

Measures of Success	Measure / Baseline / Expected Value
Healthy Streets	An uplift in the overall Healthy Streets score by more than 10 percentage points through design iteration by September 2019
Ambiance	An increase in the numbers choosing to walk and cycle through Tulse Hill gyratory comparing the 2016 and 2019 before data, to be repeated immediately before construction and after data
Bus reliability	No deterioration in peak journey time reliability relative to 2019 levels
Safety	Collision reduction relative to the 35 collisions recorded in the 36 month period to July 2019, relative to 36 months of after collision data
Cost savings	Value engineering efficiencies of 10 per cent in the current cost estimate
Public Support	Overall support at public consultation

The above will be reflected in a Benefits Management Strategy for the proposal.

7 Summary

7.1 Overall Assessment

The assessment shows ambiance benefits from the Community's preferred option that should contribute towards Healthy Streets and Vision Zero through speed reduction, as indicated by the HEAT and SART tool assessments. Traffic modelling needs to be completed to inform whether it is viable in operational terms with the current level of traffic and future levels of traffic and finalise a Benefit: Cost Ratio. A revised layout with less physical capacity for traffic should align with the Mayor's MTS policy to reduce the level of traffic in London. The SAF analysis indicates a good alignment to priorities for this scheme.

The main risk is that of available funding given wider financial pressure arising from the delay to Crossrail and wider economic influences.

The increase in project EFC from [redacted] to a Likely case of [redacted] reflects a finer level of estimation and allowances for risks and inflation to an assumed opening date of 2025 from 2021.

7.2 Next Steps

The business case needs to be further refined and updated when traffic modelling results become available.

Completion of the Healthy Streets design check.

Some further pedestrian surveys would complete the Ambiance benefit calculations for pedestrians in Norwood Road.

An Equality Impact Assessment needs to be completed.

This business case will be updated when the above are completed. It is expected this could be by September 2019.

APPENDIX A: Consultation

This section is a reminder for areas that should be consulted if there is an impact on their area. Delete those that are not appropriate, add others in as required.

Blanket consultation approaches do not work for the most important sign offs of particular aspects. Consultation should not be a generic "are you happy with this case? Please send any comments on this 100+ page business case by the end of next week otherwise I will assume you are happy." This is not proper or effective consultation.

What works is tailored consultation throughout production, so if you have agreed the ongoing opex costs with the operational finance people, and that is documented in an email, then that should be described in the "Aspect Reviewing" column and the response should be whether they have agreed to your figures or not. You could follow up by sending them the business case and saying "as agreed, the opex costs are set out in 3.2.3, are you still ok with this?"

This approach is much more useful in evidencing the robustness of the business case, which is what the consultation section is for. It is particularly important to make sure that the following roles have provided approval for their areas of expertise:

- The project delivery team – if they have not bought into the project cost estimates and the business case as a whole that sets out what they are to deliver, this implies that it may not be deliverable to the value set out.
- The opex / capex / other budget lines finance people – they need to confirm that these budget lines are robust and are budgeted / accounted for in the right way.
- The asset owners / operators once they transition to business as usual – if they do not meet these needs, then the value may not be optimised or delivered.
- The Business Case Functional Lead, who can help you in advance of any assurance / authority request and who can help you produce a quality product that can withstand external scrutiny on the robustness of TfL decision making.

Above all, remember that this is the section that evidences to the ACCOUNTABLE SPONSOR that it is ok to approve the document and that the right people have approved the right aspects of the projects. This is not a generic box ticking "have all these people seen a 100+ page business case and objected to anything that it contains". It is essential that this section is used correctly now that the Business Case Functional Lead does not sign the front of business cases from a quality point of view.

Response: e.g. No Response, Supports, Does Not Support, Comments Included – Supports, Comments Included, Approves Content, more detailed text is encouraged.

Contact	Department	Aspect Reviewing	Response
Generic			
Ryan Taylor, Business Case Functional Lead.	**TfL Finance, Group Business Planning and Performance**	**Whole document, robustness, best practice.**	
Glynn Barton	Surface Traffic Operations	Where impact on traffic	
Delivery Department (PPD etc.)	**Project / Programme Manager (responsible for delivery)**	**Whole project**	
Delivery Department	**Commercial Manager**	**Cost estimate for project**	
	Other stakeholders as necessary		
	Any budget holder for areas where opex affected.		
Surface Specific			
Jackie Neville	**Finance Business Controller**	**Financial Impact**	
Lilli Matson	Business Planning	Whole Document	
Muhammad Ali	Environment Manager	Environmental Issues	
	Other areas within Surface impacted by project as appropriate.	Where impact	

APPENDIX B: Options – March 2016 workshop

Reproduced from Pages 7-11 of the July 2016 Vision Document

Codesigning The Vision

The codesign process took the form of two two-hour workshops held on weekday evenings in a café/community space located on the gyratory itself, on Norwood Road. The outcomes of these workshops is summarised below:

Gyratory Codesign Workshop 1 February 2016
The first of the two gyratory-focussed workshops was arranged in three parts which are summarised below:

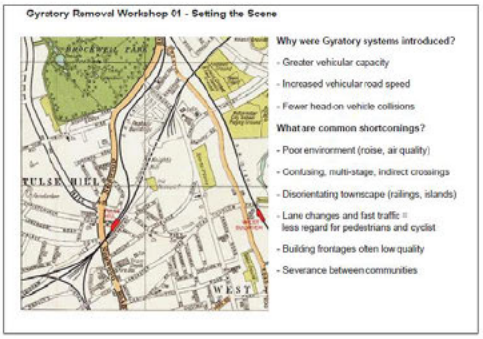
Part 1: The Steering Group team prepared a presentation which provided a detailed appraisal of the existing gyratory system, how traffic movement works, why it was first implemented and how the urban grain of the area changed during its construction.

Part 2: This second part used four recent gyratory removal projects (as discussed previously with the Steering Group) to explain the significant benefits that gyratory removal can bring, but to also make it clear that some consequences are inevitable, particularly local traffic displacement and the potential for additional queues during and shortly after construction. This part of the presentation highlighted the need to reach a solution 'on balance' so that the codesign group had an understanding of the likely negative as well as significant positive consequences of change.

Part 3: This final part of the initial workshop involved the codesigners working in groups, aided with packages of recent photographs and plans to identify specific shortcomings and issues they experience on a day-to-day basis with the current road layout, as well as identifying potential opportunities and aspirations. Specific issues raised by the codesign group included:

- Disorientating, indirect and constrained road crossings which deterred some people from walking or using buses entirely and was clearly a problem for everyone who moves on foot through the area.
- High road speeds leading to excessive vehicle noise and poor environmental conditions.
- Awkward access routes to the station, particularly on foot, for those approaching from the north or west.
- Difficult trading conditions for local shopkeepers whose businesses are negatively impacted by the 'island' conditions created by the gyratory.
- A clear observation that communities on either side of the gyratory are inward-looking, turning their backs on the gyratory, which in turn limits cohesion and integration between those living north and south of the gyratory.
- Highly challenging conditions for cyclists which are thought likely to deter cycle travel for all but the most confident of bike riders. Even the confident cyclists in the Codesign group noted they would normally take less direct routes, particularly when travelling north-south, to avoid having to navigate the one-way system.
- Dispersed and disorientating bus routes – there was a request that this was analysed in more detail by the designers before the second workshop to gain a fuller understanding of routing and potential bus stop locations.

At the end of this workshop, each group (of 4) was asked to summarise their findings and these items were sited by the significant majority of attendees. A vote was also taken to ask if those attending were likely to support a gyratory removal project, in the knowledge of the likely negative as well as positive impacts. All but two of those attending were in favour of progressing with the gyratory removal project and support for the initiative was clearly overwhelming.



The first gyratory codesign workshop explained the background to the current road system, used gyratory removal examples to explain what might be possible and asked people to work in groups to make initial observations.

Codesigning The Vision

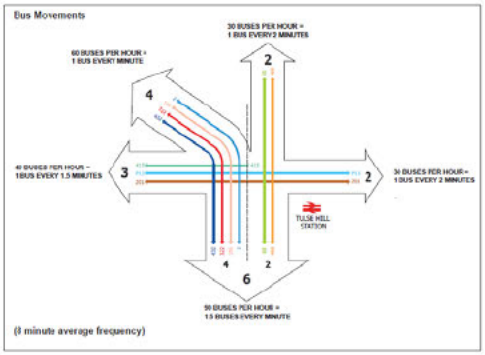
Codesign Workshop 02 March 2016

The focus of the second workshop was specifically to explain and take community views on four options for gyratory removal. In response to the discussion about bus movements in the previous workshop, a summary of bus routes and stops was presented and explained to the codesign group at the start of the workshop. This was of particular significance in assessing partial closure options and the likely weight of bus traffic through the 'closed' arm of the gyratory. This demonstrated that the largest volume of bus movements is diagonal across the gyratory, between Norwood Road and Tulse Hill.

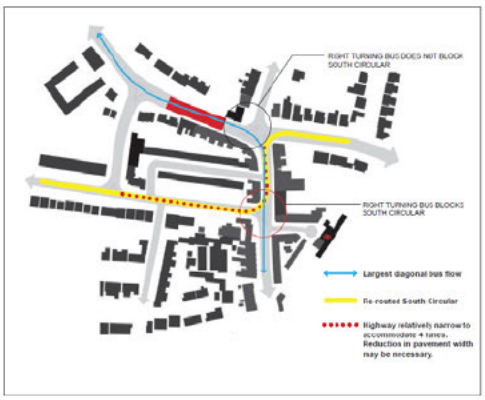
The four options presented were as follows:

Option 1: Partial closure of the north arm of the gyratory
Bus, cycle, pedestrian, timed servicing only on the northern arm, with two way south circular traffic diverted north-south down Norwood Road, east-west along Christchurch Road. Observations made by the codesign group included:

- A high proportion of bus movements would need to run through the partially closed arm of the gyratory
- The relatively narrow width of Norwood Road in respect of two-way traffic
- The likelihood of right turning buses blocking the south circular at the junction of Norwood Road and Christchurch Road (with potential capacity impacts on south circular traffic flows).
- The non-commercial and largely blank frontages on either side of the partially closed arm which would not provide an animated commercial environment and the environmental and severance improvements associated with partial closure would not benefit existing businesses.
- Limited benefit in terms of interchange with the rail station as the two-way south circular flows would form a pedestrian barrier between local homes and business immediately to the west and north of the station.
- Limited benefit in re-establishing the neighbourhood connections between Herne Hill and Tulse Hill along the historic (pre gyratory) road alignment of Norwood Road.



Diagrams used in the first workshop to explain the weighting of bus movements, the location of stops and how this might impact options assessment.



Tulse Hill Gyratory - North Arm Partial Closure

Codesigning The Vision

Option 2 – partial closure of the east arm of the gyratory
East arm confined to bus, cycle, pedestrian, timed servicing only, with two way traffic diverted onto Tulse Hill and Christchurch Road. Observations made by the codesign group included:

- A low proportion of bus movements needing to run through the partially closed arm of the gyratory
- Greater available road width on the north and west of the Gyratory to cope with two-way south circular flows.
- Reduced likelihood of right turning buses causing blockages on the south circular
- High quality, commercial frontages including a range of existing café's and local businesses located on either side of the partially closed arm, with significant potential to create an animated, welcoming and safe environment which could mark a step-change in the perceived quality of the town centre.
- Significant benefit in terms of interchange with the station with the partially closed arm making pedestrian access from the west and south substantially easier and less constrained by the two-way south circular traffic flows. Access from the north would still be restricted by the south circular movements, but this is an existing condition that would not be made worse.
- Significant benefit in terms of reinstating the historic connection between communities in Tulse Hill and Herne Hill along Norwood Road.
- This option would require closure of the eastern end of Perran Road, the residential road located in the centre of the gyratory.

Tulse Hill Gyratory - East Arm Partial Closure

Codesigning The Vision

Option 3 – Partial closure of the southern arm of the gyratory
South arm confined to bus, cycle, pedestrian, timed servicing access, with two way traffic diverted north and west along Herne Hill and Christchurch Road. Observations made by the codesign group included:

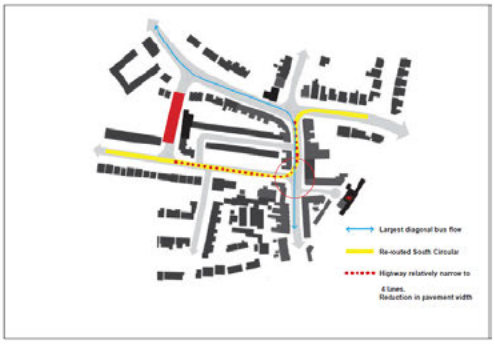
- A high proportion of bus movements would need to run through the partially closed arm of the gyratory.
- Greater available road width on the north and west of the Gyratory to cope with two-way south circular flows.
- Reduced likelihood of right turning buses causing blockages on the south circular.
- A mix of frontages comprising car parks and residential garden walls on the south side and private garden walls on the north side of the partially closed arm which have little potential to create animated, active frontages, with little benefit to local businesses gained from the environmental improvements along the partially closed arm.
- No significant benefit in terms of station interchange, though for those living immediately south of the gyratory, road crossings may be slightly improved.
- No benefit in terms of the neighbourhood connections between Herne Hill and Tulse Hill.
- This option would require closure of the southern end of Perran Road, the residential road located in the centre of the gyratory.

Tulse Hill Gyratory - South Arm Partial Closure

Codesigning The Vision

Option 4 – Partial closure of the western arm
West arm confined to bus, cycle, pedestrian and timed servicing only, with two-way south circular traffic diverted north and east of the gyratory along Herne Hill and Norwood Road. Observations made by the codesign group included:

- A low proportion of bus movements would need to run through the partially closed arm of the gyratory
- The relatively narrow width of Norwood Road in respect of two-way traffic
- The likelihood of right turning buses blocking the south circular at the junction of Herne Hill and Norwood Road (with potential capacity impacts on south circular traffic flows).
- The non-commercial frontages on either side of the partially closed arm which would not provide an animated commercial environment and the environmental and severance improvements associated with partial closure would not benefit existing businesses.
- No significant benefit in terms of interchange with the rail station as the two-way south circular flows would form a pedestrian barrier between local homes and business immediately to the west and north of the station.
- No benefit in re-establishing the neighbourhood connections between Herne Hill and Tulse Hill along the historic (pre gyratory) road alignment of Norwood Road.



Tulse Hill Gyratory - West Arm Partial Closure

APPENDIX C: Quality Checklist

Delete this section when checked.

Style

- Do you have a clear story based on the decision being made?
- Have you stripped out any irrelevant detail?
- Has any specialist jargon been removed?
- Have you removed all the blue guidance text from the business case narrative?

Content

- Do you clearly specify where you are in the project lifecycle?
- Does your business case answer the Five Case questions (see business case narrative template)?
- Did you download and use the latest templates (narrative and spreadsheet) from Source / Pathway?
- Does your business case align with what is in the Authority Paper?
- If approval is required from HM Treasury, DfT or Public Inquiry, have you done a full Five Case compliant Business Case?

Strategic Case

- Are your investment objectives clear and do they align to the TfL Corporate, Operating Unit or Department strategy (define by the end of Pathway Stage 1)?
- Do you discuss why the project needs to take place at all?
- Do you highlight the problem or opportunity with the current arrangements?
- Does your business case discuss the real benefits of the project, even the ones that do not fit into the benefit to cost ratio?
- Does your business case seamlessly fit into a hierarchy of business cases (strategy, portfolio, programme, project etc.)?

Economic Case

- Have you included all costs and benefits over the lifecycle of the asset being put in place?
- Have you included disbenefits as well as benefits?
- Are the data and calculations correct?
- Is there enough supporting data and can your benefits be justified?
- Have you considered commercial opportunities / revenue streams?
- Have the key risks been identified?
- Have you included provision for risk and optimism bias?
- Have you included a benefit to cost ratio?
- Is there a clear option selection identified (Stage 2 onwards)?
- Have you included sensitivity tests to highlight potential risks to option selection or value for money decisions?
- If the option selection has been demonstrated using Management of Value, has the robustness of this been set out?

- Is the optioneering process clearly documented with reasons why options have not been progressed and has any viable options been omitted? (Stage 2 onwards)?
- Have you demonstrated value for money or indicated what should be taken into account when judging value for money?
- Is the appraisal (value for money / option selection) set out in discounted values?
- Is the Appraisal Summary Table included and interpreted to guide senior management decision making?
- Have you considered the delivery method (design and build, Agile, PFI, internal resource) or the "Why now?" question as options?
- Have you remained objective to obtain neutral information to inform / document business decision making or have you been optimistic and biased to justify a decision that has already been made?

Financial Case

- Are the project costs and other budget impacts clearly set out (opex, revenues, savings) in outturn values in the Financial Case?

Commercial Case

- Have you indicated the preferred procurement approach and any other likely commercial implications for any other contracts (e.g. operations)?

Management Case

- Has benefit realisation been considered (measures identified Pathway Stage 1, estimated values Stage 2, baseline measures Stage 4, realisation evidence Stage 6 onwards)?
- Have you set out the expected timeline for the project?

Consultation

- Have the consultations been tailored to get buy in to specific aspects or has consultation taken place using the less effective and generic "please comment by the end of next week on this 100+ page business case" approach?
- Has the project delivery team signed up to the cost estimates, risk, milestones, delivery plan and outcomes required? (Pathway Stage 2 onwards)?
- Have the project / engineers / operational people been involved at an early enough stage (Pathway Stage 0 or Stage 1) to guide development with requirements, limitations and feasibility?
- Have the opex / capex finance people signed up to the figures?
- Have the asset owners signed up to the business case?
- Have the consultations been evidenced in the Consultation table?