



Meeting Title: Silvertown Tunnel Implementation Group meeting #02

Date & Time: 28 January 2021, 1100-1230

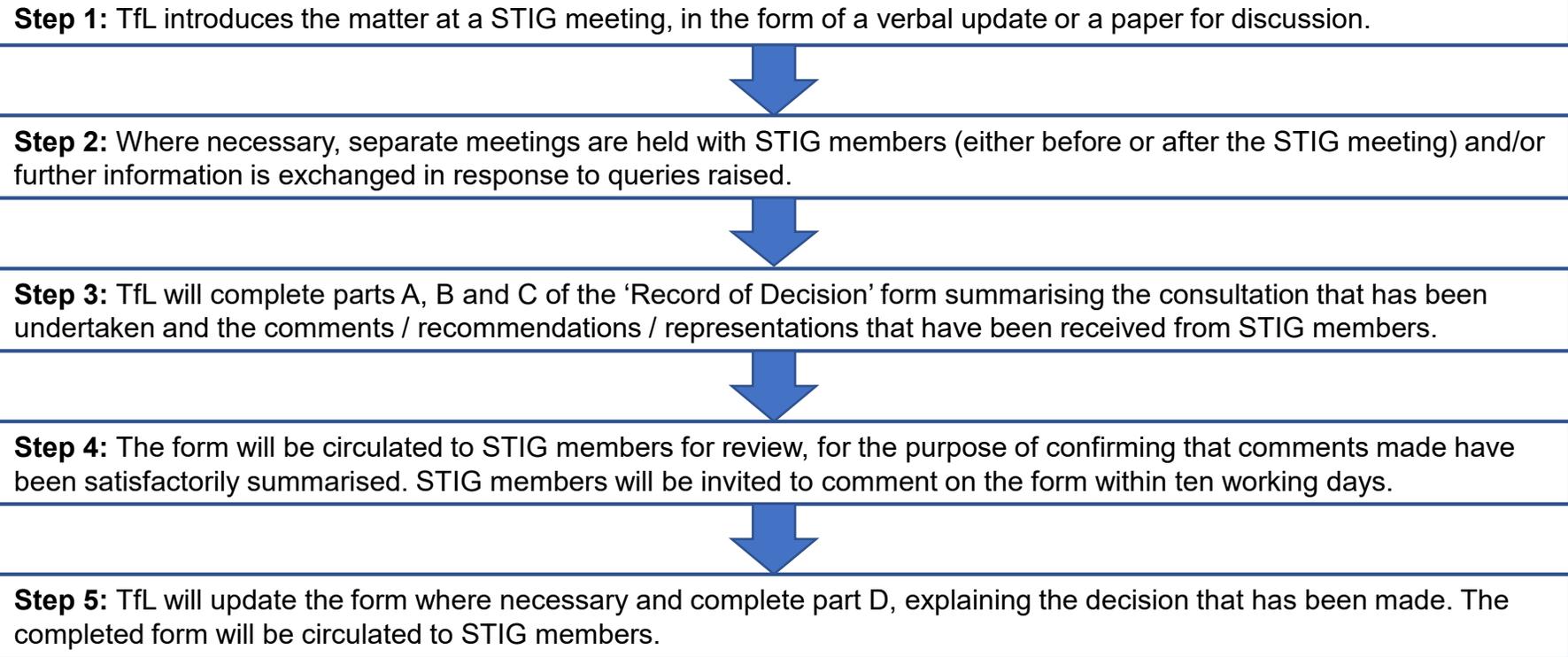
Location: Virtual meeting hosted on MS Teams

Item:

1. Introductions and welcome
2. Review of actions from previous meeting on 24 September 2020 (TfL)
3. Election of chairperson (All)
4. Recording of decisions made (TfL)
5. Project update (TfL)
 - a. General project update
 - b. MMS update
6. Approach to strategic modelling (TfL/Jacobs)
7. Other relevant updates (All)
8. DCO obligations and forward meeting planner (All)
9. Next steps and AOB (All)

In taking any decisions in respect of any of the matters set out in DCO Article 66(5), TfL is required to have regard to any recommendations or representations made by any member of STIG in response to the consultation undertaken.

For the purpose of recording engagement and documenting decisions, the following process is proposed:



If further consultation is subsequently undertaken on the same topic the form can be updated, on the same basis as the steps outlined above.

Matters on which TfL is required to consult with STIG members

Under the terms of DCO Article 66(5), TfL is required to consult with STIG members on the following matters:

- (a) the extent, nature and duration of monitoring to be implemented in accordance with the MMS;
- (b) the proposals for the initial bus services that will operate through the tunnels when the Silvertown Tunnel opens for public use;
- (c) the monitoring reports produced in accordance with the MMS;
- (d) any proposed revisions to the Charging Policy under article 53; and
- (e) the level of charges required to be paid for use of the tunnels under article 54 and any exemptions and discounts.

Record of decision form

Silvertown Tunnel Implementation Group – Record of decision

Part A: Relevant DCO references

Part B: Summary of consultation undertaken

Part C: Summary of representations/comments/recommendations received

Greater London Authority	
LB Barking & Dagenham	
LB Bexley	
LB Bromley	
City of London	
RB Greenwich	
LB Hackney	
LB Lewisham	
LB Newham	
LB Redbridge	
LB Southwark	
LB Tower Hamlets	
LB Waltham Forest	
Highways England	

Part D: Decision taken by TfL and reasoning

Silvertown Tunnel Implementation Group

Subject: Approach to strategic transport modelling

Date: 28 January 2021

1. Purpose of this note

- 1.1 The purpose of this note is to provide an update to the Silvertown Tunnel Implementation Group (STIG) on the proposed approach to the strategic transport modelling that will be undertaken as part of the refreshed assessment of the impacts of the Silvertown Tunnel scheme (the Scheme) in operation. Section 2 summarises the previous approach taken to inform the DCO application, Section 3 provides a high-level overview of the multi-model modelling approach and comments on its suitability for the representation of the Scheme impacts, and Section 4 discusses in further detail how the approach will be tailored for the refreshed assessment. Section 5 provides a conclusion and the proposed next steps.

2. Introduction

Previous DCO Modelling - LoRDM

- 2.1 The analysis to support the DCO application was undertaken using an integrated strategic modelling suite called LoRDM (London Regional Demand Model) which adopted TfL's demand model (LTS) and linked it to a bespoke RXHAM (River Crossings Highway Assignment Model) and a standard version of Railplan (public transport model). LoRDM and RXHAM were developed specifically for the assessment of the Scheme and focused on East London. Although the models provided a robust basis for assessing the impacts of the scheme as part of the DCO application the model base year (2011) and some of the assumptions are now out of date.

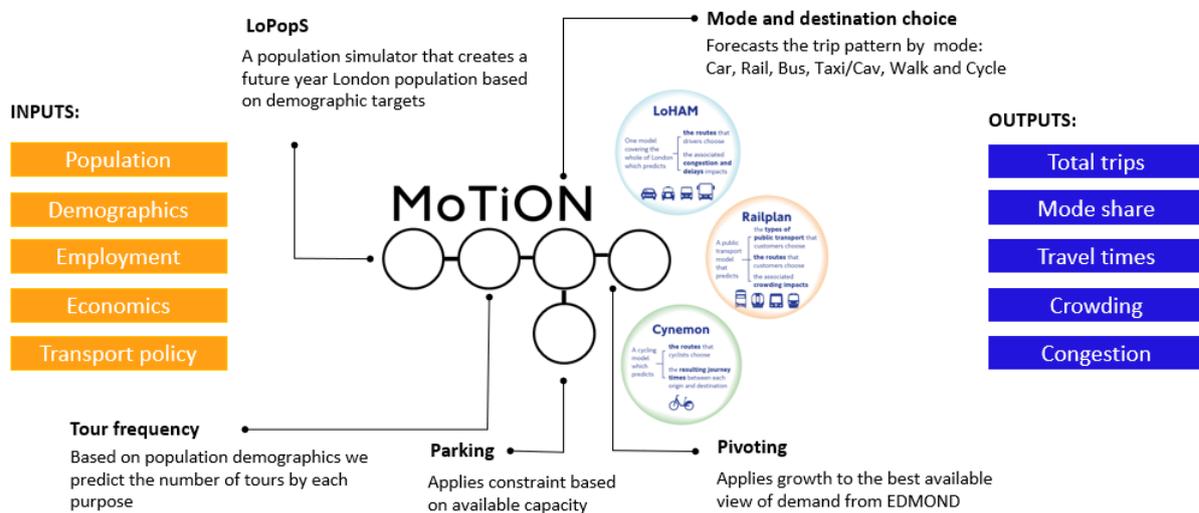
Proposed MMS Modelling - MoTiON

- 2.2 Since then TfL has taken many of the principles of the integration of these models to develop MoTiON (Model of Travel in London) which is a variable demand model covering the whole of London. To minimise the number of models that TfL operates and to improve efficiencies, the MoTiON was designed to interface directly with the latest TfL's strategic assignment models, including LoHAM (London Highway Assignment Model) P4, Railplan 8 and Cynemon (strategic cycling model). These sub-models work together to produce a consistent modelling output and the iterative approach ensures that the demand forecasts and travel costs are in equilibrium.
- 2.3 MoTiON also includes a series of enhancements that will be of particular benefit for the Refreshed Assessment. These include more detailed data (EDMOND) on observed cross-river movements, more income segmentation in the model, as well as the ability to model area based charges in LoHAM.
- 2.4 MoTiON, which currently has a base year of 2016, will be used as a starting point for the modelling required as part of the 'refreshed assessment'. As part of the model development it is necessary to re-base the model to represent 2019, and to develop a forecast scheme opening year of 2024 (both are nonstandard TfL forecasting years and so are being developed specifically for the project).

3. Upgrade of TfL Modelling Suite to MoTiON

- 3.1 The upgrade to MoTiON will, by default, offer additional capability that will be of direct benefit for the upcoming refreshed assessment. The new methodology provides a step change in TfL’s travel demand forecasting capability and builds on the findings of the Drivers of Demand study which looked at changes in transport use from the year 2000 onwards to support the vision set out in the 2018 Mayor’s Transport Strategy. MoTiON is able to reflect differences in travel behaviour depending on the local demographics and can capture attitudes to car ownership, cycling and bus use considering a person’s age, gender, household income etc.
- 3.2 The model takes the revised land use, economic and travel behaviour assumptions as well as planned transport investment and forecasts how many trips will be made, what mode they will use and the resultant crowding and congestion conditions on the public transport and highway networks. The modelling suite includes a number of new sub-models that are presented graphically in Figure 1 and described below.

Figure 1 - Overview of MoTiON’s Sub-Models



- 3.3 In line with best practice, MoTiON represents **round trips** and considers both legs of the journey starting and finishing at home (these are referred to as home-based tours in transport modelling). An example of such journey could be a journey from home to work in the morning peak with a return home in the afternoon. MoTiON also considers linked trips made during the course of a home-based tour that do not depart from or arrive at home, e.g. a trip to a shop or gym from the work location or on the way to/from home (there are defined as non-home-based tours/trips). MoTiON’s approach represents an improvement upon the previous methodology as non-home-based trips were only partially modelled in LoRDM/LTS.
- 3.4 The forecasting process starts with the tour generation stage predicting the total number of tours produced by each model zone during an average weekday. This involves running the **Population Synthesiser (LoPops)** that generates a typical zonal population profile capturing the required household and personal characteristics that influence the demand for travel. This synthetic population is then used in **Tour Frequency Models**, which predict the number of tours/trips made by different population groups depending on the purpose of travel.
- 3.5 **The mode and destination choice models** split the total tours into modes and distribute them to available destinations to create demand matrices by purpose and mode. The model hierarchy and parameters were informed through the statistical estimation in line with the

advice summarised in TAG Unit M2. The choice models operate at the all-day level (with home being treated as the "producing" end of a tour, and work, retail etc. as the "attracting" end). The sensitivity parameters, mode constants and hierarchical structure for the choice models were determined through the statistical estimation using local data, i.e. disaggregate records from 2015–2017 London Travel Demand Survey (LTDS). As part of the model development a calibration exercise was undertaken to align the synthetic matrices produced by the estimated models with the targets for 2016.

- 3.6 The demand model also includes an internal feedback loop with **the parking model**, which is used to generate estimates of the costs of parking in zones in the Greater London Area and suppresses trips to those zones whose parking supplies cannot accommodate the demand allocated to them by the demand model.
- 3.7 As required by TAG, MoTiON is an absolute model applied incrementally, i.e. the demand changes calculated from two runs of the demand model representing the test and base situations are applied to a known or observed base. TAG Unit M2 refers to this process as **pivoting** and recommends using it to improve the accuracy of forecasting in transport demand models. The use of pivoting ensures that the absolute model is used only to predict changes from a base that is known with better accuracy than is given by the model. The pivoting method in MoTiON takes advantage of the matrices delivered by Project EDMOND (Estimating Demand Matrices from Network Data), which were developed from a large sample of observed movements from mobile network data and other digital data sources.
- 3.8 Finally, the outputs are converted to time period origin/destination matrices of vehicle trips for highway and person trips for public transport and cycle assignments. These demand matrices are then assigned (routed) onto the highway, public transport and cycle networks using the assignment models. The assignment models output a detailed level of service information such as congestion, crowding, journey times, user charges/fares, distances etc. These level of service indicators are combined into a single measure called utility which is fed back to the mode and destination choice module to ensure that the newly estimated demand is in balance with the travel costs. The process is repeated until the required level of convergence is achieved.

MoTiON Geography

- 3.9 MoTiON is focussed on London but encompasses the whole of England, Scotland and Wales with the level of network and zone details reducing progressively away from London. These principles will be retained for the purpose of the refreshed assessment work. However, as was undertaken previously, some local network refinement is envisaged in the vicinity of the Scheme.
- 3.10 MoTiON's demand model is only concerned with personal travel and represents all movements with at least one of the trip ends inside the M25 boundary¹. Travel between external zones outside of the M25 boundary and to/from the Rest of Britain are assumed to be non-cost responsive. However, to reflect realistic levels of crowding and congestion, non-cost responsive rail and car trips are included in the assignment matrices with the exogenous growth applied in the forecast years. Other categories of travel that are not considered as cost responsive in the demand model but included in the assignment matrices for the relevant modes include: Black Cabs, goods vehicles, airport and Eurostar trips, visitors to London and Cycle Hire.

¹ The exceptions are cycle, walk and education trips, which are only modelled within London

Representation of Road User Charges

3.11 Improving upon the previous LTS/ LoRDM methodology, MoTiON includes the income segmentation in the demand model, which is instrumental to understanding the responses of various population groups to road user charging. In the Base year, the model includes the Central London Congestion Charging Zone (CCZ) and the Dartford Crossing tolls. The future year scenarios allow modelling of the now-committed Ultra Low Emission Zones (ULEZ) and the additional road user charges on the Blackwall and Silvertown Tunnels. The approach to the representation of various aspects of road user charges in the 'with scheme' scenarios is described below:

- Area based charges - the version of SATURN used in LoHAM P4 allows modelling of area-based charges in addition to link-based method. This ensures that a vehicle entering a charge area is charged once and a trip can exit and enter the charge area multiple times without incurring additional charges. The new method also considers different route choices of vehicles depending on their compliance for the ULEZ scheme. However, the "compliance" segmentation is not included in the demand model to avoid a significant increase in run times. This simplification is considered appropriate for the refreshed assessment as ULEZ will be present in both with and without Scheme scenarios and its impact on the Scheme responses is likely to be minor.
- The Silvertown and Blackwall Tunnel charges - these will be included as link-based tolls representing a weighted average value for a mix of account and non-account holders. Depending on the Scheme requirements these can reflect the "Peak" and "Off-Peak" values.
- Resident discount for the Scheme users - for the duration of the monitoring period and possibly beyond, low income residents living in the host boroughs will be eligible for a discount on the user charges. The standard version of MoTiON will be modified to reflect the discounts based on the population segmentation in the demand model.

3.12 In the context of user charging, one important attribute is the VoT which is understood to vary with income and by purpose of travel. In the previous model, VoTs were segmented by three income groups for out-of-work car users. This approach will be retained in the refreshed assessment, with the exception that the low-income user class will be sub-divided further to represent (1) host borough residents and (2) the rest of the population. The modelling will use the latest national VoTs modified to represent the income specific values using the information from the MoTiON's estimation. This methodology is in line with the DfT's guidance and consistent with the approach used to support the DCO. The benchmarking of the national VoTs against observed data at the DCO stage have demonstrated that the national values were appropriate for the Silvertown Tunnel Project.

4. Use of MoTiON for Silvertown Tunnel

Model Years and Scenarios

4.1 The default base year for MoTiON is 2016, with standard forecast years available for 2021, 2026, 2031, 2036 and 2041.

4.2 However, for the purposes of the refreshed assessment, a new 2019 base year is being explicitly developed in MoTiON, Railplan, and LoHAM using observed 2019 traffic count and public transport (PT) passenger demand data. In addition, a 2024 forecast year will also be developed to represent the earliest notional opening year for the Silvertown Tunnel.

Figure 2 – Approach to Forecasting



- 4.3 The forecasting will also take on board the considerable uncertainty arising from the long-term effects of the Covid-19 pandemic, in terms of the effect on economic growth – but also longer term effects on travel behaviour.
- 4.4 TfL is currently modelling a number of different longer-term post-Covid scenarios, which will be available to inform the refreshed assessment and any associated sensitivity testing. In addition, the DfT is scheduled to release new TAG guidance in February 2021 which will include recommendations regarding the treatment of this long term post-Covid uncertainty. TfL will need to consider this guidance as part of the work to be undertaken.
- 4.5 The approach to forecasting for the refreshed assessment, including the scenarios to be adopted, will therefore be finalised once this forecasting work and the DfT’s forthcoming new guidance become available.

In addition, we also need to take on board the possible effect of the Covid-19 pandemic on growth prospects in the local area, particularly over the next five years or so. We would appreciate the views of the boroughs in the local area regarding how developers are responding to the Covid-19 pandemic and in particular the extent to which it is or could affect projected build-out rates compared to pre-Covid plans.

Demand Modelling

- 4.6 The demand model covers the model responses that ultimately determine the respective highway and public transport demand matrices that are passed onto LoHAM and Railplan for assignment. These demand responses include trip generation and distribution, mode choice, as well as the effects of changes in population/employment and car ownership.
- 4.7 As MoTiON currently stands, the demand model has shown a good fit in line with observed data, and the sensitivity of the model is in line with the recommended ranges set out in DfT TAG guidance, when assessed with respect to various cost elements including fuel costs and public transport fares
- 4.8 The responsiveness of the demand model will be reassessed with the aid of 2019 demand data, with a specific focus on the study area. If required the calibration of the demand model will be improved by amending the model parameters to ensure a good fit.
- 4.9 In the meantime, it can be seen in Figure 3 below that, as MoTiON currently stands, the modelled cross-river movements (calibrated) show a good fit when assessed against two sources of observed data (LTDS, Edmond). Based on this it seems unlikely there will be a need to recalibrate the demand model.

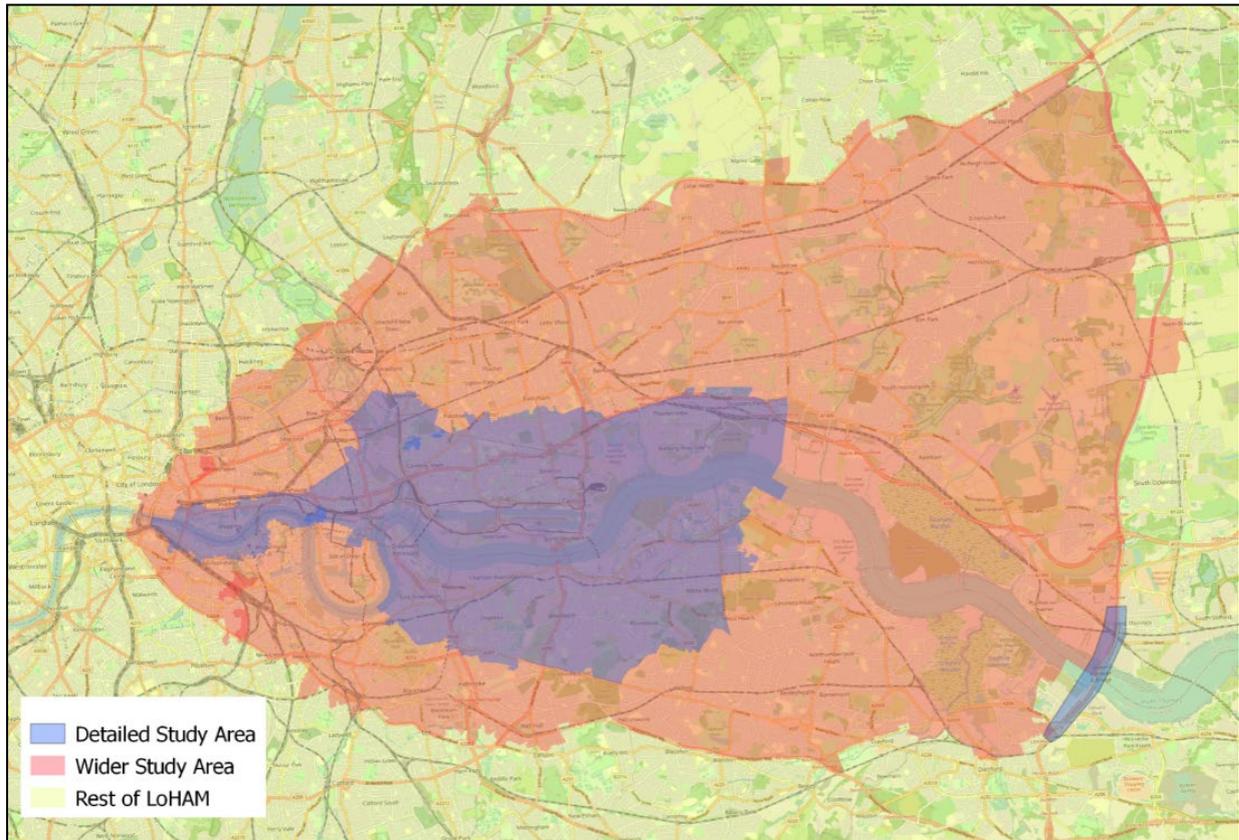
Figure 3 – Cross-river Demand Patterns for Home-based Commute (LTDS, Calibrated (Modelled), and EDMOND)



Highway Modelling

- 4.10 As mentioned previously the MoTiON model suite includes the latest version of the London-wide LoHAM highway assignment model (version P4). This version of LoHAM provides a good starting point for the project, though as was the case for the previous work further refinement will be necessary in and around the local area to ensure it is fit for the specific purpose of modelling the Silvertown Tunnel scheme.
- 4.11 The current LoHAM base year is 2016. However for the project LoHAM will be recalibrated and validated to a 2019 base year. The approach to calibration will be based on tiered model study area as shown in Figure 4 below. The detailed and wider study areas will be the main focus of the model development work, which will include a review of the schemes represented in the model, ensuring that the network representation is sufficiently detailed, as well as the use of a comprehensive set of year 2019 traffic counts for calibration and validation.
- 4.12 Particular attention will be paid to validating the cross river movements in the detailed study area. This will be undertaken with the aid of detailed observed origin-destination data on cross-river movements from the EDMOND dataset.
- 4.13 The rest of LoHAM, which includes a detailed representation of the remainder of London (and beyond), is considered less material for the purposes of the project. Nonetheless work will be undertaken to ensure that the validation of the model in the Rest of London area remains as good as that seen in the starting P4 version of LoHAM.
- 4.14 In addition, the updates to the network will ensure consistency between the respective network structures from the LoHAM and VISSIM (microsimulation) models, including the capability to incorporate VISSIM signal timing information within LoHAM. It should be noted that both the LoHAM and VISSIM modelling have been commissioned as part of a single modelling workstream (Lot A), which will help to ensure a good level of cooperation between the respective project teams.

Figure 4 – Illustration of Tiered Study Area



Public Transport Modelling

- 4.15 As mentioned previously the MoTiON model suite includes the Railplan assignment model which will model the public transport effects of the scheme – most notably the effects of the proposed new cross-river bus services.
- 4.16 Again, the base year for Railplan is 2016 but for the purposes of the project Railplan will be updated to a 2019 base year using year 2019 passenger demand data for London Underground, DLR, National Rail services, and buses.
- 4.17 For the previous work, the then-latest standard version of Railplan (version 7.0) was used. For the refreshed assessment, additional work will be undertaken to improve the validation in the local area. Again this will be based on the tiered study area shown earlier in Figure 3.
- 4.18 In addition, the zoning system and walk networks across the local area will be reviewed to ensure the model sufficiently represents development in the local area, both existing and proposed. It is noted that considerable growth is expected across the local area, particularly in the Royal Docks and Greenwich Peninsula, and this will be considered as part of the review.
- 4.19 The MoTiON modelling suite also features a mechanism that enables any changes in highway network speeds to be reflected in the bus speeds that are input into Railplan. This mechanism is still relatively new so a review will be undertaken to determine its suitability for use regarding the bus network in the local area, and whether any additional work is necessary.

5. Conclusions and Next Steps

5.1 The standard MoTiON demand model methodology is considered suitable for forecasting the Scheme impacts. In the context of the refreshed assessment work, the new modelling approach provides the following advantages compared to the LoRDM/ LTS used previously at DCO stage:

- a) The model parameters controlling the behavioural responses are based on the latest evidence and better represent modern travel choices. The base year demand matrices were estimated from the emerging digital data sources as part of project EDMOND (Estimating Demand from Network Data). EDMOND matrices are used in MoTiON pivoting process as well as in LoHAM and Railplan assignments creating greater consistency and improving the quality of the forecasts. EDMOND matrices are also of particular benefit for understanding observed cross-river movements;
- b) MoTiON has a far greater level of person segmentation and can provide insights into behavioural change by demographics. Additional journey purposes are modelled including eight home-based purposes and six non-home-based purposes. Of particular benefit (compared to the previous work) is a further segmentation by income improving the representation of the road user charging and pricing scenarios;
- c) All key modes of personal travel (including car driver, car passenger, rail, bus, taxi, cycle and walk) are now explicitly included in the mode choice models. This allows a better representation of travel choices and preferences for bus usage amongst certain population groups, the functionality critical to understanding the impact of the cross-river bus network;
- d) The latest assignment models have an improved representation of the existing and future year networks and travel demand. LoHAM benefits from the new Saturn functionality related to modelling of area-based charges (such as ULEZ); and
- e) One of the MoTiON's key strengths is in its ability to model uncertainty and reflect the impact of socio-economic factors and demographics on trip making and travel choices, which makes it a useful tool for reflecting the changes brought by the pandemic.

5.2 To deliver the requirements of the refreshed assessment, the following model development tasks are being undertaken:

- a) **Base year 2019:** the base year is envisaged to be 2019. This necessitates the update of MoTiON (and, by extension, LoHAM and Railplan) to reflect any infrastructure upgrades and the incorporation of ULEZ amongst other changes from the 2016 base model. Both LoHAM and Railplan will need to demonstrate sufficient levels of validation;
- b) **Representative demand:** 2019 demand will need to be representative of the actual changes in travel demand from 2016 depicted in LTDS. The direction of demand changes in MoTiON growth forecasts will be assessed against LTDS trends. If needed the assumptions will need to be refined to improve the forecasts. In accordance with TAG, MoTiON realism tests will be undertaken to assess the elasticity of demand with respect to car fuel cost, public transport fare and car journey time changes;
- c) **User classes:** to comply with the DfT's advice on modelling road charges, LoHAM P4 will be modified to include **additional user classes** to represent 3 income bands for discretionary travel and a separate user class to capture local low-income residents eligible for a discount; and

- d) **Behaviour and economic forecast:** in forecast years the model will have to capture the latest behaviour and economic forecast taking account of the impacts of the Covid-19 pandemic on travel behaviour. Therefore, the model parameters, network and planning data assumptions will need to be developed for a 2024 opening year.
- 5.3 The model development work will also include additional enhancements that are not deemed essential but nonetheless will provide further robustness. This includes the ability to consider the effects of highway congestion on bus speeds.
- 5.4 In terms of next steps, we will work with STIG members to ensure that the model satisfactorially represents key local effects in the study area, including planned changes to the local transport network (especially borough-promoted schemes) as well as expectations regarding planned developments, particularly in light of the Covid-19 pandemic.

Meeting 1 – 24 September 2020

- Terms of Reference
- Update on MMS procurement
- High-level milestones and engagement
- Air quality monitoring proposals



Meeting 2 – 28 January 2021

- Election of chairperson
- Recording of decisions made
- Approach to strategic transport modelling
- Lot B, C and D – general update

Meeting 3 – 27 May 2021

- Update on refreshed assessment incl. modelling of environmental effects
- Approach to socio-economic monitoring
- Traffic monitoring proposals

Meeting 4 – September 2021

- Update on refreshed assessment including:
 - Initial bus proposals
 - Emerging modelling outcomes
- Update on traffic and socio-economic monitoring

Meeting 5 – January 2022

- Opportunities for bus priority measures
- Update on bus proposals
- User charging assessment framework

Meeting 6 – May 2022

- Environmental compliance assessment
- Submission to Secretary of State

Meeting 7 – September 2022

Meeting 8 – January 2023

Silvertown Tunnel Programme - Silvertown Tunnel Implementation Group Obligations / Requirements

Work In Progress: This tracker is regularly updated & subject to change
v.20/01/2020

Category	STIG ref #	Year* Activity commences	Quarter* Activity commences	Document	Doc ref	Activity	Requirement	Status	Updates
01 - STIG administration	1	2020	Q3	DCO	66 (1)	Establishment of STIG	TfL must establish and fund the reasonable secretarial and administrative costs of a consultative body to be known as the Silvertown Tunnel Implementation Group.	Underway	18/09/2020 - First STIG meeting planned for 24/09/2020 20/01/2020 - Second STIG meeting planned for 28/01/2021
	2	2020	Q3	DCO	66 (7)	Frequency / timing of STIG meetings	Unless otherwise agreed by STIG, TfL must convene a meeting of STIG, chaired by a representative elected by the members of STIG, at least twice a year on a date to be determined by TfL, including on each occasion that TfL publishes a monitoring report in accordance with the monitoring and mitigation strategy.	Underway	Meeting 1: 16 Sep 2020 Meeting 2: 28 Jan 2021
	3	2020	Q3	DCO	66(8)	First STIG meeting	The first meeting should be held no less than 3 years before the tunnel opens.	Completed	16/09/2020 - First STIG meeting planned for 24/09/2020
	4	2020	Q3	DCO	66 (10)	Publication of STIG material	TfL must publish on its website agendas, reports, minutes and other relevant documents relating to the operation of STIG as soon as reasonably practicable after they become available.	Underway	Link to website
	5	2020	Q3	DCO	66 (5)	STIG matters - need to consult STIG	TfL must consult the other members of STIG on the following matters relating to implementation of the authorised development :	Underway	
	6	2020	Q3	DCO	66 (5)	STIG matters - (a) monitoring	(a) the extent, nature and duration of monitoring to be implemented in accordance with the monitoring and mitigation strategy;	Underway	16/09/2020 - Paper on Air Quality proposals to be presented at STIG meeting on 24/09/2020
	7	2020	Q3	DCO	66 (5)	STIG matters - (b) bus services	(b) the proposals for the initial bus services that will operate through the tunnels when the Silvertown Tunnel opens for public use;	Underway	
	8	2020	Q3	DCO	66 (5)	STIG matters - (c) monitoring reports	(c) the monitoring reports produced in accordance with the monitoring and mitigation strategy;	Underway	
	9	2020	Q3	DCO	66 (5)	STIG matters - (d) revisions to charging policy	(d) any proposed revisions to the charging policy under article 53 (the charging policy); and	Underway	
	10	2020	Q3	DCO	66 (5)	STIG matters - (e) user charges	(e) the level of charges required to be paid for use of the tunnels	Underway	
	11	2020	Q3	DCO	66 (6)	STIG recommendations / representations	In taking any decision in respect of any of the matters set out in paragraph (5), TfL must have regard to any recommendations or representations made by a member of STIG in response to the consultation carried out under that paragraph.	Underway	Process to be discussed at 28/01/21 meeting
02- Refreshed assessment / pre-opening mitigation	12	2022	Q3	DCO	Sch 2 Req 2	Agree £1m business transitional support package with councils	Prior to the opening of the authorised development for public use TfL must make all reasonable endeavours to agree a business transitional support package with the councils of the London Borough of Newham, the London Borough of Tower Hamlets and the Royal Borough of Greenwich. As part of this business transitional support package TfL must make available to those councils the sum of one million pounds for the purpose of supporting local businesses.	Not started	
	13	2020	Q4	MMS	2.1.1	Develop refreshed assessment	Prior to the Silvertown Tunnel opening for public use, TfL must refresh its assessment of Scheme impacts, in order to: • Set the opening user charges; • Define the requirement for and form of localised mitigation for residual effects; and • Specify the bus network through the Silvertown Tunnel that will operate on opening.	Underway	
	14	2020	Q3	MMS	2.1.2	Update the transport and environmental models	For this process TfL will update the relevant transport and environmental models, rerun those models, and develop its proposals for each element in conformity with the commitments, policies and procedures set out in the relevant certified documents and any DCO requirements. The assessment will incorporate a wider range of analyses than the modelling alone.	Underway	
	15	2022	Q1	MMS	2.3.13	Develop package of mitigation measures	TfL will work closely with affected local authorities to identify and develop the package of localised traffic mitigation to be implemented pre-opening. Once the proposed package of localised traffic-related mitigation measures has been finalised, TfL will submit details of the package to the Secretary of State for Transport for approval.	Underway	
	16	2022	Q1	MMS	2.3.8	Take view of LHAs into account in assessing localised mitigation measures	In assessing the need for localised mitigation for locations in the short list, TfL will take into account views from the affected local highway authority (or authorities should the location affect more than one borough).....	Not started	
	17	2022	Q2	MMS	3.8.5	TfL to install noise monitors	Once operational, the noise monitoring will continue for a minimum of three years. Before the end of that period, TfL will consult STIG members on whether it is appropriate to extend this period by up to an additional two years.	Not started	
	18	2022	Q1	DCO	Sch 2 Req 7 (2)	Implementation of mitigation measures when TfL powers are not sufficient	If the statutory powers vested in TfL in relation to highways and road traffic in Greater London are not sufficient to enable TfL to implement any mitigation measure which it is obliged to implement under this requirement, TfL must either agree with the council to implement the changes on its behalf or pay the council to implement the measures.	Not started	
	19	2020	Q4	DCO	Sch 2 Req 7(4)	Refreshed assessment	TfL must undertake an updated assessment of the scheme's impacts and consult STIG on a proposed scheme of mitigation including the locations where mitigation is required, the measures proposed and the programme for implementation	Not started	
	20	2022	Q1	DCO	Sch 2 Req 7 (5)	Consultation on the scheme of mitigation	TfL must have regard to any consultation responses from STIG members on the proposed mitigation and engage with local highway authorities as required.	Not started	
	21	2022	Q1	DCO	Sch 2 Req 7 (7)	SoS to consult STIG on mitigation measures	The Silvertown Tunnel must not open for public use until the scheme of mitigation has been approved by the Secretary of State. If the Secretary of State proposes to approve the scheme of mitigation with material modifications, the Secretary of State must consult the members of STIG on the proposed modifications and have regard to any responses received when deciding whether to approve the scheme.	Not started	
	22	2021	Q4	DCO	Sch 2 Req 7 (10)	Consultation with STIG on changes required to the highway network.	For the duration of the monitoring period (at least 3 years before opening and 3 years after scheme opens), TfL must— (c) identify in consultation with the members of STIG appropriate thresholds for changes on the highway network which require TfL to investigate whether mitigation measures are necessary;	Not started	
	23	2021	Q4	DCO	Sch 2 Req 7 (10)	Consultation with STIG on changes required to the highway network.	For the duration of the monitoring period (at least 3 years before opening and 3 years after scheme opens), TfL must— (d) develop in consultation with the relevant highway authority any measures which are necessary to mitigate adverse impacts on the highway network which are attributable to the operation of the authorised development; and	Not started	
	24	2021	Q4	DCO	Sch 2 Req 7 (10)	Consultation with STIG on changes required to the highway network.	For the duration of the monitoring period (at least 3 years before opening and 3 years after scheme opens), TfL must— (e) implement or secure the implementation of the necessary mitigation measures.	Not started	
	25	2022	Q2	DCO	Sch 2 Req 7	Mayor of London to consult relevant air quality authority	Before considering whether to approve the scheme of mitigation, the Mayor of London must consult any relevant air quality authority and take into consideration any responses received. (17) TfL must implement or secure the implementation of the scheme of mitigation approved by the Mayor of London in accordance with the programme contained in the approved scheme of mitigation.	Not started	
	26	2022	Q1	MMS	2.1.8	Development of pre-opening mitigation measures	If, through the refreshed assessment, the need for localised traffic-related mitigation measures is identified, TfL will develop these measures in consultation with STIG and submit them to the Secretary of State for Transport for approval.	Not started	
	27	2022	Q3	MMS	2.1.8	Implementation of pre-opening mitigation measures	TfL must then implement the approved measures before the Silvertown Tunnel opens for public use, or provide funding for the relevant local highway authority to implement them.	Not started	
	28	2022	Q2	MMS	2.1.9	Noise mitigation measures	Any measures required to mitigate residual noise impacts will be submitted for the approval of the local planning authority in accordance with requirement 12 of the DCO.	Not started	
	29	2021	Q3	MMS	2.2.2	Approach to refreshed assessment	TfL will engage with STIG members on the approach to completing the refreshed assessment, including aspects that are of particular interest to host boroughs such as the collection of origin and destination data and users' values of time (including stated preference surveys).	Underway	
	30	2021	Q4	MMS	2.3.4	STIG review of long-listed mitigation measures	Once the long list has been populated this will be reviewed in consultation with the members of STIG and TfL will make a decision on which locations will be included within a 'short list' to be assessed further using local modelling.	Not started	

	31	2021	Q4	MMS	2.5.2	Commencement of baseline monitoring	Collection of the data required to inform the refreshed assessment represents the first step in the process. Monitoring of baseline conditions pre-opening will commence no later than three years prior to the expected date of Scheme opening, and any data that is required to inform the refreshed assessment (for example traffic counts) will be collected as part of this process.	Underway	
	32	2021	Q2	MMS	2.5.2	Final scope of monitoring programme	The finalised scope of the monitoring programme will be presented to STIG members for review approximately six months before the commencement of traffic-related monitoring (around three and a half years prior to Scheme opening).	Not started	
	33	2020	Q3	MMS	3.3.2	Monitoring data collected by others	The monitoring programme will be of sufficient scope to provide a sound understanding of the impact of the Scheme in operation. Nonetheless, TfL recognises the value of monitoring undertaken by others and hence in addition to the data collected through the monitoring programme, TfL will take into account monitoring data collected by local authorities and other bodies where it is relevant and appropriate to do so.	Underway	
	34	2021	Q2	MMS	3.5.3	Geographical extent of monitoring	The geographical scope of the monitoring will be reviewed at the time when TfL is undertaking its refreshed assessment of Scheme impacts. Should this refreshed assessment identify potential Scheme impacts at locations not identified in current modelling, the scope of the monitoring programme will be extended to ensure these locations are included in the monitoring programme. If justified by the refreshed assessment, the monitoring of Scheme impacts could be undertaken over a much wider area through TfL's wider monitoring programmes.	Not started	
	35	2020	Q3	MMS	3.7.1	Commencement of air quality monitoring	Three years prior to Scheme opening TfL will install a network of diffusion tubes and, where appropriate, automatic air quality monitors to collect air quality data for a continuous period of at least twelve months to establish an up-to-date baseline. This will provide a picture of the actual concentrations at a point closer to the Scheme opening. In addition, the results of monitoring undertaken by relevant local authorities and Defra will be utilised by TfL to provide additional baseline information.	Underway	
03 - User Charging	36	2022	Q2	Charging Policy	2.3.4	User charge discount	For a period of not less than 56 days prior to Scheme opening, eligible residents and small businesses in the host boroughs will be able to register online for a payment account without paying the annual registration fee for the initial year (Policy 5).	Not started	
	37	2022	Q2	Charging Policy	2.3.7	User charge discount	For the duration of the monitoring period a discount of not less than 50% on the user charges will be available for eligible residents of host boroughs on a low income who register for an online account with TfL. After the expiry of the monitoring period, TfL will review in consultation with the host boroughs whether the discount should continue (Policy 6).	Not started	
	38	2022	Q2	Charging Policy	3.2.3	Setting the initial user charge	The extent to which the user charges will assist in achieving the Project Objectives is the primary consideration which TfL will have regard to when setting the initial user charges (policy 9). In this TfL will have regard to: - traffic - the environment, and - population, economy and growth - other project objective considerations, including the ability to pay for the Scheme.	Not started	
	39	2022	Q2	Charging Policy	3.2.4	Setting the initial user charge	TfL will set the initial charges at a level and subject to conditions so that the Scheme in operation is not likely to give rise to materially new or materially different environmental effects to those reported in the ES (Policy 10).	Not started	
	40	2025	Q2	Charging Policy	3.3.1	Variations to the user charges	TfL must keep the user charges under review, and will make variations to charges where this is considered necessary to ensure the continued achievement of the Project Objectives (policy 11). In this TfL will have regard to: - traffic - the environment, and - population, economy and growth - other project objective considerations, including the ability to pay for the Scheme.	Not started	
	41	2022	Q2	Charging Policy	4.2.1	Setting the initial user charge	TfL must set initial charges before the Silvertown Tunnel opens to traffic. The process for setting the charges will commence around two and a half years in advance of Scheme opening.	Not started	
	42	2022	Q2	Charging Policy	4.2.1	Setting the initial user charge	In the setting of the initial user charge, TfL will follow this process - TfL will re-run the strategic traffic model (using up-to-date data) - TfL will use the outputs of this model run to undertake a re-assessment of the significant likely effects of the proposed initial user charges on air quality, noise, socio economic effects, in accordance with the approach adopted in the Environmental Statement (Document Reference: 6.1) - TfL will populate the UCAF with its impact assessment	Not started	
	43	2022	Q2	Charging Policy	4.2.1	Setting the initial user charge	TfL will consult with members of STIG on the proposed charges for the opening year, and present the completed UCAF. STIG members may make recommendations or representations to TfL in response to these, and the views of STIG's members will be recorded	Not started	
	44	2022	Q2	Charging Policy	4.2.1	Setting the initial user charge	TfL will submit the proposed opening user charges, including setting out the recommendations and representations of STIG members, to the TfL Board for approval. When deciding whether or not to approve the proposed charges the TfL Board must: - in accordance with article 65 of the DCO have regard to any recommendations or representations made by members of STIG; and - only approve the charges if it is satisfied that Policies 9 and 10 of the Charging Policy are met.	Not started	
	45	2022	Q2	Charging Policy	4.2.1	Setting the initial user charge	The completed UCAF will be published on TfL's website as a record of the assessment undertaken.	Not started	
	46	2025	Q2	Charging Policy	4.3.1	Variations to the user charges	In proposing variations to the user charges, TfL will use the UCAF to assess the likely impacts of variations to the charges on the achievement of the Project Objectives and other considerations (set out in 3.3 of the Charging Policy). In accordance with Article 65 of the DCO, TfL will consult with members of STIG on these proposed variations who may make representations and recommendations in response.	Will be undertaken if required	
	47	2025	Q2	Charging Policy	4.3.1	Variations to the user charges	TfL will then submit the proposed variations to the user charges, including setting out the recommendations of STIG members, to the TfL Board for approval. When deciding whether or not to approve the variations the TfL Board must: - in accordance with article 65 of the DCO have regard to any recommendations or representations made by members of STIG; and - only approve the charges if it is satisfied that the proposed charges comply with Policy 12 of the Charging Policy.	Will be undertaken if required	
	48	2024	Q4	Charging Policy	4.4.1	Statement of charges	In accordance with Article 53 of the DCO, where the TfL Board decides to approve the proposed charges (for the initial charge and for subsequent variations), TfL must publish a Statement of Charges describing the charges in the form set out in Appendix A of the Charging Policy or in a form to the like effect. The Statement will set out the date from which the charges take effect.	Not started	
	49	2026	Q3	Charging Policy	5.1.2	12-month review of user charges	TfL must complete a '12-month review' of the user charges not later than 15 months after the Scheme opens for public use and, if necessary, must revise the charges to mitigate any significant adverse impacts attributable to the Scheme which were not predicted in the preopening assessment (Policy 15).	Not started	
	50	2026	Q3	Charging Policy	5.4	12-month review of user charges	TfL will consult on its proposed response to the data analysis for the '12-month review' with members of STIG. Members of STIG may make representations in response to TfL's proposal. The decision on the response to the review will be made by TfL. TfL will publish a report summarising the review and its outcome.	Not started	
51	2022	Q2	DCO	53 (2)	Revisions to charging policy	TfL must consult STIG on any proposed revisions to the charging policy	Will be undertaken if required		
	52	2022	Q3	DCO	Sch 2 Req 7 (10)	Consultation with STIG on changes required to the highway network.	For the duration of the monitoring period (at least 3 years before opening and 3 years after scheme opens), TfL must— (a) implement a monitoring programme in consultation with the members of STIG;	Not started	
	53	2022	Q3	DCO	Sch 2 Req 7 (10)	Consultation with STIG on changes required to the highway network.	For the duration of the monitoring period (at least 3 years before opening and 3 years after scheme opens), TfL must— (b) prepare— (i) quarterly monitoring reports for a period of one year from the Silvertown Tunnel opening for public use; and (ii) annual monitoring reports thereafter, derived from that monitoring, and submit them for consideration by the members of STIG;	Not started	
	54	2026	Q1	DCO	Sch 2 Req 7 (14)	TfL to consult STIG on the appointment of independent air quality experts to review each annual monitoring report	The monitoring data within each annual monitoring report referred to in sub-paragraph (10) must be reviewed as soon as reasonably practicable by a firm of independent air quality experts appointed by TfL in consultation with the members of STIG. The annual review undertaken by the firm of experts must determine in accordance with the criteria set out in the monitoring and mitigation strategy whether or not there has been a material worsening of air quality as a result of the authorised development beyond the likely impacts reported within the environmental statement at localities where there are (whether as a result of the authorised development of otherwise) exceedances of national air quality objectives.	Not started	

04 - Monitoring / post-opening mitigation	55	2020	Q3	MMS	3.4.1	Commencement of monitoring	The monitoring programme will commence no later than three years prior to the expected date of Scheme opening.	Not started	
	56	2020	Q3	MMS	3.4.1	Extending the monitoring period	The duration of the post-opening monitoring will be reviewed and TfL will consult the members of STIG on whether it is appropriate to extend this period by up to an additional two years.	Not started	
	57	2025	Q2	MMS	3.5.4	Scheme impacts not captured by monitoring programme	Once the Scheme is operational, should a member of STIG identify potential impacts that they consider may be a result of the Scheme at a location not being monitored under the Scheme's monitoring programme at that time (for instance using TfL's publicly available wider data set), this can be brought to TfL's attention for further consideration and possible inclusion in the monitoring programme going forward.	Not started	
	58	2026	Q3	MMS	3.7.6	Reporting and expert review of AQ data	The air quality monitoring data will be reported in the annual monitoring report which must be reviewed as soon as reasonably practicable by a firm of air quality experts appointed by TfL in consultation with STIG members. The expert review must determine whether or not there has been a material worsening of air quality as a result of the Scheme (as detailed in section 4.4 of this document).	Not started	
	59	2025	Q2	MMS	3.10.3	Quarterly interim reports in first year after opening	For the first year after the Silvertown Tunnel opens for public use, TfL will produce and submit to STIG interim monitoring reports on a quarterly basis to help ensure that any impacts can be identified promptly. These reports will be less detailed than the annual monitoring reports but will include data collected to date and a high level analysis of the results.	Not started	
	60	2026	Q3	MMS	3.11.1	Production of monitoring reports	The annual monitoring reports will be produced by TfL and sent to STIG members within two months of data collection.	Not started	
	61	2026	Q3	MMS	3.11.1	STIG review of monitoring reports	STIG will be responsible for: <ul style="list-style-type: none"> Reviewing the findings presented in the monitoring reports Considering the need for and type of any mitigation measures that might be required to address Scheme impacts, in line with the process set out in Chapter 4 of this document Reviewing the monitoring programme and make recommendations to TfL for changes where appropriate 	Not started	
	62	2020	Q3	MMS	3.11.2	Changes to monitoring programme	Proposals for changes to the monitoring programme can be made by any member of STIG in the interest of enabling future impacts to be fully captured. Aspects on which STIG members may request changes include the monitoring locations, metrics considered and data collection methods. In updating the monitoring programme, TfL shall have regard to any recommendations made by STIG.	Will be undertaken if required	
	63	2026	Q3	MMS	3.11.3	Contents of monitoring reports	STIG will also be able to request changes to the contents of the monitoring reports including the addition of new topics and removal of existing topics if considered appropriate. TfL will remain responsible for the final content and structure of the monitoring reports.	Not started	
	64	2026	Q3	MMS	4.1.2	Post-opening mitigation measures	The need for any mitigation following the Scheme's opening will be identified through review of the monitoring reports containing the data collected through the monitoring programme. Different processes will apply to different Scheme impacts, as follows:.....	Not started	
	65	2026	Q3	MMS	4.1.2	Post-opening mitigation measures	The air quality data will be reviewed by a firm of experts appointed by TfL in consultation with the members of STIG. If in the view of the experts there has been a material worsening in air quality as a result of the Scheme, TfL must develop a scheme of mitigation and submit this to the Mayor of London for approval.	Not started	
	66	2026	Q1	MMS	4.4.1	Appointment of independent air quality expert	TfL will appoint an independent air quality expert to review the post-opening air quality monitoring data set in the annual monitoring reports. TfL will consult with STIG members regarding the expert to be appointed.	Not started	
	67	2026	Q1	MMS	4.5.2	Appointment of noise expert	TfL will appoint an independent noise expert to carry out an annual review the post-opening noise monitoring data presented within the annual monitoring reports. TfL will consult STIG members regarding the expert to be appointed.	Not started	
	68	2026	Q2	MMS	4.5.3	Annual review by independent noise expert	If the annual review carried out by the independent noise expert concludes that the difference in calculated Basic Noise Level values between the predicted flows and measured flows through the Blackwall and Silvertown Tunnel is greater than 1dB (and that the difference is attributable to the Scheme), TfL will consider the need for localised noise mitigation measures in consultation with the relevant local authorities.	Not started	
05 - Buses	69	2025	Q2	Bus Strategy	2.2.3	Concessionary bus travel	Commitment 1: TfL must provide £2m in funding for concessionary bus travel to residents of the London Boroughs of Newham and Tower Hamlets and the Royal Borough of Greenwich for a period after the Silvertown Tunnel opens for public use	Not started	
	70	2022	Q2	Bus Strategy	3.4.3	Bus network proposals	Commitment 7: Prior to the Silvertown Tunnel opening for public use TfL will consult with STIG members on its outline proposals with regard to the bus network.	Not started	
	71	2022	Q2	Bus Strategy	3.4.5	Bus network planning	Commitment 8: Bus service planning will commence not less than 2 years prior to Scheme opening, using TfL's Bus Service Planning Guidelines	Not started	
	72	2022	Q2	Bus Strategy	3.4.8	Bus priority measures	Commitment 9: TfL will work with STIG members to seek opportunities to implement bus priority measures on the network around the Silvertown Tunnel, for example by undertaking bus priority studies	Not started	
	73	2022	Q2	Bus Strategy	3.6.3	Socio-economic impacts of bus services	Commitment 10: TfL and STIG members will consider socio-economic monitoring and information in assessing bus services.	Not started	
	74	2025	Q2	Bus Strategy	3.6.4	Socio-economic impacts of bus services	Commitment 11: TfL will collect monitoring data on cross-river bus performance and use this to modify services in order to maintain the continued achievement of the Project Objectives.	Not started	