

Road Space Management, Outcomes Network Management Team

Highway Assignment Assessment impact in lieu of the network change for Bank Station due to Cross Rail for Cycles East West Route

1. Executive Summary

- 1.1 As part of the London Underground Bank Station upgrade project, it is proposed to take ownership of Arthur Street, in the City of London. The required works would require a complete closure for all vehicles with the exception of construction vehicles. The schemes Transport Assessment requires that its traffic impact be assessed, providing indicative journey times for construction and diverted vehicles. TfL's Road Space Management Directorate have undertaken an assessment on behalf of London Underground to assist determine the most appropriate interim arrangements for the duration of the construction works.
- 1.2 The recommended routings for construction vehicles from east London to Arthur Street would be via Tower Hill and Lower Thames Street. Any other routing would add considerable journey time and therefore all routing options except for those proposed through Scenarios 4 and 5 would unlikely to be adopted, due to the severity of the increases.
- 1.3 The volume of displaced general traffic currently using Arthur Street southbound is marginal and as a number of alternative routes are available any reassignment is unlikely to see anything but a marginal network impact. The impact difference to the local City of London road network does see increases in delay between Scenarios 4 and 5, by providing a dedicated right turn facility for Arthur Street which would realise in excess of 200 vehicles/ hr in the 'am' peak period utilising the Lower and Upper Thames Street rather than the City of London Road network on roads such as Queen Victoria Street.
- 1.4 The benefits of Scenario 5 over above all other options in terms of construction vehicle journey times and optimising the number of general traffic vehicles using the TLRN rather than the City of London Road network, considering the duration of project is the recommended way forward by Surface Transports Road Space Management Directorate.

2. Background

- 2.1 As part of the London Underground Bank Station upgrade project, it is proposed to take ownership of Arthur Street in the City of London (see Figure 2.1 below). The proposals would require a complete closure for all vehicles with the exception of construction vehicles that would enter at the southern end and exit to the north. The Transport Assessment requires that the traffic impact be assessed for this closure along with indicative journey times for construction and diverted vehicles. Construction vehicles requiring access to Arthur Street are predicted to be in the order of up to 60 vehs/day during the peak construction period forecast for November 2017 (See Figure 2.2).

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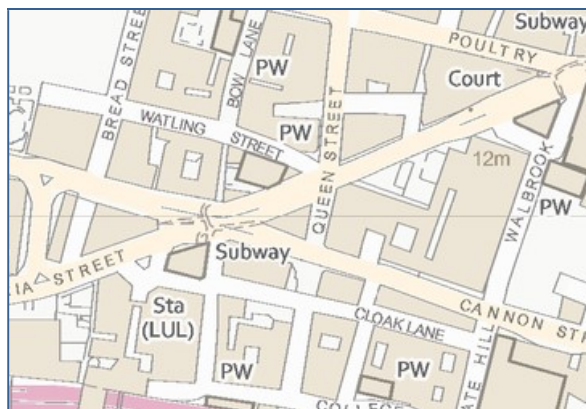


Figure 2.1 Proposed location of Arthur Street

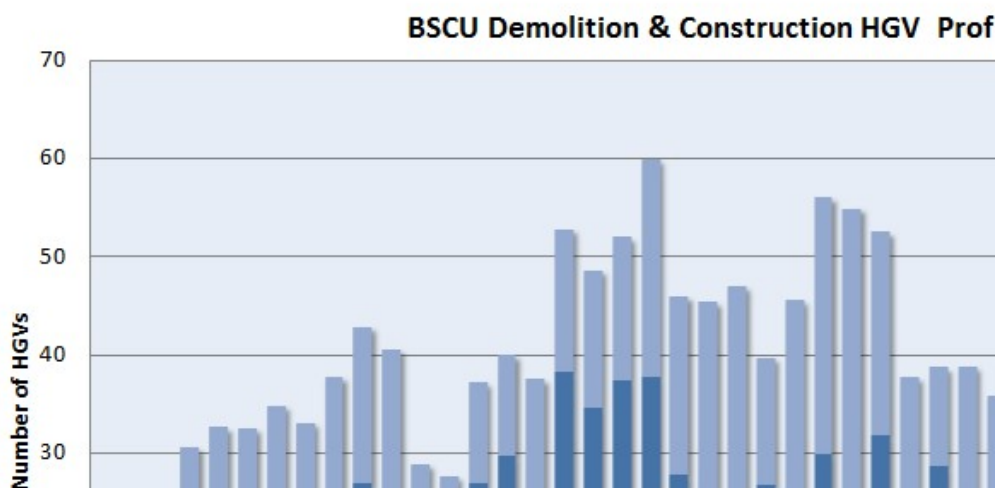


Figure 2.2 Proposed construction activity schedule

- 2.2 It is proposed that all construction traffic would enter Arthur Street via Upper Thames Street. Upon exit from servicing their respective worksites it is proposed that construction traffic would then pass through the Monument junction and follow a route along East Cheap and Great Tower Street to access Lower Thames Street and destinations further to the East.
- 2.3 TfL's Surface Transport East-West Cycle Superhighway, planned for a 2016 implementation, would dramatically change the road layout along Upper and Lower Thames Street and Victoria Embankment providing safety and operational challenges for construction vehicle access to Arthur Street and along their prescribed route. After discussing various design options, Surfaces RSM Outcomes Department will assess a variety of options and routes within its tactical model, ONE (Operational Network Evaluator) to support the TA. It is also proposed to analyse the origin-destination routing of traffic using Arthur Street to also support diversion strategies for the TA.

3. Modelling Scope Undertaken

- 3.1 Select link analysis was undertaken on Arthur Street to determine existing origin-destination routing of traffic for southbound traffic only. Note: The northbound movement is for bus only (route 344) when required to be placed on a prescribed diversion route. Therefore the focus was placed on the southbound movement. Both the base

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and future year base was analysed (Referred to as Scenario 1 and 2). Other scenarios required were as follows:

- (1) Base – no layout changes, Arthur Street open to all traffic;
- (2) Future year base (2016) – East-West Cycle Superhighway layout, Arthur Street opens to all traffic. Note there is a right-turn prohibition into Arthur Street under this design. Note the East-West scheme design is based on development stage at the time of preparing this assessment and subject to change through various statutory processes;
- (3) East-West Cycle Superhighway layout, Arthur Street closed except for construction vehicles. Left turn in only;
- (4) As per 3 but with right turn in only. This will require signalling and method of control changes to be agreed between NP and Traffic Infrastructure (TI);
- (5) As per 4 but with a revised temporary layout for the duration of the upgrade works. The layout design will be undertaken by Traffic Design Engineering (TDE) and will require agreement with NP and TI.

3.2 Indicative journey times for construction vehicles were tested within each scenario for the proposed route. These journeys commenced at North Woolwich in East London and terminate at the Arthur Street junction. In addition 4 alternative route options were tested where applicable within each scenario. This provides a matrix of the various options to inform TfL-Surface Transport and TfL-London Underground. Modelled outputs were provided for the ‘am’ and ‘pm’ peak period.

4. Modelled Outputs

4.1 To inform on the base situation the following parameters are worthy of note:

- Journey time validation of the base model was set against 60 routes within the 2012 model which are calibrated against continuously acquired real time LCAP data;
- The proposed construction vehicular route which is a variant of a recognised one known as Route 13 and meets DfT assignment modelling criteria, as is noted to produce outputs within 15% of observed journey times. See Figure 4.1 below:

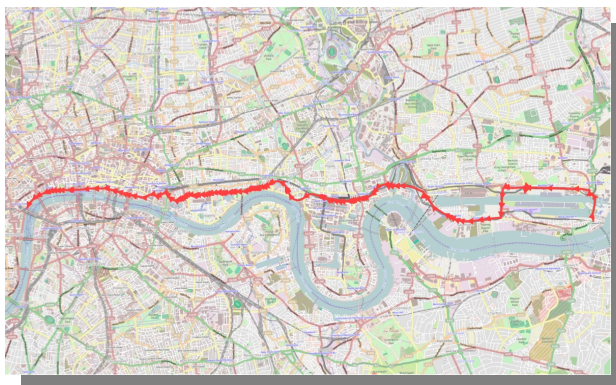


Figure 4.1 Route 13 Construction Route

4.2 Routings from the work site to Arthur Street in the base case have been tested through a number of variants; as set out in the 5 scenario’s detailed in section 3.1, but also for each of these through series of alternative routes.

Scenario description	Route 13	Route 2	Route 3	Route 4
Scenario 1 (base situation) Arthur Street open to all	21 mins	+ 105% (i.e. in excess	+69%	+63%

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traffic		of JT doubling)		
Scenario 2 (2016 base situation with EWCR added)	-	+122%	+74%	+104%
Scenario 3 (2016/ EWCR/ construction vehicles only in A St & left turn only)	-	+120%	+73%	+101%
Scenario 4 (2016/ EWCR/ construction vehs only right turn with EW CR design)	+5%	-	-	-
Scenario 5 (2016/ EWCR/ construction vehs only right turn with new signal arrangement)	+4%	-	-	-

Table 4.2 Scenario and alternative JT forecasts (for 'am' peak period only)

Notes:

1. Alternative Route 2 is via Blackfriars and Southwark Bridges
2. Alternative Route 3 is via Cannon Street. No JT has been added for lay over at Cannon Street Station

- 4.3 The proposed closure of Arthur Street would see approximately 60 vehs for the 'am' peak hour in the southbound direction needing to find alternative routes. However first it would be useful to understand where vehicles using Arthur Street are originating from and destined for. This is illustrated below in Figure 4.3. The key routings using Arthur Street being Bermondsey area to Victoria Embankment and Lambeth area to Upper Thames Street. Though not modelled, survey evidence for the LU Project for the 'pm' peak has recorded 175 vehs/ hr.



Figure 4.3 current origins & destinations of Arthur Street (am peak period only)

- 4.4 By introducing a closure for all vehicles onto Arthur Street would see reassignment in the local area as illustrated in Figure 4.4 below. The headline changes being:
- Marginal increase in flow on Blackfriars and Southwark Bridges. Note that the Cross-rail for cycles north-South Route is provided dedicated cycle segregated facilities on Blackfriars Bridge and therefore greater queuing would be expected approaching Blackfriars Bridge from the south;
 - Marginal increase flows on Southwark Street;
 - Though not modelled it would be expected a similar distribution pattern would be adopted in the 'pm' peak period, with maximum flow increases of 50-90 vehs/ hr on any one of the routes highlighted in Figure 4.4.

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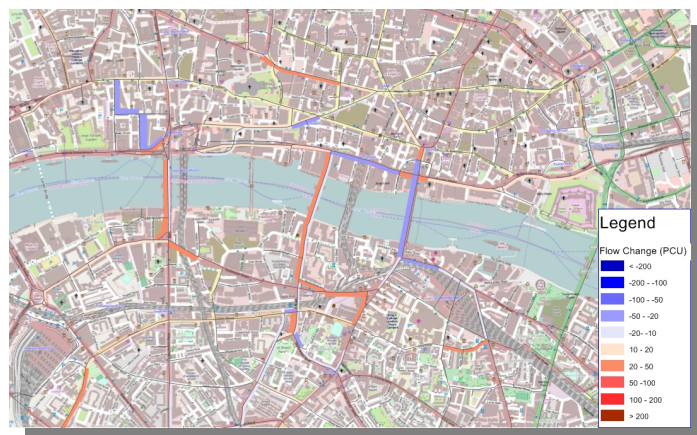


Figure 4.4 Forecast general traffic flows as a result of proposed Arthur Street closure

- 4.5 To put into context the flow distributions illustrated in Figure 4.4, Figure 4.5 below illustrates in the morning peak period the existing flow distribution for Central and Inner London. It is clearly evident flows on the Inner Ring Road, the A1203 The Highway and the A40 are the dominant flow corridors of central London. To provide some scale to this, flows on the A1203 are typically 1,800 vehs/ hr in a single direction. Should a comparison plot be produced the relative impact to Central and Inner London would be so negligible that there would be no discernible difference between Figure 4.5 and a comparison.

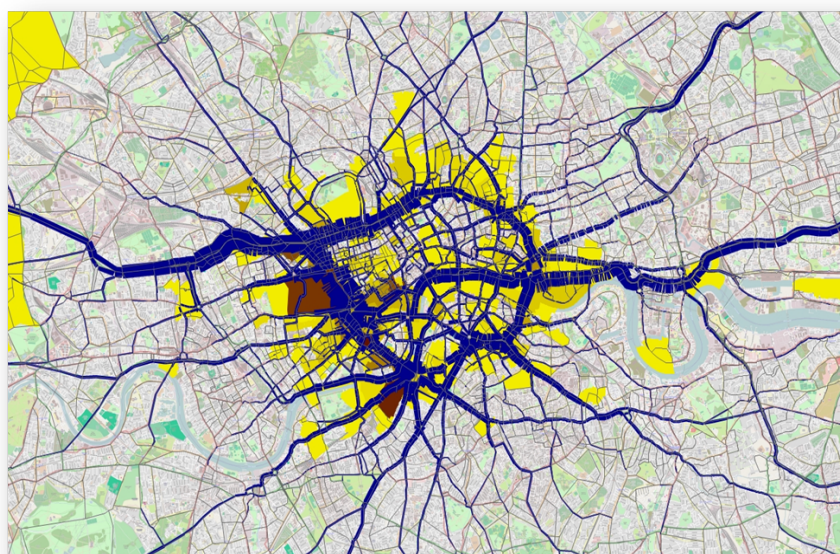


Figure 4.5 Representation of Central and Inner London distribution of traffic flows

- 4.6 The wider local area of the City of London, as illustrated in Figure 4.6 below can be summarised as follows:
- By introducing an enhanced Bank Station right turn lane provision into Arthur Street for construction vehicles only (Scenario 5) would result in a net 4% change in average journey time/ vehicle within the City of London for the 'am' peak period, in comparison to the proposed CSHEWR proposed junction layout (Scenario 4). The increase in average area journey time would be 2% in the pm peak period;

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- An alternative measurement for the same scenario's is the change in total seconds of delay across the City of London would be 6% less in scenario 5 in comparison to scenario 4 for the 'am' peak period. The difference would be 2% for the 'pm' peak period.

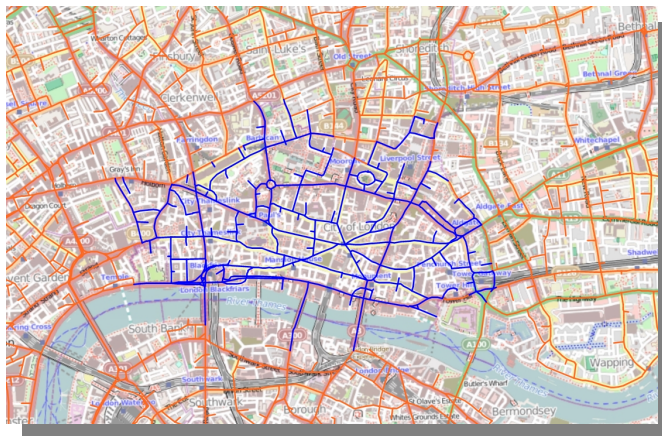


Figure 4.6 Wider area impact assessments

- 4.7 A comparison of whether a dedicated right turn facility at the Arthur Street junction over the current proposed EW Cycle Route junction would result in more westbound vehicles being attracted to remain on the TLRN corridor rather than re-route onto streets such as Leddenhall Street, London Wall and Queen Victoria Street. The volume of vehicles during am 'am' peak hour would be of the magnitude in excess of 200 vehicles/ hr in the vicinity of Upper Thames Street as shown in Figure 4.7 below.

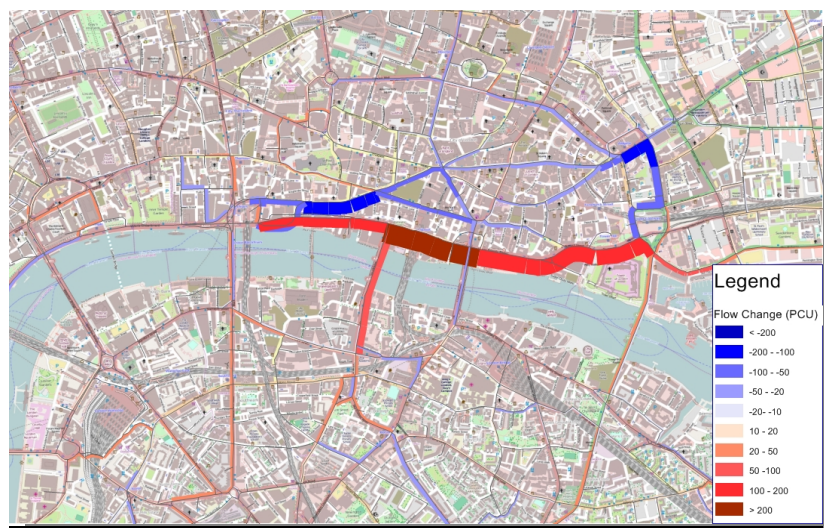


Figure 4.7 Difference in flow assignment when comparing Scenario 5 to scenario 4

- 4.8 Please note, that going forward that continued refinement of design proposals will need to be secured through TfL's usual development processes that may result in refinements to the outputs set out in this document.

5. Conclusions

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- 5.1 Routings for construction vehicles other than to continue on Route 13 from East London to Arthur Street via Tower Hill would add a considerable journey time for these vehicles and there all routings except for those proposed through Scenarios 4 and 5 would unlikely to be adopted by London Underground.
- 5.2 The volume of displaced traffic currently using Arthur Street southbound is marginal and as a number of alternative routes are available any reassignment is unlikely to see anything but a marginal impact.
- 5.3 The impact difference to the local City of London road network does see increases in delay between Scenarios 4 and 5, which is illustrated with more clarity when the benefits of providing an enhanced dedicated right turn facility for Arthur street would realise in excess of 200 vehicles/ hr in the 'am' peak period utilising the Lower and Upper Thames Street rather than the City of London Road network on roads such as Queen Victoria Street.

6. Recommendations

- 6.1 The benefits of Scenario 5 over above all other options in terms of construction vehicle journey times and optimising the number of other traffic vehicles using the TLRN rather than the City of London Road network, considering the duration of project is the preferred scheme option of Road Space Management Directorate.

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