

Appendix D: Highway layout and traffic assessments of Alternative Scheme Proposals

1 Introduction

- 1.1 The Torrington Place/Tavistock Place traffic trial (the Trial) layout was implemented in November 2015. It incorporated single-direction cycle lanes on either side of the road which are protected from the adjacent traffic.
- 1.2 In response to the public consultation process which sought views on whether to make features of the Trial permanent a number of alternative proposals were identified by local residents, businesses and amenity societies. This report assesses and provides officer views on the feasibility and traffic effects of these alternative proposals.
- 1.3 The alternative proposals include:
- Reinstatement of two-way motor traffic on the Torrington Place/Tavistock Place corridor (the Corridor) and introduce single-direction cycle lanes on either side of the road. (This was requested by the Bloomsbury Residents' Action Group (BRAG) in their response to the consultation and included a paper which outlined the feasibility of their preferred option)
 - Reverse the one-way direction of motor traffic on the Corridor (making it one-way westbound for motor vehicles) this response from Imperial London Hotels Limited stated that they wanted the corridor reverted to pre-trial layout, but that the westbound option suggested by others undergo traffic modelling before arriving at a final decision on the future of the Corridor)
 - Reinstatement of two-way motor traffic on a short section of the corridor between Woburn Place and Gordon Square (the response from The Licensed Taxi Drivers' Association (LTDA) stated a preference for an option similar to one suggested by BRAG, but with a comment that should the council decide this is not possible due to space and decide to keep the remainder of the trial layout, then they requested consideration for the section of corridor between Bedford Way and Byng Place be two way for motor traffic).

2 Assessment of the highway Layout

2.1 Background

- 2.1.1 In an ideal scenario two-way working would be provided for all modes along the Corridor with sufficient space for each to operate safely and comfortably. But as is often the case, existing buildings on either side of the Corridor dictate the overall usable width which must be optimised to suit the needs of road users.
- 2.1.2 Alternative designs proposed by respondents to the public consultation would require a variety of different design changes. Compared to the pre-Trial layout, making the trial permanent i.e. removing one direction of motor traffic from a large portion of the Corridor, would generally increase the usable width potentially available for pedestrians and cyclists while still providing an adequate lane width for motor traffic in a single direction. This is

applicable whether it is implemented in its current configuration or reversed. This type of proposal is consistent with Camden's Transport Strategy which seeks to encourage sustainable and active modes of transport and reduce impacts of motor traffic on the environment. Making a short section two-way as suggested is possible in terms of space available on the highway, but would preclude the potential to widen footways at that location.

2.1.3 The BRAG proposal, while reintroducing two-way working for motor traffic, requires a reduction in width of footways, cycle lanes and the carriageway lanes from what has been in place as part of the Trial. It also requires footway and carriageway widths that are narrower than were in place prior to the Trial. This appendix deals with an assessment of BRAG's alternative proposal and how it impacts on the highway layout. In this case the highway layout takes into account the total space including the footway and the road.

2.1.4 BRAG have based their alternative design on recommended guidance from the Manual for Streets (2007) the Transport for London's (TfL) draft London Cycling Design Standards, the Chartered Institution of Highways and Transportation and Inclusive Design for Getting Outdoors (I'DGO) footway widths. However, it is noted that the London Cycling Design Standards (LCDS) has now been published as part of TfL's Streets Toolkit. Schemes which are funded by TfL's cycling programme are reviewed by TfL officers against these standards before they are progressed.

2.2 Footway widths

2.2.1 The potential for improving facilities for pedestrians that are future-proofed against growth in footfall is an important consideration. Increased footway widths can encourage greater use of walking as a means of transport. They make pedestrians safer and more comfortable, and discourage them from encroaching into the cycle lanes or carriageway. Reducing widths has the opposite effect. The Department for Transport's (DfT) Adjacent and Shared Use Facilities for Pedestrians and Cyclists (2004) guidance states the recommended minimum width for urban footways on local roads should be 2m. However this needs to be unobstructed width. To ensure footway widths are inclusive for all users we must also consider the implications for people with mobility and visual impairments, as well as pram users. DfT's Inclusive Mobility (2005) indicates that a 2m clear width allows two wheelchair users to pass one another and 'should be regarded as the minimum under normal circumstances'. TfL's Pedestrian Comfort Level (2010) guidance takes account of DfT's guidance, considers obstructions such as street furniture e.g. street lighting, and recommends a minimum width of 2.9m. This is reflected in Camden's Streetscape Design Manual which recommends a 3m footway width. It is recognised that in a constrained area such as inner London, it is not always possible to achieve this width however it would need serious consideration alongside the needs of other modes.

2.2.2 The alternative design proposed by BRAG reduces the minimum footway widths to between 1.7m and 1.8m (excluding the width of the kerb). This does not meet the minimum requirements for footway width as set out above. It does not give substantial improvement over the existing provisions and could potentially be obstructive to some users. The BRAG scheme would preclude further improvement by widening footways.

2.3 Cycle lane widths

- 2.3.1 Increasing the widths of cycling lanes is also a key objective of the scheme. The Corridor is a popular cycling route which, with the previous bi-directional cycle lane layout, was operating over capacity and becoming hazardous due to overcrowding. The trial layout addresses this by providing adequate space for cyclists travelling in a single direction on either side of the road. LCDS, *Cycle Lanes and Tracks* (2015) indicates minimum cycle lane widths based on the volume of usage. Counts taken during the Trial indicated that each cycle lane exhibited what is categorised as 'medium flow' during the peak-hour periods. To accommodate this volume, each cycle lane should be a minimum of 2.2m wide. To future-proof the scheme against aspirations for growth in cycling encouraged by TfL and the Council, and to make it attractive to users, a width of 2.5m+ is desirable.
- 2.3.2 BRAG propose to revert to a road layout which uses unprotected cycle lanes of widths varying between 1.7m (20% of the route), 2m (20%) and 2.2m (60%). Simply meeting minimum widths (along 60% of the route) would not tend to encourage greater use of cycling as a mode of travel and, taken together with variations in widths to below minimum standards, could even act as a disincentive. While a majority of the provision (60%) would meet the minimum widths outlined in LCDS, the narrow section may pose a problem for cyclists especially as the lack of any segregation could result in passing vehicles encroaching the cycle lanes and subsequently causing side-swipe collisions between motor vehicles and cyclists. Consistently providing widths at or above the recommended minimum along the Corridor is also a desirable outcome where it can be achieved, but would not be achieved with BRAG's alternative.

2.4 Traffic lane widths

- 2.4.1 DfT's document *Design Manual for Road and Bridges, Highway Link Design* (2002) indicates that 3.65m is the standard general traffic lane width in the UK. However, often this width is not achievable and indeed not necessary when volumes of large vehicles are low, particularly in central London. Best practice in Camden is to use traffic lane widths of 3.25m wherever possible. This width allows sufficient space for large heavy goods vehicles (HGV's) which can often occupy 3m (including wing mirrors). In some circumstances, where the geometry of the public highway does not allow for such widths, and there is a need to accommodate other modes, an absolute minimum lane width of 3m can be accepted. LCDS, *Cycle Lanes and Tracks* (2015) indicates that 'If the proportion of HGV and public service vehicle traffic is less than 10 per cent then, subject to the carriageway geometry and speed and volume of traffic, motor traffic lane widths may generally be reduced to between 2.5 and 2.9 metres. Lanes adjacent to cycle lanes or bus lanes, however, should be a minimum of 3.0 metres wide'.
- 2.4.2 The alternative design proposed by BRAG suggests using 2.75m wide general traffic lanes, so as to allow motor traffic in both directions (east and west). This could resolve some issues regarding desire-lines for motor traffic and accessibility for emergency vehicles. However, the narrow width is considered below the desired minimum and could result in head-on or side-swipe collisions between opposing motor traffic, particularly involving HGV's. It would also increase the probability of vehicles encroaching the nearside cycle lanes resulting in side-swipe collisions with cyclists (further increased by the proposed narrow cycle lane widths). Officers consider such a layout to carry a high risk of motor vehicle collision and expect that it would not pass the standard road safety audit process.

2.5 Summary of the assessment of the highway layout

- 2.5.1 The proposal to reverse the direction of one-way motor traffic flow in the Corridor and the proposal to introduce a short section of two-way operation in the Corridor between Woburn Place and Gordon

Square, pose no major geometric design changes, however the latter would prevent the potential to widen footways at that location.

- 2.5.2 BRAG's alternative design proposal suggests using footway, cycle lane and carriageway widths that do not meet minimum desired dimensions set out in various guidance and standards documents and could be considered unsafe. Officers consider that, given that one of the key objectives of the scheme is to improve the corridor for walking and cycling, these desirable minimum widths should at least be met, if not exceeded.

3 Traffic Reassignment Assessment

3.1 Background

- 3.1.1 A traffic modelling exercise has been undertaken to assist in assessing the possible impacts of making permanent the interventions currently in place in the Tavistock Place/Torrington Place corridor as part of the Trial. Further testing has also taken place to consider the alternative proposals raised in response to the public consultation. The Council commissioned an external consultant to investigate the possible redistribution of motor traffic when the Trial interventions are combined with future committed and other potential schemes in the surrounding area. TfL officers have been involved throughout this process and have agreed the method adopted for the assessment and confirmed that the traffic model is fit for purpose.
- 3.1.2 The strategic traffic model used is owned by TfL and is known as the ONE model (which covers all of central London). It uses actual traffic data from a number of locations including traffic volumes and origin-destination information. It is a tool used to provide an assessment at a high level of how traffic might be expected to behave and what routes drivers would likely take should a change to the road network be introduced. The model has been calibrated using on-site traffic survey data collected after the Trial was implemented. The ONE Model utilises an equilibrium assignment methodology wherein it assigns trips between all origins and destinations to their least cost path and assumes that drivers have perfect network knowledge when selecting routes. The model assumes a fixed traffic volume demand matrix, meaning no traffic evaporation due to modal shift is considered. It does, however, provide useful guidance, especially when considering the potential effects of different designs.
- 3.1.3 While the primary objective of this analysis is to test predicted impacts of making the Trial permanent, and consider the impacts of alternative proposals, it is noted that there are two other proposals within the vicinity of the project area which have been consulted upon but where no decision has yet been taken; these are proposals for Judd St/Euston Road/Midland Road junction and for Brunswick Square. Therefore a number of different scenarios have been tested to ensure the assessment is robust and provides a good overview of likely differences between options under consideration. This includes consideration of their predicted impacts individually and cumulatively; these would help officers in reaching their recommendation on a way forward for the three schemes. Although it should be noted that a decision on the Judd St/Euston Road/Midland Road junction, and Brunswick Square proposals, will be taken at a later date and therefore any proposals which may be approved, and their subsequent traffic impacts, are subject to change.
- 3.1.4 The traffic model also assumes that the West End Project (WEP) is in place as this project has received approval and construction is expected to start early this year. Therefore the results will differ somewhat from what is being seen on the street as part of the Trial as, once the WEP is in place, travel patterns for some drivers are expected to alter. Hence the use of the model to assist in

assessing those new travel patterns which the WEP is likely to generate. In addition, the traffic data captured after the trial was put in place does indicate a change in volume for a number of roads in the area, with some showing an increase whilst others show a decrease. It is difficult in most cases (apart from the obvious where the westbound route is removed as part of the trial) to attribute the change in volume solely to the trial. This is because at the same time there have been many instances of prolonged highway and building construction works which would likely have contributed (at least in part), to traffic congestion and redistribution within the surrounding road network, potentially skewing the observed traffic patterns. Perhaps most notable among these have been Endsleigh Street, Endsleigh Gardens, Cartwright Gardens, Judd Street, Tavistock Place; Herbrand Street; Bedford Way; Tavistock Square, Gower Place, Gordon Square; and Gordon Street.

3.1.5 Morning peak-hour periods have generally shown higher predicted changes, in terms of traffic volume, across the study area than in the afternoon peak. To be conservative and for simplicity, this report considers the morning peak period only. The ONE Model designates this period as 8.00am to 9.00am on an average weekday. The highest flow for this area is slightly later in the morning but the model is limited to the worst case across the area covered by the model which extends much further than the trial area. Nevertheless, the data shared during the consultation provided traffic data during the worst period for the project area therefore useful for comparative assessment.

3.1.6 The schemes tested include:

- The Trial (eastbound only in most of the Corridor for motor vehicles)
- The Trial Reversed (westbound only in the Corridor for motor vehicles)
- Midland Road and Euston Road/Judd Street Junction Proposed Walking and Cycling Improvements (consulted upon, with decision to be taken at a later date)
- Brunswick Square Proposed Walking and Cycling Improvements (consulted upon, with decision to be taken at a later date)
- Two-way section on the Corridor between Gordon Square west and Woburn Place (this is slightly longer than the section suggested by LTDA but it provides an assessment of the section where the highway layout permits two way to be provided)

3.2 Predicted impact of making the Trial Permanent

3.2.1 The Trial makes Tavistock Place/Torrington Place eastbound only for motor traffic, meaning all westbound movements that were previously using the Corridor are reassigned to other parts of the network (except the section between Gower Street and Tottenham Court Road, which remains westbound). In addition to vehicles removed from the westbound direction in the Corridor, the model also shows some notable traffic reductions in the eastbound direction; westbound on Sidmouth Street; northbound on Gordon Street and southbound on Gower Street. Broadly, traffic is shown to reassign to the Transport for London Road Network (TLRN) and Strategic Road Network (SRN) with increases in traffic volumes shown on Gray's Inn Road northbound and Euston Road. However, there are some identifiable moderate increases predicted on local roads including; Judd Street northbound; Endsleigh Street northbound; Endsleigh Gardens westbound and Gordon Street southbound. Activity around Gordon Street appears to be increasing due to it being the primary access/egress for Euston Station – turning restrictions limit access from Euston Road.

3.3 Impact of the Trial if it were Reversed to make motor traffic westbound only

3.3.1 In response to the public consultation a number of local residents indicated a strong desire to consider reversing the direction of one-way traffic in the Corridor, making it one-way westbound for motor traffic. Predicted motor traffic reassignment has therefore been tested for this option. In

addition to removal of eastbound traffic along the Corridor, the model shows some notable traffic reductions heading northbound and southbound on Gordon Street; eastbound on Sidmouth Street and southbound on Hunter Street. The TLRN also experiences some minor relief. However, impacts to local borough roads are more substantial. Moderate increases to traffic volumes are shown on Endsleigh Street and Endsleigh Gardens in both directions and southbound on Woburn Place. Traffic heading eastbound finds an alternative route using Keppel Street, Malet Street, Montague Place, Russell Square and Bernard Street, rather than Euston Road (TLRN).

- 3.3.2 There is also a predicted increase on Sidmouth Street and Tavistock Place in the westbound direction, as traffic uses this route rather than Euston Road. Combined with predicted increases on Hunter Street (northbound) this option poses potential traffic reassignment on more borough roads. This would be detrimental to nearby cycling schemes including the committed North-South Cycle Superhighway (CS6) and routes on the Central London Cycle Grid.

3.4 Impact of making short section of the Corridor two-way for motor vehicles

- 3.4.1 Responses to the public consultation also highlighted a desire to make a short section of the Corridor two-way for motor vehicles. This change has been considered in both options for the trial (i.e. if the Corridor is made either one-way eastbound or one-way westbound for motor vehicles). The traffic model predicted no notable impacts from this change in either option. Therefore, this design change is considered neutral in terms of strategic traffic reassignment.

3.5 Impact of the Trial, combined with potential Brunswick Square and Judd Street proposals

- 3.5.1 In close vicinity to the Trial there are two other schemes which have been consulted upon; proposing traffic changes as part of the Central London Cycling Grid. If these schemes progress in line with the proposals consulted upon, then their net effect would be to reduce motor traffic in the Judd Street/Hunter Street area. This would encourage through-traffic to use the TLRN and SRN such as Euston Road, Gray's Inn Road and Upper Woburn corridor rather than local roads, thus creating a safer environment for pedestrians and cyclists along these local roads. This would be achieved (if approved) by introducing closures to motor vehicles on Judd Street at the junction of Euston Road; and Lansdowne Terrace at Brunswick Square.
- 3.5.2 Due to the close proximity of these two potential schemes, a cumulative option has been modelled to provide an overall view of how traffic in the area is predicted to behave should a decision be made to implement all three schemes. It should be noted that the decisions relating to the possible Brunswick scheme and Judd Street scheme will be taken at a later date. As before, the predicted effects of traffic affected by the committed WEP is common to all assessments.
- 3.5.3 As with the assessment of the Trial alone, limiting traffic along most of the Corridor to eastbound only (for motor vehicles) means westbound motor traffic reassigns to other parts of the network. There are also isolated traffic reductions predicted on Gower Street southbound and Gordon Street northbound. The presumed introduction of Brunswick Square and Judd Street schemes shows reductions in the amount of traffic using Judd Street, Hunter Street, Brunswick Square, Grenville Street, Guilford Street and a portion of Gray's Inn Road.
- 3.5.4 Motor traffic appears to be largely reassigning to the TLRN and SRN rather than to local roads although there are some local roads with predicted increases in traffic volume. The model shows an emerging traffic route in the westbound direction which uses Gray's Inn Road, Euston Road, turning left into Upper Woburn Place, then right into either Endsleigh Place or Endsleigh Gardens. An alternative eastbound route is also apparent whereby vehicles bypass Euston Road by heading southbound from Melton Street into Gordon Street southbound and into the Corridor. All of these

local roads are predicted to see moderate increases in traffic volume. Bernard Street also experiences a predicted traffic increase as eastbound traffic converges from multiple origins.

3.6 Impact of the Trial Reversed, combined with potential Brunswick Square and Judd Street closures

3.6.1 An option was also modelled considering the predicted traffic reassignment if all three schemes were implemented, and the Trial was reversed to make it westbound only to motor traffic. Similar to the option with the trial in its current direction, reductions in traffic volumes are predicted in both directions on Judd Street, Hunter Street, Brunswick Square and Guilford Street. As the Corridor is westbound only for this assessment, eastbound movements are reassigned and there are moderate reductions in traffic predicted on Gower Street southbound; northbound on Gordon Street and eastbound on Sidmouth Street.

3.6.2 However, as shown with just the Trial in reverse, the predicted impact to local borough roads is significant. There are predicted increases as traffic finds alternative eastbound routes using local roads eg notably around the British Museum and Russell Square. The impact is particularly heavy on Bernard Street as eastbound traffic converges from a number of origins.

3.6.3 Acton Street westbound, Gray's Inn Road southbound and Sidmouth Street westbound also see increased traffic due to the Corridor becoming an attractive through-route as an alternative to the TLRN (Euston Road). There are increases predicted in both directions on Endsleigh Street and Endsleigh Gardens; eastbound/southbound on King's Cross Road and northbound on Gray's Inn Road.

3.7 Traffic modelling summary

3.7.1 The strategic traffic modelling shows that if the Trial is made permanent traffic is predicted to reassign primarily to the SRN and TLRN rather than local roads. Monitoring of the Trial has identified instances of traffic reassignment on local roads neighbouring the scheme. The traffic modelling predicts mitigation of this in some sensitive areas once the WEP is implemented - as was expected. These patterns differ further when the other potential schemes are considered. If the Trial were to be made permanent in its current form isolated predicted impacts to the borough network are not insignificant but could be mitigated with local interventions such as banned turns.

3.7.2 Given the dynamic nature of traffic in this area, a post-implementation monitoring exercise should be used to determine whether the predicted reassignment occurs in areas of concern and whether or not additional mitigation measures should be progressed. This exercise would need to be undertaken once WEP is in place and traffic patterns have had a chance to settle. Additionally, consideration would need to be given to potential effects of High Speed Rail Link 2 (HS2) which is also in close proximity to the Corridor. While it has not yet received formal approval, HS2 may well go ahead, causing significant impact to the surrounding road network during and after construction. At the time of writing, sufficient data is not available to inform a quantifiable or even a broad basis for understanding of the possible traffic impacts of HS2 during construction, or upon completion.

3.7.3 Although both options show some predicted impacts on local roads, reversing the Trial to allow only westbound- motor traffic appears to open a desire line for westbound motor traffic which provides relief for the TLRN/SRN by reassigning more traffic to the Corridor and the surrounding network of local roads. This is far more significant and could potentially compromise the committed and planned walking and cycling schemes in close proximity to this project. Additionally, the reassigned eastbound movements are predicted to use local routes around the British Museum, Russell Square and Brunswick Square rather than Euston Road. The trial in its current form allows for traffic to remain on, or reassign to, the main networks which can carry larger volumes of traffic.

- 3.7.4 When combined with the potential road closures from the Judd Street and Brunswick Square proposals, the expected restriction of through-traffic using Judd Street/Hunter Street appears to be successful. Broadly speaking, there is a larger predicted traffic increase on local borough roads when the Trial is made westbound only for motor vehicles than when it is eastbound.

4 Other factors

- 4.1 Other factors were raised by BRAG when giving their views on the Trial. These have been addressed with officer comments in the Appendix C: Consultation Report - Headline results and discussion and EQIA appendices, C and E.

5 Summary

- 5.1 The assessment of BRAG's alternative proposals for the Corridor has shown that, based on the required geometric design changes, retaining two-way operation for motor vehicles and two way cycling on the Corridor is not achievable whilst also meeting the primary objectives of the scheme i.e. encouraging sustainable and active modes of transport and reduce impacts of motor traffic on the environment through the provision of better facilities for pedestrians and cyclists. But even if the BRAG scheme could be made to fit, it would not only fail to achieve the objectives of the Trial scheme, but would also reduce options for future improvements within the corridor.

- 5.2 Using strategic traffic modelling to assess predicted impacts of the remaining alternative options it is shown that:

- Making the Trial features permanent (with motor traffic permitted one-way eastbound only on most of the corridor) would optimise the opportunities for management of motor traffic in terms of having least overall impact to local roads; and acting harmoniously with other committed (and consulted) schemes.
- Reversing the one-way direction for motor traffic in the Corridor would re-introduce a through-route for motor traffic, result in widespread traffic reassignment on local roads and potentially preclude future improvements consulted upon.
- A short two-way section in the Corridor results in neutral traffic impacts compared with making the whole corridor one way or the other. However it does appear to result in reassignments along new routes that traffic could use utilising local roads, and would not allow the potential improvements to be made to the footway. These include widening the footway which is currently narrow and would benefit from being wider to meet the present and future needs of pedestrians.

6 Recommendation

- 6.1 Based on the assessments outlined in this document it is recommended that the current Trial be considered for progression of a permanent traffic order, subject to detailed design, statutory processes and securing required approvals from TfL. Alternative design proposals raised in the public consultation are not recommended for further consideration.