Thames Pedestrian and Cycle Bridge, Canary Wharf to Rotherhithe

Chapter 8: Outline Connectivity Assessment

February 2016

Authors

Sustrans makes smarter travel choices possible, desirable and inevitable. We're a leading UK charity enabling people to travel by foot, bike or public transport for more of the journeys we make every day. We work with families, communities, policy-makers and partner organisations so that people are able to choose healthier, cleaner and cheaper journeys, with better places and spaces to move through and live in.

Head Office
Sustrans
2 Cathedral Square
College Green
Bristol
BS1 5DD

Version History:

Revision	Issue date	Prepared by	Checked by	Authorised by	Purpose of Issue
v001	9 October 2015	Bryn Lockwood	Matt Winfield	Matt Winfield	Draft for comment
v002	16 October 2015	Bryn Lockwood	Cliff Matsuya	Annette Jezierska	Draft for Comment
v003	30 November 2015	Cliff Matsuya	Annette Jezierska	Annette Jezierska	Final issue

For further information please contact:

Cliff Matsuya, Business Support Manager

70 Cowcross Street, Farringdon, London, EC1M 6EJ

Telephone: 020 7017 2350

Thames Pedestrian and Cycle Bridge, Canary Wharf to Rotherhithe Chapter 8: Outline Connectivity Assessment		
	Report Number:	SUSL281-TBFS-OCA
	Revision Number:	v003
	Purpose of issue:	Final issue
	Issue date:	04 February 2016
	Prepared by:	Cliff Matsuya
	Checked by:	Annette Jezierska
	Date checked:	30 November 2015
	Approved by:	Annette Jezierska
	Date approved:	30 November 2015

Table of Contents

1. Introduction

This chapter seeks to highlight the main issues and opportunities associated with the movement of cyclists and pedestrians using the proposed bridge. The approach and dispersal of cyclists and walkers on both sides is considered, with the main issues and constraints highlighted.

Further analysis of these movements is required, as well as concept and detailed designs for highway and other interventions required to facilitate these new movements safely while ensuring that the highway network continues to function effectively.

2. Connections from Bridge Landing Points Into Existing Network

2.1 South Bank Links

On the south bank the access ramp for the bridge would link to the highway network on Rotherhithe Street at Durand's Wharf allowing onward connections:

- North: Rotherhithe Street to Thames riverside and north part of Rotherhithe, with connections to National Cycle Network Route 4 (NCN4) and Cycle Superhighway 4 (CS4)
- West: Salter Road overbridge via Greenway link to Russia Dock Woodland and Canada Water, and CS4
- South West: Rotherhithe Street and Salter Road towards Quietway 2 (QW2) and CS4, Bermondsey, Peckham and South London
- South East: Rotherhithe Street and Bonding Yard Walk towards Deptford and NCN4, and CS4 to Greenwich

Figure 1: Network links (South bank)

Imagery ©2015 Google

2.2 North Bank Links

On the north bank the access ramp for the bridge would link to the highway network at the upper level of Westferry Circus allowing onward connections:

- North - Westferry Road towards CS3, Limehouse, Westferry, Poplar and the Olympic Park/ Stratford City
- East - West India Avenue to the offices around Canada Square in Canary Wharf
- South East - Westferry Road towards South Quay, Marsh Wall

Figure 2: Network links (North bank)

Imagery ©2015 Google

3. Network Flows

To undertake an assessment of the impact of additional journeys on network capacity an understanding of the distribution of trips from the bridge landing point is required in order to determine forecast flows for specific parts of the network. For the current concept development stage a working assumption of the distribution of trips has been adopted, based primarily on an understanding of the distribution of trip generators and attractors on the south and north bank respectively. Further refinement of the analysis of trip distribution will be needed in subsequent stages of development.

3.1 Demand Forecast

The demand forecasting undertaken for the new bridge indicates an annual average daily flow of 10,200 cycle trips in the opening year, 2020. This is the total number of movements which are assumed to be equal in both directions over the whole day. As the north side of the bridge is primarily a centre of employment and the south side primarily residential, the morning and afternoon peak flows would be significantly tidal. It has been assumed that flows over the bridge will be predominately northbound (towards Canary Wharf) in the morning peak and predominately southbound in the afternoon peak.

This suggests there would be approximately 3,400 northbound cycle trips during the morning peak (07:00 – 10:00) of which, 50%, 1,700 occur in the peak hour (8:00-9:00), with an equivalent total number of southbound trips in evening peak but with a slightly lower peak hour flow, following normal patterns of travel in London.

Trips will also be generated from the growing residential development on south Isle of Dogs to destinations such as London Bridge. However, as such trips will have minor impact on the overall network capacity, they have not been included at this stage.

3.1.1 South Bank Forecast Flows

On the south bank (Rotherhithe) an assessment of the distribution of local housing areas, residential developments and wider population centres indicates that trips over the bridge would distribute approximately as shown in Figure 3 and Table 1 below:

- 5% from/to destinations along the riverside immediately north of Durand's Wharf and residential areas in the north part of Rotherhithe. A low number of onward utility trips would be expected in this direction as more direct routes would be available. This though remains an important connection for leisure journeys. So the proportion of weekend and off-peak demand would be higher - though not absolute trip numbers
- 10% from/to residential areas immediately west of Durand's Wharf around Russia Dock Woodland and the Canada Water development. Although of high aesthetic quality/ ambience, this would be relatively slow route and it is anticipated that it would only be used for onward utility trips to points further west by less confident cyclists who prefer quiet traffic free routes over directness and the majority of commuters would opt for the quicker alternative routes. The quiet, woodland environment may also deter some from using this route at night-time
- 55% from/to points towards Bermondsey, Peckham, Brixton, Lewisham and destinations further west, south-west and south. This flow is anticipated to form the largest proportion

of the demand for the bridge

- 30% from/to points to the south-east towards Deptford, Greenwich and destinations further east

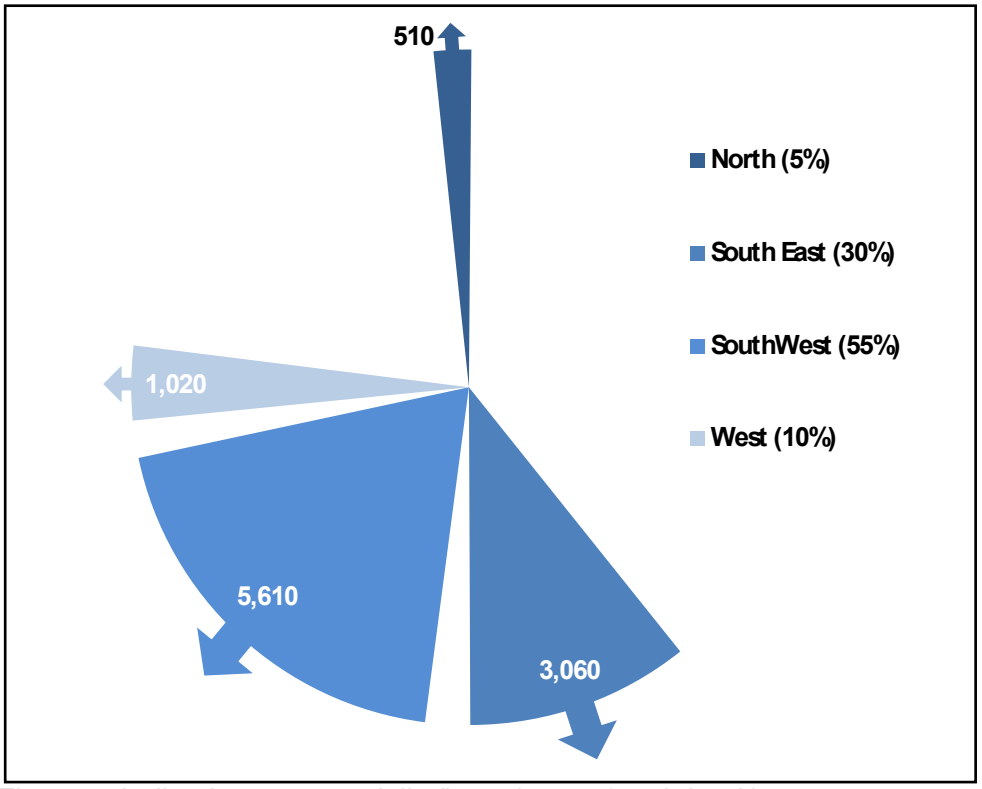

Figure 3: Indicative average daily flows (2020, South bank)

Origins	Split	Daily	AM peak, 7am - 10am	Peak hour, 8am - 9am
North	5%	510	170	85
South East	30%	3,060	1,020	510
South West	55%	5,610	1,870	935
West	10%	1,020	340	170
Total Journeys		**10,200**	**3,400**	**1,700**

Table 1: Indicative distribution of trips (2020, South bank)

3.1.2 North Bank Forecast Flows

On the north bank (Canary Wharf), an estimate of the distribution of employment centres in each of these areas indicates that trips over the bridge would distribute approximately as shown in Figure 4 and Table 2 below. These distributions are based on existing origin and workplace destination data taken from the 2011 Census, and applied to those trips which could be made by bike within 25 minutes, if a bridge were in place. The majority of trips landing at Westferry Circus (89%), are estimated to travel to the Canary Wharf area.

- 6% to points north of the landing ramp, towards destinations in Limehouse, Westferry

and Poplar including those connecting to Cycle Super Highway 3 (CS3) traveling to destinations further away such as Mile End, Lea Valley, Stratford

- 90% east into the employment destinations in the immediate area around Canada Square - Canary Wharf etc.
- 4% to points south and south east towards South Quay, Marsh Wall and destinations in central and southern part of the Isle of Dogs.

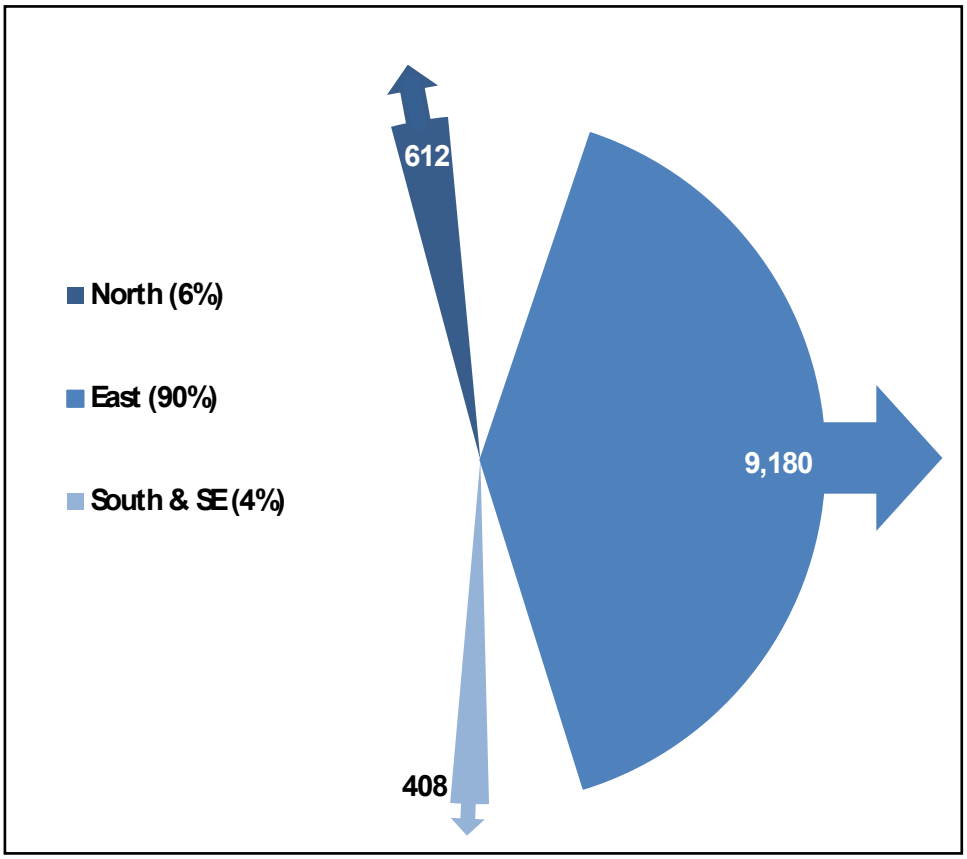

Figure 4: Indicative average daily flows (2020, North bank)

Origins	Split	Daily	AM peak, 7am - 10am	Peak hour, 8am - 9am
North	6%	612	204	102
East	90%	9,180	3,060	1,530
South and South East	4%	408	136	68
Total Journeys		**10,200**	**3,400**	**1,700**

Table 2: Indicative distribution of trips (2020, North bank)

4. Network Suitability and Capacity

Likely travel flows and the suitability of networks have been determined by reviewing how the bridge will connect to existing and programmed routes. Figure 5 below illustrates how the bridge connects to existing and programmed routes such as Cycle Superhighways, Quietways and NCN routes.

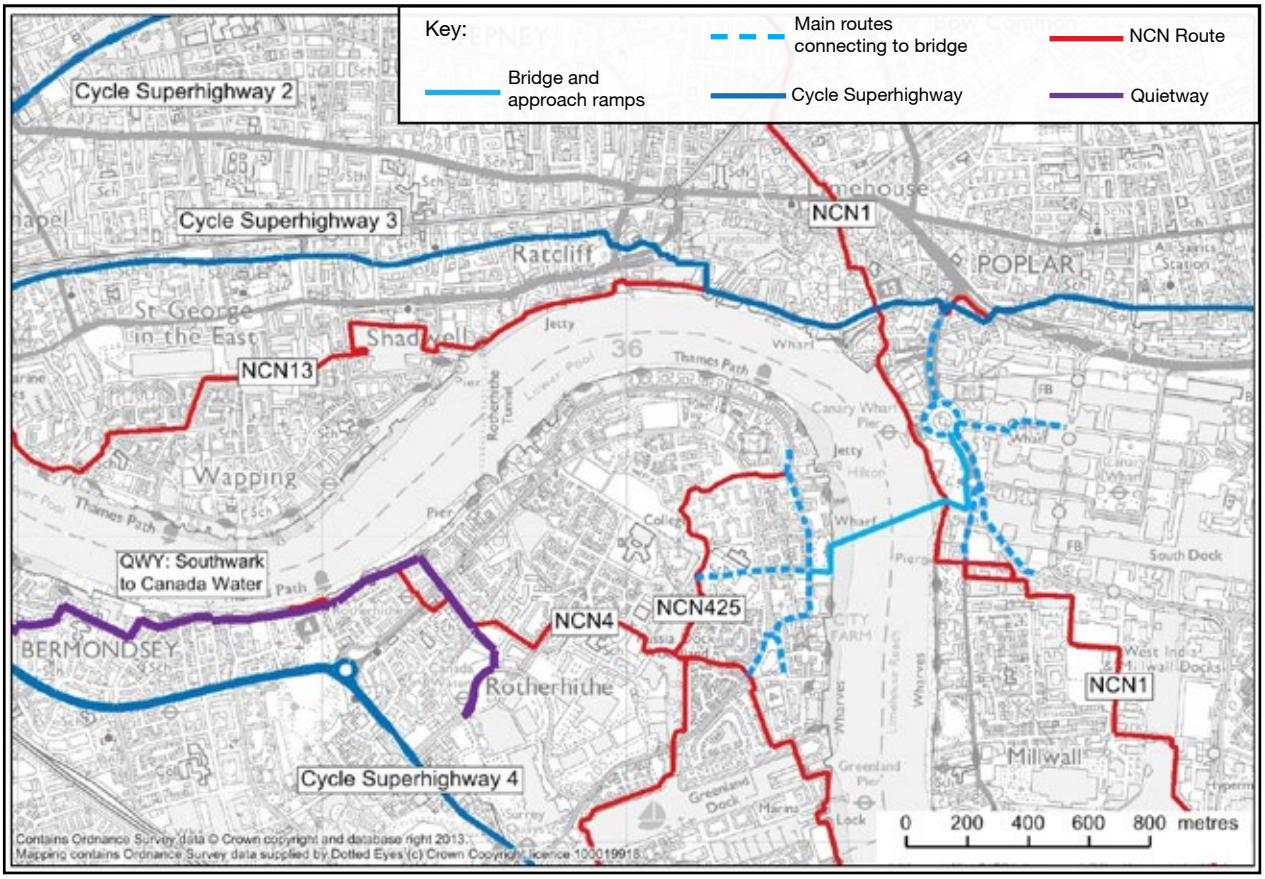

Figure 5: Map of existing and programmed routes in area around proposed bridge site

4.1 South Bank

The ramp from the bridge would land at Durand's Wharf, a public green space on Rotherhithe St. The level of the ground in the green space is approximately 3m higher than street level. Access from Rotherhithe Street to the bridge ramp base is via an existing sloped and partly cobbled roadway. Changes to the landscape design of Durand's Wharf, including the slope to Rotherhithe Street will be considered in the next stage of design development. This should as far as is practicable mitigate the effect of the gradient which is greater than recommended best practice design for access for people with restricted mobility.

Further possible interventions are described in this section, and shown on Figure 6 below.

Figure 6: Locations of possible interventions on the South Bank

Map Data ©2015 Google

1. Rotherhithe Street (North) – to give access to riverside and residential areas in the north part of Rotherhithe and the Thames Path.

Cyclists leaving the bridge ramp would continue north along Rotherhithe Street. Traffic levels are relatively low along Rotherhithe Street with one bus route (C10) operating as single deck midi-bus approximately 6 buses per hour in each direction. Level of service for cyclists should be sufficient that no significant interventions would be anticipated.

With the forecast peak flows – 85 cycles in AM peak hour (Table 1 on page 7) – and assuming no significant change in other traffic volumes, there would be adequate capacity in the existing highway configuration.

2. Salter Road bridge – to give access to residential areas around Russia Dock Woodland and Canada Water.

Cyclists leaving the bridge ramp would continue west along Holyoake Path to the existing footbridge over Salter Road, on designated cycle routes through new residential development adjacent to Downton Road onto existing cycle track through Russia Dock Woodland. This connects with NCN4 which continues through on traffic free and low trafficked roads into the new large-scale development at Canada Water. Flow assumptions consider this route to be more likely used during the daytime, and so estimates low numbers of users.

This provides a good quality traffic free-route which will attract less confident cyclists and serves the surrounding residential areas well.

The access to the path between Rotherhithe Street and the Salter Road bridge is constrained in places between building lines. However, it would be possible to maintain a width of 3m through the pinch point, so it is anticipated that this would be sufficient to accommodate the forecast peak flow of 170 cycles in AM peak hour (Table 1 on page 7). It is also anticipated to be sufficient to accommodate the expected increase in pedestrian flow from new residential developments, with monitoring to identify any requirement for managing potential conflict with pedestrians on the path.

Consideration should be given to changes required to the existing bridge over Salter Road, including suitability of the parapet height, potential for widening and reducing the gradient.

3. Rotherhithe Street (South) – The route away from Durand's Wharf for the majority of trips would be south along Rotherhithe Street. This would carry all south, south-east and south-west bound trips for the first 300m to the junction of Rotherhithe Street with Salter Road where the majority of traffic (south-westbound) would continue along Salter Road and a smaller number continue south on Rotherhithe Street toward Greenland Dock.

This section of Rotherhithe Street has a carriageway width of approximately 7.2m with parking permitted on one side of the road, which reduces the effective width. Parking restrictions (double yellow lines) alternate between sides of road according to the frontage and to accommodate sight lines around two bends. The parking restrictions help maintain sufficient width to allow the bus to pass. As noted above traffic levels are relatively low on Rotherhithe St. with most traffic accessing properties and low levels of through traffic, which is served more directly by Salter Road.

The forecast overall peak flow of cycles along this section of Rotherhithe Street – 1,445 cycles in AM peak hour (combined south-east and south-west flows in Table 1) – would create a steady stream of cycles (northbound AM, southbound PM).

Although vehicle flows are low, the current configuration could create difficulties and low level of service for cyclists when having to negotiating on-coming traffic, particularly when the bus is passing.

Consideration should be given to configuring the street space to formalise parking layout and movements to allow passing of on-coming traffic and traffic management during peak hours.

4. The junction of Rotherhithe Street and Salter Road currently gives priority to traffic accessing the southern end of Rotherhithe Street with traffic traveling to/from the northern part of Rotherhithe Street required to make the movement in two stages. Consideration should be given to changing the configuration and priorities of this junction to improve flows and minimise the potential for conflicting movements.

5. Salter Road (South-West) – to allow connections towards Bermondsey, Peckham, Brixton, Lewisham and destinations across south London.

The largest proportion of the bridge traffic on Rotherhithe Street –935 cycles forecast in AM peak hour – would continue on/from the direction of Salter Road.

Salter Road (B205) is a key distributor for through traffic around the Rotherhithe peninsula with higher levels of traffic, mix of heavy vehicles and higher traffic speeds than the surrounding

residential street network. The current configuration would not provide a sufficiently high level of service for cyclists and would risk suppressing usage of the bridge by less confident cyclists.

Salter Road has a wide formation (approximately 18m) for most of it length towards Surrey Quays, with verges and footways of approximately 5.5m each side, which provide the opportunity to include some form of segregated cycle facilities to deliver the required level of service for bridge users. A hybrid cycle lane may be appropriate, as illustrated in Figure 7 below). There is also the potential for Salter Road to become an extension of CS4.

Figure 7: Example of similar width corridor with hybrid cycle tracks[1]

Salter Road (B205) continues as Redriff Road forming the principal corridor south-westward for cycle and motor vehicle traffic for approximately 1 km where it joins the Surrey Quays/Lower Road, A200, one-way system. These roads form part of the Strategic Road Network (SRN) and carry high volumes of traffic which are not suitable for cycle routes without segregation. The long term configuration of the gyratory system is under review to accommodate planned new major development around Surrey Quays. Lower Road is also proposed to revert to two-way traffic by 2017, with protected cycling infrastructure as part of CS4.

Consideration should be given to enabling cycle routes through the newly configured road system to connect the Rotherhithe peninsula to destinations south and west of A200 and particularly to Quietway 2 (westbound to Waterloo and eastbound to Greenwich), NCN425 and connections further south-west towards Peckham and Brixton.

6. Bonding Yard Walk (South-East) – to allow connections towards Deptford, the Convoys Wharf development and Greenwich.

From the junction with Salter Road, Rotherhithe Street continues southward (~200m) to link to National Cycle Network Route 4 (NCN4) along Bonding Yard Walk, a greenway cycle track.

NCN4 also allows connection westwards from Rotherhithe Street to Russia Dock Woodland and Canada Water – providing an alternative high quality and attractive but less direct route to the

1 The Old Shoreham Road, Bristol, https://aseasyasridingabike.wordpress.com

Salter Road overbridge.

The first part of this section of Rotherhithe Street has residential frontage on the east side only no parking restrictions either side of the road. As there are no through routes southwards from here the vehicle flows are relatively low and there is no bus service along this section.

With the forecast peak flows – 510 cycles in AM peak hour – and assuming no significant change in other traffic volumes, there would be adequate capacity in the existing highway configuration.

Consideration should be given to configuring the street space to formalise parking layout to improve the level of service and bring this section of the route up to the high standard on NCN4 further south.

From Bonding Yard Walk the existing cycle route continues around the east end of Greenland Dock and along the Thames-side path to Greenwich, signed as NCN4 and providing a high quality and largely traffic free route for most if its length.

7. South Dock Marina between Rope Street/Princes Court and Calypso Way, creates a pinch point for NCN4 as pedestrians and cyclists need cross the lock over the lock gate.

Consideration should be given to a new crossing of the lock at this point to complete this link and avoid congestion and potential conflict on the lock gate. Any new structure would need to accommodate the movement of masted craft in and out of the marina (e.g. swing bridge), so may present challenges for design or funding. Improvements at this point would be particularly beneficial in increasing pedestrian and cycle accessibility to the new residential development at Convoy's Wharf.

4.2 North Bank

The ramp from the bridge would connect to the upper level of Westferry Circus at the southern side adjacent, on western side, to the south ramp down to Westferry Road. It is important to note that the upper level of Westferry Circus is part of the Canary Wharf estate and not public highway. Possible interventions are described in this section, and shown on Figure 8 below.

Figure 8: Locations of possible interventions on the North Bank

Map Data ©2015 Google

8. Westferry Road (North) – to accommodate onward journeys towards destinations in Limehouse, Westferry and Poplar and connection to CS3, Mile End, Stratford and Lea Valley.

Cyclists leaving the bridge ramp would continue around Westferry Circus to exit via the north ramp, which leads down to Westferry Road at the signalised junction with the A1203 Limehouse Link. All cycle traffic must proceed straight ahead along the Westferry Road, which is a dual carriageway, as cycles and pedestrians are prohibited on the Limehouse Link.

This junction and Westferry Road carry a significant volume of heavy traffic and are currently not of sufficient quality for any but the most confident cyclists.

With the forecast peak flows – 340 cycles in AM peak hour (Table 2 on page 8) – and assuming no significant change in other traffic volumes, there would be adequate capacity in the existing highway configuration, however of inadequate quality.

Consideration should be given to alterations to the junction configuration to allow cycles to transfer to/from the ramp in the centre of the carriageway to segregated facilities at the nearside of each (n/b and s/b) carriageway to link to CS3 at Westferry DLR station (approximately 170m).

A connection to CS3 (eastbound) should also be established along Garford St to give a more direct route to points north of the DLR line and A1261 West India Dock Rd.

9. West India Avenue – to give access to the offices in the immediate Canary Wharf area around Canada Square.

For cyclist movements continuing eastwards, to access offices around Canada Square, consideration should be given to establishing a crossing of the top of Westferry Road and a short (30m) access track adjacent to the roundabout carriageway and crossing of the eastbound arm of West India Avenue. This would allow efficient movement from the bridge into West India Avenue avoiding turning conflicts with other traffic. Locating this access track nearer the roundabout carriageway will also avoid the main pedestrian routes around Westferry Circus. Movements from West India Avenue on to the bridge ramp could also be accommodated by the access track or could use the existing road configuration. This would be dependant on the specific orientation and design of the bridge ramp landing area.

10. Westferry Road (South) – to allow connections to employment centres at South Quay, Marsh Wall and destinations in central and southern part of the Isle of Dogs.

Cyclist movements continuing southwards would also be accommodated by the arrangement described above. This would allow cyclists exiting the bridge ramp to turn down the south ramp to Westferry Road.

The bottom of the ramp merges with southbound traffic from the lower level of Westferry Circus. Consideration should be given to changes to the configuration to allow cycles to transfer to the nearside of the carriageway. Alternatively facilities could be introduced to allow cyclists to continue along a track in the central reservation to the signalised junction with Heron Quays (approx. 40m), where there is more space to introduce an integrated controlled crossing (see Figure 9 below).

A similar arrangement with an offside cycle track from the signalised junction onto the south ramp to the upper level of Westferry Circus would accommodate cycle movements onto the bridge from Heron Quays and approaching from the south on Westferry.

This junction and section of highway is currently under reconstruction.

Figure 9: Example of segregated cycle path on a dual carriageway[2]

2 Tolworth Broadway, London, www.radiojackie.com

4.3 Alternative Routes

When users have sufficient warning of a scheduled bridge closure to allow making alternative travel arrangements, it is anticipated that a significant proportion will opt to make the journey by cycle via an alternative route.

4.3.1 Alternative Pedestrian Routes

For pedestrians the nearest alternative crossing points are Greenwich Foot Tunnel, approximately 4 kilometres to the east, and Tower Bridge, approximately 4 kilometres to the west. The river ferry from Greenland Pier to Canary Wharf Pier also provides an alternative approximately 1 kilometre to the east. The Hilton (Doubletree) pier is closer and offers a shorter journey, however its future operation would be uncertain if the bridge were built.

Routing via the Greenwich Tunnel or Tower Bridge would add up to 6km (or approximately 1 hour 20 minutes) onto the journey to or from Canary Wharf from Rotherhithe. For regular utility trips this increase in distance and time would rule the journey out so it is assumed that the majority of non-discretionary walking trips will switch to an alternative mode with a small percentage diverting to the river ferry.

It will be particularly important for regular pedestrian users of the bridge to have ample notice of bridge closures which could disrupt their journey so they can plan accordingly. They may otherwise lose confidence that the bridge will be available and opt for more reliable modes reducing overall scheme benefits. This is discussed in more detail in Chapter 6: Operational Parameters.

4.3.2 Alternative Cycling Routes

With sufficient prior notice of bridge closures cyclists would be able to plan alternative journeys via Tower Bridge or the Greenwich foot tunnel. Although the Rotherhithe Tunnel permits cyclists and offers a shorter journey than Tower Bridge it is well below the standard necessary to present a valid alternative route for cycling.

For people starting journeys to the west of a line approximately following Rotherhithe New Road from Surrey Quays to Kent Rd/ Commercial Way and Rye Lane in Peckham, the shortest alternative route would be via Tower Bridge. For people starting journey to the east of here the shortest route by cycle would be via the Greenwich Foot Tunnel.

Taking Canada Square as a typical representative destination for trips to the Isle of Dogs – the journey from Peckham Library is approximately 9km or 35mins via either Tower Bridge or Greenwich, assuming a journey speed of 16kmph (10 mph).

Although this could increase journey length by up to 6km for journeys starting from around Durand's Wharf, with prior notice this occasional increase in journey time could be accommodated by a large proportion of regular cycling bridge users. There would however be a significant decrease in the quality of the journey particularly with respect to traffic mix, volumes and speeds. Without significant improvements in the quality of these alternative routes for cyclists this reduction in quality and increased exposure to heavier traffic is likely to deter many users. A feasibility study, using the Quietway Definition Phase methodology, should be conducted along alternative routes, as part of the next phase.

As current use of the ferry by people with cycles is low it is assumed that there will remain small numbers opting to use the ferry as an alternative route for planned closures. Discussion with the ferry operator (Thames Clippers) is required to determine interest in running an occasional service.

Consideration should be given to how planned closures are communicated and how alternative routes are advised; bearing in mind the quality of provision regular cyclist users of the bridge would require to consider diversion to alternative routes. Failure to address quality and capacity issues on alternative routes or to provide effective and timely communication about closures could lead to potential users losing confidence that the bridge will be available and choosing other modes, which would reduce benefits of the scheme.

4.4 Extraordinary Flows Following Closures

It is estimated that it will be necessary to close the bridge to pedestrians and cycles approximately three times a day to allow passage of large river traffic. When the closure is planned and advised ahead of departure and trip planning it will allow users to either reschedule departure times to avoid delays or select an alternative route, by cycle or other modes. However there will be a group of users who are not aware or able to re-plan their journeys that will arrive at the bridge during the closure and wait for reopening resulting in a higher than normal number of users passing over the bridge when it reopens.

This would temporarily increase the flow of cyclists along each of the network links away from the bridge for a short period until the backlog has dispersed. This increase will be most significant if a closure occurs during the peak hour.

Adopting the assumptions and analysis from the Operational Parameters Technical Note indicates that, for the some of the scenarios considered, the build-up of people waiting to cross the bridge would exceed the capacity of the bridge, so the peak flows onto the network will be determined by the maximum capacity on the bridge itself.

As detailed in Chapter 5, the most likely maximum number of cyclists held at the bridge would occur following a 21 minute bridge lift occurring during the PM peak hour. The worst theoretical scenario would occur if there were a 45 minute bridge lift during the AM peak hour.

An estimate of the capacity of the bridge based on the track width and assumed average speed and spacing of cycles suggests that flows might temporarily rise to approximately twice the forecast peak hour flow for a period of up to ten minutes after bridge reopens.

This would create a steady stream of cyclists off the bridge which would require a degree of management – for example by part-time signal control – to minimise impact on network traffic flows.

The length of time required for the post opening flow management to be in operation will be dependent on the specifics of the management regime implemented - e.g. whether to allow the bridge to operate alternately in one direction only to increase efficiency and safety.

The management of flows in all scenarios should be considered in more detail during the subsequent stages of development, alongside a detailed operational procedure for the bridge. This will allow a more complete analysis of the temporary flows following bridge re-opening and the most effective strategies for managing and mitigating impacts of these.

4.5 Further Work

A full transport assessment will be required at the next stage, including detailed discussion with key stakeholders such Canary Wharf Group, LB Tower Hamlets and TfL (particularly to consider bus routes). A microsimulation will also be needed to assess the impact of background and bridge-generated growth in cycling on the road network in the Canary Wharf Estate. This assessment will consider both the impact of the bridge, but also rerouted and new trips arising from the cycle superhighways, and from the growing residential development in the south of the Isle of Dogs. This work is required to test the outline proposals in this report, and progress development of concept designs. Strategic cycle links between the bridge and the growing origins and destinations on the Isle of Dogs, and wider Tower Hamlets, should also be developed at the next stage.