

Bus Services In South Tower Hamlets And Surrounds

TfL Surface Transport – Buses Directorate

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1. BACKGROUND

- 1.1 This note seeks to understand what impact new development and rail enhancements (both planned and recently delivered) will have on the South Tower Hamlets bus network and how the network might change in response to the impact. South Tower Hamlets focuses mainly on Wapping and the Isle of Dogs but, inevitably, the results of the investigation extend beyond this to include most of Tower Hamlets and parts of the neighbouring boroughs.
- 1.2 The area has been the subject of previous reviews, particularly focusing on the Isle of Dogs. Reviews in 2003 and 2007 increased capacity on routes serving the island to accommodate the increased demand generated by new development. The 2007 review proposed the 135 which came into service in May 2008. Both reviews also proposed links to the east. Initially this was an extension of the D7 to Canning Town which was replaced by an extension of route 330 to the Isle of Dogs. Neither of these eastern extensions were implemented, in part due to developer contributions not being forthcoming.
- 1.3 In addition, routes in the study area have been continually monitored and adjusted to take account of changes in the area. Routes relevant to the study area have evolved as follows over the past 10 years:
 - Route 135 introduced (May 2008) operating at up to 6 buses per hour (bph).
 - Route 277 increased in frequency from 8 to 9 bph Monday – Saturday daytimes and from 4 to 6 bph on all evenings.
 - Route D3 increased in frequency on Sunday daytimes from 3 to 4 bph.
 - Route D6 increased in frequency from 7.5 to 8 bph Monday to Saturday daytimes. Also, the routeing shortened to Ash Grove from Hackney to accommodate a trial closure of Hackney Narrow Way.
 - Route D7 increased in frequency Monday to Friday daytimes from 5/6 bph to 9 bph; Saturday daytimes from 5 to 7.5 bph and evenings and Sundays from 3 to 5 bph.
 - Route D8 has been extended into the Olympic Park and Stratford City and increased in frequency weekday interpeaks and Saturday shopping hours from 4 to 5 bph.
 - Route N50 has been replaced by routes N550 to N551 thus doubling the level of service and serving new areas e.g. The Highway.
- 1.4 This note seeks to build on previous reviews by:
 - Summarising the current public transport network.
 - Identifying those factors generating changes to bus use including Crossrail, development sites, local issues and aspirations.
 - Identifying how the bus network may change as development comes forward.

2. LOCAL PUBLIC TRANSPORT NETWORK

2.1 Map 1 shows the public transport network in the area and Table 1 summarises key route details in the core study area. The bus routes provide a comprehensive network across the day and night providing links within and without the study area. The bus network complements the local rail network, in particularly the newly expanded East London Line and the DLR. The rail network (and the foot tunnel) provides links south of the river.



Map 1: Public Transport Network in the Study Area

2.2 Bus routes serving Wapping are single deck reflecting a combination of demand and street constraints while the Isle of Dogs has more double deck services. Key nodes where bus routes are busiest include Tower Gateway, Westferry Road, Mile End and the City. The network generally operates reliably despite known challenges (e.g. congestion on The Highway).

Route	Termini	Via	Pk Freq	SD / DD	Busiest Point	Current Min Standard	Last 4 Qtrs
100	Elephant & Castle - Shadwell	Liverpool St	8	SD	Tower Gateway	1.3	0.8
135	Crossharbour - Old Street Stn	Canary Wharf	6	DD	Westferry Road	1.1	0.9
277	Highbury & Islington - Leamouth	Hackney	9	DD	Mile End	1.1	0.9
D3	Bethnal Green - Crossharbour	Canary Wharf	6	SD	Westferry Road	1.2	1.1
D6	Cambridge Heath - Crossharbour	Mile End	8	SD	Mile End	1.1	0.9
D7	Poplar - Mile End	Isle of Dogs	9	DD	Westferry Road	0.9	1.0
D8	Stratford - Crossharbour	Canary Wharf	5	SD	Bow Church	0.9	1.2
N550	Trafalgar Square - Canning Town	Isle of Dogs	2	DD	Aldgate East	82.0%	66.1%
N551	Gallions Reach - Trafalgar Square	Custom House	2	DD	Wapping	82.0%	83.7%

Table 1: Bus Routes serving South Tower Hamlets

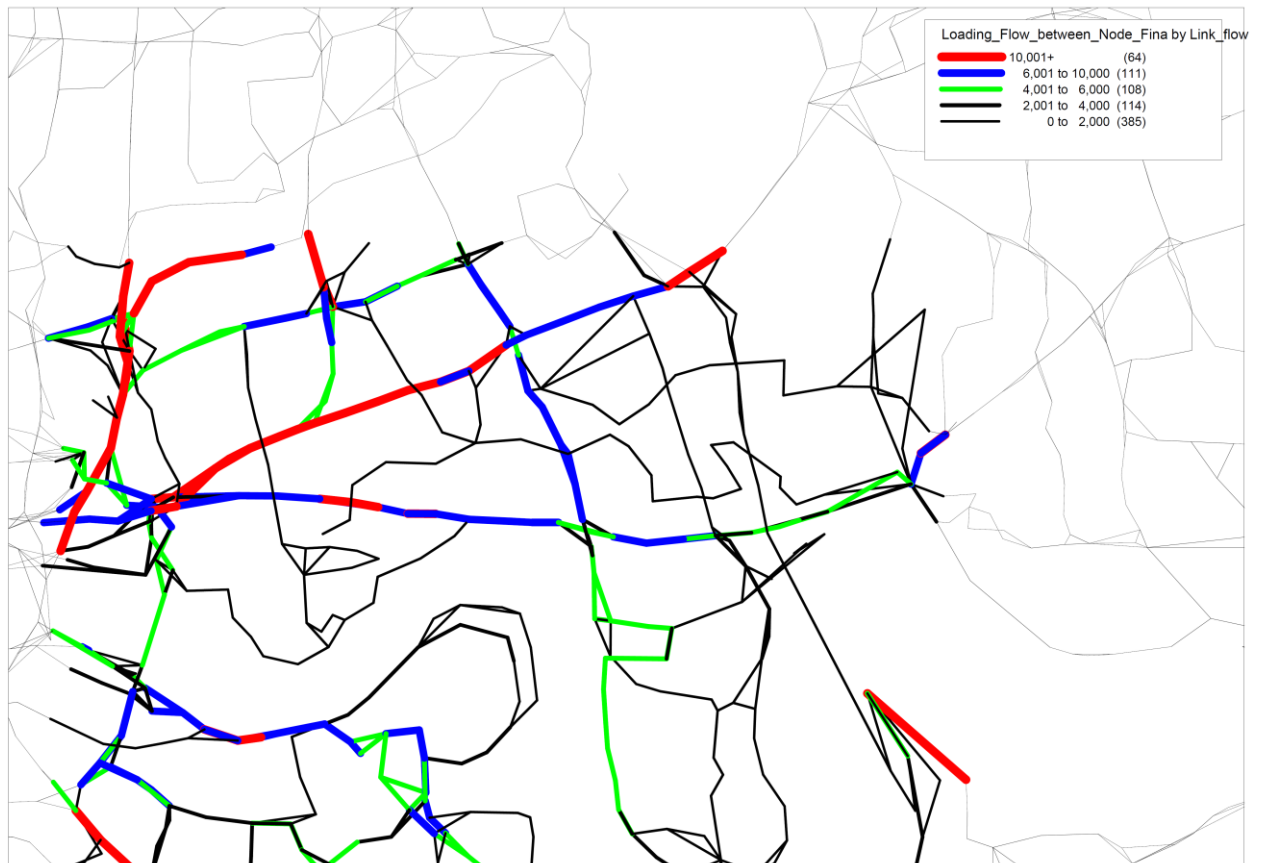
PK Freq = Peak frequency measured in buses per hour (bph)

SD = Single deck. DD = Double deck

Current minimum standard = Reliability standard for each route based on Excess Wait Time for high frequency routes (5bph or higher) and % on-time for low frequency routes (4 bph or lower). Last 4 quarters are from Quarter 2 12/13 to Q1 13/14.

2.3 Map 2 below provides a visual guide to bus loadings by link in the study area based on 2009 BODS data. Although absolute figures will have changed since 2009, it still provides a good indication of travel patterns and key corridors in the study area which still essentially hold true when compared with more recent data (see table 1).

2.4 It can be seen that the City and the key corridors into it (Commercial Road, Whitechapel Road etc) are the busiest, but it also highlights the relatively high demand on the west side of the Isle of Dogs and the north – south movement to Mile End. Wapping / Shadwell has lower demand when compared to these areas, reflecting its size and relatively homogeneity of land use i.e. residential.



Map 2: Loadings By Link in the South Tower Hamlets Area (All Day)

- 2.5 Tables 2 and 3 below divide the study area into key zones and identifies both the bus routes linking them and the number of two-way trips on a typical weekday. It should be noted that it includes only the day routes listed in Table 1 and does not represent every origin - destination the routes provide. Consequently it does not show, for example, the high number of trips on the D3 north of Shadwell towards Whitechapel.
- 2.6 The results confirm the high usage on Westferry Road (Isle of Dogs West) and identifies key destinations as the Canary Wharf Estate, Mile End and City. It also highlights other travel patterns:
- High number of trips between the City and Wapping (100), Isle of Dogs and Canary Wharf (135) but relatively few trips between the Shadwell zone and the City (100).
 - Very high number of local trips within the Isle of Dogs south of Canary Wharf (Zones: Isle of Dogs East and West). Trips to Crossharbour Asda explain only a (significant) minority of these trips (D3, D7).
 - Relatively high demand from the Isle of Dogs and Canary Wharf to Mile End (277, D6, D7).
 - Relatively low demand from Wapping to south of Canary Wharf (D3).

From / To	Shadwell	Wapping	Isle of Dogs E	Isle of Dogs W	Canary Wharf	City	Mile End
Shadwell	100, D3	100, D3	D3	D3	D3	100	N/A
Wapping		100, D3	D3	D3	D3	100	N/A
Isle of Dogs E			135, D3, D6, D7, D8	135, D3, D7	135, D3, D7, D8	135	D6, D7
Isle of Dogs W				135, D3, D7	135, D3, D7	135	D7
Canary Wharf					135, 277, D3, D7, D8	135	277, D7

Table 2: Origin – Destination Bus Route Connections

From / To	Shadwell	Wapping	Isle of Dogs E	Isle of Dogs W	Canary Wharf	City	Mile End
Shadwell	41	467	8	13	12	126	-
Wapping		635	87	75	353	2054	-
Isle of Dogs E			1515	2380	1475	183	798
Isle of Dogs W				670	5590	622	765
Canary Wharf					508	882	1086

Table 3: Origin – Destination Typical Weekday Trips

3. DEVELOPMENT SITES

3.1 Table 4 summarises the main development sites within the study area. Maps to illustrate how new development is changing the area are shown in appendix C.

Wapping Area					
Development	Res Units	School (Students)	Retail Jobs	Planning Status	Est Pk Hr Trips
London Dock (News Intl)	1,800	1,200	0	GLA Stage 1	420
Canary Wharf & Isle Of Dogs Area					
Development	Res Units	Office Jobs	Retail Jobs	Planning Status	Est Pk Hr Trips
15 Salter St	252	0	0	Approved	25
Columbus Tower, Hertsmere House	0	1,430	119	Approved	41
North Quay (Shed 35)	0	17,250	250	Approved	477
25 Churchill Place	0	4,153	0	Approved	114
Riverside South	0	13,170	0	Approved	362
Emerging Newfoundland	566	0	108	Pre-application	58
Emerging Park Place	0	3,886	0	Pre-application	107
Cuba Street (Manilla St / Tobago St)	439	33	29	GLA Stage 1	45
Heron Quay	0	6,782	43	GLA Stage 1	187
City Pride, 15 Westferry Road	948	0	0	GLA Stage 1	95
Arrowhead Quay	0	3,326	26	Approved	92
40 Marsh Wall	0	48	62	Approved	2
225 Marsh Wall, Angel House	249	98	30	GLA Stage 1	28
Former Idescon Court Phase 2	546	83	0	Approved	57
Wood Wharf (#)	1,668	23,120	520	Approved	808
Crossharbour Phase 2	1,111	0	248	Approved	114
Blackwall & Leamouth Area					
Development	Res Units	Office Jobs	Retail Jobs	Planning Status	Est Pk Hr Trips
Leamouth Peninsula	1,700	0	0	Pre-application	170
Blackwall Reach	1,400	0	0	GLA Stage 1	140

Table 4: Major Development Sites in South Tower Hamlets

Based on TA submitted for Heron Quay development (LUP Ref 13-1368), LBTH Local Development Framework & London Dock TA. # New application expected.

- 3.2 Overall this selection of developments represents a potential 3,300 additional peak hour bus trips or the equivalent of 47 double deck buses. Large, single development sites are found in Wapping, Leamouth Peninsula and Blackwall Reach of which the London Docks site is most advanced. However it is Canary Wharf and the Isle of Dogs which has most development representing 2,600 of those peak hour trips. The Westferry Road / Marsh Wall area has a particular concentration of developments although Wood Wharf further east is the single biggest development. It is understood that the approved Wood Wharf scheme is to be re-designed and submitted for further approval. Pre-application discussions have highlighted an expectation to provide a through routing for buses from Prestons Road to Cartier Circle.
- 3.3 An assessment has been made on how the peak hour bus demand generated by the above sites might materialise on the network. This is set out in table 5.

Corridor	→	Development Demand Estimates	
		Site Specific	Railplan 2021 without Crossrail
Vaughan Way	WB	7	(22)
Vaughan Way	EB	33	(150)
Wapping Lane	NB	86	0
Wapping Lane	SB	274	8
Cannon St Rd	NB	43	0
Cannon St Rd	SB	115	9
Burdett Road	NB	65	150
Burdett Road	SB	461	168
Limehouse	NB	363	355
Westferry Road	NB	591	677
Westferry Road	SB	185	163
Marsh Wall	EB	143	13
Prestons Road	SWB	296	85
Prestons Road	NEB	207	94

Table 5: Estimated AM Peak Hour Demand by Corridor from New Development
Shaded area reflects where there is a good correlation between the two methodologies.

- 3.4 Although the above shows significant variations between the two methodologies, this is to be expected. Firstly Railplan data takes into account London Plan estimates and rail enhancements other than Crossrail while the site specific methodology selects only certain major sites. Further the figures presented represent the change from a 2007 base and so some of the demand change may already have been realised. However, the highlighted rows show a reasonable correlation in demand estimates. Of particular note is the demand growth on Westferry Road which is the busiest point for a number of routes.
- 3.5 There is less correlation in the Wapping area which is possibly explained by the London Dock planning application, only recently submitted, proposing a 1,200 student

secondary school and 1,800 residential units. However, both the TA and Railplan suggest only marginal changes to demand on Vaughan Way into the City which will largely be due to the effect of the London Overground. Vaughan Way is the busiest point on route 100.

- 3.6 The scale of development in the study area justifies seeking developer contributions to enhance the bus network.

4. CROSSRAIL

- 4.1 A station at North Dock in the Canary Wharf Estate is to open in 2018. Located on the Abbey Wood branch, it will have 12 trains per hour. The stations either side will be Custom House and Whitechapel.
- 4.2 Table 6 below shows Railplan outputs (adjusted to take account of current demand) for the AM peak hour at certain locations on selected bus corridors.
- 4.3 Railplan shows significant demand increases by 2021 due to a range of factors including developments such as those highlighted above generating new trips. The main exception is Vaughan Way which shows a small decrease. (There are also a few exceptions eastbound on Commercial Road but this is not the busiest direction in the morning in any case).
- 4.4 The impact of Crossrail is, broadly, to greatly reduce demand on the bus network. However, care should be taken on what this means for bus capacity. For example, demand on Commercial Road eastbound continues to drop but this direction does not influence frequency. Westbound demand levels post Crossrail broadly match current demand. Assuming the development comes forward at a similar time to Crossrail, no change to frequency is likely to be required.
- 4.5 Similarly the reduction in demand between Wapping and Tower Gateway may permit a frequency reduction. However, trips generated by London Dock may offset this.
- 4.6 However, there are locations where Railplan predicts additional demand on corridors either because Crossrail does not offset demand generated by new development or because it influences travel patterns. These increases are found northbound on the already busy Westferry Road (as well as in the east of the Isle of Dogs) and on Violet Road northbound.

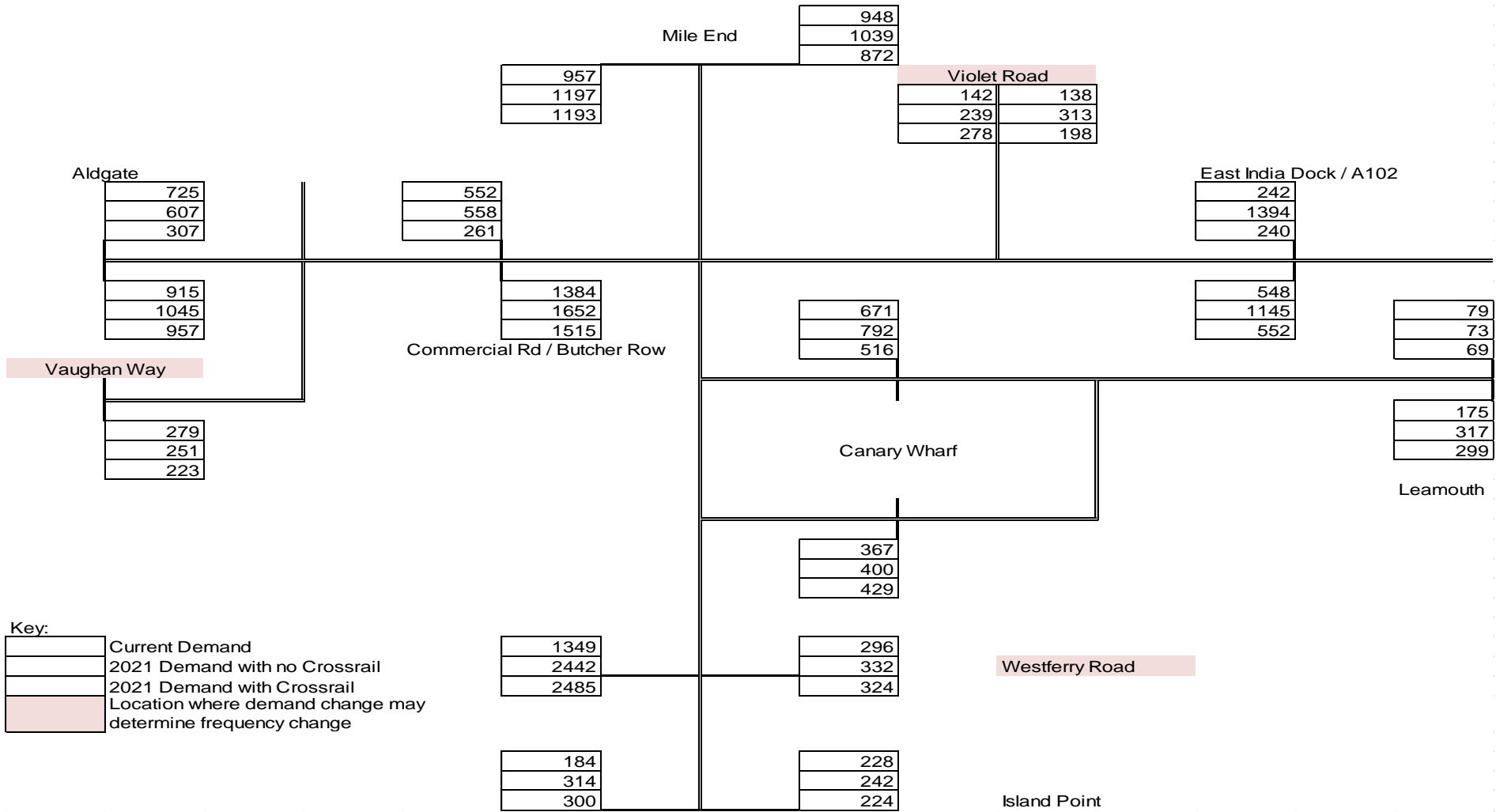


Table 6: Corridor 2021 AM Peak Hour Demand Forecasts With & Without Crossrail

5. LOCAL ISSUES & ASPIRATIONS

Schools & NHS

- 5.1 LB Tower Hamlets has predicted a requirement for additional secondary schools within the borough. To address this sites have been identified at London Dock in Wapping and at Twelvetrees Crescent.
- 5.2 Bow Boys school is presently located on Fairfield Road near Bow Road and has 625 pupils. It is to be relocated to Twelvetrees Crescent / Gillender Street and increased in size to 1,350 places plus sixth form for 160. It is due to open in September 2014 when all existing pupils will transfer over. However the growth in year size will be incremental with each year 7 intake.
- 5.3 Key medical centres in the borough include the Royal London Hospital at Whitechapel, Mile End Hospital and the London Chest Hospital at Bethnal Green. Route D3 links the Isle of Dogs and Wapping with the Royal London and the Chest Hospital. Routes 277, D6 and D7 link the Isle of Dogs to Mile End and the 339 links Mile End with Shadwell. Due to the location and layout of the Hospital, it is an 8 to 12 minute walk from Mile End to the entrance on Bancroft Road. Other than interchanging with other routes for one stop, it would be difficult to reduce this walk distance since there is not space to terminate buses at the hospital. Stakeholders have not raised this as a particularly problematic issue recently.
- 5.4 Island Health Centre serves the Isle of Dogs south of Canary Wharf and is ideally located at Crossharbour where all island routes terminate. Wapping Group Practice is also well located on Wapping Lane for both the 100 and D3. All Saints Practice is located on Robin Hood Lane and is best served by the 15, D6, D7 and D8. There are no known significant changes to the provision of medical services relevant to the area.

Borough aspirations

- 5.5 Discussions with Borough officers focused on maximising access to the London Dock site in Wapping; a request for the 277 to be diverted onto Blackwall Way to better serve existing developments and new links from the east into the Isle of Dogs.

Local Constraints

- 5.6 The nature of the roads in Wapping and experience of residents' views means that operating double deck buses through Wapping would be problematic.
- 5.7 Rotherhithe Tunnel permits the use of only very small buses not commonly used within London. This, together with river crossings provided by the East London and Jubilee lines, mean providing a bus service through the tunnel is unlikely to be cost effective.

6. OPTION DEVELOPMENT

6.1 An analysis of strengths, weaknesses, opportunities and challenges was undertaken to summarise the key issues facing the study area. This is set out below.

<p>STRENGTHS</p> <ul style="list-style-type: none"> • Comprehensive network with areas no more than 400m from a bus service. • High frequency services. • Reliable services. • Provides for the current main travel patterns. 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • D6 not currently providing Hackney town centre links. • Bus interchange with Canary Wharf Crossrail requires a walk. • Access from east side of Isle of Dogs to Canary Wharf is always via the west side. • D8 frequently parallels the DLR. • Excess capacity provided from Leamouth into Canary Wharf. • No direct bus link from the east into the Isle of Dogs. • Buses on Aspen Way unable to serve adjacent land uses.
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Less capacity potentially required on 100. • Scope to split route 100 due to relatively few end to end trips. • Scope to extend the 100 to Aylesbury Estate in Southwark (possible implications on route structure). • Wood Wharf to provide new road link into Canary Wharf from the East. • Probable desire for new links to Whitechapel Crossrail from Roman Road (possible implications for the D6). • Probable desire for new links to Whitechapel from the Stepney area (possible implications for the 115). 	<p>CHALLENGES</p> <ul style="list-style-type: none"> • Forecast demand for 35 bph on Westferry Road (currently 19 bph double deck equivalent). • New school in Wapping likely to require additional capacity. • Difficult to operate double deck buses in Wapping. • More capacity predicted on the Violet Road corridor (D8). • New school at Twelvetrees Crescent. • High demand across Roman Road/Bethnal Green Road corridor.

Table 7: Summary of Key Issues (see also map C5 in appendix C)

Route 100

6.2 Route 100 has seen a reduction in usage. In large part this has been due to the re-opening of the East London Line but also the impact of Crossrail works preventing high quality access to the Liverpool Street area. The busiest point on the route is

currently departing Wapping towards Tower Gateway. Railplan projections indicate a small decrease in usage on this section in future whereas the development of London Docks site suggests a small increase. There is potential to reduce the frequency from 8 bph to 7.5 bph based on current demand and this is being explored further as part of the current re-tendering of the contract.

- 6.3 End to end demand is relatively low and splitting the route would allow the western section to be converted to double deck operation to better accommodate the demand from new developments in Southwark. Any split in service would need to protect the main travel patterns e.g. from Wapping into the City but would create the opportunity of extending the western section to the Heygate and Aylesbury Estates in Southwark. However, the timescale for re-developing these two major estates is not expected for another 7 years. Consequently restructuring of route 100 is not proposed at this time and will be reconsidered in the future.

Westferry Road Initial Re-structuring

- 6.4 Westferry Road has seen continued growth in demand with corresponding increases in service provision. With the recent D7 frequency enhancement, there is now the equivalent of 19 double deck buses per hour operating on the corridor in the peak period. The prediction is for a further 15 bph making a peak requirement of 34 bph. How precisely and how quickly this demand will materialise is open to question but it seems reasonable to assume that this corridor will see demand continue to grow for some years to come.
- 6.5 Converting the Westferry Road corridor to operation by double deck buses has been investigated so the network can be more flexible in accommodating future demand. Routes 135 and D7 use double deck buses but route D3 uses single deck buses. Converting the D3 to double deck has been ruled out due to a low bridge in Vallance Road and local sensitivities within Wapping.
- 6.6 Two options to restructure the local bus network have been appraised. These seek to provide an initial increase in capacity on the corridor that could be adjusted further over time.
- **Option 1:** Divert the D3 to Leamouth at Canary Wharf via Blackwall Way rather than Aspen Way. Divert the 277 at Canary Wharf to Crossharbour instead of Leamouth via Westferry Road, Spindrift Avenue and East Ferry Road. Route 135 would be amended to serve Limeharbour, Marsh Wall and Manchester Road. Route D7 would be decreased in frequency to 7.5 bph resulting in 22.5 bph on Westferry Road compared to the current 19 bph. [See map C6 in appendix C].
 - **Option 2:** Divert the D3 at Marsh Wall via Limeharbour to Crossharbour and swap the D8 onto the D3 alignment. Route D8 would then be converted to double deck providing the equivalent of over one extra double deck bus on the Westferry Road corridor. Route D8 is to serve Carpenters Road and the Aquatics Centre from Spring 2014 which involves a low bridge, so it would also be necessary to swap the D8 with the 108 at the Stratford end of the route. The provision of a direct link from SE London to the Olympic Park was a key request during the Queen Elizabeth Olympic Park consultation process. [See map C7 in appendix C].

6.7 The benefits of option 1 include:

- Greater capacity provided initially on Westferry Road thus future proofing the corridor for some time.
- New links provided from Westferry Road to beyond Mile End such as Hackney town centre.
- Direct links from Manchester Road towards the City.
- Serving Leamouth with the D3 rather than route 277 better matches capacity with demand and provides more direct links from Tower Hamlets borough (Whitechapel, Wapping etc) to the Town Hall on Clove Crescent.
- An additional night route for the Isle of Dogs.

6.8 The disbenefits of option 1 include:

- Around 650 (7%) broken trips on route D3 and 850 (4%) broken trips on route 277. This includes such links as Leamouth to Mile End / Burdett Road.
- A small section of East Ferry Road (270m) near Millwall Park will become unserved. This could be addressed by routeing the 277 via East Ferry Road rather than Spindrift Avenue (and diverting the 135 onto Spindrift Ave) but is likely to require additional resource.
- The section of Westferry Road between Spindrift Avenue and East Ferry Road at the southern tip of the island would see a reduction in service from 15 bph to 13.5 bph. This could be addressed by routeing the 277 via East Ferry Road and the 135 via Spindrift Avenue but would likely require additional resource.
- The journey time from the southern tip of the Island to the local centre at Crossharbour would increase significantly by an estimated 5 – 6 minutes.
- It would leave the single deck D3 the most likely route to serve the Leamouth peninsula site rather than the higher capacity 277 route.

6.9 The benefits of option 2 include:

- Additional capacity on Westferry Road although less than option 1.
- Less duplication of the DLR by route D8 in the Isle of Dogs and Stratford City.
- New links from SE London to the Olympic Park as requested by some members of the public.
- New links from Westferry Road to north of Canary Wharf
- Quicker journey times from Crossharbour to Wapping / Whitechapel and higher frequencies on Marsh Wall.
- Less disruption to bus services at the southern tip of the island.

6.10 The disbenefits of option 2 include:

- Around 650 (7%) broken trips from Westferry Road to Wapping / Whitechapel (D3).
- Around 300 (6%) broken trips from Marsh Wall to north of Canary Wharf (D8).
- Around 540 (5%) broken trips from the east side of Stratford town centre to south of Bow (D8).
- Frequency reduction of 1 bph where the D8 replaces the D3.
- Longer journey times from Limeharbour to north of Canary Wharf on the D8.

- 6.11 Option 1 is worthwhile with a passenger disbenefit to net savings ratio of 0.4 to 1. However both the savings and disbenefits are minimal. Option 2 is not worthwhile.

Wood Wharf (and Westferry Road)

- 6.12 With the development of Wood Wharf and the provision of a new link road from Prestons Road to Cartier Circle, there becomes scope to re-route buses.
- 6.13 One potential option is to re-route the D6 to serve East Ferry Road [re-serving a section of road no longer served under option 1 above] then Manchester Road into Canary Wharf Estate via Wood Wharf. From Cartier Circle the D6 could return to line of route via Trafalgar Way or via Upper Bank Street, thus bringing a route closer to the Crossrail Station. As well as directly serving Wood Wharf it would provide a more direct link than the D3/D7 (if less frequent) from Manchester Road to Canary Wharf and so contribute to reducing demand on Westferry Road. This would break around 7% of trips as it removes a direct link from Prestons Road into Crossharbour. A summary of the estimated costs and broken trips is set out in appendix A. Map C8 in appendix C illustrates the scheme.
- 6.14 The scale of the Wood Wharf development together with the forecast potential demand on Westferry Road may justify a new route. This could be the previously proposed extension of route 330 from Canning Town. An estimate of the cost extending it via East India Dock Road, Leamouth Road, Blackwall Way, Yabsley Street, Preston Road, Canary Wharf Estate, Westferry Road, East Ferry Road to Crossharbour is set out in Appendix A. Map C9 in appendix C illustrates the scheme. This extension could take other forms including terminating at Canary Wharf.

D8 and 108 Corridors

- 6.15 The new school at Twelvetrees Crescent will only be served by single deck bus routes (routes 108, 323 and 488). Catchment from the school will primarily be from the west of the A12 with route 488 providing links from the current school location and route 323 providing links from the west. Route 108 is expected to provide relatively few links from the intended catchment area to the school. Running as it does along the A12, the 108 does little to remove the barrier of east – west movement by pedestrians. Adjacent to the A12 is the Violet Road / Campbell Road corridor served by the D8 where there is forecast to be an increase in bus demand. Further, the D8 has considerable parallels with the DLR, limiting its usefulness.
- 6.16 A scheme to swap the 108 onto the D8 corridor and vice versa and double deck the D8 has been investigated. Consideration was given to making the swap at either Zetland Street or East India Dock Road. Although the Zetland Street routing broke fewer trips it was estimated to cost an additional bus. Therefore the option of swapping the route at East India Dock Road was evaluated. Map C10 provides a diagram of the scheme. Benefits of the scheme include:
- Better links to the school from its anticipated catchment area including the ability to serve the school by double deck bus.
 - The option to relocate stops from the tunnel mouth to East India Dock Road thus improving the waiting environment for passengers.

- Route 108 is 1 bph more frequent than the current D8 and would provide some additional capacity on the Violet Road corridor to address the forecast increase in demand. However, the Blackwall Tunnel acts as a constraint against it becoming double deck in the future.

6.17 The scheme also includes swapping the D8 with the 108 at Stratford due to the low bridge on Carpenters Road. This further removes the parallel between the D8 and the DLR and meets an aspiration from stakeholders south of the river for a direct link into the Olympic Park.

6.18 The scheme is worthwhile with a benefit to net cost of 3.7 to 1. The majority of the disbenefit is focused on the A12 corridor going to / from south of the river.

6.19 Further, an investigation will be made into identifying whether the 488 can terminate nearer the school by utilising an existing lay-by stop and creating a new stop for the 108 further south on the main highway.

Whitechapel Crossrail Station

6.20 Located prior to the bifurcation of the Crossrail line, Whitechapel Station will benefit from the full frequency of train service increasing its attractiveness as a destination.

6.21 Options for new links to Whitechapel include:

- Diverting the 115 past Whitechapel via Stepney (e.g. Sidney Street) [See map C11]
- Extending the D6 to Whitechapel from Bethnal Green [See map C8]

6.22 Appendix A sets out the cost implications of re-routeing the 115 via Jubilee Street, Stepney Way, Sidney Street and Whitechapel Road to line of route at Aldgate. This would break around 1,800 or 6% of freehold trips.

6.23 Routeing the D6 to Whitechapel from Bethnal Green rather than Ash Grove would be subject to the outcome of the Narrow Way trial closure. Appendix A sets out the cost implications of a routeing from Roman Road to Whitechapel, Cavell street via Bethnal Green Road and Vallance Road. This would break around 1,100 or 8% of trips but assist in providing additional capacity across the busy Roman Road / Bethnal Green Road corridor.

7. BUS INFRASTRUCTURE

- 7.1 Crossharbour Asda is the main bus stand in the Isle of Dogs. This is being re-developed as part of a wider development scheme. Once completed the number of bus standing spaces will increase from 5 (with 2 overflow stands) to 8 – 10 stands depending on the detailed design. If all the schemes described were to be implemented, it is estimated that 10 stands would be required. It is therefore worth identifying other potential stand facilities within the Isle of Dogs including Canary Wharf.
- 7.2 It is understood that there would be sufficient stand space at Whitechapel to accommodate the potential extension of route D6 when the Crossrail works finish and the Durward Street stand reopens. However, in view of the potential change Crossrail may make to demand for bus links to Whitechapel it may also be appropriate to identify additional stand space within the area.
- 7.3 A bus stand is expected to be provided adjacent to the Leamouth Peninsula site, under the Lower Lea Crossing. Other key bus stands in the area are at Blackwall Station and Shadwell, Cable Street. The Blackwall stand is expected to be slightly relocated as part of the Blackwall Reach development.

8. IMPLEMENTATION & FUNDING

- 8.1 This review will be shared and discussed with various stakeholders. Developer contributions for bus service enhancements will continue to be sought.
- 8.2 Proposals for the Westferry Road / Isle of Dogs could be progressed to implementation now if local stakeholders are supportive. Similarly changes to the A12 corridor.
- 8.3 Schemes related to Wood Wharf, subject to detailed cost benefit analysis and consultation, would be pursued as part of any development timescales. S106 contributions would also be required.
- 8.4 Whitechapel Station related schemes would also be subject to a detailed appraisal. The opening of Crossrail would strongly influence the timescale. With regard to the D6 scheme this would also need to have regard to the outcome of the Narrow Way trial.

9. SUMMARY & CONCLUSIONS

- 9.1 The review has considered current travel demand patterns and how these may change in the future due to new development and rail schemes.
- 9.2 The most significant issue identified is the large projected demand increases on Westferry Road. A number of schemes have been identified which would address this, including:
- Swapping routes 277 and D3 in the Isle of Dogs.
 - Diverting route D6 to provide direct links from the east side of the Isle of Dogs east side to Canary Wharf.
 - Extending route 330 along Westferry Road.
- 9.3 The review has also suggested that the opening of a large school at Twelvetrees Crescent may be the impetus to restructure the D8 by swapping it with the 108 on the Campbell Road/Violet Road and A12 corridors. This also requires swapping them in Stratford.
- 9.4 Finally, the review acknowledges how Whitechapel may become a bigger passenger objective and suggests how the bus network might respond to this by changing routes 115 and D6.

APPENDIX A – RESOURCE SUMMARY

Route	Scheme	Cost £pa	Mileage	PVR	Broken Trips
115	Re-route via Sidney Street	£262,059	38,623	1	1,794
330	Extend to Crossharbour via Wood Wharf	£1,500,657	272,155	7	0
D6	Re-route via Manchester Road & Wood Wharf	£538,802	107,597	3	1,030
D6	Extend to Whitechapel via Vallance Road	£444,016	71,304	2	1,151
TOTAL		£2,745,534	489,679	13	3,975

Table A1: Scheme Costings

APPENDIX B – PRESENT AND PROPOSED STRUCTURE SUMMARY

	AM Peak	Mid day	PM Peak	Eve	AM Peak	Mid day	PM Peak	Eve
<u>Route 108 Option 2</u>								
<i>MF</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	6	6	6	5/4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	6	6	6	5/4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Sat</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	4/6	6	6	5/4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	4/6	6	6	5/4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Sun</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	2/3	4	4	4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	2/3	4	4	4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Nightly</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	2				-			
Stratford International Bus Station - Lewisham Bus Station	-				2			

Toilets available at Lewisham Bus Station & Stratford Bus Station

	AM Peak	Mid day	PM Peak	Eve	AM Peak	Mid day	PM Peak	Eve
<u>Route 108 Option 3</u>	Via A102				Via Violet Road			
<i>MF</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	6	6	6	5/4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	6	6	6	5/4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Sat</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	4/6	6	6	5/4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	4/6	6	6	5/4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Sun</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	2/3	4	4	4	-	-	-	-
North Greenwich to Lewisham Bus Stn	-	-	-	-/JNYS	-	-	-	-
Stratford International Bus Station - Lewisham Bus Station	-	-	-	-	2/3	4	4	4
North Greenwich to Lewisham Bus Stn	-	-	-	-	-	-	-	-/JNYS
<i>Nightly</i>								
Stratford Bus Station, East Side - Lewisham Bus Station	2				-			
Stratford International Bus Station - Lewisham Bus Station	-				2			

Toilets available at Lewisham Bus Station & Stratford Bus Station

	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route 115</u>	Via Commercial Road					Via Whitechapel Road			
<i>MF</i>									
East Ham, White Horse - Aldgate Bus Station	9	7.5	9	5		9	7.5	9	5
<i>Sat</i>									
East Ham, White Horse - Aldgate Bus Station	6	7.5	7.5	5		6	7.5	7.5	5
<i>Sun</i>									
East Ham, White Horse - Aldgate Bus Station	5	6	6	5		5	6	6	5

Toilets available at Aldgate Bus Station

	Via East Ferry Road					Via Manchester Road			
<u>Route 135 Option 1</u>									
<i>MF</i>									
Crossharbour, Asda - Old Street Station, East Road	6	6	6	6/4		-	-	-	-
Crossharbour Asda to Old St Stn, East Rd	Jny	-	-	-					
Crossharbour, Asda - Old Street Station, East Road	-	-	-	-		6	6	6	6/4
Crossharbour Asda to Old St Stn, East Rd	-	-	-	-		-	-	-	-
<i>Sat</i>									
Crossharbour, Asda - Old Street Station, East Road	3/6	6	6	6/4		-	-	-	-
Crossharbour, Asda - Old Street Station, East Road	-	-	-	-		3/6	6	6	6/4
<i>Sun</i>									
Crossharbour, Asda - Old Street Station, East Road	3/4	4	4	4		-	-	-	-
Crossharbour, Asda - Old Street Station, East Road	-	-	-	-		3/4	4	4	4

Toilets available at Crossharbour, Asda

	Via Spindrif Avenue								
<u>Route 277 Option 1</u>									
<i>MF</i>									
Leamouth, Saffron Avenue - Highbury & Islington Station	9	9	9w	6		-	-	-	-
Crossharbour, Asda - Highbury & Islington Station	-	-	-	-		9	9	9w	6
<i>Sat</i>									
Leamouth, Saffron Avenue - Highbury & Islington Station	6	9	9	6		-	-	-	-
Crossharbour, Asda - Highbury & Islington Station	-	-	-	-		6	9	9	6
<i>Sun</i>									
Leamouth, Saffron Avenue - Highbury & Islington Station	5	6	6	6		-	-	-	-
Crossharbour, Asda - Highbury & Islington Station	-	-	-	-		5	6	6	6
<i>Nightly</i>									
Leamouth, Saffron Avenue - Highbury & Islington Station	2								
Crossharbour, Asda - Highbury & Islington Station	-								

Toilets available at Highbury & Islington Stn

	AM Peak	Mid day	PM Peak	Eve	AM Peak	Mid day	PM Peak	Eve
<u>Route 330</u>								
<i>MF</i>								
Wanstead Park Stn, Woodford Rd - Canning Town Bus Station	5	5	5	4/3	-	-	-	-
Wanstead Park Stn, Woodford Rd - Crossharbour, Asda	-	-	-	-	5	5	5	4/3
<i>Sat</i>								
Wanstead Park Stn, Woodford Rd - Canning Town Bus Station	3/5	5	5	4/3	-	-	-	-
Wanstead Park Stn, Woodford Rd - Crossharbour, Asda	-	-	-	-	3/5	5	5	4/3
<i>Sun</i>								
Wanstead Park Stn, Woodford Rd - Canning Town Bus Station	2	3	3	3	-	-	-	-
Wanstead Park Stn, Woodford Rd - Crossharbour, Asda	-	-	-	-	2	3	3	3

Toilets available at Canning Town Bus Station and Crossharbour, Asda

Route D3 Option 1

Via Blackwall Way

<i>MF</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	6	6	6	6/3	-	-	-	-
Bethnal Green, London Chest Hospital - Leamouth, Saffron Avenue	-	-	-	-	6	6	6	6/3
<i>Sat</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	3/6	6	6	6/3	-	-	-	-
Bethnal Green, London Chest Hospital - Leamouth, Saffron Avenue	-	-	-	-	3/6	6	6	6/3
<i>Sun</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	2/3	4	4	3	-	-	-	-
Bethnal Green, London Chest Hospital - Leamouth, Saffron Avenue	-	-	-	-	2/3	4	4	3

Toilets available at Bethnal Green, London Chest Hospital & Crossharbour, Asda

Route D3 Option 2

Via Westferry Road

Via Marsh Wall

<i>MF</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	6	6	6	6/3	6	6	6	6/3
<i>Sat</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	3/6	6	6	6/3	3/6	6	6	6/3
<i>Sun</i>								
Bethnal Green, London Chest Hospital - Crossharbour, Asda	2/3	4	4	3	2/3	4	4	3

Toilets available at Bethnal Green, London Chest Hospital & Crossharbour, Asda

	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route D6</u>	Via Limeharbour					Via M/cr Road/Wood Wharf			
<i>MF</i>									
Crossharbour, Asda - Ash Grove, Bush Road	8	8	8	4/3		8	8	8	4/3
<i>Sat</i>									
Crossharbour, Asda - Ash Grove, Bush Road	6/8	8	8	4/3		6/8	8	8	4/3
<i>Sun</i>									
Crossharbour, Asda - Ash Grove, Bush Road	3	4	4	4/3		3	4	4	4/3

Toilets available at Crossharbour, Asda

	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route D6</u>						Via Vallance Road			
<i>MF</i>									
Crossharbour, Asda - Ash Grove, Bush Road	8	8	8	4/3		-	-	-	-
Crossharbour, Asda - Whitechapel, Cavell Street	-	-	-	-		8	8	8	4/3
<i>Sat</i>									
Crossharbour, Asda - Ash Grove, Bush Road	6/8	8	8	4/3		-	-	-	-
Crossharbour, Asda - Whitechapel, Cavell Street	-	-	-	-		6/8	8	8	4/3
<i>Sun</i>									
Crossharbour, Asda - Ash Grove, Bush Road	3	4	4	4/3		-	-	-	-
Crossharbour, Asda - Whitechapel, Cavell Street	-	-	-	-		3	4	4	4/3

Toilets available at Crossharbour, Asda

	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route D7</u>									
<i>MF</i>									
Poplar, All Saints Station - Mile End Station, Grove Road	9	9	9	5		7.5	7.5	7.5	5
<i>Sat</i>									
Poplar, All Saints Station - Mile End Station, Grove Road	4/6	7.5	7.5	5		4/6	7.5	7.5	5
<i>Sun</i>									
Poplar, All Saints Station - Mile End Station, Grove Road	4	5	5	5		4	5	5	5

Toilets available at Mile End Station, Grove Road

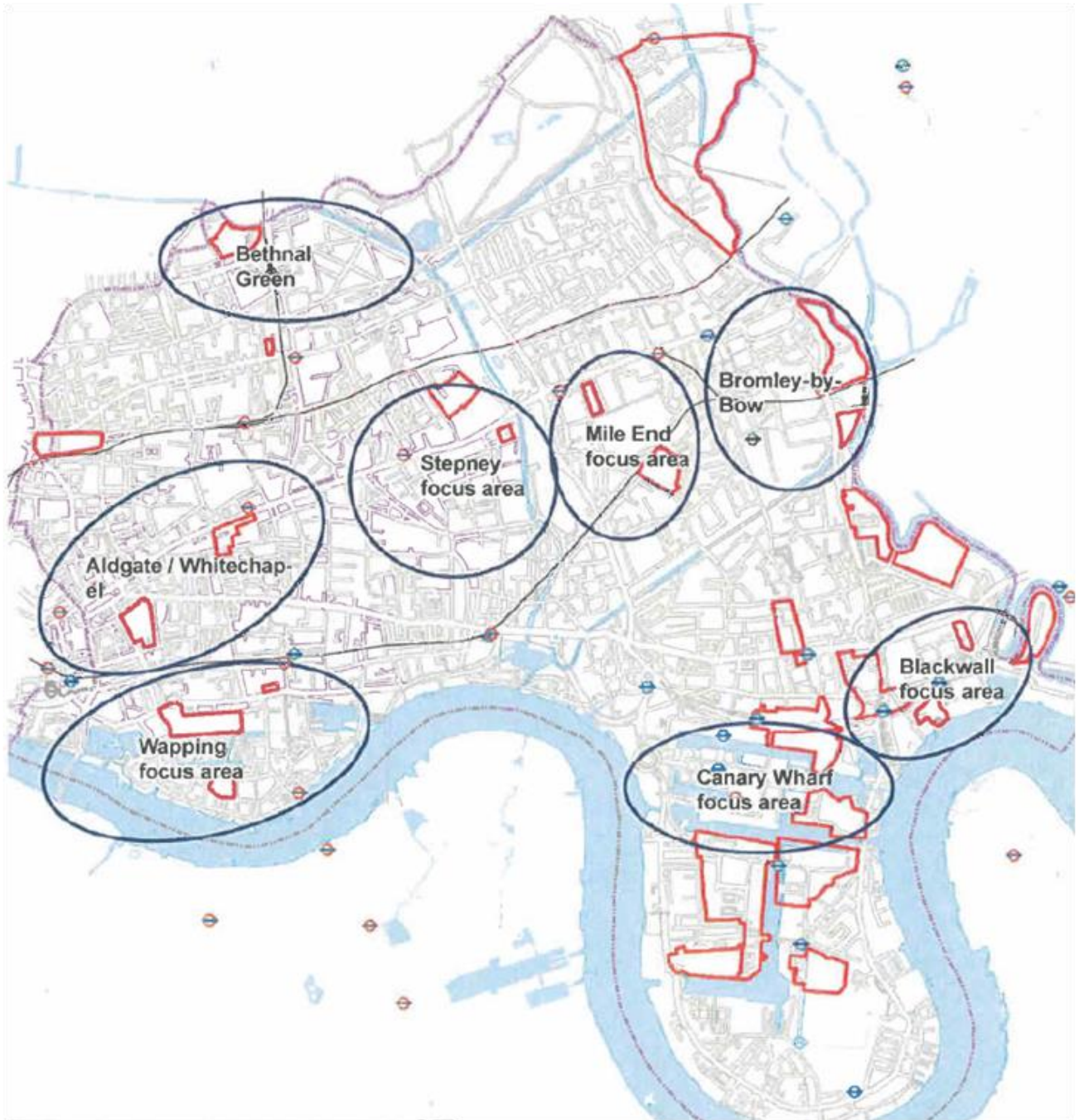
	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route D8 Option 2</u>	Single Deck Via Marsh Wall					Double Deck Via Westferry Road			
<i>MF</i>									
Crossharbour, Asda - Stratford International Bus Station	5	5	5	5/3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	5	5	5	5/3	
<i>Sat</i>									
Crossharbour, Asda - Stratford International Bus Station	3/5	5	5	5/3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	3/5	5	5	5/3	
<i>Sun</i>									
Crossharbour, Asda - Stratford International Bus Station	2/3	3	3	3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	2/3	3	3	3	

Toilets available at Crossharbour, Asda

	AM Peak	Mid day	PM Peak	Eve		AM Peak	Mid day	PM Peak	Eve
<u>Route D8 Option 3</u>	Single Deck Via Violet Road					Double Deck Via A102			
<i>MF</i>									
Crossharbour, Asda - Stratford International Bus Station	5	5	5	5/3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	5	5	5	5/3	
<i>Sat</i>									
Crossharbour, Asda - Stratford International Bus Station	3/5	5	5	5/3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	3/5	5	5	5/3	
<i>Sun</i>									
Crossharbour, Asda - Stratford International Bus Station	2/3	3	3	3	-	-	-	-	-
Crossharbour, Asda - Stratford Bus Station, East Side	-	-	-	-	2/3	3	3	3	

Toilets available at Crossharbour, Asda

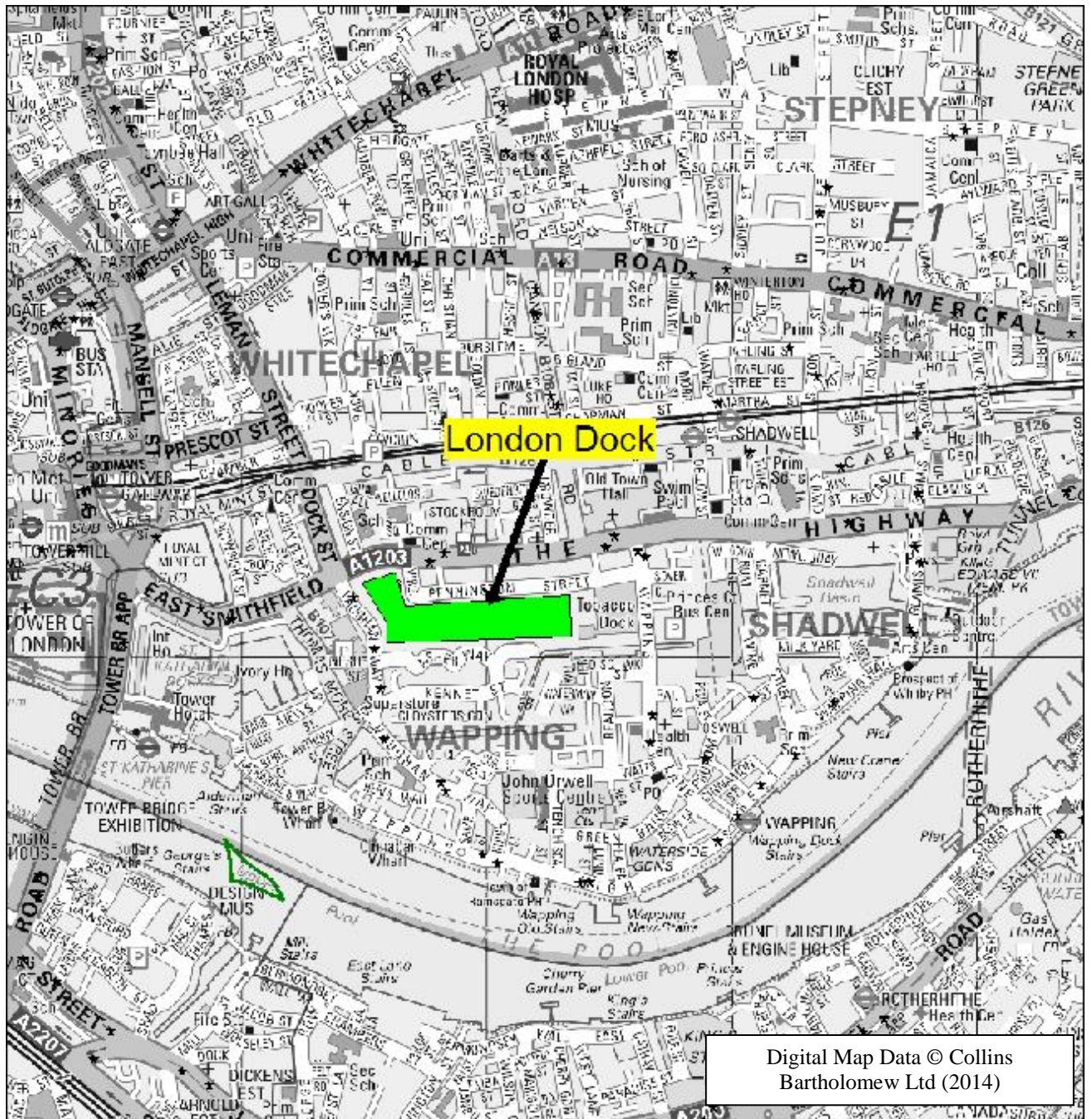
APPENDIX C – MAPS



Key: Red Outlines are development Sites

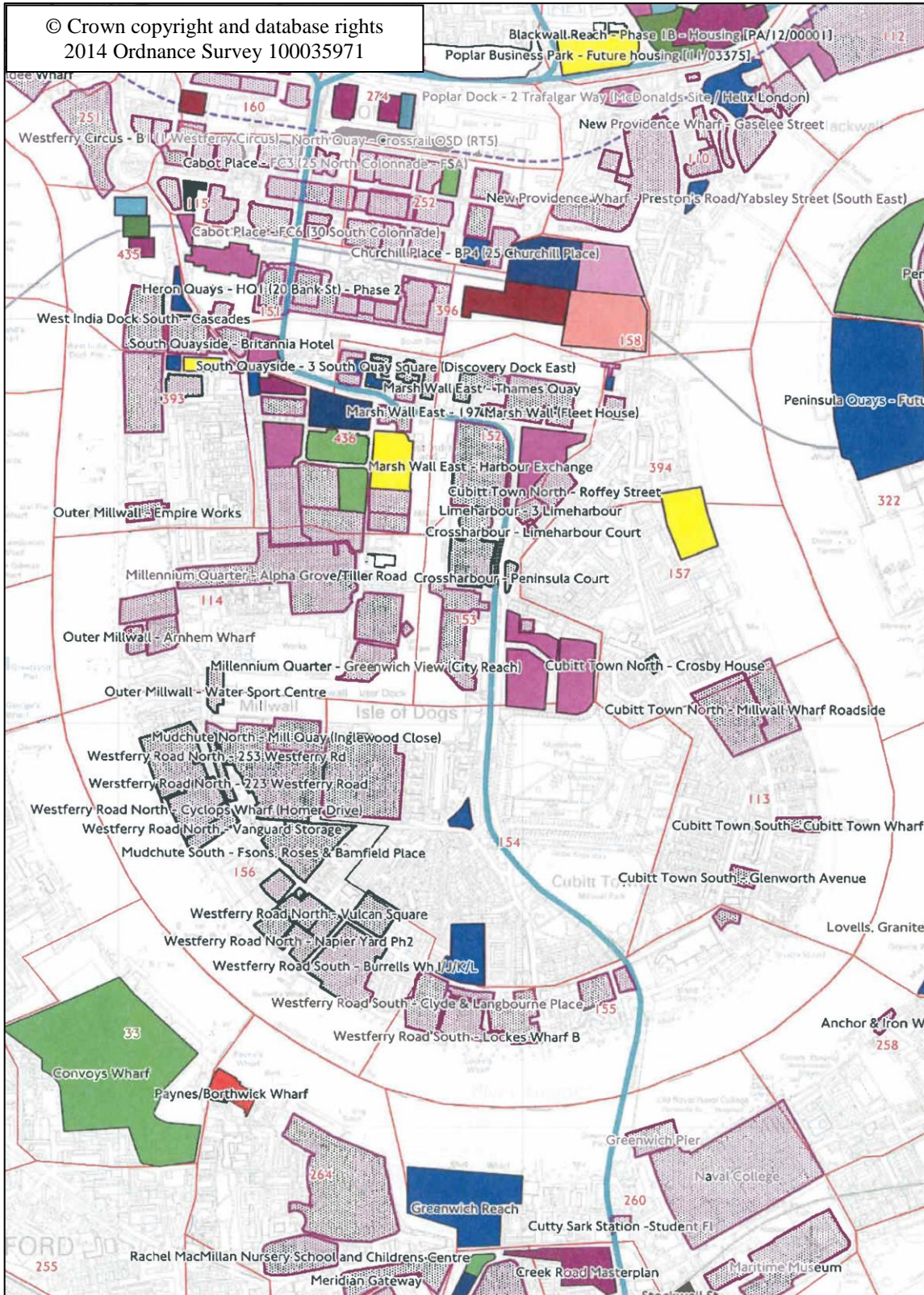
Map C1: Development & Intensification Sites in LB Tower Hamlets

Based on LBTH Local Development Framework



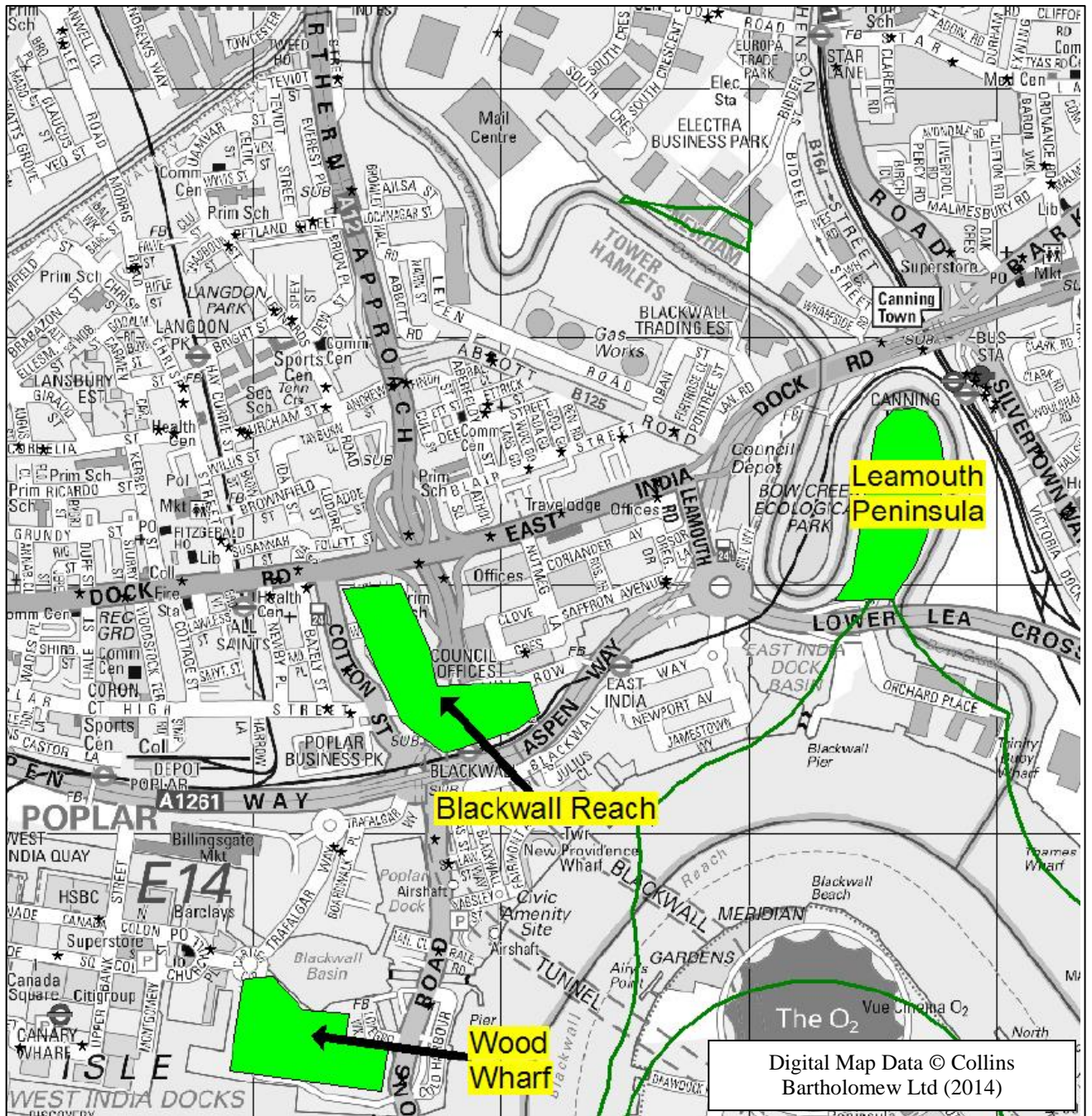
Map C2: Main Development Sites Within Wapping

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Key: Purple = Re-developed sites. Other Colours = Development Sites

Map C3: Development Sites Within the Isle of Dogs
From DLR LUTE



Map C4: Blackwall Reach & Leamouth Development Sites

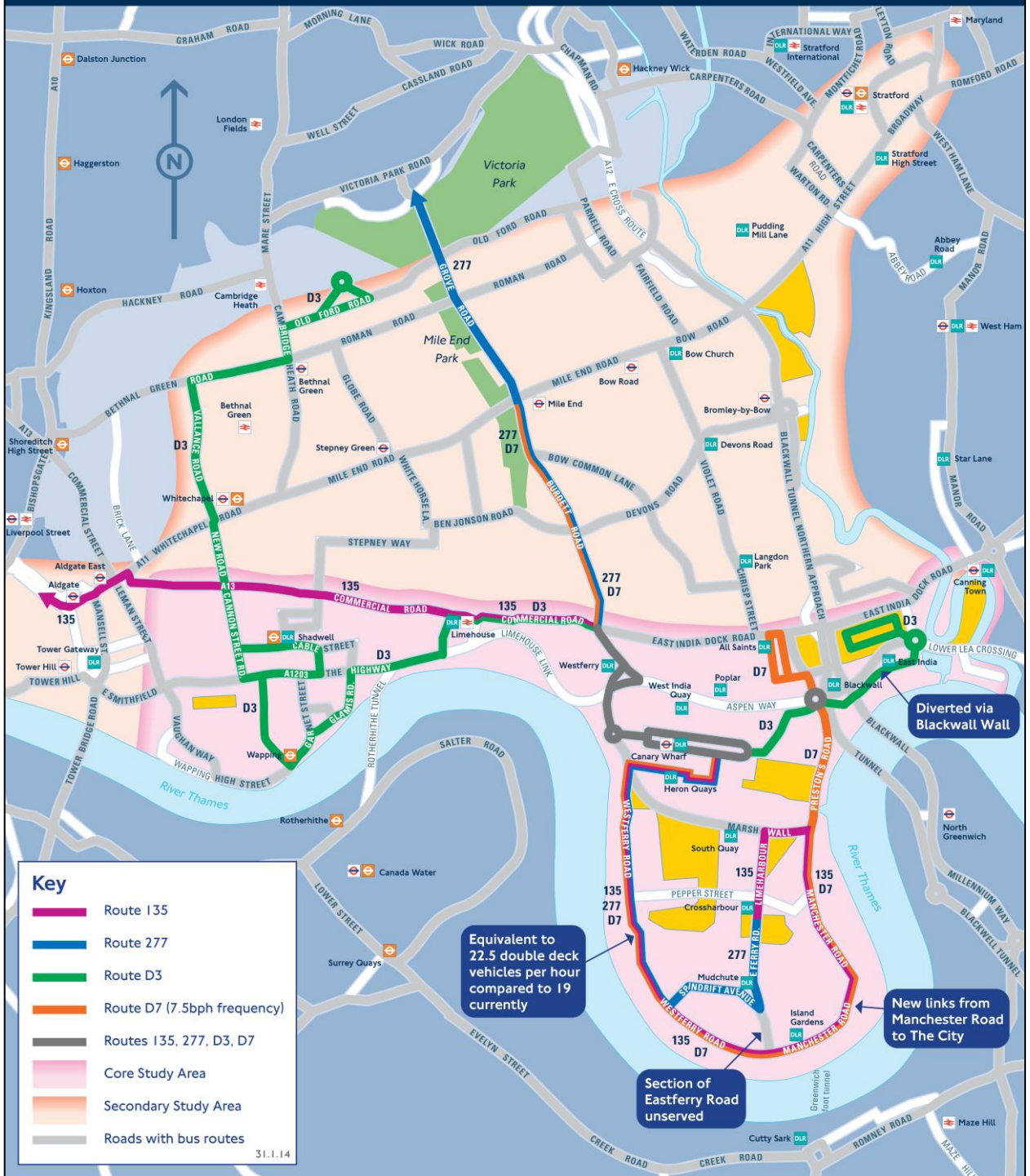
South Tower Hamlets and Surrounds Issues map



- 1** Westferry Road - Busiest point for many routes. Significant additional demand predicted
- 2** Access from East Isle of Dogs to Canary Wharf via West Isle of Dogs
- 3** Large parallel between DLR and D8
- 4** Additional demand forecast on Violet Road/Campbell Road corridor
- 5** New secondary school at Twelvetees Crescent
- 6** Route 277 - Excess capacity Leamouth to Canary Wharf
- 7** Poor pedestrian access onto Aspen Way
- 8** No direct bus link from 'East' to Canary Wharf
- 9** New road through Wood Wharf
- 10** Low Bridge, Vallance Road
- 11** New School, Wapping & 1,800 dwellings
- 12** Historic Road layout in Wapping
- 13** Vaughan Way - Route 100 busiest point
- 14** Possible desire for new links to Whitechapel Station
- 15** Bethnal Green - busiest point on Route 8
- 16** Route D6 now terminates south of Hackney Central

Map C5: Summary of issues

Bus Routes 135, 277, D3 and D7 Ideas



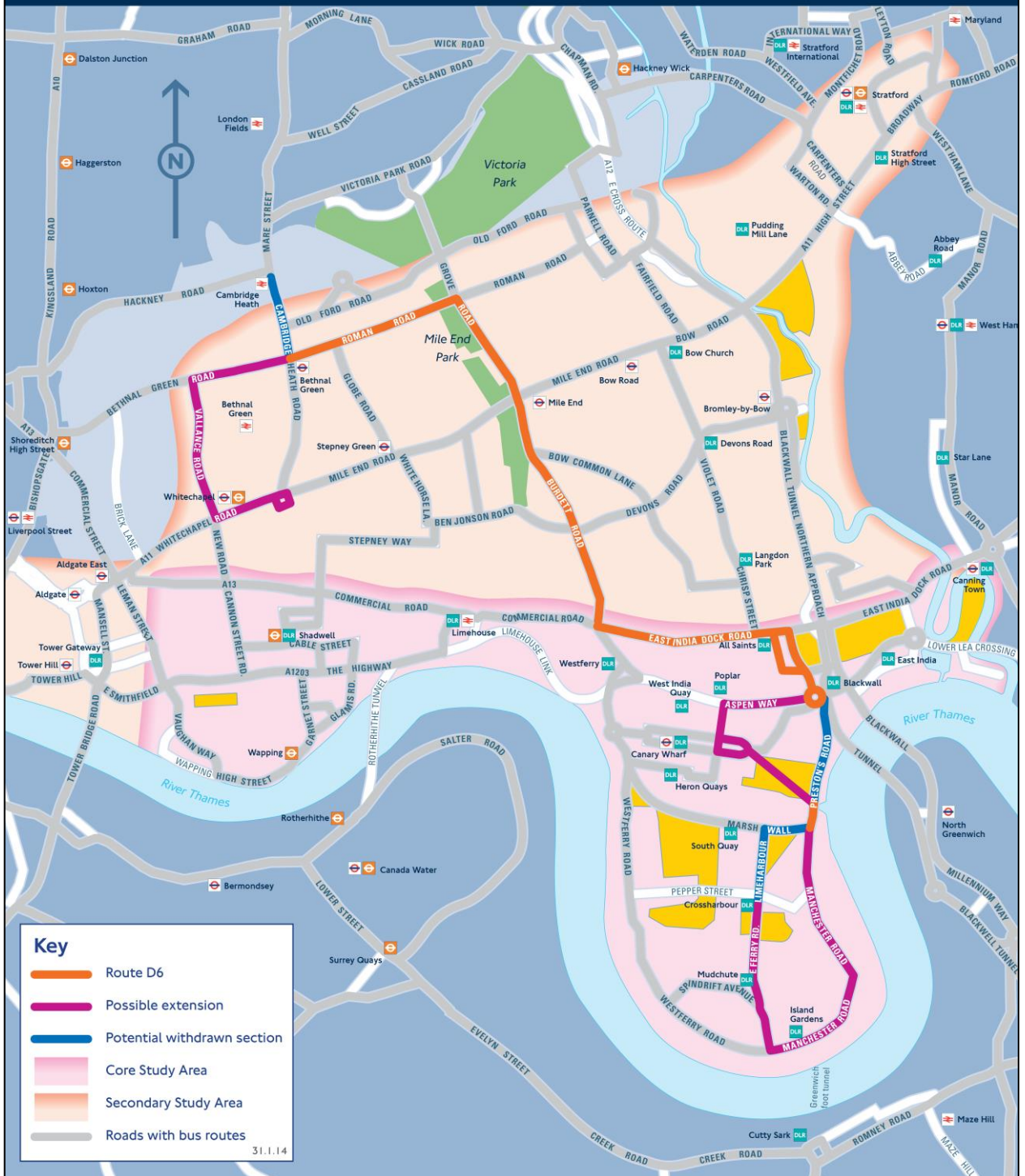
Map C6: Option 1 – Routes 135, 277, D3 and D7

Bus Routes D3 and D8 Ideas (option 2)



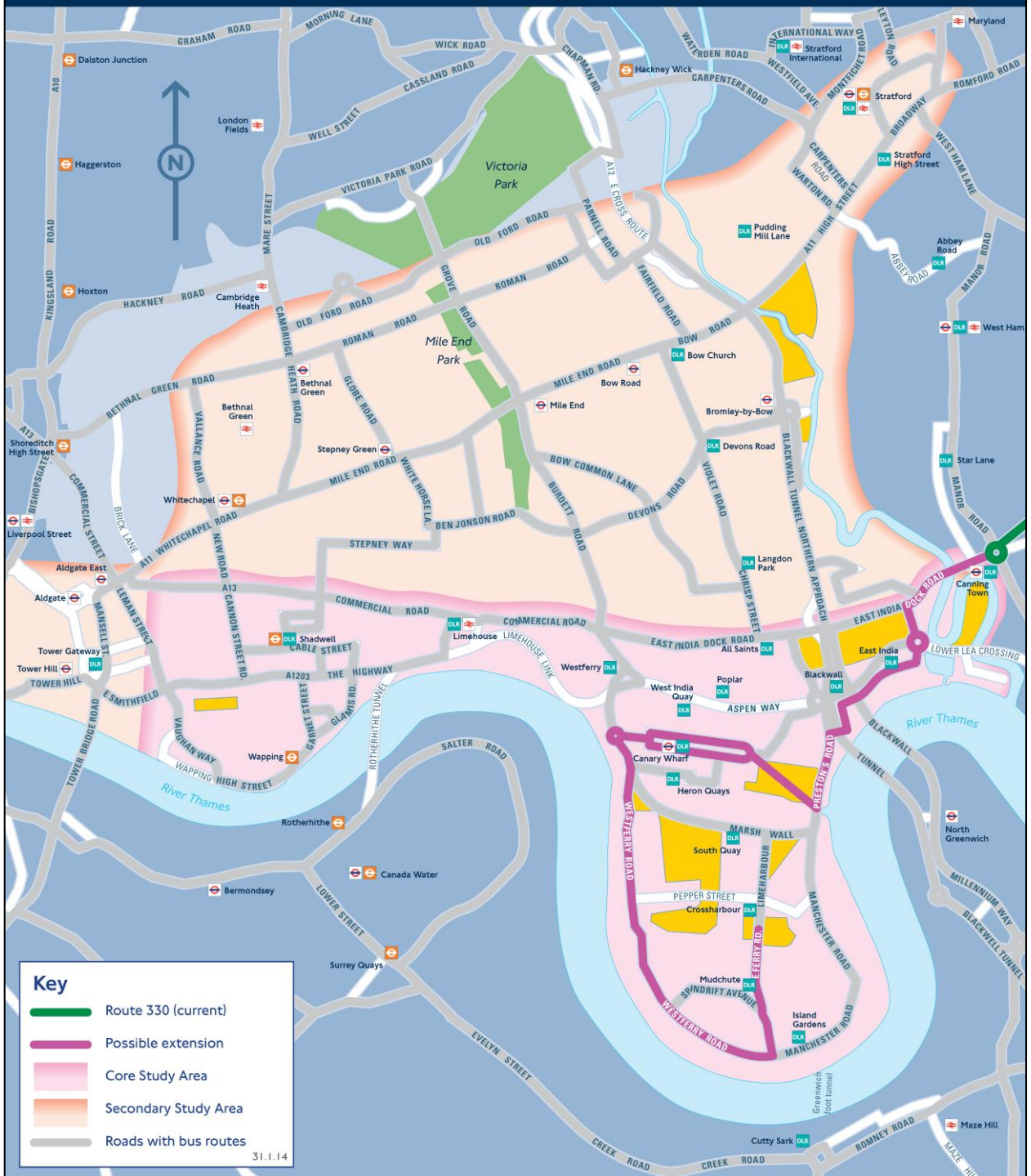
Map C7: Option 2 – Route D3 and D8

Bus Route D6 Ideas



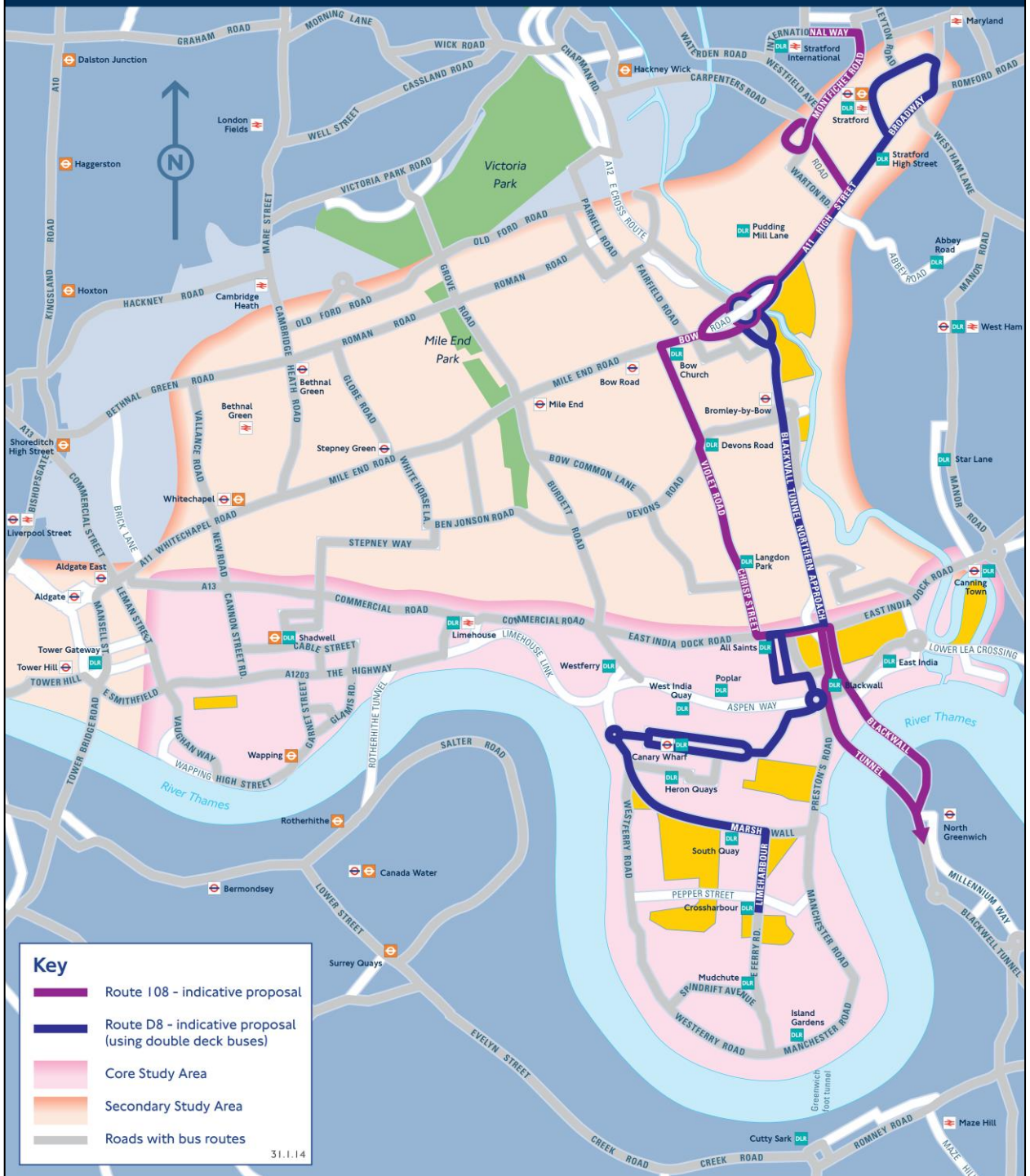
Map C8: D6 Scheme (Wood Wharf & Whitechapel)

Bus Route 330 Ideas



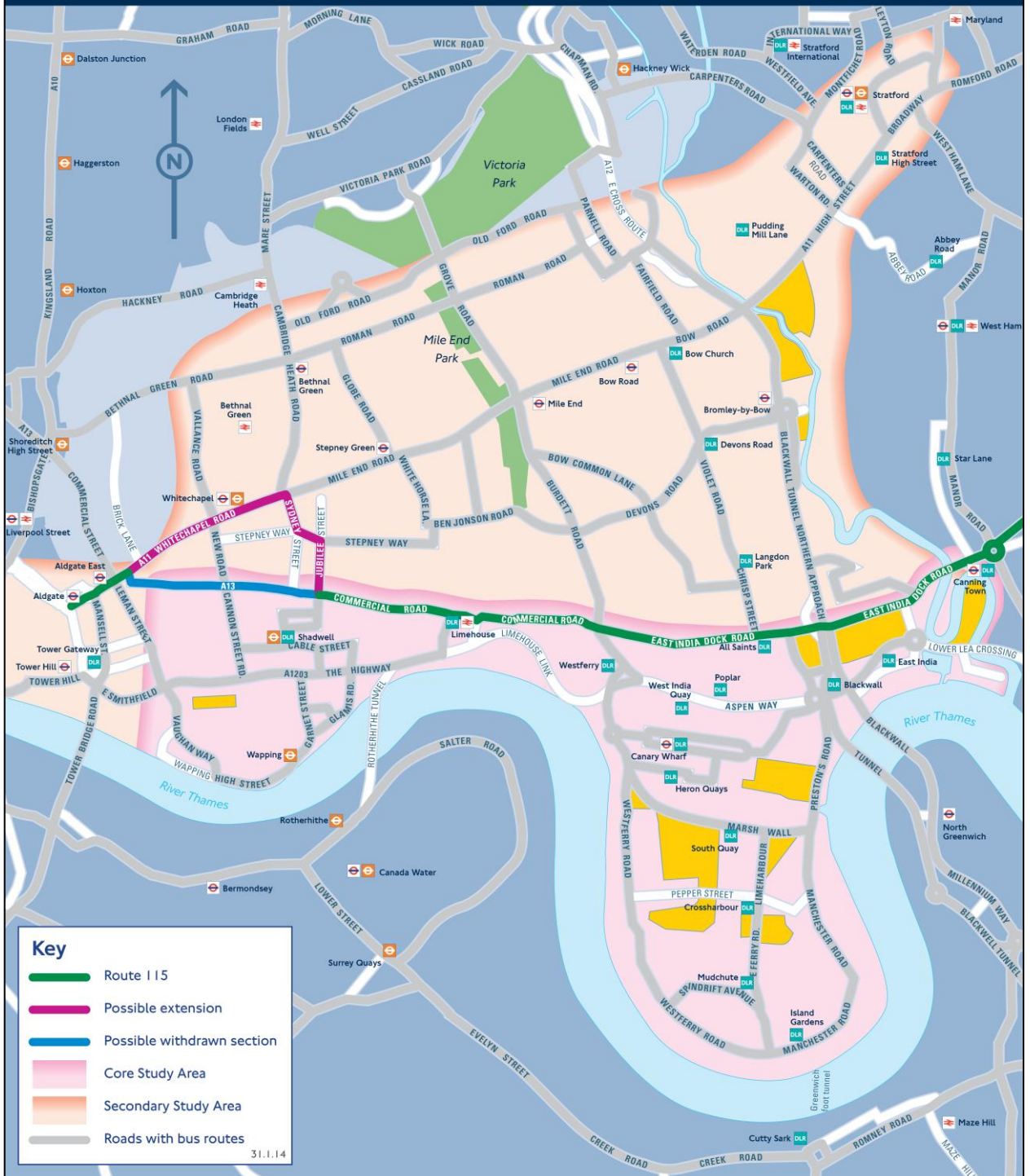
Map C9: Route 330 Scheme

Bus Routes 108 and D8 Ideas



Map C10: Route D8 and 108 (Option 3)

Bus route 115 Ideas



Map C11: 115 Scheme