
Re: Bus stop spacing for the C2CC Project

Dublin City Council has received a number of messages from members of both the North Central and Central Area Committees relating to bus stops spacing for the Clontarf to City Centre Project (C2CC). This report is intended to give some background to the design process, the consultation, and the decision making process surrounding the current bus stop spacing.

Part VII Planning

The Project was lodged with the Planning Department in January 2017, and went through a period of statutory consultation, obtaining approval from the City Council at their meeting in October 2017. Following representations from elected members, the following amendments to the proposal before the council were agreed;

“The locations of bus stops shall be examined and all bus stops along the route shall be redesigned to segregate buses and bicycles as recommended by the National Cycle Manual.”

And

“The junctions and traffic signalling on the route shall be designed....to provide for full segregation of bicycles and motor vehicles.”

The Part VIII proposal was approved subject to these amendments. This has defined the design process.

The C2CC Consultative Committee discussions

A C2CC Consultative Committee was established to ensure the local community would be engaged and consulted throughout the C2CC design process. Existing and proposed bus stop locations were presented at their first meeting in May of 2018, a subsequent discussion was had referring to bus stop location, type, segregation, and it was noted at this meeting that *“in broad terms, (the scheme) was accepted by the committee and that no major change was suggested.”* Included in the appendix (pages 8 to 10) is an extract from the slides which were presented at this meeting.

At another Consultative meeting in March of 2019, general arrangement drawings were “tabled”, showing the location of the bus stops, and it should be noted that since this meeting the location of the bus stops have not altered. Following the meeting the drawings were uploaded to DCC’s Sharefile, and links to downloads were given to all committee members.

In February of 2021 the general arrangement drawings were uploaded to www.dublincity.ie/c2cc, which illustrate what are the current bus stops locations.

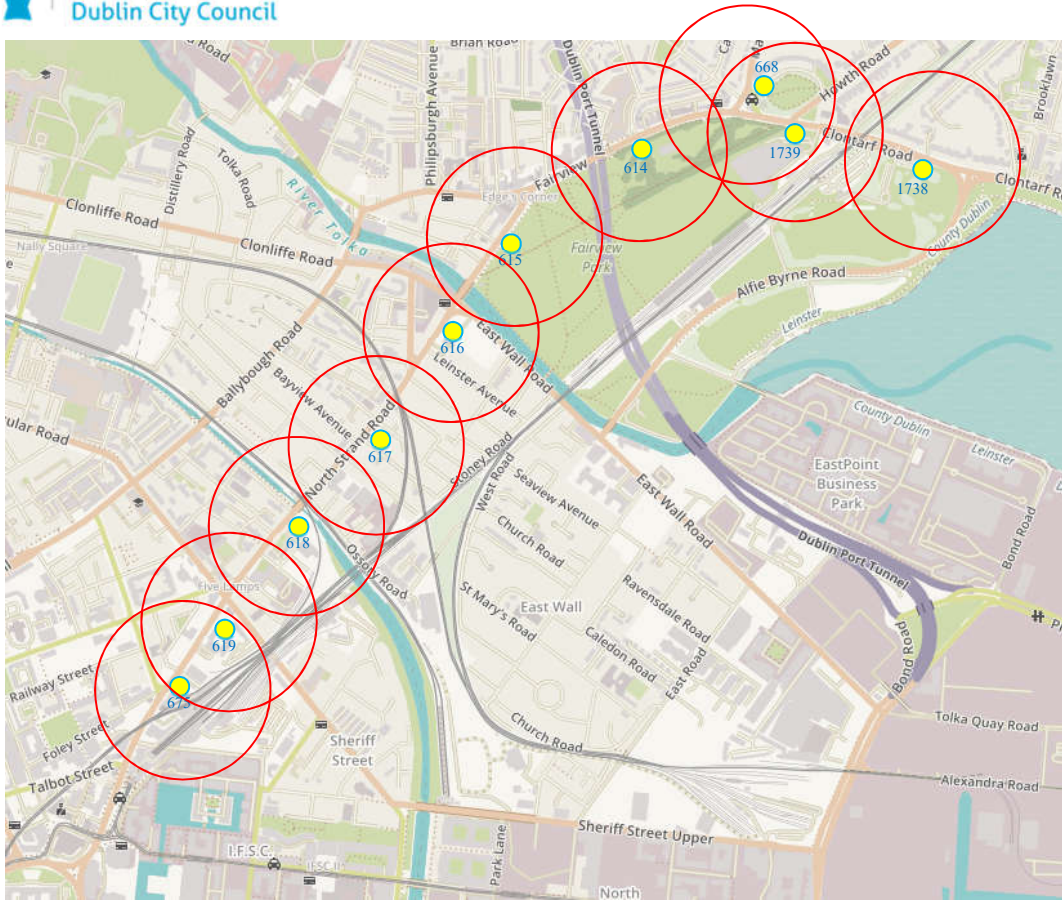


Figure 1: Existing Inbound Bus Stops and Catchment Radii

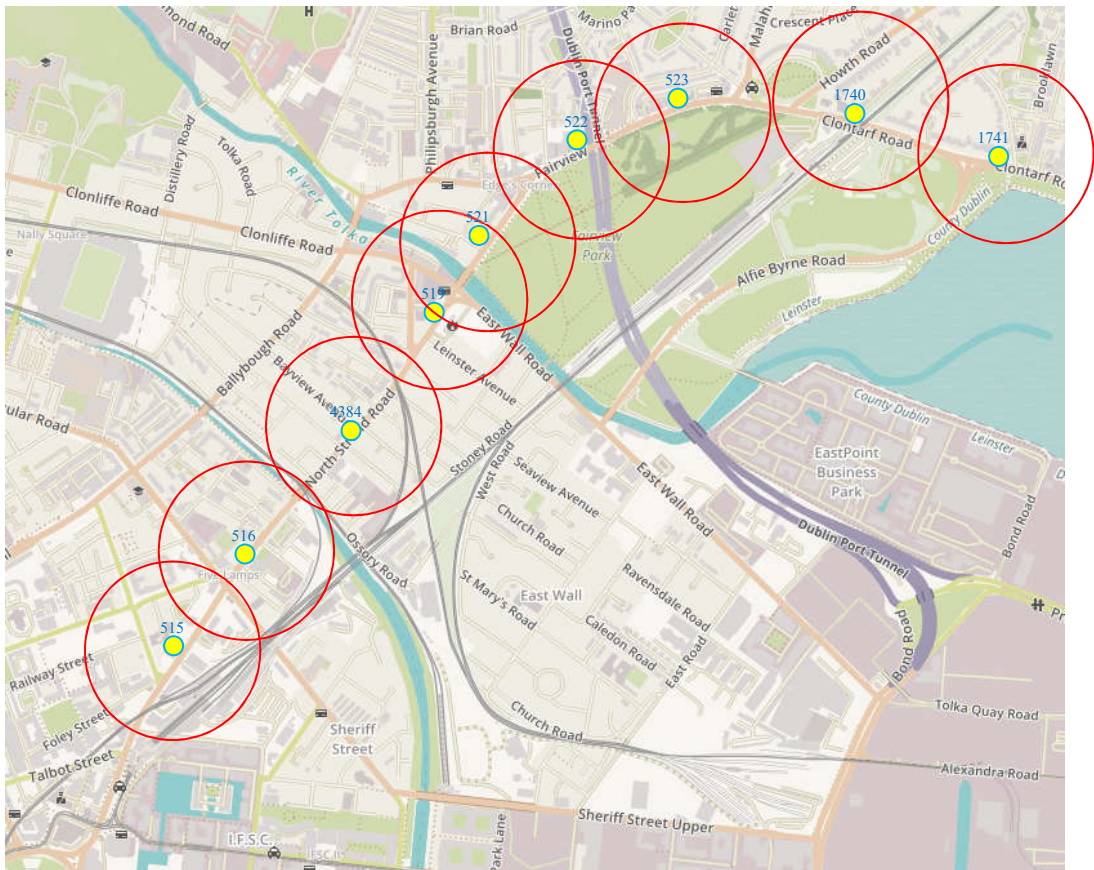


Figure 2: Existing Outbound Bus Stops and Catchment Radii

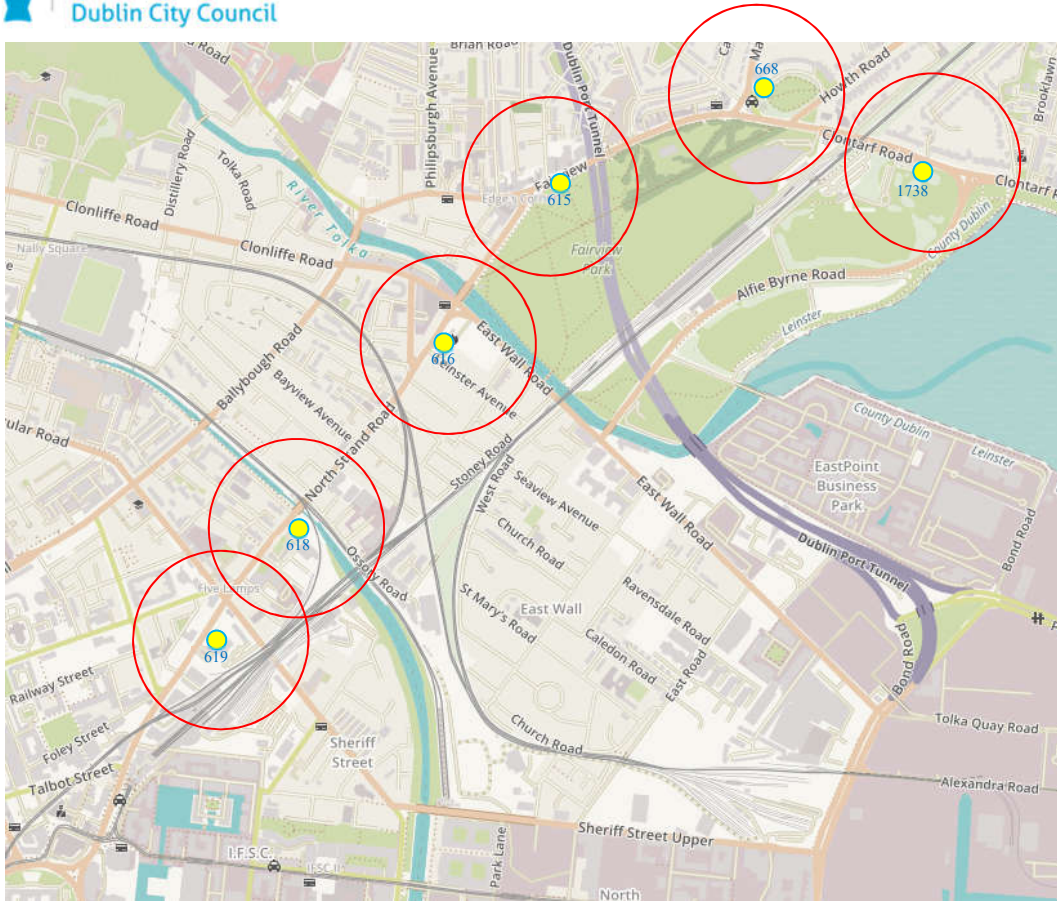


Figure 3 - Proposed Inbound Bus Stops and Catchment Radii

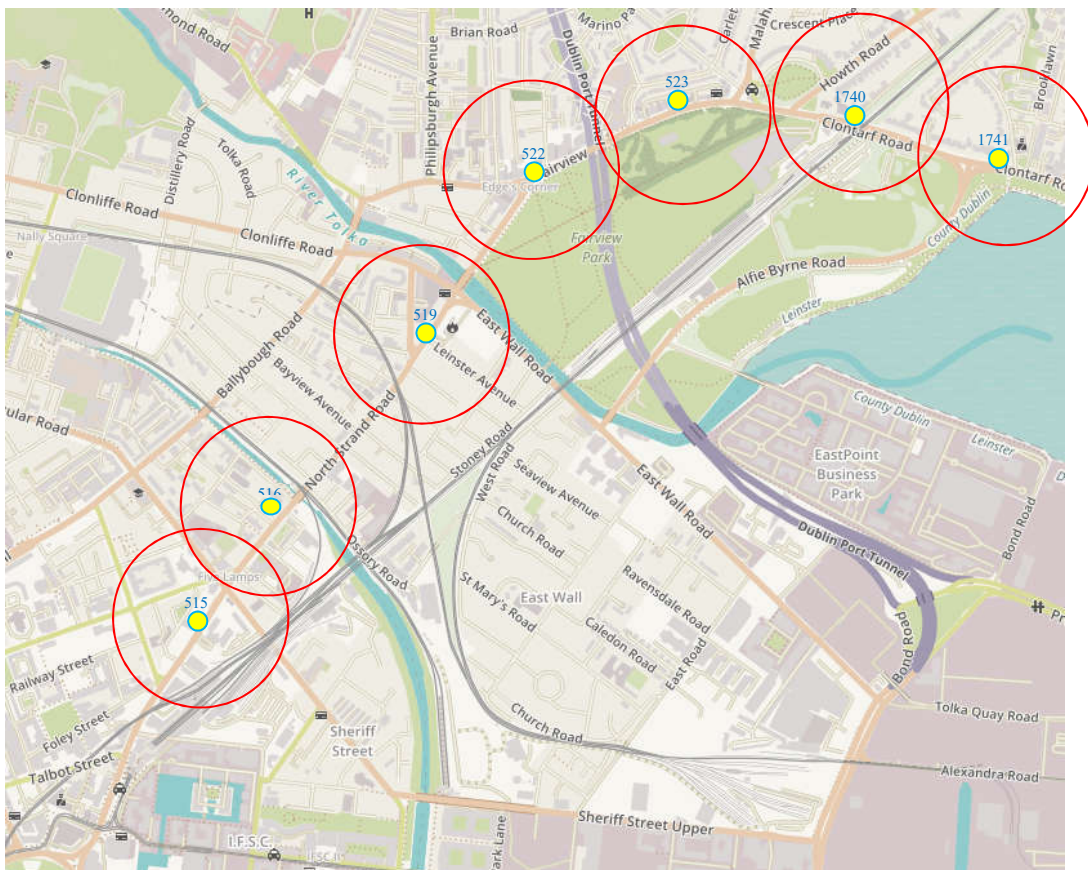


Figure 4 - Proposed Outbound Bus Stops and Catchment Radii

The current bus stops spacing

Currently there are 16 bus routes in operation along the C2CC scheme. There are 10 inbound bus stops and 10 outbound bus stops along the Project area. The existing bus stops are not uniformly spaced, and the spacing between stops varies from 153m to 487m. The drawings on page 2 indicated that the existing arrangements are sub-optimal and that the services along the route are therefore operating inefficiently. This is the inevitable result of haphazard evolution of the bus service and bus stop networks over time. This has created an inherently inefficient bus service, resulting in longer journey times and poorer journey time reliability for passengers.

Rational for the optimisation of Bus Stop Spacing

The ongoing rollout of the BusConnects programme of service amendments (which has seen the introduction of the H (h1, h2, h3) Spine on this corridor) will result in the more efficient and reliable operation of the city bus service network. In turn, this requires more consistent headway management along the major bus transit corridors. Improving bus stop spacing can benefit all bus service stakeholders. Benefits can include but are not limited to:

- Increased bus reliability
- Reduced bus journey times
- Reduced operator costs

Reducing the frequency of bus stops has the effect of reducing and standardising bus dwell times. Concentrating passengers at fewer stops improves boarding times over the course of the route and passenger loads become more predictable. Increased service predictability improves schedule adherence and ideally reliability of service (World Conference on Transport Research, 2013). Optimising bus stop locations reduces acceleration and deceleration requirements for buses and helps to economise fuel consumption. Maintenance costs for bus stops are also reduced.

Research has indicated that the optimal balance between bus stop frequency and pedestrian walking time to stops is between 400m and 800m to access public services such as bus stops (NTA Permeability Best Practise, 2015). This leads to an acceptable bus stop spacing of up to 800m. However, Transport for London and other international research suggests that the spacing should be reduced in dense urban areas with high transit patronage, and the C2CC scheme would certainly fall under this category. The recommendation for such scenarios is a catchment radius of about 200m, with a consequent bus stop spacing of around 400m.

With an average walking time of 5Km per hour, a 200m distance equates to about 2.5 minutes duration.

The following issues were considered during the design optimisation of the bus stopping arrangements;

1. Segregation of cyclists and buses – the creation of an ‘island’ bus stop separates the buses from cyclists, this requires 2.7m cross section width per direction to create a bus stop separate to the footpath. The geometric constraints on the street played a significant role in the revised location of bus stops,
2. The bus islands are designed to include sufficient waiting/standing area for a greater number of passengers, thus increasing the capacity of individual stops,
3. The length of the bus islands are designed to accommodate two buses stopping concurrently, where practicable,
4. Ideally the preferred location for bus stops is downstream of junctions, where they are served by crossing facilities at the junctions, and they won't be delayed by traffic lights when departing

- a stop. This also improves safety by reducing the probability of a stopped bus obstructing visibility of a traffic signal, and
5. The largest gap along the route between the proposed bus stops will be 592 metres, which is a 296m walk, and at an average walking speed would take about 3.5 minutes.

Taking these items into consideration, and the level of demand at each bus stop the existing bus stop spacing was reviewed and re-organised as shown in Figures 3 and 4 above.

The reorganisation of bus stops will result in a significantly faster and more reliable bus service in both directions, while ensuring that all bus stops are located within a 3-4min walking catchment of the local community. The bus stop platform, or 'island' will also be of a higher quality and standard, thus improving the passenger experience while boarding, alighting and waiting for a bus.

This matter is being dealt with by Victor Coe, Project Resident Engineer of the Active Travel Programme Office.

Project Webpage - www.c2cc.ie

Active Travel Programme Office
Email: ActiveTravelOffice@dublincity.ie

BIBLIOGRAPHY

https://www.nationaltransport.ie/wp-content/uploads/2011/12/Permeability_Best_Practice_Guide_NTA_20151.pdf

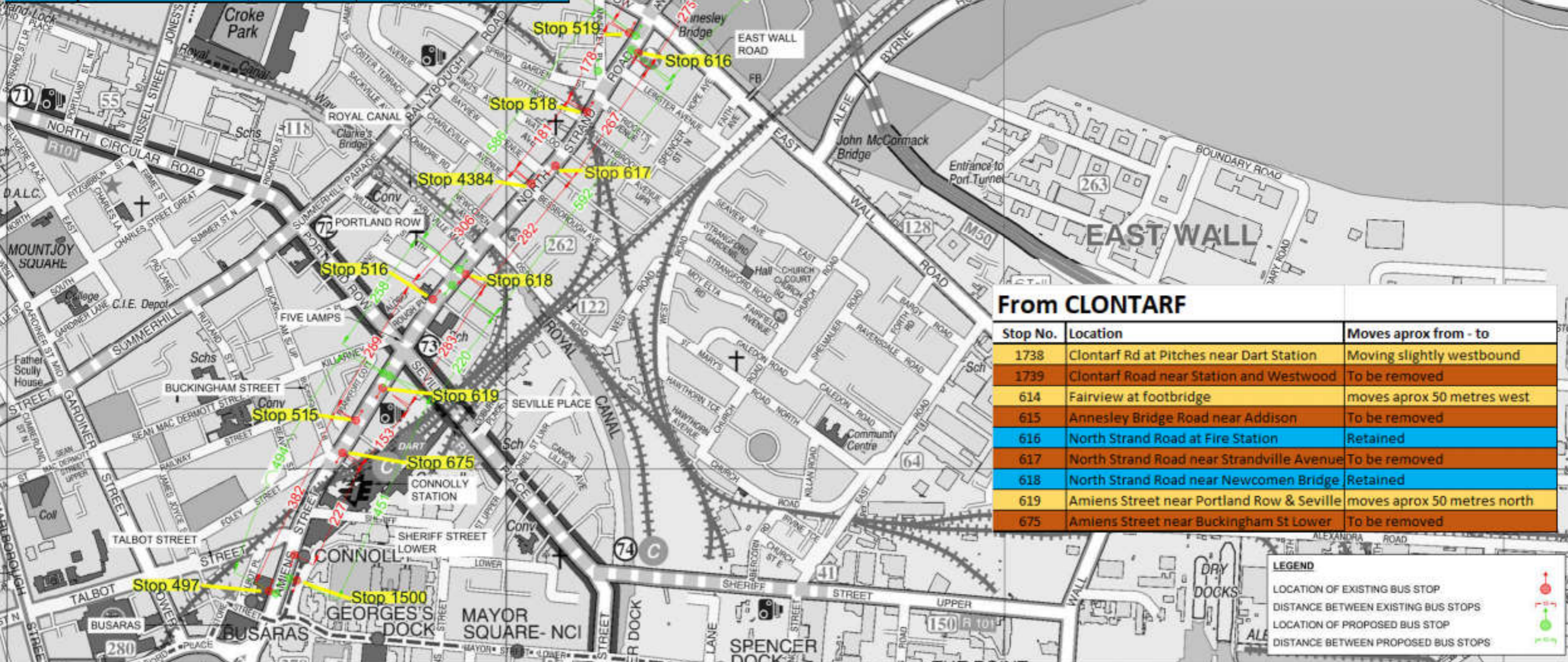
<http://www.wctrs-society.com/wp/wp-content/uploads/abstracts/rio/selected/1846.pdf>

<http://content.tfl.gov.uk/bus-stop-design-guidance.pdf>

Furth, P. and Rahbee, A., 2000. Optimal bus stop spacing through dynamic programming and geographic modeling. Transportation Research Record: Journal of the Transportation Research Board, (1731), pp.15-22.

From CITY CENTRE

Stop No.	Location	Moves aprox from - to
515	Amiens Street near Portland Row	Moves aprox 100 metres north
516	North Strand Road near Health Centre	Moves aprox 100 metres north
4384	North Strand Road near Bayview Avenue	To be removed
518	North Strand Road near Waterloo Avenue	To be removed
?	Annesley Place near North Strand Road	New
519	North Strand Road near East Wall Road	Retained
521	Annesley Bridge Road near Addison Road	To be removed
522	Fairview near Merville Ave	Retained
523	Fairview near Marino College	Retained
668	Malahide Road naer Marino Crescent Park	Retained
1740	Clontarf Road near Howth Road	Moves aprox 50 metres east
1741	Clontarf Road near Alfie Byrne Road	Retained



From CLONTARF

Stop No.	Location	Moves aprox from - to
1738	Clontarf Rd at Pitches near Dart Station	Moving slightly westbound
1739	Clontarf Road near Station and Westwood	To be removed
614	Fairview at footbridge	moves aprox 50 metres west
615	Annesley Bridge Road near Addison	To be removed
616	North Strand Road at Fire Station	Retained
617	North Strand Road near Strandville Avenue	To be removed
618	North Strand Road near Newcomen Bridge	Retained
619	Amiens Street near Portland Row & Seville	moves aprox 50 metres north
675	Amiens Street near Buckingham St Lower	To be removed

LEGEND

- LOCATION OF EXISTING BUS STOP
- DISTANCE BETWEEN EXISTING BUS STOPS
- LOCATION OF PROPOSED BUS STOP
- DISTANCE BETWEEN PROPOSED BUS STOPS



AECOM - Roughan & O'Donovan Alliance



ROUGHAN & O'DONOVAN CONSULTING ENGINEERS ARENA HOUSE, ARENA ROAD SANDYFORD, DUBLIN 18 D18 V8PS, IRELAND

Project Title	Clontarf to City Centre Project (Main Works)
Drawing Title	BUS STOP LOCATIONS
Drawing Number	C2CC-ROD-HCM-S2_AF-8K-CH-6022001
Scale (A1)	1:250
Date	AUGUST 2022
Job No.	17.203
Rev	01

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

Motion/Report Amendment Form

City Council Meeting held on the 2nd October 2017

N.B This form must be completed, signed and handed to the Lord Mayor for each and every amendment put forward. Copies of Amendments must be circulated to all Members & Officials before Amendment is tabled.

(a) **Details of Motion/Report to be amended :**

1. I wish to put forward an amendment to **Report No 300/217 (Clontarf to City Centre Cycle Route)** on the Agenda

(b) **Amendment Text**

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'This Council proposes the acceptance of the development of a detailed design for the Clontarf-Amiens Street cycle route, subject to the following amendments

- o The locations of bus stops shall be examined and all bus stops along the route shall be redesigned to segregate buses and bicycles as recommended by the National Cycle Manual.
- o The junctions and traffic signalling on the route shall be designed
 - a) to provide for pedestrians in line with the Design Manual For Urban Roads and Streets and
 - b) to provide for full segregation of bicycles and motor vehicles.
- o The widths of cycle facilities and buffers are to be in line with the specifications in the National Cycle Manual. If there are pinch points where this is not possible, such locations are to be subject to special design consideration and a safety audit.'

[]

(c) **Signature of Councillor(s) Proposing Amendment**

Cllr Ciarán Cuffe

Cllr Andrew Montague

Cllr _____ Cllr _____

Cllr _____ Cllr _____

Cllr _____ Cllr _____

For Official Use only

Amendment No ___ to Motion No _____
Amendment complies with Standing Orders _____
Amendment Approved by Council _____
Vote Taken _____
Amended Motion approved by Council _____
Signed : _____



Clontarf to City Centre Cycle Route Consultative Committee Meeting #1

PLANNING COMPLIANCE

David Skene
Senior Executive Engineer

18th May 2018



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

Summary of Part VIII Conditions: (excluding inter-departmental condition requirements)

- 1) The right turn lane to Fairview Strand shall be 170m to Merville Avenue and the trees at Fairview Park shall be maintained;
- 2) The locations of bus stops along the route shall be examined;
- 3) Buses shall be segregated from cyclists at all bus stops;
- 4) Widths of cycling facilities to be as per NCM. A safety audit shall be undertaken where this isn't achieved;
- 5) The junctions shall be redesigned
 - a) to provide for pedestrians; and
 - b) to provide full segregation between bicycles and motor vehicles.



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



2). Bus Stop Location Review:

Bus Stop Spacing and Segregation of Cyclists

- 1) The scope to rationalise bus stop spacing was investigated in conjunction with the separate planning requirement to segregate cyclists at bus stops;
- 1) ROD conducted an examination of international best practice, which suggests a catchment radius of 200m;
- 2) This implies an ideal spacing of 400m between stops.

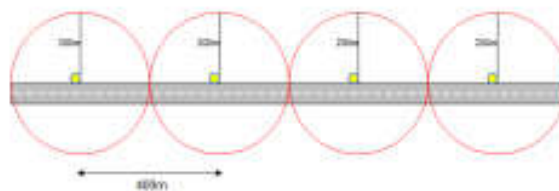


Figure 4: Idealised Bus Stop Spacing and Catchment Radii



2). Bus Stop Location Review:



Figure 2: Existing Proposed Bus Stops and Catchment Radii



Figure 3: Existing Outdoor Bus Stops and Catchment Radii



Figure 4: Proposed Indoor Bus Stops and Catchment Radii

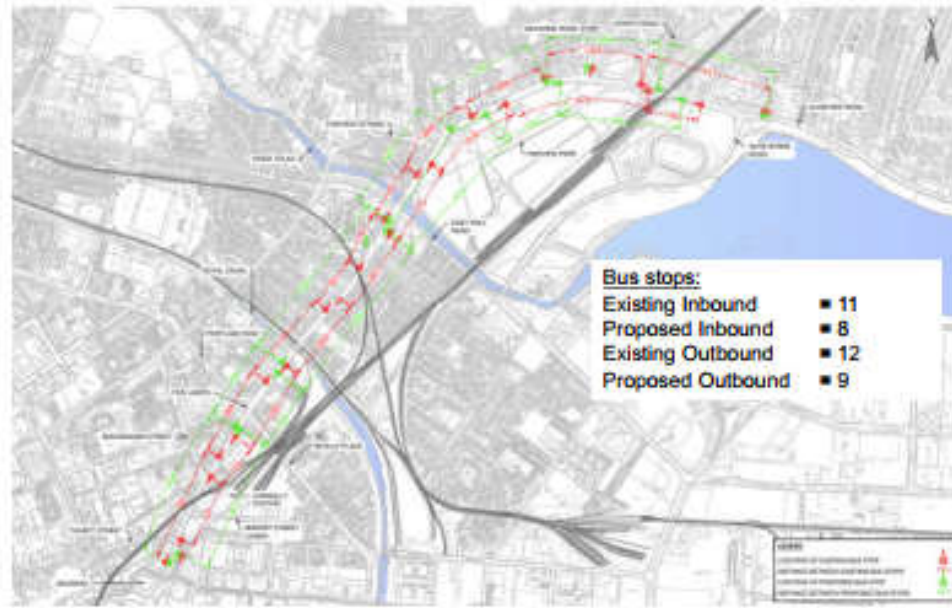


Figure 5: Proposed Outdoor Bus Stops and Catchment Radii





2). Bus Stop Location Review:



Existing Configuration on C2CC Corridor during 2018

The following table summarise the existing numbers of boarding and alighting passengers at each stop over a 24 hour period during 2018.

Location	Buses	Inbound			Buses	Outbound		
		Stop No.	Spacing (m)	Boardings		Stop No.	Spacing (m)	Boardings
Clontarf Road	32, 32x	1738	176	-	32, 32x	1741	-	-
	130	1739	487	-	130	1740	417	-
Malahide Road	14, 14c, 15, 27, 27a, 27b, 42, 43	668	300	388	-	-	-	-
Fairview	14, 14c, 15, 27, 27a, 27b, 27x, 29a, 31, 31a, 31b, 32, 32x, 42, 43, 130	614	318	359	14, 15, 27, 27a, 27b, 27x, 29a, 31, 31a, 31b, 32, 42, 43, 130	523	324	499
	14, 14c, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 32x, 42, 43, 130	615	275	529	14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 32x, 42, 43, 130	522	269	683
					14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 130	521	268	174
North Strand	14, 14c, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 53, 130	616	267	961	14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 130	519	182	305
					14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 130	518	178	-
		617	282	267	14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 53, 130	4384	181	207
Amiens Street	14, 14c, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 53, 130	618	283	299		516	306	646
		619	153	131	14, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 42, 43, 53, 130	515	289	488
	14, 14c, 15, 27, 27a, 27b, 29a, 31, 31a, 31b, 32, 32x, 42, 43, 53, 130	675	227	129				

Table 1: Existing Bus Stop Usage (Figures from 2018)