Appendix A

Scheme Options Assessment Stage 2			Section 1	
	Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
1	**Economy**	Capital Cost	Total - € 14.6 m Cost per KM - € 12.8 m Indicative Scheme Infrastructure Works Cost - €4.4 m Private Land Costs - €10.2 m -Dedicated bus lanes will be constructed from Castle St to Wilford Roundabout -Upgrades on the Dublin Rd will involve land take from gardens as well as the purchase of the Topaz garage and car park spaces from businesses. -Land take involves 3385 sqm of gardens/green spaces, 280 sqm of St Philomena's National school, 1088 sqm of parking spaces/commercial property, a Topaz Garage, a house and one commercial building that has been demolished and has yet to be reconstructed -Wilford Roundabout and junctions at Upper Dargle Rd, Old Connaught Ave, Seapoint Rd and The Maltings will be upgraded as part of the scheme. 2 new pedestrian cyclist/bridges will be constructed either side of the existing DArgle Bridge 26 private landowners affected	Total - € 30.25 m Cost per KM - € 10.99 m Indicative Scheme Infrastructure Cost - € 7.3 m Private Land Costs - € 22.95 m -Dedicated bus lanes will be provided from Lidl to the Wilford Roundabout -This scheme uses part of a road being constructed as a new access to St Philomena's National School. A new road would be constructed through the green field site of the Old Bray Golf Club which links to a new bridge over the Dargle River. A new bridge would also be constructed over Seapoint Rd leading to Bray DART station. Dedicated bus lanes will be provided for the majority of this section, with some share running with future LUAS likely required between the new Dargle River bridge and Bray DART station. -Wilford Roundabout and junctions at Old Connaught Ave, Quinsborough Rd and Florence Rd will be upgraded as part of the scheme -Land take involves 13466 sqm of private land, 111 sqm of commercial parking, a house and the Topaz garage 24 private landowners affected
		Rank		
		Journey-time reliability and quality of service	The scheme has a total length of 1.35 km and from initial journey time calculations would take an average of 6-7 mins. Full priority is provided on Dublin Rd and Castle St. It is anticipated that supplementary measures such as a queue relocation system would reduce delays for buses on the Bray Main St approach to the scheme when it is congested leading to more reliable journey times, however some delays will still be experienced 94% dedicated bus lanes inbound and 100% dedicated bus lanes outbound provided (As far as the River Dargle)	The scheme has a total length of 2.33 km and from initial journey time calculations would take an average of 7-8 mins. Full priority is provided on Dublin Rd, and new road through the golf club lands. Shared running likley required with future LUAS between the new Dargle River bridge and Bray DART station. It is anticipated that supplementary measures such as a queue relocation system would reduce delays for buses on the Bray Main St approach to the scheme when it is congested leading to more reliable journey times, however some delays will still be experienced 95% dedicated bus lanes inbound and 100% dedicated bus lanes outbound provided
		Rank		

Scheme Options Assessment Stage 2			Section 1	
	Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
2	**Integration**	Land Use Integration	The route provide a direct link into Bray Town Centre which offers a mix of employment and retail development. The section on Dublin Road between St. Phlomena's School and Wilford roundabout (Wilford to Bray County Boundary) is in accordance with Dun Loaghaire Rathdown Development Plan (2016-2022) 6-year road proposal and objective to provide a bus priority route.	The route will serve the proposed future mixed-use development of the former Bray Golf Club Lands designated for development within the Bray Town Development Plan and will also link directly to the town centre.The section on Dublin Road between St. Phlomena's School and Wilford roundabout (Wilford to Bray County Boundary) is in accordance with Dun Loaghaire Rathdown Development Plan (2016-2022) 6-year road proposal and objective to provide a bus priority route.
		Rank		
		Residential Population		
		400m (5 mins)	3024	4031
		800m (10 mins)	8461	9336
		1200m (15 mins)	14896	15461
		Employment Catchment		
		400m (5 mins)	2021	2600
		800m (10 mins)	3486	3770
		1200m (15 mins)	4390	4513
		Total residential and employment (10 mins)	**11947**	**13106**
		Total residential and employment (10 mins) per km	6637	4854
		Rank		
		Transport Network Integration	This scheme can be used by other buses passing through Bray Town and continuing further South. There is a short walk to link with Bray DART station. The route will likely provide connectivity with proposed LUAS line B2 (depending on location of future Luas stops) Access to all areas of Bray maintained as normal. A supplementary queue relocation system will mean additional delays for general traffic using Bray Main St.	This scheme links directly with Bray DART station, and future LUAS line B2 and it also provides direct access to bus services that use Bray Main St. Queue relocation system will mean additional delays for general traffic using Bray Main St. Access to all areas of Bray maintained as normal.
		Rank		
		Cyclists and pedestrian Integration	This scheme follows GDACNP primary/secondary cycle route B1 along Dublin Road and Castle Street. Potential to provide sufficient level of service for cyclists.	This scheme follows GDACNP primary/secordary route B1 along Dublin Road with potential to provide sufficient level of service for cyclists. Cycle facilities could be incorporated along the proposed new road through the Old Bray Golf Course which would provide links to GDACNP route W11/N5 greenway.
		Rank		

Scheme Options Assessment Stage 2			Section 1	
	Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
3	**Accessibility and Social Inclusion**	High volume trip attractors	Route serves Bray town centre including a number of employment and education trip attractors as listed below. -Bray Town Centre -Employment Centres along Corke Abbey Ave. -5 Primary Schools (1808 students) -4 Secondary School (2476 students)	Route serves Bray town centre and DART station, including a number of employment and education trip attractors as listed below. -Bray Town Centre -Employment Centres along Corke Abbey Ave. -5 Primary School (1808 students) -4 Secondary Schools (2476 students)
		Rank		
		Deprived Geographic Areas	Equal across all options. No RAPID areas	Equal across all options. No RAPID areas
		Rank		
4	**Safety**	Road Safety	The route interfaces with 6 no. junctions, all of which would require "straight-through" movements of buses. Improvements to Wilford roundabout will improve road safety.	The route interfaces with 7 no. junctions,which would require 4 turn movements for buses in each direction (1 right turns and 3 left turns in outbound direction and 3 right turns and 1 left turns inbound). Improvements to Wilford roundabout will improve road safety.
		Rank		
5	**Environment**	Archaeological, Architectural and Cultural Heritage	The route runs through the designated ZAP of the historic core of Bray town along Bray Main St. There is a potential that remains may be uncovered in in this area during construction if ground works are proposed beneath the current street levels **Architectural Heritage**: Demolition of Protected Structure Woodbrook Side Lodge (RPS 1874)	The route runs in greenfields in the vicinity of a number of recorded archaeological sites. The presence of these sites is an indication of a general archaeological potential to reveal previously unknown (truncated) features beneath the topsoil. **Architectural Heritage**: Demolition of Protected Structure Woodbrook Side Lodge (RPS 1874)
		Rank		

Scheme Options Assessment Stage 2		Section 1	
Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
	Flora and Fauna	There is unlikely to be any significant impact on any sites of international or national conservation value. This is because there is unlikely to be any connectivity or impact on pathways between the route option and any nationally or internationally designated sites. Several small trees and shrubs may be lost north of the bridge on castle street. Potential impacts on birds if removed in breeding season. Crossing of River Dargle has the potential to result in impacts on water quality through release of polluting construction materials. This could impact fauna, particularly aquatic species such as fish. No invasive species were noted on the bank, and there were no signs of otter holts. An old ivy-covered wall and sections of hedgerow/treeline at entrance to St. Philomena's School/John of Gods will be removed. Map 13 of Town Plan indicates Tree Preservation Order (TPO) apply to these trees. Potential impacts on birds if removed in breeding season. Where removal of Topaz petrol station, Fitzpatrick motors and gate lodge/protected structure north of Nissan Garage is required, there is a risk that the buildings host roosting bats. The risk for all but the latter is considered to be low. Loss of individual trees and shrubs in public and private green space on Dublin Road in Little Bray has potential for impact on breeding birds if vegetation cleared in breeding season. Several trees will need to removed to provide a bus lane around Wilford Rbt. Potential to host nesting birds in the bird breeding season.	There is unlikely to be any significant impact on any sites of international or national conservation value. This is because there is unlikely to be any connectivity or impact on pathways between the route option any nationally or internationally designated sites. 'This route will involve the removal of two buildings - one east of Bray Wanderer's club, and one north of the Nissan Garage close to the Wilford roundabout. There is potential that either building could host roosting bats. Area of rough grassland and hedge to be removed adjacent to railway line has potential to host nesting birds in the bird breeding season. This area was not accessible for survey and is based on study of aerial imagery. Crossing of River Dargle has the potential to result in impacts on water quality through release of polluting construction materials. This could impact fauna, particularly aquatic species such as fish. No invasive species were noted on the bank, and there were no signs of otter holts. Several trees will need to removed to provide a bus lane around Wilford Rbt. Potential to host nesting birds in the bird breeding season. Part of scheme to run through existing greenfield site (Old Bray Golf Club lands), this may result in the loss of habitats of ecological value. The ecological value of these habitats cannot be fully assessed at this stage prior to access to lands, however the lands appear to have significant tree cover. There is potential that trees are used by roosting bats and nesting birds. Where removal of Topaz petrol station and Fitzpatrick motors is required, there is a risk that the buildings host roosting bats. For these buildings, this risk is considered to be low. Loss of individual trees and shrubs in public and private green space on Dublin Road in Little Bray has potential for impact on breeding birds if vegetation is cleared in breeding season.
	Rank		

Scheme Options Assessment Stage 2		Section 1	
Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
	Soils and Geology	This scheme (as with scheme 1B) passes through and requires the outright purchase of a Topaz garage. Other notable features relating to soils and geology along this route include possible bedrock outcropping in Bray town and associated areas of extreme aquifer vulnerability.	As with route 1A this route passes beside a Topaz garage and will require the purchase of the garage. This route also crosses through a golfcourse and park area and will require the construction of a bridge over the River Dargle, with associated bridge foundations. This route also passes close to an electroplating and manufacturing company and possible factory/plant (although it is unknown if these would suggest ground contamination). The extend of groundworks on this scheme is considerably higher than that for scheme 1A and so it scores comparitively worse on this criterion
	Rank		
	Hydrology	Route passes through area of Castle Street/Ravenswell which has been subjected to flooding, however ongoing flood protection works likely to mitigate any risks. Existing bridge crossing of River Dargle to be utilised with additional pedestrian/cycle bridges are proposed either side of the existing Dargle Bridge. Minimal potential for impacts to Hydrology.	'Route passes through area of Ravenswell which has been subjected to flooding, however ongoing flood protection works likely to mitigate any risks.New bridge over River Dargle required. It is assumed that any new bridge will be designed to ensure minimal potential impact to Hydrology
	Rank		
	Landscape and visual	Widening of the Dublin Rd from Wilford Roundabout to Supervalu will have a negative impact because of the removal of portions of front gardens and green spaces Land-take along east side of Castle Street – Dublin Road from south of St. Philomena's School Entrance north to N11 / Dublin Road Roundabout will result in direct loss of existing boundaries, portion of gardens, mature plantings and trees at St. Philomena's School Entrance; and from Corke Abbey Avenue junction north to N11 / Dublin Road Roundabout.	Widening of the Dublin Rd from Wilford Roundabout to Lidl will have a negative impact because of the removal of front gardens and green spaces The Old Bray Golf Club has been zoned for redevelopment, the scheme is in keeping with the planned developments Visual impact on residential streets of Quinsborough Road, Duncairn Road, Florence Road and Seapoint Court. Land-take along east side of Dublin Road from Lidl to N11 / Dublin Road Roundabout will result in direct loss of existing boundaries, portion of gardens, mature plantings and trees from Corke Abbey Avenue junction north to N11 / Dublin Road Roundabout.
	Rank		
	Noise, Vibration and Air	On Dublin Rd and Castle St the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise vibration and air pollutants	On Dublin Rd the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise vibration and air pollutants. This scheme travels partially on a new built road away from sensitve receptors
	Rank		

Scheme Options Assessment Stage 2		Section 1	
Assessment Criteria	**Sub-Criteria**	**SCHEME 1A**	**SCHEME 1B**
	Land Use and the Built Environment	From Topaz to Wilford Rd. widening of roads along the scheme would result in potential significant impact (loss of portions of front gardens) to a number of properties Land-take along east side of Castle Street – Dublin Road from south of St. Philomena's School Entrance north to N11 /Dublin Road Roundabout.	CBC will be planned and developed as part of mixed-use development of the former Bray Golf Club Lands From Topaz to Wilford Rd. widening of roads along the scheme would result in potential significant impact (loss of portions of front gardens) to a number of properties. Land-take along east side of Dublin Road from Lidl north to N11 /Dublin Road Roundabout. Significant impact to the streetscape of Quinsborough Road & Florence Road. Likely removal of street trees and large numbers of on-street parking residential parking spaces
	Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2				
	Assessment Criteria	Sub-Criteria	SCHEME 2A	SCHEME 2B	SCHEME 2C	SCHEME 2D	SCHEME 2E
1	Economy	Capital Cost	'Total - € 31.7 million Cost per KM - € 7.6 million Indicative Scheme Infrastructure Cost - € 15.9 million Private Land Costs - € 15.8 million Between Wilford junction and the Dublin Road south of Loughlinstown Roundabout the bus will run in a dedicated bus- only corridor to the east of the M11 with landtake generally from the existing wide road reservation and some gardens and private lands. Upgrade of Wilford Roundabout to signalised junction and signalisation of Loughlinstown Roundabout. Land take involves 10530 sqm of private land 13 private landowners affected	'Total - € 24.6 million Cost per KM - € 5.9 million Indicative Scheme Infrastructure Cost - € 10.5 million Private Land Costs - € 14.1 million South of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided on the Dublin Rd between Wilford junction and Crinken lane. This will involve land take in the form of green fields, front gardens and lands from public amenity and green space. Dedicated bus lanes will be provided between Crinken Lane and Quin's Road junction. An alternative cycle route will be provided to the east of the village following Beech Road/Crinken/Mountain View with land take required to provide a connection to Lower Road via Assumpta Park or Stone Bridge Close. On the northern end of Lower Road landtake would be required to provide a connection through to Dublin Road in the vicinity of St. Annes Church roundabout. Sections of dedicated bus lanes in both direction in Shankill Village between Quins Road and St. Annes Church junction, with enhanced priority for buses provided using queue relocation at the upgraded Quins Road, St. Annes/CorbawnLane and Lower Road junctions. North of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided along Dublin Road. This will involve land take from St Anne's Church carpark, Rathmichael School, green spaces and front gardens. Quins Rd and St. Annes Church roundabouts will be upgraded to a signalised junctions and the junction at Stonebridge road will also be upgraded as part of the scheme. Upgrades to Loughlinstown and Wilford junctions to provide enhanced priority for buses. Land take involves 9396 sqm of private land 42 private landowners affected	'Total - € 22.6 million Cost per KM - € 5.4 million Indicative Scheme Infrastructure Cost - € 13.3 million Private Land Costs - € 9.3 million South of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided on the Dublin Rd between Wilford junction and Crinken lane. This will involve land take in the form of green fields, front gardens and lands from public amenity and green space. Between Crinken Lane and the Dublin Road south of Loughlinstown Roundabout the bus will run in a dedicated corridor to the east of the M11 with landtake generally from the existing wide road reservation and some gardens and private lands. Upgrade of Wilford Roundabout to signalised junction and signalisation of Loughlinstown Roundabout. Land take involves 6220 sqm of private land 23 private landowners affected	'Total - € 41 million Cost per KM - € 10 million Indicative Scheme Infrastructure Cost - € 17.2 million Private Land Costs - € 23.8 million South of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided on the Dublin Rd between Wilford junction and Crinken lane. This will involve land take in the form of green fields, front gardens and lands from public amenity and green space. Between Crinken Lane and the Dublin Road south of Loughlinstown Roundabout general traffic will be routed via a new road running to the east of the M11 with landtake generally from the existing wide road reservation and some gardens and private lands. Dedicated bus lanes will be provided between Crinken Lane and Quin's Road junction. A bus-only gate would be provided between the St. Annes/Corbawn Lane junction and the Dublin Road/Lower Road with through traffic routed via the new road to the west of Shankill. North of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided along Dublin Road. This will involve land take from St Anne's Church carpark, Rathmichael School, green spaces and front gardens. Upgrades to Loughlinstown and Wilford junctions to provide enhanced priority for buses. Land take involves 5810 sqm of gardens and 9740 sqm of agricultural land 49 private landowners affected	'Total - € 33.7 million Cost per KM - € 7.5 million Indicative Scheme Infrastructure Cost - € 13.1 million Private Land Costs - € 20.6 million Between Wilford junction and Crinken Lane the bus will run in a dedicated bus- only corridor to the east of the M11 with landtake generally from the existing wide road reservation and some gardens and private lands. Upgrade of Wilford Roundabout to signalised junction Dedicated bus lanes will be provided between Crinken Lane and Quin's Road junction. An alternative cycle route will be provided to the east of the village following Beech Road/Crinken/Mountain View with land take required to provide a connection to Lower Road via Assumpta Park or Stone Bridge Close. On the northern end of Lower Road landtake would be required to provide a connection through to Dublin Road in the vicinity of St. Annes Church roundabout. Sections of dedicated bus lanes in both direction in Shankill Village between Quins Road and St. Annes Church junction, with enhanced priority for buses provided using queue relocation at the upgraded Quins Road, St. Annes/CorbawnLane and Lower Road junctions. North of Shankill Village dedicated bus lanes and segregated cycle tracks will be provided along Dublin Road. This will involve land take from St Anne's Church carpark, Rathmichael School, green spaces and front gardens. Quins Rd and St. Annes Church roundabouts will be upgraded to a signalised junctions and the junction at Stonebridge road will also be upgraded as part of the scheme. Upgrades to Loughlinstown and Wilford junctions to provide enhanced priority for buses. Land take involves 13706 sqm of private land 32 private landowners affected
		Rank					
		Journey-time reliability and quality of service	'96% dedicated bus lanes in bound and 100% outbound. Scheme has a total length of 4.2 km and from initial journey time calculations would take an average of 7-8 mins	'89% dedicated bus lanes inbound and 94% dedicated bus lanes outbound provided 'The scheme has a total length of 4.17 km and from initial journey time calculations, would take an average of 9-10 mins. In general good bus priority is provided throughout and therefore journey times will be reliable. Journey time savings would be minimal however, particularly along the section to the south of Shankill as buses currently experience few delays.	'96% dedicated bus lanes in bound and 100% outbound. Scheme has a total length of 4.2 km and from initial journey time calculations would take an average of 8-9 mins	'86% dedicated bus lanes inbound and 89% dedicated bus lanes outbound provided 'The scheme has a total length of 4.17 km and from initial journey time calculations, would take an average of 8-9 mins. In general good bus priority is provided throughout and whilst a bus-only gate is provided at Shankill village limiting access to local traffic there is a possibility of some journey time unreliability due to local traffic turning movements.	'89% dedicated bus lanes inbound and 94% dedicated bus lanes outbound provided 'The scheme has a total length of 4.5 km and from initial journey time calculations, would take an average of 10-11 mins. In general good bus priority is provided throughout and therefore journey times will be reliable.
		Rank					
2	Integration	Land Use Integration	' The route would pass to the south and west of the propsed Woodbrook-Shanganagh LAP. Sections of the LAP including most of the Shanganagh Castle lands and some of the Woodbrook lands would still be within a 10-15minute walk of the route. This route also passes within a 10-15 min walk of the Old Connaught LAP development lands, access to these lands would be facilitated by constructing a new pedestrian/cycle access route accross the M11 at Allies River Road. This new access route is a specific objective of the county development plan	' The route would pass alongside the propsed Woodbrook-Shanganagh LAP, thereby providing good integration with residential zoned lands.	' The route would pass alongside the propsed Woodbrook-Shanganagh LAP, thereby providing good integration with residential zoned lands.	'The route would pass alongside the propsed Woodbrook-Shanganagh LAP, thereby providing good integration with residential zoned lands.	' The route would pass to the south and west of the propsed Woodbrook-Shanganagh LAP. Sections of the LAP including most of the Shanganagh Castle lands and some of the Woodbrook lands would still be within a 10-15minute walk of the route. This route also passes within a 10-15 min walk of the Old Connaught LAP development lands, access to these lands would be facilitated by constructing a new pedestrian/cycle access route accross the M11 at Allies River Road. This new access route is a specific objective of the county development plan
		Rank					
		Residential Population Catchment					
		400m (5 mins)	2361	3292	2672	3292	2981
		800m (10 mins)	7975	10239	8378	10239	9836
		1200m (15 mins)	19280	20648	19522	20648	20406
		Employment Catchment					
		400m (5 mins)	714	885	724	885	875
		800m (10 mins)	2225	2403	2272	2403	2356
		1200m (15 mins)	5824	5698	5788	5698	5734
		Total residential and employment (10 mins)	**10200**	**12642**	**10650**	**12642**	**12192**
		Total residential and employment (10 mins) per km	2429	3010	2536	3010	2903
		Rank					
		Transport Network Integration	This route passes to the west of Shankill village but would link with other buses using the national road network at Loughlinstown. The route would be further away from Shankill DART station and the proposed Woodbrook DART station and possible future park-and-ride facility when compared to other routes.	This route passes through Shankill Village and would link well with existing buses that use this route. The route is located a short walk from Shankill DART station and the proposed Woodbrook DART station and possible park-and-ride facility.	'This route passes to the west of Shankill village but would link with other buses using the national road network at Loughlinstown. The route is located a short walk from the proposed Woodbrook DART station and possible park-and-ride facility but would be further away from Shankill DART station when compared to other routes.	This scheme passes through Shankill Village and would link well with existing buses that use this route. The route is located a short walk from Shankill DART station and the proposed Woodbrook DART station. The proposed bus gate is likley to result in significant diversion lengths for local traffic.	This route passes through Shankill Village and would link well with existing buses that use this route. The route is located a short walk from Shankill DART station.
		Rank					
		Cyclists and pedestrian Integration	The sections of this route that follow primary cycle route 12A would incorporate cycle facilities. The section of route between Wilford junction and the proposed junction to the south of Loughlinstown roundabout does not follow the cycle route and no pedestrian or cycle facilities would be provided along this bus-only road.	The route follows GDACNP primary cycle route 12A. Cycle facilities will be provided through a combination of segregated cycle tracks and an alternative off-line cycle route passing to the east of Shankill Village. There is insufficient space to povide online cycle facilities between Crinken Lane and Shankill Village and cyclists would either travel in the bus lanes or utilise the alternative route. Upgrades to existing footpaths and pedestrian crossings would also be provided.	This route partially follows primary route 12A, on the N11 and Crinken lane to Woodbrook junction sections. Segregated cycle facilities will be provided for this portion of the route. The section of route between Crinken Lane and the proposed junction to the south of Loughlinstown roundabout does not follow the cycle route and no pedestrian or cycle facilities would be provided along this bus-only road, however pedestrian and cycle access would be provided to proposed bus stops.	The route follows GDACNP primary cycle route 12A. Cycle facilities will be provided through segregated cycle tracks with provision of a bus gate and resultant reduction in general through-traffic facilitating a shared cycle street between Shankill village and Quins Road. Upgrades to existing footpaths and pedestrian crossings would also be provided.	The route partially follows GDACNP primary cycle route 12A. Cycle facilities will be provided through a combination of segregated cycle tracks and an alternative off-line cycle route passing to the east of Shankill Village. There is insufficient space to povide online cycle facilities between Crinken Lane and Shankill Village and cyclists would either travel in the bus lanes or utilise the alternative route. Upgrades to existing footpaths and pedestrian crossings would also be provided. The section along the new road paralel to the M11 is not on the GDA CNP and no cycle facilities would be provided.

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2				
	Assessment Criteria	Sub-Criteria	SCHEME 2A	SCHEME 2B	SCHEME 2C	SCHEME 2D	SCHEME 2E
		Rank					
3	Accessibility and Social Inclusion	High volume trip attractors	Offers access to a number of high volume trips attractors and residential centres as outlined below. -Cherrywood Business Park -St. Columcille's Hospital -4 Primary Schools (930 students) -2 Secondary Schools (655 students)	Offers access to a number of high volume trips attractors and residential centres as outlined below. -Cherrywood Business Park -St. Columcille's Hospital -Shankill Village -5 Primary Schools (1259 students) -2 Secondary Schools (655 students)	Offers access to a number of high volume trips attractors and residential centres as outlined below. -Cherrywood Business Park -St. Columcille's Hospital -4 Primary Schools (930 students) -2 Secondary Schools (655 students)	Offers access to a number of high volume trips attractors and residential centres as outlined below. -Cherrywood Business Park -St. Columcille's Hospital -Shankill Village -5 Primary Schools (1259 students) -2 Secondary Schools (655 students)	Offers access to a number of high volume trips attractors and residential centres as outlined below. -Cherrywood Business Park -St. Columcille's Hospital -Shankill Village -5 Primary Schools (1259 students) -2 Secondary Schools (655 students)
		Rank					
		Deprived Geographic Areas	Serves the northern section of the Loughlinstown and Shanganagh/Rathsallagh RAPID area but not the southern section.	Serves the northern and southern sections of the Loughlinstown and Shanganagh/Rathsallagh RAPID area.	Serves the northern section of the Loughlinstown and Shanganagh/Rathsallagh RAPID area but not the southern section.	Serves the northern and southern sections of the Loughlinstown and Shanganagh/Rathsallagh RAPID area.	Serves the northern and southern sections of the Loughlinstown and Shanganagh/Rathsallagh RAPID area.
		Rank					
4	Safety	Road Safety	The route interfaces with 5 no. junctions. Upgrade and signalisation of the Loughlinstown, Wilford and Quins Road junctions would result in road safety improvements. The route option would result in a reduction in buses passing through Shankill Village. The integration of the bus-only route at the Wilford junction will likely be complex with potential traffic safety risks. With the exception of the sections running on existing roads this route does not provide for segregated cycle facilities. Pedestrian access at bus stops is likley to be provided through a combination of both controlled and uncontrolled crossings.	The route interfaces with 6 no. junctions (and a likely further 2 additional junctions associated with the proposed Shanganagh Castle and Woodbrook developments). Upgrade and signalisation of the Loughlinstown, St. Annes, Wilford and Quins Road junctions would result in road safety improvements. 'A combination of segregated cycle facilities and an alternative off-line cycle route passing to the east of Shankill Village will improve safety for cyclists. No cycle facilities will be provided through Shankill Village, however there are a number of locations where the village can be accessed from the alternative cycle route. The alternative route will have minimal benefits to the west of the village, however it will increase permeability between the residential areas to the south and the schools to the north. Segregated cycle facilities would improve safety for cyclists however widening of the road to the north and south of Shankill to provide bus lanes will likely result in increased vehicle speeds. Provision of bus lanes in Shankill Village will result in an increase in the number of traffic lanes at pedestrian crossing. Upgrades to existing footpaths and pedestrian crossings would also be provided.	The route interfaces with 6 no. junctions (and a likely further 2 additional junctions associated with the proposed Shanganagh Castle and Woodbrook developments). Upgrade and signalisation of the Loughlinstown, and Wilford junctions would result in road safety improvements. The route option would result in a reduction in buses passing through Shankill Village. The integration of the bus-only route at the Wilford junction will likely be complex with potential traffic safety risks. Segregated cycle facilities between Wilford and Crinken Lane would improve safety for cyclists however widening of the road along this to provide bus lanes will likely result in increased vehicle speeds. The provison of a dedicated bus route to the west of Shankill would mean no segregated cycle facilities between Crinken lane and south of Loughlinstown roundabout and existing advisory lanes would be retained.	The route interfaces with 6 no. junctions (and a likely further 2 additional junctions associated with the proposed Shanganagh Castle and Woodbrook developments). Upgrade and signalisation of the Loughlinstown, St. Annes, Wilford and Quins Road junctions would result in road safety improvements. Segregated cycle facilities would improve safety for cyclists however widening of the road to the north and south of Shankill to provide bus lanes will likely result in increased vehicle speeds. No cycle facilities will be provided through Shankill Village, however provision of a bus gate will reduce through traffic and improve safety for pedestrians and cyclists.	The route interfaces with 6 no. junctions. Upgrade and signalisation of the Loughlinstown, St. Annes, Wilford and Quins Road junctions would result in road safety improvements. 'A combination of segregated cycle facilities and an alternative off-line cycle route passing to the east of Shankill Village will improve safety for cyclists. No cycle facilities will be provided through Shankill Village, however there are a number of locations where the village can be accessed from the alternative cycle route. The alternative route will have minimal benefits to the west of the village, however it will increase permeability between the residential areas to the south and the schools to the north. Segregated cycle facilities would improve safety for cyclists. Provision of bus lanes in Shankill Village will result in an increase in the number of traffic lanes at pedestrian crossing. Upgrades to existing footpaths and pedestrian crossings would also be provided. The route option would result in a reduction in buses along the Dublin Road south of Shankill Village, Pedestrian access at bus stops is likley to be provided through a combination of both controlled and uncontrolled crossings.
		Rank					
		Archaeological, Architectural and Cultural Heritage	RMP/SMR sites The site of a cemetery cairn is known as Toole's Moat (DU026-067) is located in Old Connaught townland; disturbance of the site in the 1890s produced at least five inhumation burials, possibly within cists, and with a range of pottery, stone artefacts, and animal bones . The site was levelled in the 1960s to make way for playing fields at the new St Brendan's School. More recently, an area adjacent to the monument was excavated in advance of construction on the Shankill and Bray by-pass (the present M11) in 1989, revealing part of a ditch and some post-medieval material (Keeley 1989, 20). Stray finds The National Museum was also presented with a quantity of animal and human bones, possibly from O'Tooles Moat in Old Connaght (DU026-067) 'NIAH/ Protected Structures N/a Summary Constraints Earthmoving works may identify further features associated with DU026-067 if the corridor runs outside the wayleave of the original N11 Corridor.	'RMP/SMR sites Existing road adjacent to the site of an early 'Kiltuck Church' , Building, Cross , graveyard DU026-054001 Stray finds N/a 'NIAH/ Protected Structures Protected structures on the route/ in landtake: None Protected Structures immediately adjacent: RPS 1873 Wilford House 'Wilford House (RPS 1873), 'Woodbrook Front Lodge (RPS 1871 including gates railings and Side lodge), the Aske Lodge and Main house (RPS 1866), Beauchamp House (RPS 1862) ; Saint James's Church (Original Building) (Note: Railings and Gates also Protected Structures) (RPS 1543); Shanganagh Marble and Stone Centre (Note: Railings and Gates and Granite Milestone also Protected Structures)(RPS 1858); Shanganagh Castle House, Castle and Gate Lodge (RPS 1845);Crinken Cottage (former Gate Lodge to Shanganagh Castle)(RPS 1850); Plaque (Opposite Shankill Post Office)(RPS 1838); Saint Anne's Church (RPS 1805); Saint Anne's (RPS 1800); Saint Rita's (RPS 1521) Summary Constraints 'There is a potential for features associated with the site of Kiltuck Church might extend into the road, however the existing road has been disturbed and extended and the potential is deemed to be low.	'RMP/SMR sites N/a Stray finds N/a 'NIAH/ Protected Structures 'Protected structures on the route/ in landtake: None Protected Structures immediately adjacent: RPS 1873 Wilford House 'Wilford House (RPS 1873), 'Woodbrook Front Lodge (RPS 1871 including gates railings and Side lodge), the Aske Lodge and Main house (RPS 1866), Beauchamp House (RPS 1862) ; Saint James's Church (Original Building) (Note: Railings and Gates also Protected Structures) (RPS 1543); Shanganagh Marble and Stone Centre (Note: Railings and Gates and Granite Milestone also Protected Structures)(RPS 1858); Shanganagh Castle House, Castle and Gate Lodge (RPS 1845); Summary Constraints A number Protected Structures are located adjacent to the road in a number of incidents their protection includes their entrance gates and railings .	RMP/SMR sites Archaeological sites on the Bus route/ in landtake: 'Existing road adjacent to the site of an early 'Kiltuck Church' , Building, Cross , graveyard DU026-054001 'Along the alternative route for Cars: The site of a cemetery cairn is known as Toole's Moat (DU026-067) is located in Old Connaught townland; disturbance of the site in the 1890s produced at least five inhumation burials, possibly within cists, and with a range of pottery, stone artefacts, and animal bones . The site was levelled in the 1960s to make way for playing fields at the new St Brendan's School. More recently, an area adjacent to the monument was excavated in advance of construction on the Shankill and Bray by-pass (the present M11) in 1989, revealing part of a ditch and some post-medieval material (Keeley 1989, 20). Stray finds: Along the alternative route for Cars: The National Museum was also presented with a quantity of animal and human bones, possibly from O'Tooles Moat in Old Connaght (DU026-067) 'NIAH/ Protected Structures Protected Structures immediately adjacent: RPS 1873 Wilford House 'Wilford House (RPS 1873), 'Woodbrook Front Lodge (RPS 1871 including gates railings and Side lodge), the Aske Lodge and Main house (RPS 1866), Beauchamp House (RPS 1862) ; Saint James's Church (Original Building) (Note: Railings and Gates also Protected Structures) (RPS 1543); Shanganagh Marble and Stone Centre (Note: Railings and Gates and Granite Milestone also Protected Structures)(RPS 1858); Shanganagh Castle House, Castle and Gate Lodge (RPS 1845); Summary Constraints 'Along the alternative route for Cars: :'Earthmoving works may identify further features associated with DU026-067 if the corridor runs outside the wayleave of the original N11 Corridor. ' Archaeological sites on the Bus route: 'There is a potential for features associated with the site of Kiltuck Church might extend into the road, however the existing road has been disturbed and extended and the potential is deemed to be low.	'RMP/SMR sites Existing road adjacent to the site of an early 'Kiltuck Church' , Building, Cross , graveyard DU026-054001 The site of a cemetery cairn is known as Toole's Moat (DU026-067) is located in Old Connaught townland; disturbance of the site in the 1890s produced at least five inhumation burials, possibly within cists, and with a range of pottery, stone artefacts, and animal bones . The site was levelled in the 1960s to make way for playing fields at the new St Brendan's School. More recently, an area adjacent to the monument was excavated in advance of construction on the Shankill and Bray by-pass (the present M11) in 1989, revealing part of a ditch and some post-medieval material (Keeley 1989, 20). Stray finds The National Museum was also presented with a quantity of animal and human bones, possibly from O'Tooles Moat in Old Connaght (DU026-067) 'NIAH/ Protected Structures Protected structures on the route/ in landtake: None Protected Structures immediately adjacent: RPS 1873 Wilford House 'Wilford House (RPS 1873), 'Woodbrook Front Lodge (RPS 1871 including gates railings and Side lodge), the Aske Lodge and Main house (RPS 1866), Beauchamp House (RPS 1862) ; Saint James's Church (Original Building) (Note: Railings and Gates also Protected Structures) (RPS 1543); Shanganagh Marble and Stone Centre (Note: Railings and Gates and Granite Milestone also Protected Structures)(RPS 1858); Shanganagh Castle House, Castle and Gate Lodge (RPS 1845);Crinken Cottage (former Gate Lodge to Shanganagh Castle)(RPS 1850); Plaque (Opposite Shankill Post Office)(RPS 1838); Saint Anne's Church (RPS 1805); Saint Anne's (RPS 1800); Saint Rita's (RPS 1521) Summary Constraints 'There is a potential for features associated with the site of Kiltuck Church might extend into the road, however the existing road has been disturbed and extended and the potential is deemed to be low. Earthmoving works may identify further features associated with DU026-067 if the corridor runs outside the wayleave of the original N11 Corridor.
		Archaeological, Architectural and Cultural Heritage					
		Rank					

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2				
	Assessment Criteria	Sub-Criteria	SCHEME 2A	SCHEME 2B	SCHEME 2C	SCHEME 2D	SCHEME 2E
5	Environment	Flora and Fauna	No demolitions are proposed for this option. 'This option will result in the loss of existing immature woodland, treelines and amenity grassland verge along the M11. These trees have the potential to host nesting birds within the bird breeding season although based on their age and size, it is considered unlikely that any would support roosting bats. The loss of immature woodland is considered to be less significant when compared to the loss of a large number of mature trees along the Dublin Road. There is unlikely to be any significant impact on any sites of international conservation value. Although the route option passes through the Loughlinstown Wood pNHA, the area affected is taken up by existing N11 roadway. There will be no road widening in this section and therefore no significant ecological impact on the pNHA.	No demolitions are proposed for this option. There is unlikely to be any significant impact on any sites of international conservation value. Although the route option passes through the Loughlinstown Wood pNHA, the area affected is taken up by existing N11 roadway. There will be no road widening in this section and therefore no significant ecological impact on the pNHA. This option will result in the loss of existing tree lines, field boundaries, hedge rows, as well as public green areas along Dublin road (R119) through Woodbrook. A large number of mature trees will need to be removed on the section between Shankill Village and Wilford Roundabout along the Dublin Rd. These trees have the potential to host nesting birds within the bird breeding season and roosting bats. Many of these trees are included within the Dun Laoghaire Rathdown County Development Plan 2016-2022 under the objective 'to protect and preserve trees and woodlands'.	'No demolitions are proposed for this option. 'This option will result in the loss of existing immature woodland, treelines and amenity grassland verge along the M11. These trees have the potential to host nesting birds within the bird breeding season although based on their age and size, it is considered unlikely that any would support roosting bats. This option will result in the loss of existing tree lines, field boundaries, hedge rows, as well as public green areas along Dublin road (R119) through Woodbrook. A large number of mature trees will need to be removed on the section between Shankill Village and Wilford Roundabout along the Dublin Rd. These trees have the potential to host nesting birds within the bird breeding season and roosting bats. Many of these trees are included within the Dun Laoghaire Rathdown County Development Plan 2016-2022 under the objective 'to protect and preserve trees and woodlands'. There is unlikely to be any significant impact on any sites of international conservation value. Although the route option passes through the Loughlinstown Wood pNHA, the area affected is taken up by existing N11 roadway. There will be no road widening in this section and therefore no significant ecological impact on the pNHA.	No demolitions are proposed for this option. There is unlikely to be any significant impact on any sites of international conservation value. Although the route option passes through the Loughlinstown Wood pNHA, the area affected is taken up by existing N11 roadway. There will be no road widening in this section and therefore no significant ecological impact on the pNHA. This option will result in the loss of existing tree lines, field boundaries, hedge rows, as well as public green areas along Dublin road (R119) through Woodbrook. A large number of mature trees will need to be removed on the section between Shankill Village and Wilford Roundabout along the Dublin Rd. These trees have the potential to host nesting birds within the bird breeding season and roosting bats. Many of these trees are included within the Dun Laoghaire Rathdown County Development Plan 2016-2022 under the objective 'to protect and preserve trees and woodlands'.	No demolitions are proposed for this option. 'This option will result in the loss of existing immature woodland, treelines and amenity grassland verge along the M11. These trees have the potential to host nesting birds within the bird breeding season although based on their age and size, it is considered unlikely that any would support roosting bats. The loss of immature woodland is considered to be less significant when compared to the loss of a large number of mature trees along the Dublin Road. There is unlikely to be any significant impact on any sites of international conservation value. Although the route option passes through the Loughlinstown Wood pNHA, the area affected is taken up by existing N11 roadway. There will be no road widening in this section and therefore no significant ecological impact on the pNHA.
		Rank					
		Soils and Geology	Requires a new road to be constructed along all of the route involving significant earthworks	Include works adjacent to a petrol station and land take to widen the existing roads although there will be no new road required for this route	Requires a new road to be constructed along the northern half of the route involving significant earthworks	Includes works adjacent to a petrol station and requires the construction of a new road in the northern half of the route (to the west) and road widening along the entire eastern side of the route	Requires a new road to be constructed along the southern half of the route involving significant earthworks. Includes works adjacent to a petrol station which may encounter contaiminated soils
		Rank					
		Hydrology	Loughlinstown River passes under the existing N11 however it can be assumed that existing cross section of road will remain the same. Crinken stream crosses under the R119 (Dublin road) in Woodbrook	Loughlinstown River passes under the existing N11 however it can be assumed that existing cross section of road will remain the same. Crinken stream crosses under the R119 (Dublin road) in Woodbrook	Loughlinstown River passes under the existing N11 however it can be assumed that existing cross section of road will remain the same. Crinken stream crosses under the R119 (Dublin road) in Woodbrook	Loughlinstown River passes under the existing N11 however it can be assumed that existing cross section of road will remain the same. Crinken stream crosses under the R119 (Dublin road) in Woodbrook	Loughlinstown River passes under the existing N11 however it can be assumed that existing cross section of road will remain the same. Crinken stream crosses under the R119 (Dublin road) in Woodbrook
		Rank					
		Landscape and visual	Protected Views & Prospects: Little or No Impact Recreation Access Routes / Designated Walk Ways: Little or No Impact Tree Protection / Preservation: Potential Low-Medium Impact, Impact on mature woodland screen planting along M11, and localised impact on tree protection/preservation objectives. Landscape Impact on Protected Structures: Little or No Impact Landscape Impact Record of Monuments and Places: Little or No Impact Landscape Impact Architectural Conservation: Little or No Impact Visual Impact on properties: Potential Low Impact, Impacts primarily at Mountain View where new carriageway alongside the M11 will encroach on the residential area. Impact on Landscape / Townscape Character Potential Low-Medium Impact, Impacts primarily at Mountain View where new carriageway will impact the landscape character alongside the M11.	Protected Views & Prospects: Little or No Impact Recreation Access Routes / Designated Walk Ways: Little or No Impact Tree Protection / Preservation: Potential High-Major Impact Significant impact on a number of tree protection/preservation objectives throughout. Landscape Impact on Protected Structures: Potential High Impact Significant impact on the curtilage of a number of Protected Structures throughout Landscape Impact Record of Monuments and Places: Little or No Impact Landscape Impact Architectural Conservation: Little or No Impact Visual Impact on properties: Potential High-Major Impact Significant land-take to either side of road both south and north of Shankill Village. Works proposed to carriageway/footpaths within village but with limited land-take required. Land-take will result in significant loss of boundary stone walls, existing mature trees and impact on garden properties both north and south of Shankill Village. Impact on residential properties providing an off-line shared footpath/cycle lane from end of Mountain View cul-de-sac through to end of Stonebridge Court Impact on Landscape / Townscape Character Potential High-Major Impact Significant land-take will have a dramatic effect on the existing character of the road corridor south and north of Shankill Village. Changes to the road will have a medium impact on Shankill Village. Impact on mature trees / tree-lines along old railway line to provide off-line shared footpath/cycle access from roundabout at St. Anne's Church to Lower Road	Protected Views & Prospects: Little or No Impact Recreation Access Routes / Designated Walk Ways: Little or No Impact Tree Protection / Preservation: Potential High Impact Significant impact on a number of tree protection/preservation south of Crinken Lane, and impact on mature woodland screen planting along M11. Landscape Impact on Protected Structures: Little or No Impact, Note route requires modification of boundary to Woodbrook Lodge. Landscape Impact Record of Monuments and Places: Little or No Impact Landscape Impact Architectural Conservation: Little or No Impact Visual Impact on properties: Potential High Impact Significant land-take to either side of road south of Crinken Lane. Land-take will result in significant loss of boundary stone walls, existing mature trees and impact on garden properties south of Crinken Lane. Impact on Landscape / Townscape Character Potential High Impact Significant land-take will have a dramatic effect on the existing character of the road corridor south of Crinken Lane and along Crinken Lane.	Protected Views & Prospects: Little or No Impact Recreation Access Routes / Designated Walk Ways: Little or No Impact Tree Protection / Preservation: Significant impact on a number of tree protection/preservation objectives throughout, and impact on mature woodland screen planting along M11. Landscape Impact on Protected Structures: Potential High Impact Significant impact on the curtilage of a number of Protected Structures throughout Landscape Impact Record of Monuments and Places: Little or No Impact Landscape Impact Architectural Conservation: Little or No Impact Visual Impact on properties: Potential Major Impact Significant land-take to either side of road both south and north of Shankill Village. Works proposed to carriageway/footpaths within village but with limited land-take required. Land-take will result in significant loss of boundary stone walls, existing mature trees and impact on garden properties both north and south of Shankill Village. Impact on residential properties providing an off-line shared footpath/cycle lane from end of Mountain View cul-de-sac through to end of Stonebridge Court. Impacts on properties at Mountain View where new carriageway alongside the M11 will encroach on the residential area. Impact on Landscape / Townscape Character Potential Major Impact Significant land-take will have a dramatic effect on the existing character of the road corridor south and north of Shankill Village. Changes to the road will have a medium impact on Shankill Village. Impacts at Mountain View where new carriageway will impact the landscape character alongside the M11. Impact on mature trees / tree-lines along old railway line to provide off-line shared footpath/cycle access from roundabout at St. Anne's Church to Lower Road.	Protected Views & Prospects: Little or No Impact Recreation Access Routes / Designated Walk Ways: Little or No Impact Tree Protection / Preservation: Potential Low-Medium Impact, Impact on mature woodland screen planting along M11, and localised impact on tree protection/preservation objectives. Landscape Impact on Protected Structures: Potential High Impact Significant impact on the curtilage of a number of Protected Structures throughout Landscape Impact Record of Monuments and Places: Little or No Impact Landscape Impact Architectural Conservation: Little or No Impact Visual Impact on properties: Potential High-Major Impact Significant land-take to either side of road both south and north of Shankill Village. Works proposed to carriageway/footpaths within village but with limited land-take required. Land-take will result in significant loss of boundary stone walls, existing mature trees and impact on garden properties both north and south of Shankill Village. Impact on residential properties providing an off-line shared footpath/cycle lane from end of Mountain View cul-de-sac through to end of Stonebridge Court Impact on Landscape / Townscape Character Potential High-Major Impact Significant land-take will have a dramatic effect on the existing character of the road corridor south and north of Shankill Village. Changes to the road will have a medium impact on Shankill Village. Impact on mature trees / tree-lines along old railway line to provide off-line shared footpath/cycle access from roundabout at St. Anne's Church to Lower Road
		Rank					
		Noise, Vibration and Air	There will be sections of the scheme (to the west of Shankill primarily) where the proposed scheme will result the bus only route being located close to sensitive receptors. Where this is the case there is likely to be an increase in noise, vibration and air pollutants. Increases will be relative to the existing M11 running adjacent and it is likley that landscaping and screening can be incorporated into design to minimise these effects. There will be a reduction in the number of buses using the Dublin Road and this will reduce the levels of noise, vibration and air pollution experienced by a comparatively larger number of sensitive receptors	There will be sections of the scheme (through Shankill primarily) where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise, vibration and air pollutants	There will be sections of the scheme (to the west of Shankill primarily) where the proposed scheme will result the bus only route being located close to sensitive receptors. Where this is the case there is likely to be an increase in noise, vibration and air pollutants. Increases will be relative to the existing M11 running adjacent and it is likley that landscaping and screening can be incorporated into design to minimise these effects. There will be a reduction in the number of buses using the Dublin Road and this will reduce the levels of noise, vibration and air pollution experienced by a comparatively larger number of sensitive receptors	There will be sections of the scheme (to the west of Shankill primarily) where the proposed scheme will result the traffic route being located close to sensitive receptors. Where this is the case there is likely to be an increase in noise, vibration and air pollutants. Increases will be relative to the existing M11 running adjacent and it is likley that landscaping and screening can be incorporated into design to minimise these effects. There will be a reduction in traffic using the Dublin Road and this will reduce the levels of noise, vibration and air pollution experienced by a comparatively larger number of sensitive receptors	There will be sections of the scheme (through Shankill primarily) where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise, vibration and air pollutants
		Rank					

Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2				
Assessment Criteria	**Sub-Criteria**	**SCHEME 2A**	**SCHEME 2B**	**SCHEME 2C**	**SCHEME 2D**	**SCHEME 2E**
	Land Use and the Built Environment	Amenity, Open Space, Recreational / Sports Land-use Potential Low Impact, Encroachment on open space at Mountain View and rear of Assumpta Park. Land take is from comparatively low amenity lands when compared to other schemes. No parking will be removed from Shankill Village	Amenity, Open Space, Recreational / Sports Land-use Potential Medium-High Impact Significant land-take from High Amenity Landscape at Woodbrook House and west of Dublin Road north to Kilturk Park/St. Joseph's. Impact on Playground / open space at Shanganagh Park. Impact on open space at Beech Road, Castle Farm, Cherrington Drive, etc. There will be a reduction in the number of parking spaces available in Shankill Village	Amenity, Open Space, Recreational / Sports Land-use Potential Medium-High Impact Significant land-take from High Amenity Landscape at Woodbrook House and west of Dublin Road north to Kilturk Park/St. Joseph's. Impact on Playground / open space at Shanganagh Park. Impact on open space at Mountain View, rear of Assumpta Park, etc.	Amenity, Open Space, Recreational / Sports Land-use Potential High Impact Significant land-take from High Amenity Landscape at Woodbrook House and west of Dublin Road north to Kilturk Park/St. Joseph's. Impact on Playground / open space at Shanganagh Park. Impact on open space at Beech Road, Castle Farm, Cherrington Drive, etc. and encroachment on open space at Mountain View and rear of Assumpta Park.	Amenity, Open Space, Recreational / Sports Land-use Potential High Impact Significant land-take from High Amenity Landscape at Woodbrook House and west of Dublin Road north to Kilturk Park/St. Joseph's. Impact on Playground / open space at Shanganagh Park. Impact on open space at Beech Road, Castle Farm, Cherrington Drive, etc. and encroachment on open space at Mountain View and rear of Assumpta Park. There will be a reduction in the number of parking spaces available in Shankill Village
	Rank					

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 3			
	Assessment Criteria	Sub-Criteria	SCHEME 3A	SCHEME 3B	SCHEME 3C	SCHEME 3D
1	Economy	Capital Cost	**Total - €33.3 million** **Cost per KM - €2.8 million** Indicative Scheme Infrastructure Works Cost - €26.1 million Private Land Costs - €7.1 million Dedicated bus lanes and segregated cycle facilities will be provided for the full length of the scheme. Upgrade of North and South Avenue will require removal of portions of public green space and front gardens Upgrades to a total of 19 junctions would be required as part of the scheme (9 minor, 8 moderate and 2 major junction upgrades). 5113 sqm private lands affected, 0 houses to be removed 135 private landowners affected	**Total - €11.8 million** **Cost per KM - €1.2 million** Indicative Scheme Infrastructure Works Cost - €10 million Private Land Costs - €1.8 million Dedicated bus lanes will be provided for the full length of the scheme, this scheme will benefit from current provision of bus lanes along the majority of the scheme. 12 minor and 2 moderate junction upgrades will be part of the scheme 1236 sqm of private lands affected 29 private landowners affected	**Total - €40.8 million** **Cost per KM - €4.1 million** Indicative Scheme Infrastructure Works Cost - €18.9 million Private Land Costs - €21.9 million Dedicated bus lanes will be provided for the full length of the scheme except for a short section through Baker's Corner. Upgrade of Fleurville Road and Benamore Road will require the removal of 4 properties Upgrades of Stillorgan Park will require extensive removal of public green space 10 minor, 7 moderate and 1 major junction upgrades will be part of the scheme 13,266 sqm private lands affected, 4 propertiess to be removed 169 private landowners affected	**Total - €51.5 million** **Cost per KM - €4.7 million** Indicative Scheme Infrastructure Works Cost - €29.1 million Private Land Costs - €22.4 million Dedicated bus lanes will be provided for the full length of the scheme except for a short section through Baker's Corner. Upgrade of Fleurville Road and Benamore Road will require the removal of 4 properties Upgrades of Stillorgan Park will require extensive removal of public green space 10 minor, 7 moderate and 1 major junction upgrades will be part of the scheme 13,627 sqm private lands affected, 4 propertiess to be removed 188 private landowners affected
		Rank				
		Journey-time reliability and quality of service	The scheme has a total length of 11.86 km and from initial journey time calculations, would take an average of 32-33 mins 100% dedicated bus lane provided both inbound and outbound.	The scheme has a total length of 9.2 km and from initial journey time calculations, would take an average of 22-24 mins 100% dedicated bus lane provided both inbound and outbound.	The scheme has a total length of 10 km and from initial journey time calculations, would take an average of 26-27 mins 97% dedicated bus lanes provided inbound and outbound	The scheme has a total length of 11 km and from initial journey time calculations, would take an average of 27-28 mins 97% dedicated bus lanes provided inbound and outbound
		Rank				
		Land Use Integration	Offers the potential to link a number of large residential areas with key trip attractors such as Sandyford Industrial Estate (largest employment destination in the study area), UCD and the Cherrywood SDZ.	Serves a largely residential corridor providing links with a number of key destinations such as Stillorgan Shopping Centre, which has planning permission for redevelopment, a number of smaller employment centres and the Cherrywood SDZ.	Serves a largely residential corridor providing links to destinations such as the Stillorgan Shopping Centre, which has planning permission for redevelopment, and the Cherrywood SDZ as well as zoned employment lands along Pottery Rd.	The vast majority of the scheme is zoned as residential though it will serve the Stillorgan Shopping Centre, which has planning permission for redevelopment and will partially serve Cherrywood SDZ.
		Rank				
		Residential Catchment				
		400m (5 mins)	10067	9090	10267	12234
		800m (10 mins)	27234	25052	28146	34481
		1200m (15 mins)	53197	48493	55589	61885
		Employment Catchment				
		400m (5 mins)	7455	4040	3730	3254
		800m (10 mins)	17415	8868	9007	8477

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 3			
	Assessment Criteria	Sub-Criteria	SCHEME 3A	SCHEME 3B	SCHEME 3C	SCHEME 3D
2	Integration	1200m (15 mins)	29432	15905	18166	17411
		Total residential and employment (10 mins)	**44649**	**33920**	**37153**	**42958**
		Total residential and employment (10 mins) per km	3987	3727	3753	4053
		Rank				
		Transport Network Integration	Sections along the N11 will link well with Dublin Bus services and this scheme also links directly with the Green Luas line at Sandyford and Stillorgan stops.	This scheme is an existing strongly performing bus corridor and would integrate well with other Bus routes using the N11	Sections along the N11 will link well with Dublin Bus services. Sections diverging from the N11 (Stillorgan Park, Pottery Road, etc.) have some bus connectivity but less than the adjacent N11	Sections along the N11 will link well with Dublin Bus services. Sections diverging from the N11 (Stillorgan Park, Rochestown Avenue, etc.) have some bus connectivity but less than the adjacent N11
		Rank				
		Cyclists and pedestrian Integration	This scheme follows a combination of primary, secondary and feeder GDANCP routes. The portions on the primary routes 12 & 12A (N11) have existing good quality cycle facilities and these would be improved. Improvements to junction layouts or signalling would also benefit cyclists and pedestrians. The sections on secondary routes (St Raphael's Rd, Blackthorn Ave & Leopardstown Road) have a combination of on and off road cycle lanes while the feeder routes (North and South Avenue) have no cycle lanes at present. Provision of a CBC provides an opportunity to improve these facilities.	This scheme directly follows the existing GDACNP primary routes 12 & 12A and intersects with 1 other primary route and 9 secondary routes. Existing good quality cycle facilities are provided for the length of the scheme and these would be improved. Any improvements to junction layouts or signalling would also benefit cyclists and pedestrians.	This scheme follows a combination of primary and secondary GDANCP routes. The sections on the N11 (primary route) have existing good quality cycle facilities for the length of the route and these would be improved. Any improvements to junction layouts or signalling would also benefit cyclists and pedestrians. The sections on primary route S05 (Fleurville Road to Brookfield Park) have good cycle facilities and these would be improved. Improvements to the roundabout at Abbey Road and Monkstown Ave junction would increase safety for pedestrians and cyclists. Abbey Road is designated as a secondary cycle route but currently has no cycle facilities. Construction of a CBC on this route would allow the improvement of the cycle facilities. Pottery Road (secondary route) has recently been upgraded and has excellent cycle and pedestrian facilities.	This scheme follows a combination of primary and secondary GDANCP routes. The sections on the N11 (primary route) have existing good quality cycle facilities for the length of the route and these would be improved. Any improvements to junction layouts or signalling would also benefit cyclists and pedestrians. The sections on primary route S05 (Fleurville Road to Brookfield Park) have good cycle facilities and these would be improved. Improvements to the roundabout at Abbey Road and Monkstown Ave junction would increase safety for pedestrians and cyclists. Abbey Road and Rochestown Ave are designated as a secondary cycle route but currently have no cycle facilities. Construction of a CBC on this route would allow the improvement of the cycle facilities. Church Road and Wyattville Road are designated as secondary routes and have some sections of cycle facilities which will also be improved.
		Rank				

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 3			
	Assessment Criteria	Sub-Criteria	SCHEME 3A	SCHEME 3B	SCHEME 3C	SCHEME 3D
3	Accessibility and Social Inclusion	High volume trip attractors	Strong mix of high volume trip attractors including employment, recreational and educational along the scheme as outlined below: -UCD -Sandyford Industrial Estate -Leopardstown Hospital -Leopardstown Racecourse -Cornelscourt Shopping Centre -Cherrywood Business Park - 13 Primary Schools (5265 students) -10 Secondary Schools (5024 students)	Serves a number of high volume of employment, recreational and educational trip attractors as outlined below: -UCD -Stillorgan Shopping Centre -St. John of God Hospital -Cornelscourt Shopping Centre -Cherrywood Business Park - 14 Primary Schools (4738 students) -10 Secondary Schools (5253 students)	Serves a number of high volume of employment, recreational and educational trip attractors as outlined below: -UCD -Stillorgan Shopping Centre -Dun Laoghaire Institute of Design -Cherrywood Business Park - Dun Laoghaire Industrial Estate/Amgen Pharmaceuticals - 13 Primary Schools (3299 students) -10 Secondary Schools (5201 students)	Offers a link to a number of high volume of recreational and educational trip attractors, though less high density employment centres, as outlined below: -UCD -Stillorgan Shopping Centre -Dun Laoghaire Institute of Design - Loughlinstown FAS Training Centre -Cherrywood Business Park - 19 Primary Schools (4748 students) -11 Secondary Schools (5351 students)
		Rank				
		Deprived Geographic Areas	Equal Across All Options. Each option has a bus stop within a ten minute walk of the northern section of the Loughlinstown & Shanganagh/Rathsallagh RAPID Area	Equal Across All Options. Each option has a bus stop within a ten minute walk of the northern section of the Loughlinstown & Shanganagh/Rathsallagh RAPID Area	Equal Across All Options. Each option has a bus stop within a ten minute walk of the northern section of the Loughlinstown & Shanganagh/Rathsallagh RAPID Area	Equal Across All Options. Each option has a bus stop within a ten minute walk of the northern section of the Loughlinstown & Shanganagh/Rathsallagh RAPID Area
		Rank				
4	Safety	Road Safety	The route interfaces with 16 no. outbound and 17 no. inbound junctions, including 3 no. minor junctions. 7 turn movements required in outbound direction (3 right turns and 4 left turns) and 8 turn movements (4 right turns and 4 left turns) required in inbound direction	The route interfaces with 15 no. straight through Junctions with no turns required for buses.	The route interfaces with 16 no. junctions. 4 turn movements required in each direction (2 right turns and 2 left turns in outbound direction and 2 right turns and 2 left turns inbound)	No. of Junctions: 21 No. of minor Junctions: 3 3 turn movements required in each direction (0 right turns and 3 left turns in outbound direction and 3 right turns and 0 left turns inbound)
		Rank				
		Archaeological, Architectural and Cultural Heritage	**Potential Impact on Areas of Archaeological Interest**: A segment of a large Early Medieval enclosed cemetery was excavated at Mount Offaly a significant proportion of which remains largely undisturbed beneath the surrounding properties north, south and west.There is a potential that features associated with the site might extend beneath the N11 (northbound), however historically there was a watermain laid here, the road has been extended and there are likely to be modern services beneath all of which may have removed evidence for the early church site.	**Potential Impact on Areas of Archaeological Interest:** A segment of a large Early Medieval enclosed cemetery was excavated at Mount Offaly a significant proportion of which remains largely undisturbed beneath the surrounding properties north, south and west.There is a potential that features associated with the site might extend beneath the N11 (northbound), however historically there was a watermain laid here, the road has been extended and there are likely to be modern services beneath all of which may have removed evidence for the early church site. In addition to the Mount Offaly site (Woodlands and St Brigid's), there are two other roadside ecclesiastical enclosure sites, such enclosures can be extensive. At St Brigid's there is a slight curve in the road indicating that the road may 'have curved to avoid/respect a former enclosure. There is a potential that some remains associated	**Potential Impact on Areas of Archaeological Interest:** A segment of a large Early Medieval enclosed cemetery was excavated at Mount Offaly a significant proportion of which remains largely undisturbed beneath the surrounding properties north, south and west. There is a potential that features associated with the site might extend beneath the N11 (northbound), however historically there was a watermain laid here, the road has been extended and there are likely to be modern services beneath all of which may have removed evidence for the early church site. In addition to the Mount Offaly site (Woodlands and St Brigid's), there are two other roadside ecclesiastical enclosure sites, such enclosures can be extensive. In both cases, there is a slight curve in the road indicating that the road may have curved to avoid /respect a former enclosure. There is a potential that some remains associated	**Potential Impact on Areas of Archaeological Interest:** None **Architectural Heritage:** With regard to the protected structures along the route the CBC works are unlikely to extend beyond the existing roadand given that the structures have clearly defined boundaries they are unlikely to be impacted as they can easily be avoided.

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 3			
	Assessment Criteria	Sub-Criteria	SCHEME 3A	SCHEME 3B	SCHEME 3C	SCHEME 3D
			Architectural Heritage: With regard to the protected structures along the route the CBC works are unlikely to extend beyond the existing road, the structures have clearly defined boundaries that lie outside the landtake	with these sites may extend beneath the present road surface, albeit heavily truncated or indeed removed by subsequent road development. Architectural Heritage: With regard to the protected structures along the route the CBC works are unlikely to extend beyond the existing road, the structures have clearly defined boundaries that lie outside the landtake	with these sites may extend beneath the present road surface, albeit heavily truncated or indeed removed by subsequent road development. Architectural Heritage: With regard to the protected structures along the route the CBC works are unlikely to extend beyond the existing road, the structures have clearly defined boundaries that lie outside the landtake	
		Rank				
5	**Environment**	Flora and Fauna	Impacts to watercourses cannot be ruled out where construction results in increased sediments and pollutants entering the surface water network. As watercourses within this route are connected to Dublin Bay and its European Sites downstream, significant effects cannot be ruled out at this stage. There are no proposed building demolitions for this route option. Widening along North Avenue in Mount Merrion is likely to encroach into Deer Park resulting in loss of parkland. Off the main N11/Stillorgan Road, tree protection / preservation objectives are located at Torquay Road Junction; Stillorgan Wood; Kilmacud House; Deerpark (North Avenue); North Avenue (between Wilson Road & Greenfield Road); Foster's Avenue (UCD). These may be used by nesting birds within the bird breeding season. The loss of gardens along the Leopardstown Road and of public and private green space on South and North Avenues in Mount Merrion has the potential to impact breeding birds if vegetation clearance occurs within the bird breeding season	'Impacts to watercourses cannot be ruled out where construction results in increased sediments and pollutants entering the surface water network. As watercourses within this route are connected to Dublin Bay and its European Sites downstream, significant effects cannot be ruled out at this stage.' There are no proposed building demolitions for this route option. There is unlikely to be any significant impact on any sites of international or national conservation value This option runs along an existing established road corridor with limited widening required when compared to other schemes- therefore impact on ecology expected to be limited to where trees need to be removed to facilitate redirecting cycle lanes. Minimal ecological impact.	Impacts to watercourses cannot be ruled out where road widening crosses streams/rivers. As watercourses within this route are connected to Dublin Bay and its European Sites downstream, significant effects cannot be ruled out at this stage. There are four proposed building demolitions for this route option. All buildings have the potential to host roosting bats. There will be some loss of treelines along the main N11 where footpaths are constructed. Vegetation clearance could impact nesting birds if conducted during the bird breeding season. Off the main N11, ecological impacts are likely to be limited to vegetation clearance. In most cases, these are small trees or shrubs in front gardens facing existing roads. Some trees, notably those fronting lands at Johnstown House, Kilgobbet, are large and have potential to host roosting bats, as well as nesting birds.	Impacts to watercourses cannot be ruled out where road widening crosses streams/rivers. As watercourses within this route are connected to Dublin Bay and its European Sites downstream, significant effects cannot be ruled out at this stage. This option would result in the demolition of four properties. All of these buildings have the potential to host roosting bats. This option would result in significant loss of mature hedgerows and treelines along Church Road and Rochestown Avenue, which may be used by nesting birds within the bird breeding season. Land take from front gardens along Wyatville Road and Johnstown Avenue is likely to result in the loss of hedgerows/treelines and ornamental shrubs which may be used by nesting birds within the bird breeding season. Several large horse chestnut trees on Rochestown Avenue close to the junction with Pottery road are considered to have potential to host roosting bats based on their age and presence of roost features. Off the main N11/Stillorgan Road, tree protection / preservation objectives are located at The Lodge (to Johnstown House), Johnstown Road; Rochestown Avenue; and The Grange (Baker's Corner). These may be used by nesting birds within the bird breeding season.
		Rank				

Option Assessment Stage 2 (Multi Criteria Analysis)		Section 3			
Assessment Criteria	**Sub-Criteria**	**SCHEME 3A**	**SCHEME 3B**	**SCHEME 3C**	**SCHEME 3D**
	Soils and Geology	Requires land take and construction works in some areas - as such, has a slightly higher impact on soils and geology than Route 3B, but not significantly.	Minor construction works along the N11 - as such, minimal impact on soils and geology.	This route requires significant construction works and land-take. It also passes in the vicinity of a number of petrol stations and a site with historical industries. As such, it has some disadvantages over the other options.	This route requires significant construction works and land-take. It also passes in the vicinity of a number of petrol stations and sites with historical industries. As such, it has some disadvantages over the other options.
	Rank				
	Hydrology	This scheme option does not pass over or adjacent to any water bodies	This scheme option does not pass over or adjacent to any water bodies	This scheme option does not pass over or adjacent to any water bodies	This scheme option does not pass over or adjacent to any water bodies
	Rank				
	Landscape and visual	**Protected Views & Prospects :**Little or No Impact There is an objective to preserve views north from Deerpark (Mount Merrion) – no impact arises. **Tree Protection / Preservation:**Potential Low Impact: Tree protection / preservation objectives are located at Torquay Road Junction; Stillorgan Wood; Kilmacud House; Deerpark (North Avenue); North Avenue (between Wilson Road & Greenfield Road); Foster's Avenue (UCD); **Landscape Impact on Protected Structures:** Potential Low Impact There are few Protected Structures along route. No impact is anticipated **Visual Impact on properties:** Potential Medium-High Impact No impact envisaged along the main N11 /Stillorgan Road. Off the main N11/Stillorgan Road there is potential for medium to high visual impact along Leopardstown Road; St. Raphaela's Road; Kilmacud Road Upper; South Avenue; and North Avenue.	Makes use of the existing N11 corridor with no particular landscape or visual sensitivities. The majority of the proposed scheme will utilise the existing bus lanes/facilities	**Tree Protection / Preservation:**Potential Low Impact Tree protection /preservation objectives are located at Johnstown Road; and The Grange (Baker's Corner). **Landscape Impact on Protected Structures:** Potential Low Impact: There are few protected Structures along route. No impact anticipated **Visual Impact on properties:** Potential Medium Impact. No impact envisaged along the main N11/Stillorgan Road. Off the main N11/Stillorgan Road there is potential for medium visual impact along Johnstown Road; Pottery Road; Abbey Road; Brookville Park; Rowanbyrn; Anneville Terrace;	**Tree Protection /Preservation:**Potential Low Impact, Tree protection /preservation objectives are located at The Lodge (to Johnstown House), Johnstown Road; Rochestown Avenue; and The Grange (Baker's Corner). **Landscape Impact on Protected Structures:** Potential Low Impact: There are few Protected Structures along route. **Visual Impact on properties:** Potential Medium Impact No impact envisaged along the main N11/Stillorgan Road. Off the main N11/Stillorgan Road there is potential for medium visual impact along Johnstown Road; Rochestown Avenue Road; Abbey Road; Brookville Park; Rowanbyrn; Anneville Terrace; Fleurville; and Stillorgan Park.
	Rank				
	Noise, Vibration and Air	There are long sections of the proposed scheme (North Avenue through Mount Merrion) which will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise, vibration and air pollutants	The majority of the proposed scheme will utilise the existing bus facilities and consequently there is likely to be no change in noise, vibration and air pollutant levels from the existing scenario	There will be long sections of the proposed scheme (Stillorgan Park Road, Rowanbyrn, Brookville Park, Abbey Road, Pottery Road) which will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise, vibration and air pollutants	There will be long sections of the proposed scheme (Stillorgan Park Road, Rowanbryn, Brookville Park, Abbey Road, Rochestown Road) which will result in traffic being relocated closer to sensitive receptors due to road widening. Where this is the case there is likely to be an increase in noise, vibration and air pollutants
	Rank				
	Land Use and the Built Environment	Potential Medium Impact: No impact envisaged along the main N11/Stillorgan Road. Off the main N11/Stillorgan Road there is potential for medium – high impact along South Avenue and North Avenue.	The scheme makes use of the existing N11 corridor. The majority of the proposed scheme will utilise the existing bus lanes/facilities. Negligible impact on existing land use character and built environment	No impact envisaged along the main N11/Stillorgan Road. Off the main N11/Stillorgan Road there is potential for low-medium impact along Pottery Road; Abbey Road; Brookville Park; Rowanbyrn; Anneville Terrace; and Fleurville.	No impact envisaged along the main N11/Stillorgan Road. Off the main N11/Stillorgan Road there is potential for low-medium impact along Abbey Road; Brookville Park; Rowanbyrn; Anneville Terrace; and Fleurville.
	Rank				

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Wilford Junction to Crinken Lane	
	Assessment Criteria	**Sub-Criteria**	**Option 1**	**Option 2**
1	**Economy**	Capital Cost	Total - € 12.4 million Indicative Scheme Infrastructure Cost - € 3.3 million Private Land Costs - € 9.1 million Dedicated bus lanes and segregated cycle tracks will be provided on all of the Dublin Rd between Wilford junction and Crinken lane. This will involve land take in the form of green fields, front gardens and lands from public amenity and green space.	Total - € 16 million Indicative Scheme Infrastructure Cost - € 3.8 million Private Land Costs - € 12.2 million The construction cost of option 2 is slightly higher as additional works such as public lighting and drainage would be required along the offline cycle track Additional land take is required as the off line cycle track is seperated from the Dublin Road. It is assumed that the piece of land between the road and the cycle track would also need to be purchased.
		Rank		
		Journey-time reliability and quality of service	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
2	**Integration**	Land Use Integration	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Residential Population Catchment	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Transport Network Integration	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Cyclists and pedestrian Integration	This option provides segregated cycle tracks on either side of the Dublin Road This option is slightly preferrable as northbound cyclists are not required to cross the road to use the cycle facilities and is in accordance with the GDA CNP	This option provides a two-way cycle track to the east of Dublin Road This option is slightly less preferrable as northbound cyclists are required to cross the road to use the cycle facilities and iit is a slight deviation from the GDA CNP
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Wilford Junction to Crinken Lane	
	Assessment Criteria	**Sub-Criteria**	**Option 1**	**Option 2**
3	**Accessibility and Directness**	High volume trip attractors	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Deprived Geographic Areas	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
4	**Safety**	Road Safety	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
5	**Environment**	Archaeological, Architectural and Cultural Heritage	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Flora and Fauna	Widening the Dublin Road to provide bus lanes and cycle tracks will have a severe impact on mature trees, These trees have the potential to host nesting birds within the bird breeding season and roosting bats. Many of these trees are included within the Dun Laoghaire Rathdown County Development Plan 2016-2022 under the objective 'to protect and preserve trees and woodlands'.	The narrower cross section used along the Dublin Road means that the impact on these trees will be less severe than option 1
		Rank		
		Soils and Geology	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Hydrology	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Wilford Junction to Crinken Lane	
	Assessment Criteria	Sub-Criteria	Option 1	Option 2
		Landscape and visual	Widening the Dublin Road to provide bus lanes and cycle tracks will have a severe impact on mature trees and stone boundary walls along the route. Protection of these trees is part of an objective in the DLRCC development plan	Providing an offline cycle track allows for a narrower cross section to be used along the Dublin Road. This will mean that fewer mature trees wiould need to be removed when compared to option 1, although the impact on boundary walls will be the same as option 1.
		Rank		
		Noise, Vibration and Air	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Land Use and the Built Environment	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Crinken Lane to St Annes		
	Assessment Criteria	Sub-Criteria	Scheme 2	Scheme 3	Scheme 4
1	Economy	Capital Cost	Road widening to provide bus lanes on one side of the road through Shankill Village	Road widening to provide bus lanes on one side of the road through Shankill Village	Road widening to provide bus lanes on both sides of the road through Shankill Village
		Rank			
		Journey-time reliability and quality of service	There will be one bus lane provided through Shnakill Village, this is northobund north of Stonebridge Close junction and southbound south of the junction. Two queue reloaction systems will be used at Quins Road jand Lower Road juncitons to provide priority for northbound buses These bus priority measures will reduce delays when the village is congested and will lead to faster and more reliable journey times than option 1	Bus lanes are provided for southbound buses only thorugh Shankill Village. A queue reloaction system will be used at Quins Road junciton to provide priority for northbound buses These bus priority measures will reduce delays when the village is congested and will lead to faster and more reliable journey times than option 1	Bus lanes are provided for southbound buses thorugh Shankill Village, the northbound bus lane stretches from the Stonebridge Close junction to the Lower Road junction. Two queue reloaction systems will be used at Quins Road jand Lower Road juncitons to provide priority for northbound buses These bus priority measures will reduce delays when the village is congested and will lead to faster and more reliable journey times all three other options
		Rank			
2	Integration	Land Use Integration	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Residential and employment catchment	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Transport Network Integration	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Cyclists and pedestrian Integration	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
3	Accessibility and Directness	High volume trip attractors	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Deprived Geographic Areas	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
4	Safety	Road Safety	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
5	Environment	Archaeological, Architectural and Cultural Heritage	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Flora and Fauna	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria

Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Crinken Lane to St Annes		
Assessment Criteria	**Sub-Criteria**	**Scheme 2**	**Scheme 3**	**Scheme 4**
	Rank			
	Soils and Geology	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
	Rank			
	Hydrology	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
	Rank			
	Landscape and visual	Option 1 requires reallocation of road reserve from two lanes with parking both sides, to a three-lane carriageway with parking on one side only and removal of street trees and reduction in footpath widths	Option 2 requires reallocation of road reserve from two lanes with parking both sides, to a three-lane carriageway with parking on one side only and removal of street trees and reduction in footpath widths	Option3 requires reallocation of road reserve from two lanes with parking both sides, to a four-lane carriageway with parking on one side only and removal of street trees and reduction in footpath widths This Option has a more severe visual impact than Options 1 and 2 on the streetscape of Shankill Village
	Rank			
	Noise, Vibration and Air	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
	Rank			
	Land Use and the Built Environment	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
	Rank			

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Shanganagh Road (St Anne's Church) to Loughlinstown Roundabout	
	Assessment Criteria	**Sub-Criteria**	**Option 1**	**Option 2**
1	**Economy**	Capital Cost	**Total - € 8.2 million** *Indicative Scheme Infrastructure Cost - € 3.1 million* *Private Land Costs - € 5.1 million* Dedicated bus lanes and segregated cycle tracks will be provided along Dublin Road. This will involve land take from St Anne's Church carpark, Rathmichael School, green spaces and front gardens.	**Total - € 6.9 million** *Indicative Scheme Infrastructure Cost - € 4.9 million* *Private Land Costs - € 2.0 million* Dedicated bus lanes will be provided along Dublin Road. This will involve land take from St Anne's Church carpark, green spaces and front gardens. An alternate cycle track will be provided along Seaview Park and Seaview Road linking to Shanganagh Road. Segregated cycle tracks will be constructed on wither side of the road along Shanganagh Road
		Rank		
		Journey-time reliability and quality of service	Same level of bus priority provided as option 2 however provision of segregated cycle tracks means that buses will not have to wait behind cyclists and will have slightly faster and more reliable journey times	Same level of bus priority provided as option 1 however buses will occasionally have to wait behind cyclists as they share a lane. This will result in slightly slower and less reliable journey times
		Rank		
2	**Integration**	Land Use Integration	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Residential Population Catchment	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Transport Network Integration	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Cyclists and pedestrian Integration	Segregated cycle tracks provided alongside bus lanes. This cycle route is in accordance with the GDA CNP	Cycle detour provided instead of online cycle track. This option will involve changes to the GDA CNP. It is likely some cyclists will continue to use the Dublin Rd and they will be required to share the bus lane
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Shanganagh Road (St Anne's Church) to Loughlinstown Roundabout	
	Assessment Criteria	**Sub-Criteria**	**Option 1**	**Option 2**
3	**Accessibility and Directness**	High volume trip attractors	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Deprived Geographic Areas	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
4	**Safety**	Road Safety	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
5	**Environment**	Archaeological, Architectural and Cultural Heritage	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Flora and Fauna	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Soils and Geology	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Hydrology	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Landscape and visual	This option involves significant road widening to a proposed cross section width of 20m along the Dublin Rd. Land take from gardens is required along the route. This option is considered more visually impactful due to the wider cross section along the Dublin Rd	This option involves significant road widening to a proposed cross section width of 16m along the Dublin Rd. Land take from gardens is required along the route. Road wideing is also required on Shanganagh road to provide segregated cycle tracks. This option is considered less visually impactful due to the narrower cross section along the Dublin Rd
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Shanganagh Road (St Anne's Church) to Loughlinstown Roundabout	
	Assessment Criteria	**Sub-Criteria**	**Option 1**	**Option 2**
		Noise, Vibration and Air	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		
		Land Use and the Built Environment	Options considered equal under this criteria	Options considered equal under this criteria
		Rank		

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Louglinstown Roundabout		
	Assessment Criteria	**Sub-Criteria**	**Scheme 1**	**Scheme 2**	**Scheme 3**
1	**Economy**	Capital Cost	Construction of a new southbound bus lane around the roundabout	Construction of a new southbound bus lane around the roundabout and a new toucan crossing to the north of the roundabout	Construction of a new southbound bus lane around the roundabout and signalising three arms of the junction
		Rank			
		Journey-time reliability and quality of service	Addition of a southbound bus lane through the roundabout results in significantly reduced delays for southbound buses through the junction. No additional priority is provided for northbound buses	Addition of a southbound bus lane through the roundabout results in significantly reduced delays for southbound buses through the junction. Junction modelling shows that the introduction of a toucan crossing to the north would increase the gaps in southbound traffic and results in journey time savings for northbound buses entering the roundabout. This does delay southbound buses more than option 1 however, as buses will be occasionallly required to stop at the toucan crossing	Addition of a southbound bus lane through the roundabout results in significantly reduced delays for southbound buses through the junction. Junction modelling shows that the partially signalised Loughlinstown roundabout would result in significant journey time savings for northbound buses as well
		Rank			
2	**Integration**	Land Use Integration	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Residential Population Catchment			
		400m (5 mins)			
		800m (10 mins)			
		1200m (15 mins)			
		Employment Catchment			
		400m (5 mins)			
		800m (10 mins)			
		1200m (15 mins)			
		Total residential and employment (10 mins)			
		Total residential and employment (10 mins) per km	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Transport Network Integration	Junction modelling shows no significant change to the journey times for general traffic or other bus services using the roundabout	Junction modelling shows no significant change to the journey times for general traffic or other bus services using the roundabout Introduction of a new toucan crossing leads to slightly increased journey times due to the extra red time at these new signals	Junction modelling shows an overall decrease in the average journey time through the junction for all traffic. This is particularly effective in reducing journey times for northbound traffic joining from the M11 during the morning peak
		Rank			
		Cyclists and pedestrian Integration	No change to existing pedestrian or cyclist facilities at the roundabout as part of this option	An new toucan crossing is proposed as part of this option	No change to existing pedestrian or cyclist facilities at the roundabout as part of this option
		Rank			

	Option Assessment Stage 2 (Multi Criteria Analysis)		Section 2 - Sub-section Louglinstown Roundabout		
	Assessment Criteria	Sub-Criteria	Scheme 1	Scheme 2	Scheme 3
3	Accessibility and Directness	High volume trip attractors	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Deprived Geographic Areas	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
4	Safety	Road Safety	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
5	Environment	Archaeological, Architectural and Cultural Heritage	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Flora and Fauna	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Soils and Geology	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Hydrology	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Landscape and visual	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Noise, Vibration and Air	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			
		Land Use and the Built Environment	Options considered equal under this criteria	Options considered equal under this criteria	Options considered equal under this criteria
		Rank			

Appendix B

REPORT

Bray to UCD Core Bus Corridor (CBC)

Road Safety Audit Stage 1

Prepared for

Halcrow Barry

Date: April 2017

3rd Floor,
St Johns House,
High Street,
Tallaght,
Dublin 24,
Ireland

Contents

Appendices

Document History

This report has been prepared in accordance with the instructions of the client, Halcrow Barry, for the client's sole and specific use.

Any other persons who use any information contained herein do so at their own risk.

This document has been issued and amended as follows:

Version	Date	Description	Created By	Verified by	Approved by
A	24/04/2017	Issued	R Brewster	R Brewster	G Turley

SECTION 1

Introduction

This report results from a Stage 1 Road Safety Audit of the proposed Bray to UCD Core Bus Corridor (CBC).

The audit has been prepared in accordance with Part 2 NRA HD 19/15 Road Safety Audit.

The Audit Team has examined and reported on only the road safety implications of the scheme and has not examined or verified the compliance of the design to any other criteria.

The Audit Team was as follows:

G. Turley Team Leader	MEng, HDip PM, H Dip H'ways & Geo, CEng MIEI, Associate Director, Halcrow Group Ireland Ltd, A CH2M Company, 3rd Floor St Johns House, High Street, Tallaght, Dublin 24, Ireland
R. Brewster Team Member	BEng (Hons) MIEI, Design Engineer, Halcrow Group Ireland Ltd, A CH2M Company Classon House, Dundrum Business Park, Dundrum Road, Dublin 14.
P. Kelly Observer	BEng, MEng (Hons), MIEI Design Engineer, Halcrow Group Ireland Ltd, A CH2M Company 3rd Floor St Johns House, High Street, Tallaght, Dublin 24, Ireland

The audit was carried out on Wednesday 19th April to Tuesday 25th April 2017. The daytime site visit was carried out on Wednesday 19th April 2017.

Weather conditions during the daytime site visit was overcast with some heavy showers. Road surfaces were damp to wet.

Scheme drawings audited are listed in **Appendix B**.

Problems Identified

2.1 Problem

The bus stop located opposite the Castle Street Shopping Centre is crossing an access lane. This could lead to vehicles undertaking unsafe maneuvers while crossing the kassel kerbs located at the bus stop.

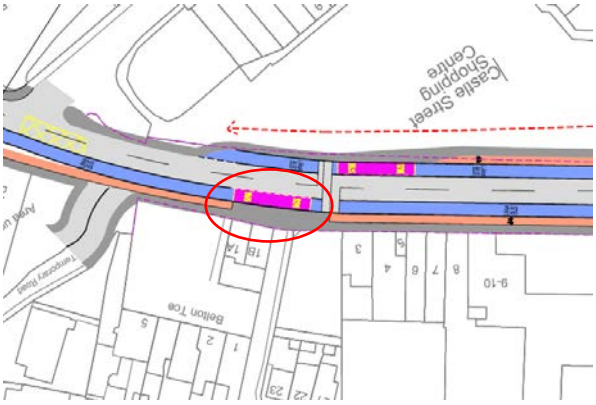


Figure 1 Bus stop crossing a vehicular access (Example drawing sheet 1)

Recommendation

The design team should review all bus stop locations to ensure they do not impede on vehicular accesses.

2.2 Problem

It is noted from the typical cross sections that it is proposed to reduce the footway to 2m. The presence of street furniture will reduce the cross section further which may force pedestrians onto the carriageway in conflict with vehicular traffic.

Figure 2 Street furniture reducing footway widths to below minimum (Example drawing sheet 1)

Recommendation

The design team should ensure street furniture is considered during the design to maintain minimum footway widths when accommodating street furniture.

2.3 Problem

The right turn lanes appears to end prematurely for the right turn in the Castle Street Shopping Centre car park leading to increased risk of side swipe collisions.

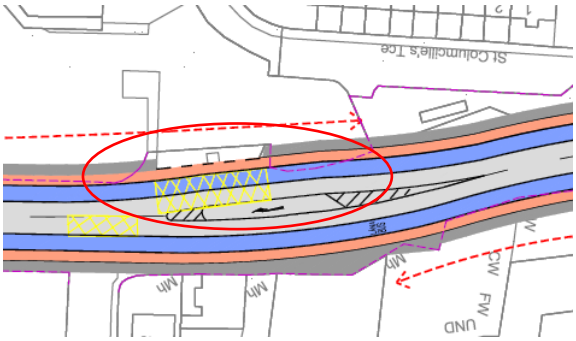


Figure 3 Right turn lane ends prematurely (Example drawings sheet 1)

Recommendation

The design team should ensure the right turn lane is sufficiently long to avoid potential collisions.

2.4 Problem

Wide bell mouth entrances into residential areas could lead to high entry speeds and potential conflicts with vulnerable road users due to longer crossing distances.

Figure 4 Wide bell mouth entrance (Example drawing sheet 1 – Cronan's Road)

Recommendation

The design team should review all side road entrances to reduce conflicts with vulnerable road users to a minimum.

2.5 Problem

The layout of the Upper Dargle Road junction layout is unclear for cyclists who wish to turn right as they have two traffic lanes to cross leading to potential conflicts with vehicular traffic. Cyclists heading in a north bound direction could conflict with left turning traffic due to the increased vertical alignment of the realigned minor arm.

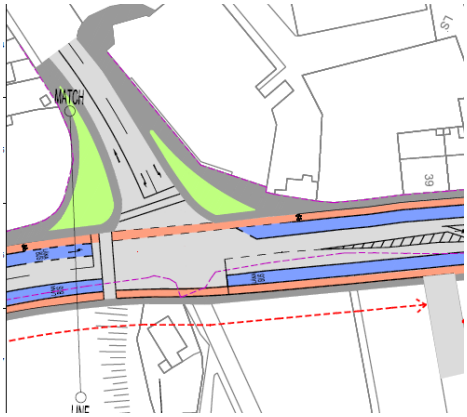


Figure 5 Junction layout unclear for cyclists (Example drawing sheet 2)

Recommendation

The design team should ensure adequate facilities are provided for cyclists and vertical alignment gradients are minimised. This may include sacrificing the grass verges adjacent to the carriageway to increase the space available for shared areas.

2.6 Problem

Along the route there is inconsistency with how the footway crosses accesses leading to increased risk of pedestrian confusion over priority and conflicts with vehicular traffic.

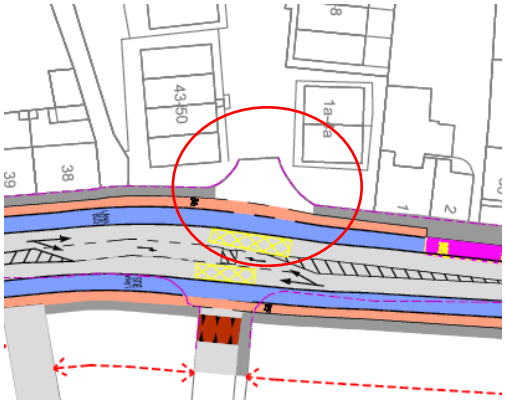


Figure 6 Inconsistent of footway crossing accesses (Example drawing sheet 2)

Recommendation

The design team should review all accesses to ensure consistency of footways crossing vehicular accesses. Priority should be given to the pedestrian footways.

2.7 Problem

Along the route, there is inconsistency with the use of left turn filter lanes within bus lanes to side roads. This may lead to increased risk of rear shut collisions with vehicles on main carriageway traffic due to unexpected stopping.

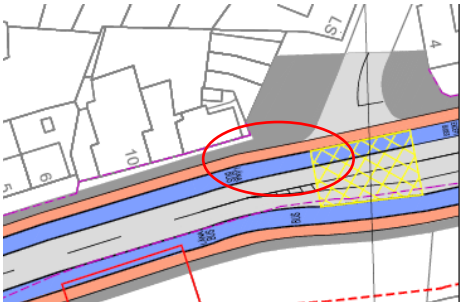


Figure 7 Inconsistent use of left turn filter lane (Example drawing sheet 2)

Recommendation

The design team should review all left turns at priority junctions and ensure consistent use of left turn lanes.

2.8 Problem

At the Old Connaught Avenue/ Dublin Road/ Croke Abbey Ave Junction, there is a lack of pedestrian facilities. This could lead to vulnerable road users coming into conflict with vehicular traffic.

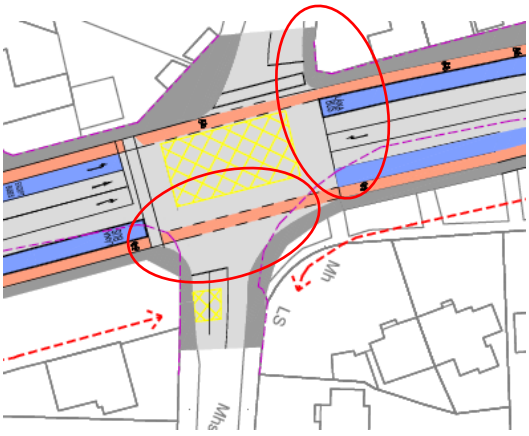


Figure 8 Lack of Pedestrian crossing facilities (Example drawing sheet 3)

Recommendation

The design team should review all signalised junctions to ensure there are adequate pedestrian crossing facilities.

2.9 Problem

At the Old Connaught Avenue/ Dublin Road/ Croke Abbey Ave Junction , there is a number of property accesses in close proximity to the signalised junction with one property access appearing beyond the stop line of the junction. There is a risk of confusion for a motorist leaving the property as to when it would be safe to exit.

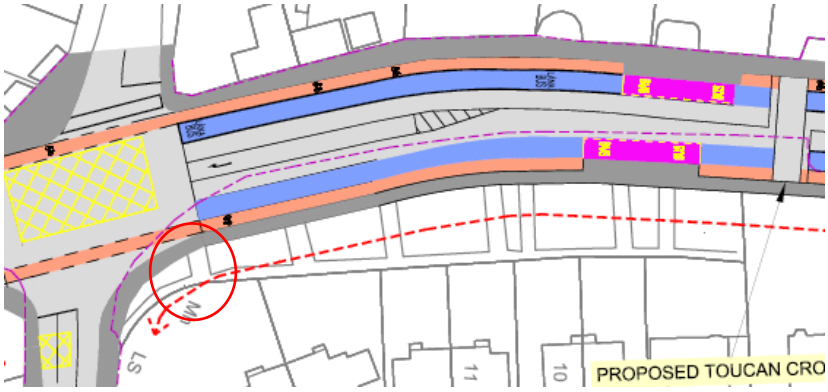


Figure 9 Property access located within junction area (Example drawing sheet 3)

Recommendation

The design team shall ensure there are no accesses beyond the stop line within the junction area.

2.10 Problem

There are a number of property access in close proximity to the signalised junction (Old Connaught Ave/Croke Abbey Ave/Dublin Road) and bus stop. Risk of side impacts to cyclists and vehicular traffic to traffic accessing and egress from the properties

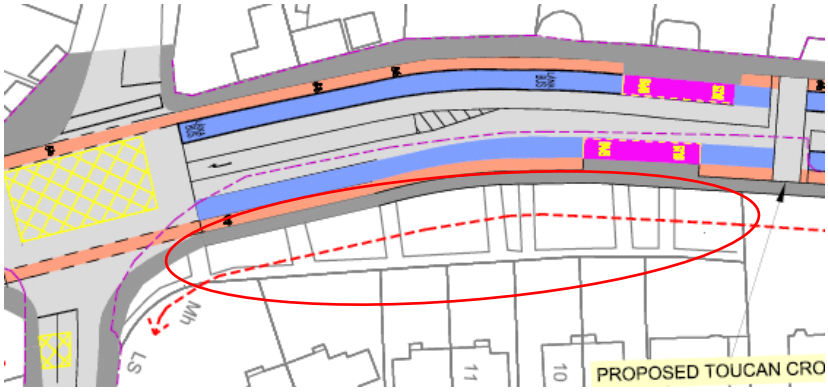


Figure 10 Numerous property access (drawing sheet 3)

Recommendation

The design team should consider grouping the entrances together to form a single access from the carriageway.

2.11 Problem

The toucan crossing is located at a property access potentially leading to conflicts with access/egress traffic and road signal furniture/ pedestrians waiting to use the crossing.

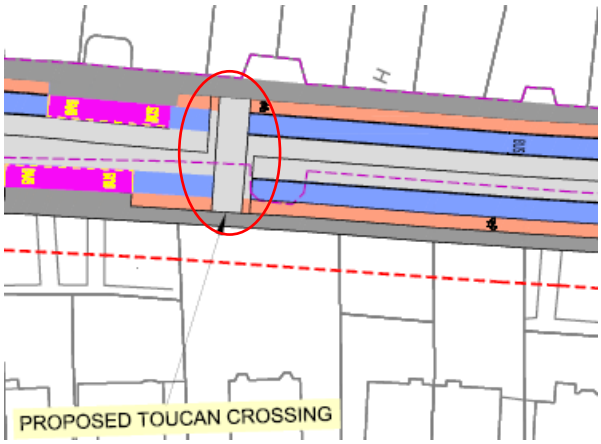


Figure 11 Toucan crossing at property access (Example drawing number 3)

Recommendation

The design team should all review crossing locations to ensure they are located away from vehicular accesses.

2.12 Problem

There are numerous signalised junctions along the route where a left turning slip lane is proposed. These are undesirable for cyclists and pedestrians due to increased risk of conflict with left turning vehicles and encourage high speeds.

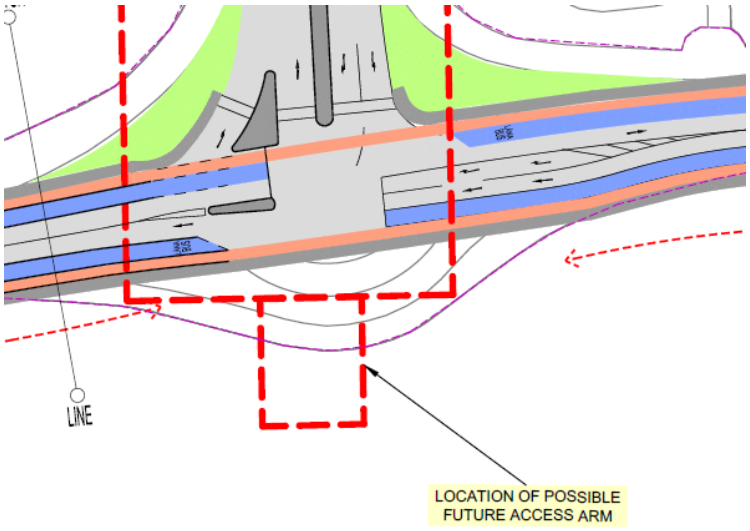


Figure 12 Left turn slip lanes (Example drawing sheet 4)

Recommendation

The design team should consider the removal of left slip turning lane in favour of left turning lanes.

2.13 Problem

Along the route there is an inconsistent approach to the layout of bus stops, specifically where bus stops are shown to be within the cycle lane. This will lead to buses cutting of cyclists while they are at the stops, forcing cyclists onto the road, leading to an increased risk of collisions with vehicles.

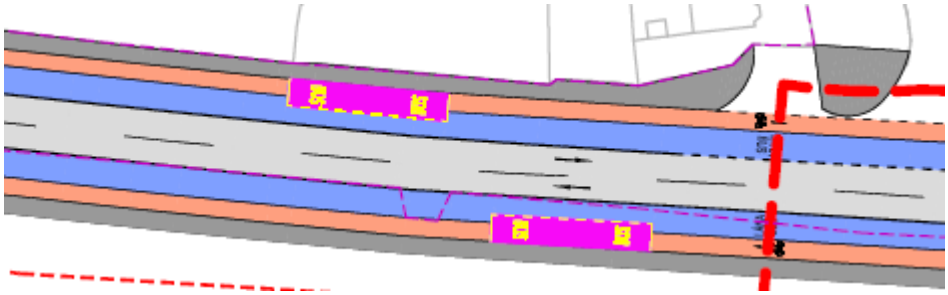


Figure 13 Bus stops located within cycle lane (Example drawing sheet 5)

Recommendation

The design team should ensure that bus stops do not conflict with the cycle lanes.

2.14 Problem

Prior to the access to the future Woodbrook development, it is noted that the bus stops are located away from any crossing points. This could lead to increased numbers of vulnerable road users crossing a wide carriageway and coming into conflict with vehicular traffic.

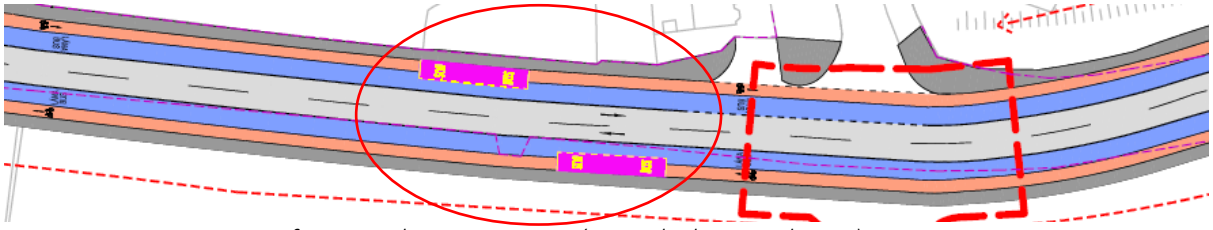


Figure 14 Bus stop remote from a pedestrian crossing (Example drawing sheet 5)

Recommendation

The Design Team should adopt a consistent design approach for bus stops and their proximity to pedestrian crossings throughout the scheme.

2.15 Problem

At the junction with Crinken Lane, the start of the shared surface cycle track is shown opposite the footway on the left hand side of the junction. There is a risk of visually impaired pedestrians walking northwards across the junction may mistake the shared surface as the footway leading to conflicts with vehicles/ cyclists.

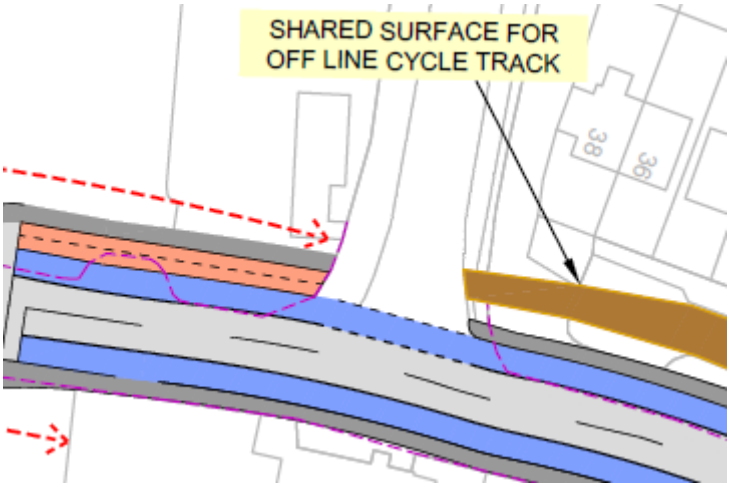


Figure 15 Start of shared surface (drawing sheet 7)

Recommendation

The design team should ensure the shared surface is angled away from the footway and appropriate corduroy paving used at the start of the shared surface.

2.16 Problem

At the proposed Cherrington Road/ Quinns Road/ Dublin Road junction, it is unclear how the two lanes traveling northbound merge into one at the opposite side of the junction leading to increased risk of side swipe, sudden breaking/rear shunt collisions.

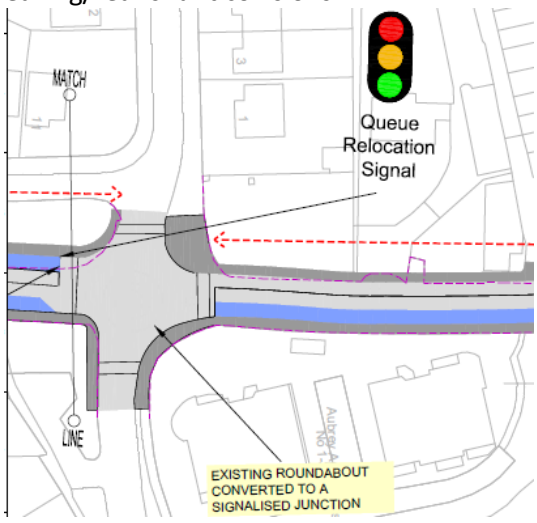


Figure 16 Unclear Merging of 2 lanes to 1 lane across the junction (Drawing sheet 9)

Recommendation

The design team should review junction layout and ensure there is a clear and concise layout for the merging of the two lanes.

2.17 Problem

There is a see through effect for the shared surface along Lower Road with reduced visibility to signage due to parked vehicles. There is also a risk of conflicts between vulnerable road users and vehicle traffic due to the parked vehicles forcing road users onto the opposite side of the road.

Figure 17 Shared surface junction see through Drawing sheet 9

Recommendation

The design team should consider additional measures to highlight the presence of the junction ahead. Measures may include additional signage, prohibitive parking, and colour contrast for the raised table.

2.18 Problem

Approaching the Dublin Rd/ Corbawn Lane/ Shanganagh Road Roundabout, there is a significant level difference between the shared surface and the tie in point at the roundabout. There is risk of slips through steep gradients being required to achieve the proposed design.

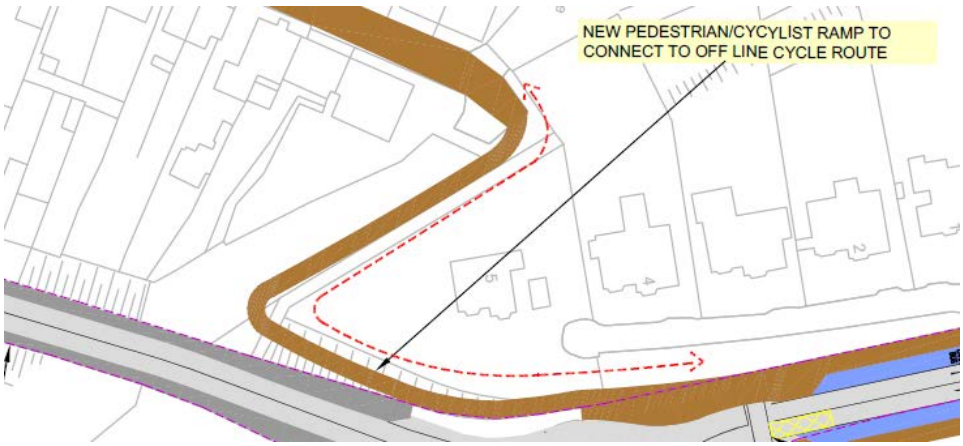


Figure 18 Major level difference for proposed ramp (Drawing sheet 10)

Recommendation

The design team should ensure the proposed design gradients comply with both DMURS and the National Cycle Manual. If desirable gradients cannot be achieved alternative design shall be considered.

2.19 Problem

The Audit Team notes that an existing crossing to be removed from outside St Anne's church. There is an existing desire line at this location due to the church and the demand will increase due to the location of the proposed bus stops. There is a risk of conflicts between vulnerable road users and vehicular traffic.

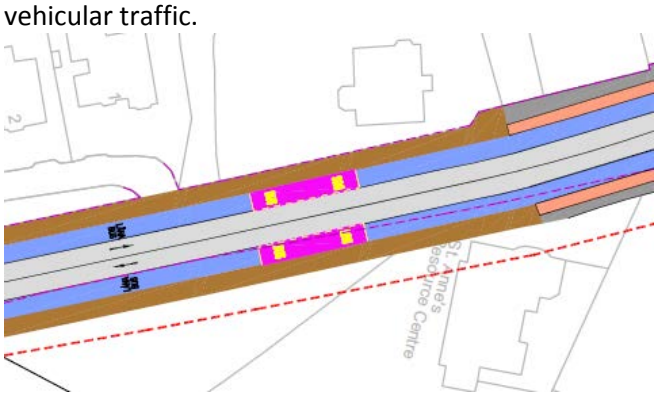


Figure 19 Remove of crossing at desire line (Drawing sheet 10)

Recommendation

The design team should consider maintaining the pedestrian crossing at this location.

2.20 Problem

At the roundabout linking the R837 Dublin Road to the N11, unclear road markings could increase risk of side swipe collisions.

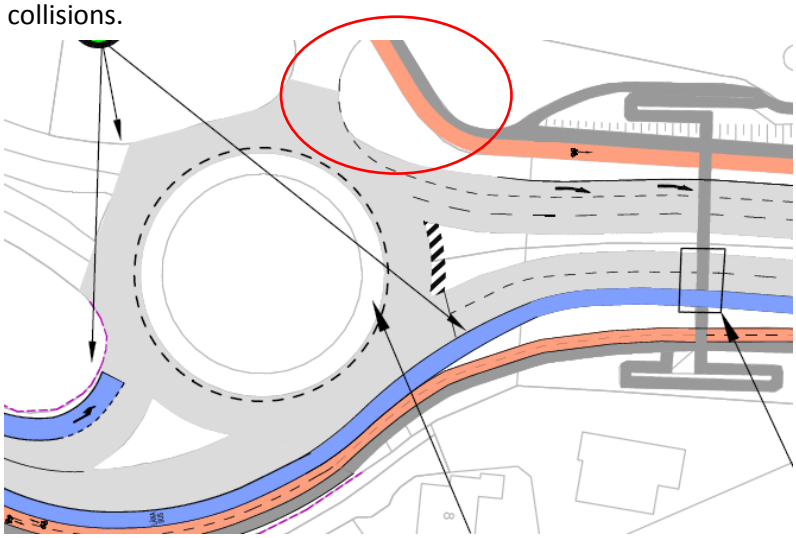


Figure 20 Unclear road markings (drawing sheet 13)

Recommendation

The design team should ensure road markings are in accordance with the Traffic Signs Manual.

2.21 Problem

The proposed partial signalisation of the R837 Dublin Road /N11 Roundabout could lead to conflicts with traffic going around the roundabout and traffic entering the roundabout leading to sudden swerving and breaking maneuvers increasing the risk of side swipe and or rear shunt collisions.

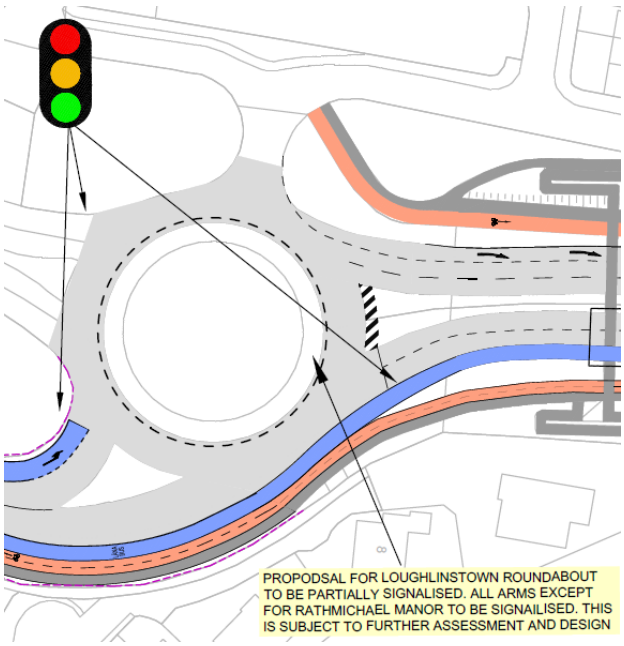


Figure 21 Partial signalization of the junction (drawing sheet 13)

Recommendation

The design team should consider providing full signalisation or signals with flashing ambers instead of green aspects.

2.22 Problem

There is potential for high vehicle speeds on the proposed shared surface of pedestrians, cyclist and vehicles parallel to the N11 leading to conflicts between vulnerable road users and vehicles.

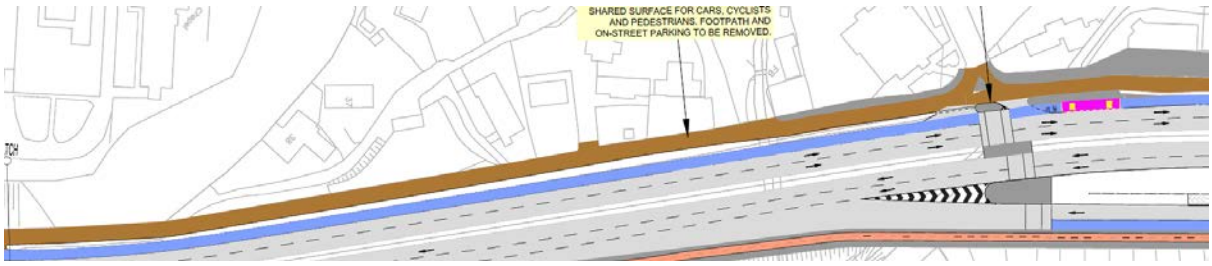


Figure 22 Shared surface (Drawing sheet 14)

Recommendation

The design team should consider appropriate speed reduction measures to ensure low vehicle speeds on the shared surface.

2.23 Problem

At the N11/ Cherrywood Rd junction, the existing island to be reconfigured appears to be very small to cater for stacking room for waiting cyclists.

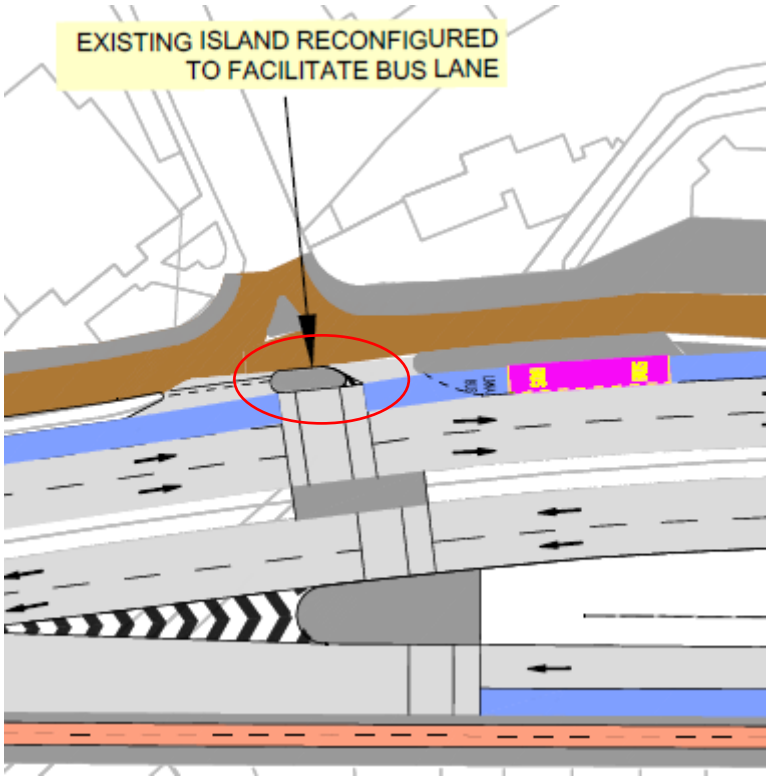


Figure 23 Reduced island area (Drawing sheet 14)

Recommendation

The design team should review the layout to ensure that sufficient space is provided for cyclists and pedestrians waiting to cross.

2.24 Problem

There are locations where existing sign poles are located in the middle of the footway. This could lead to conflicts with visually impaired pedestrians.

Figure 24 Existing sign with in footway (Drawing sheet 15)

Recommendation

The design team should review all signage and replace existing multiple pole signs with cantilever type poles.

2.25 Problem

The location of the yield line so close to the slip lane could cause rear shunt type collisions due to vehicles stopping unexpectedly.

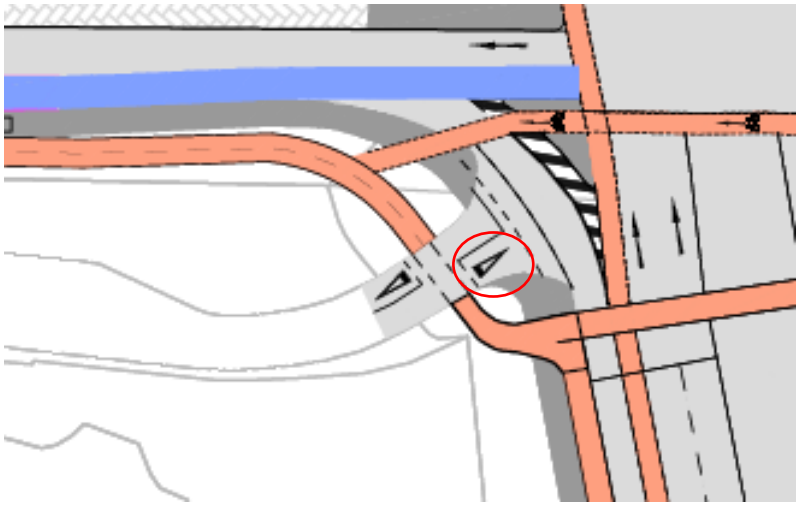


Figure 25 Yield line located close to bell mouth (Drawing sheet 15

Recommendation

The design team should consider relocating the crossing to ensure vehicle approaching the yield line are sufficient located away from the bell mouth of the junction on the slip road.

2.26 Problem

The stagger on the toucan crossing places the pedestrians such they turn their back on oncoming traffic increased risk of vulnerable road users conflicting with vehicular traffic.

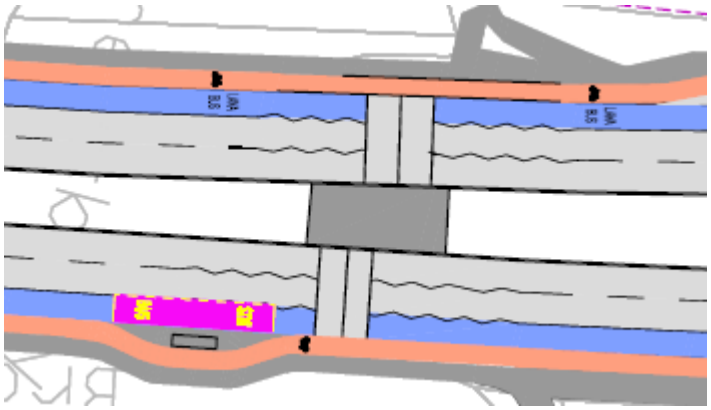


Figure 26 Reversed staggered crossing (Example drawing sheet 19)

Recommendation

The design team should review all staggered crossings to ensure the stagger when required, turns the vulnerable road user towards the oncoming traffic.

2.27 Problem

Along the route there is inconsistent use of right turning facilities for cyclist, with some instances using the “jug” type of turn facilities.

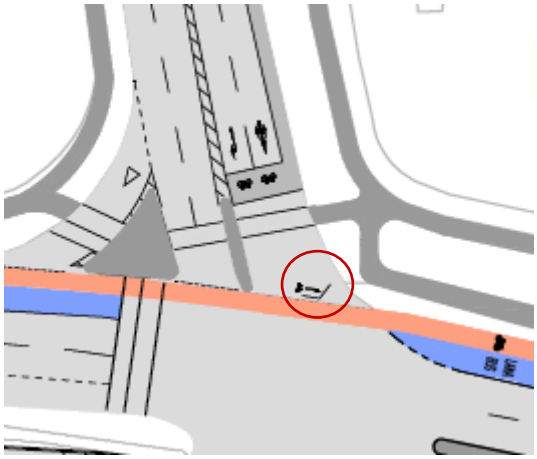


Figure 27 Cyclist right "jug" type turn

Recommendation

The Design Team should adopt a consistent design approach for all right turn facilities for cyclists throughout the scheme.

2.28 Problem

At the Bray Road/ N11 Junction, the footway on the minor arm takes a convoluted route after the crossing leading to increased risk of slips, trips and falls on the desire line.

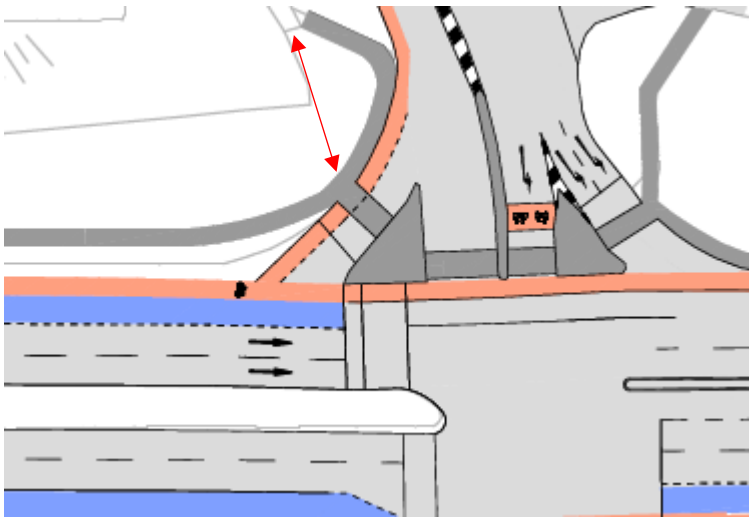


Figure 28 Lack of footway on the desire line (Example drawing sheet 24)

Recommendation

The design team should review all footways and provide footways on the desire line.

2.29 Problem

Along the route there is inconsistent and inappropriate use of advance stop lines for cyclists. Increased risk of vulnerable road user collisions.

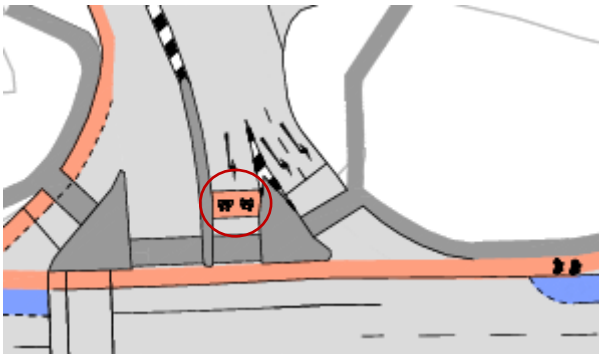


Figure 29 Inconsistent use of advanced stop line (Example drawing sheet 24)

Recommendation

The design team should review all signalised junctions and provide advance stop lines and cycle lines for cyclists in accordance with the National Cycle Manual

2.30 Problem

At the N11/ Westminster Rd junction, it appears that the pedestrian refuge in the median is to be reduced in width. This will create a localised constriction preventing cyclists and pedestrians from freely passing each other.

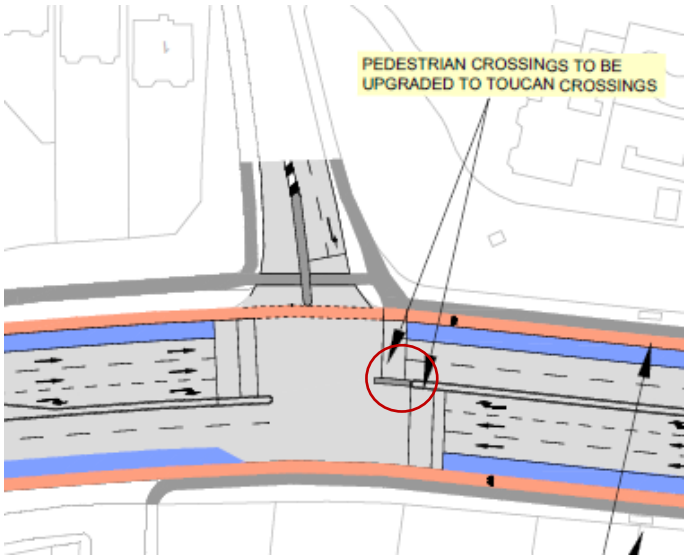


Figure 30 Inconsistent use of advanced stop line (Example drawing sheet 25)

Recommendation

The design team should review the proposed refuge island and provide a suitable width to accommodate pedestrians and cyclists waiting to cross.

2.31 Problem

At the N11/ Clonkeen Rd junction, it appears that the island in the median is to be moved. This will impact upon the location of secondary traffic signals increasing the risk of driver confusion and rear shunt type collisions.

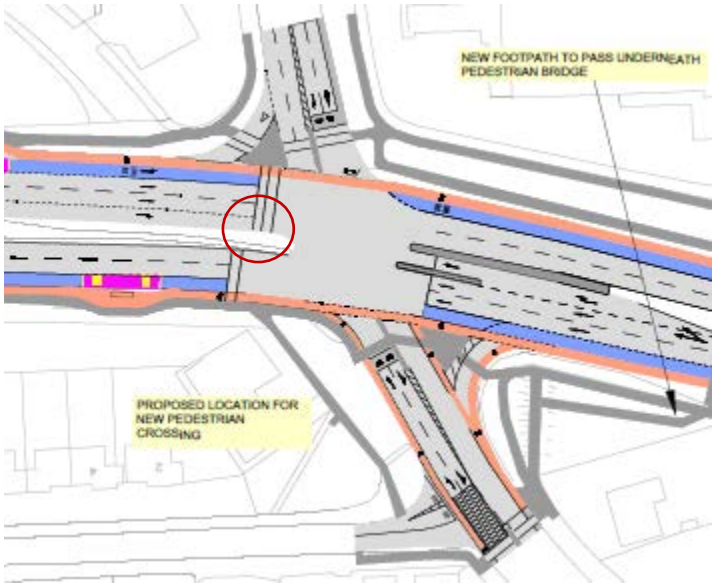


Figure 31 Removal of Central Island (Example drawing sheet 22)

Recommendation

The design team should review the proposed junction layout to ensure there is sufficient space for secondary traffic signals.

2.32 Problem

The proposed typical cross section details all lane widths as 3 metres in width which is below minimum standard as detailed in DMURS. This could lead to an increased risk of side swipe collisions.

Recommendation

The design team should review the proposed lane widths and comply with the typical standard as detailed in DMURS.

Audit Team Statement

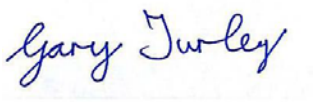
We certify that we have examined the drawings and documents listed in the appendices to this report.

The examination and subsequent report was made with the sole purpose of identifying any features of the scheme that could be removed or modified in order to improve the safety of the proposals.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we recommend should be studied for implementation.

No one on the Audit Team has been involved in any way with the scheme design.

Audit Team Leader

Name:	G Turley Meng HDip H'ways & Geo, HDip PM, CEng MIEI	Signed: 
Position:	Associate Director	Dated: 24th April 2017
Organisation:	Halcrow Barry Ltd	
Address:	3rd Floor, St. Johns House, High Street, Tallaght Dublin 24	

Audit Team Member

Name:	Rory Brewster BEng(Hons) MIEI	Signed: 
Position:	Design Engineer	Dated: 24th April 2017
Organisation	Halcrow Barry Ltd	
Address:	Classon House, Dundrum Business Park Dundrum Road, Dublin 14.	

Appendix A
Site Location Plan

Appendix B
List of drawings supplied with Audit Brief

Drawing No.	Title
Sheet 1 of 42	Bray to UCD CBC
Sheet 2 of 42	Bray to UCD CBC
Sheet 3 of 42	Bray to UCD CBC
Sheet 4 of 42	Bray to UCD CBC
Sheet 5 of 42	Bray to UCD CBC
Sheet 6 of 42	Bray to UCD CBC
Sheet 7 of 42	Bray to UCD CBC
Sheet 8 of 42	Bray to UCD CBC
Sheet 9 of 42	Bray to UCD CBC
Sheet 10 of 42	Bray to UCD CBC
Sheet 11 of 42	Bray to UCD CBC
Sheet 12 of 42	Bray to UCD CBC
Sheet 13 of 42	Bray to UCD CBC
Sheet 14 of 42	Bray to UCD CBC
Sheet 15 of 42	Bray to UCD CBC
Sheet 16 of 42	Bray to UCD CBC
Sheet 17 of 42	Bray to UCD CBC
Sheet 18 of 42	Bray to UCD CBC
Sheet 19 of 42	Bray to UCD CBC
Sheet 20 of 42	Bray to UCD CBC
Sheet 21 of 42	Bray to UCD CBC
Sheet22 of 42	Bray to UCD CBC
Sheet 23 of 42	Bray to UCD CBC
Sheet 24 of 42	Bray to UCD CBC
Sheet 25 of 42	Bray to UCD CBC
Sheet 26 of 42	Bray to UCD CBC
Sheet 27 of 42	Bray to UCD CBC
Sheet 28 of 42	Bray to UCD CBC
Sheet 29 of 42	Bray to UCD CBC
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Sheet 31 of 42	Bray to UCD CBC
Sheet 32 of 42	Bray to UCD CBC
Sheet 33 of 42	Bray to UCD CBC
Sheet 34 of 42	Bray to UCD CBC
Sheet 35 of 42	Bray to UCD CBC
Sheet 36 of 42	Bray to UCD CBC
Sheet 37 of 42	Bray to UCD CBC
Sheet 38 of 42	Bray to UCD CBC
Sheet 39 of 42	Bray to UCD CBC
Sheet 40 of 42	Bray to UCD CBC
Sheet 41 of 42	Bray to UCD CBC
Sheet 42 of 42	Bray to UCD CBC

Appendix C
Road Safety Audit Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

Scheme: Bray to UCD QBC

Audit Stage: Road Safety Audit Stage 1

Date Audit Completed: 2017

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative Measures accepted by Auditors (yes/no)
2.1	Y	Y		
2.2	Y	Y		
2.3	Y	Y		
2.4	Y	Y		
2.5	Y	Y		
2.6	Y	Y		
2.7	Y	Y		
2.8	Y	Y		
2.9	Y	Y		
2.10	Y	Y		
2.11	Y	Y		
2.12	Y	Y		
2.13	N	N	It is agreed that the design approach is inconsistent regarding single carriageway at the southern part of scheme versus the N11 dual carriageway section, however the design team do not consider this to be a problem. The approach adopted is to provide bus stops in-line with cycle tracks on the single carriageway part of the route from Bray to the N11. This is	Yes

			harmonious with the lower design speed, lower traffic volume and more restricted available space along this link. The approach adopted on the N11 is different: the cycle track is brought off-road to the rear of bus stops because of the higher design speed, higher traffic volume and in most cases, more available space along the N11.	
2.14	Y	Y		
2.15	Y	Y		
2.16	Y	Y		
2.17	Y	Y		
2.18	Y	Y		
2.19	Y	Y		
2.20	Y	Y		
2.21	Y	Y		
2.22	Y	Y		
2.23	Y	Y		
2.24	Y	Y		
2.25	Y	Y		
2.26	Y	Y		
2.27	Y	Y		
2.28	Y	Y		
2.29	Y	Y		
2.30	Y	Y	*Note: The design team have decided to remove this Toucan crossing due to the lack of space and retain the pedestrian crossing. A Toucan crossing will instead be provided on the south side of the junction to serve as a right-turning facility for cyclists on the N11.*	Yes
2.31	N	N	The new pedestrian crossing proposed for this arm of the junction requires a reconfiguration	Yes

			of the existing layout. That includes removal of the existing splitter island at the right-turn lane to create a wider median for a pedestrian refuge / staggered crossing and to provide as short a crossing length as possible for pedestrians. It should be feasible to provide a satisfactorily safe new traffic signal layout design here as is currently provided at other similar junctions on the N11, e.g. Kill Lane junction to the north.	
2.32	Y	Y		

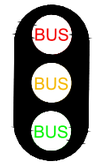
Signed: ..... Designer Date 23rd November 2017

Signed: Audit Team Leader Date 23rd November 2017

Signed: .....Client Date .....

Appendix C

ALTERNATIVE OFF-LINE BUS WAY OPTION



Bus Gate Signal

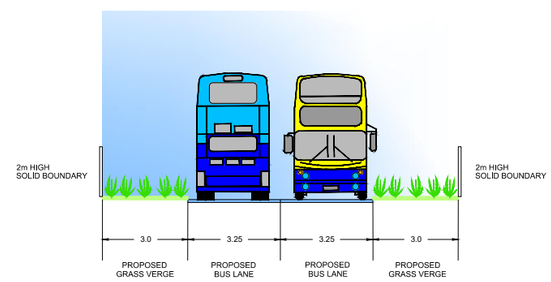
TO M11 SOUTHBOUND ON-RAMP

TO M11 NORTHBOUND

NEW BUS-WAY ROUTE

MATCH LINE

EXISTING JUNCTION TO BE UPGRADED TO FULLY SIGNALISED, TO PROVIDE BUS PRIORITY AND PEDESTRIAN FACILITIES. SUBJECT TO FURTHER ASSESSMENT AND DESIGN

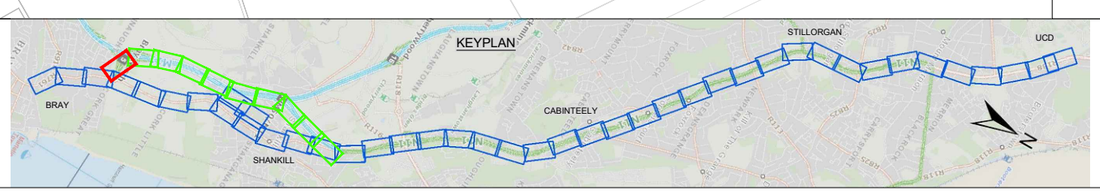


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary

KEYPLAN



Bray to UCD CBC
Sheet 43 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

M11

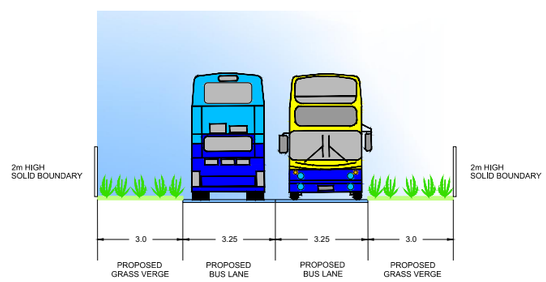
M11
SOUTHBOUND OFF-RAMP

MATCH

LINE

MATCH

LINE

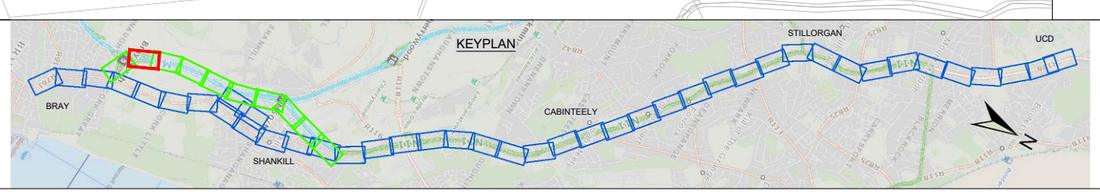


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary

KEYPLAN



Bray to UCD CBC
Sheet 44 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

ALLIES RIVER ROAD

PROPOSED PEDESTRIAN CONNECTION ACROSS M11

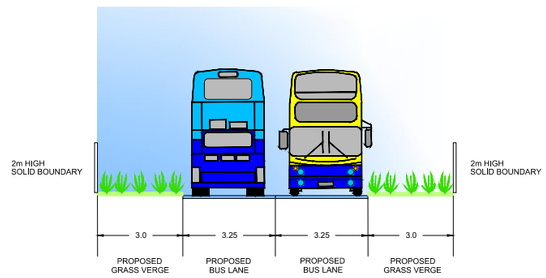
M11

MATCH LINE

MATCH LINE

NEW BUS-WAY ROUTE

ALLIES RIVER ROAD

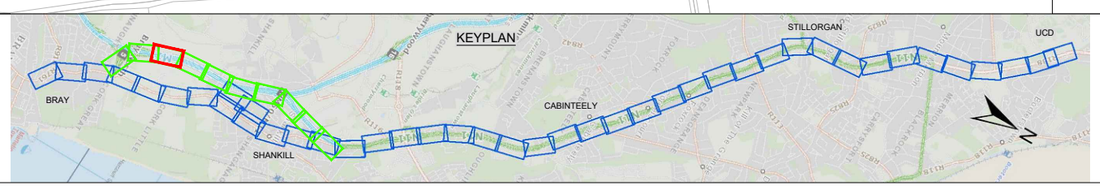


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary

KEYPLAN



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Bray to UCD CBC
Sheet 45 of 52

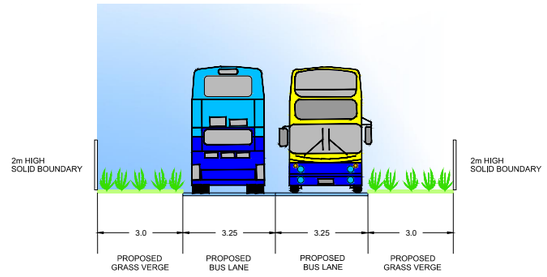
ALTERNATIVE OFF-LINE BUS WAY OPTION

M11

MATCH LINE

MATCH LINE

ALLIES RIVER ROAD

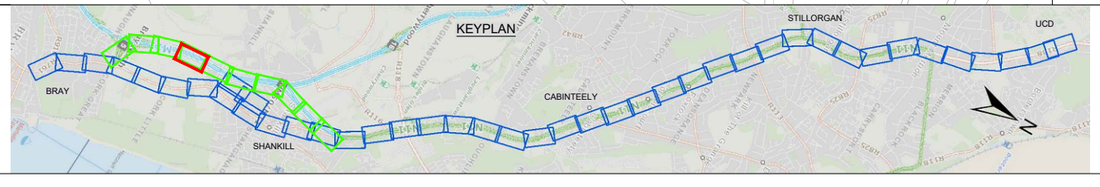


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary
- Proposed Retaining Structure

KEYPLAN



Bray to UCD CBC
Sheet 46 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

CRINKEN LANE

BUS
BUS
BUS

Bus Gate Signal

PROPOSED SIGNALISED AT GRADE JUNCTION TO PROVIDE BUS PRIORITY AND PEDESTRIAN FACILITIES

M11

MATCH

LINE

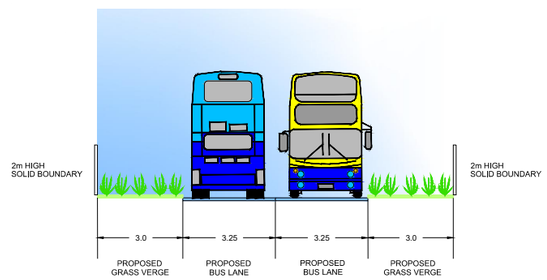
MATCH

LINE

THE WOOD

MOUNTAIN VIEW

N

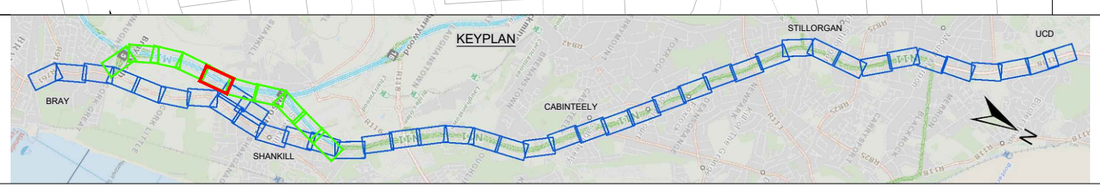


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary
- Proposed Retaining Structure

KEYPLAN



Bray to UCD CBC
Sheet 47 of 52

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A1

ALTERNATIVE OFF-LINE BUS WAY OPTION

LORDELLO ROAD

M11

MATCH

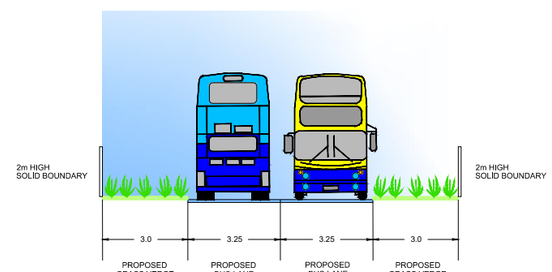
LINE

MATCH

LINE

MOUNTAIN VIEW

EXISTING FOOTBRIDGE

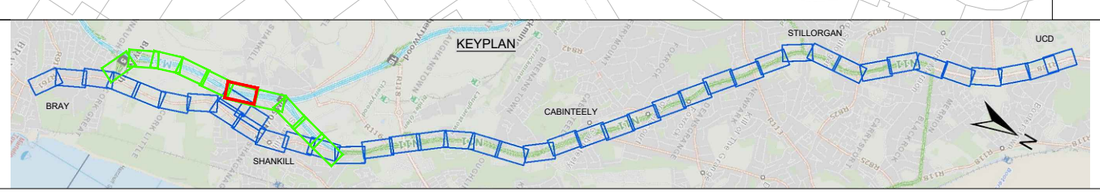


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary

KEYPLAN



Bray to UCD CBC
Sheet 48 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

M50

M11

NEW BUS-WAY ROUTE

MATCH

LINE

MATCH

LINE

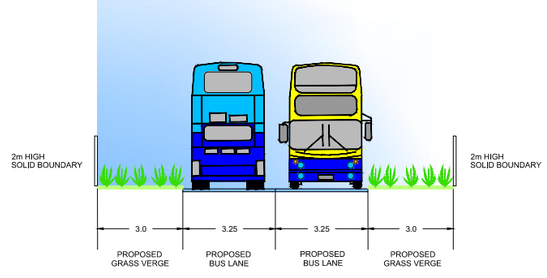
STONEBRIDGE GROVE

NEW VALE COTTAGES

EXISTING FOOTBRIDGE

ASSUMPTA PARK

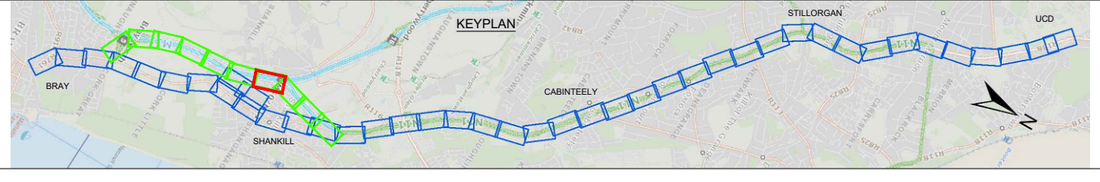
0 5 10 20 Metres



LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary

KEYPLAN



Bray to UCD CBC
Sheet 49 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

MATCH

LINE

M11

STONEBRIDGE GROVE

STONEBRIDGE COURT

BUS
BUS
BUS

Bus Gate Signal

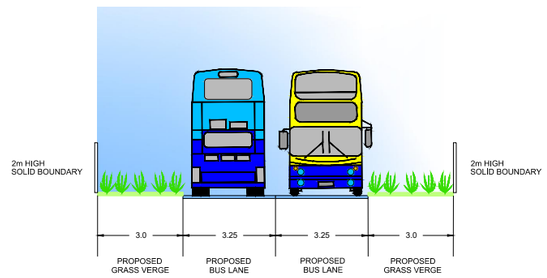
STONEBRIDGE ROAD

FALLS ROAD

MATCH

LINE

PROPOSED SIGNALISED AT GRADE JUNCTION TO PROVIDE BUS PRIORITY AND PEDESTRIAN FACILITIES

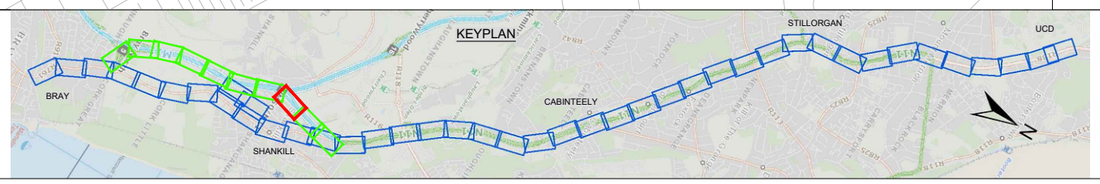


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary
- Proposed Retaining Structure

KEYPLAN



Bray to UCD CBC
Sheet 50 of 52

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ALTERNATIVE OFF-LINE BUS WAY OPTION

FALLS ROAD

PARC NA SILLA RISE

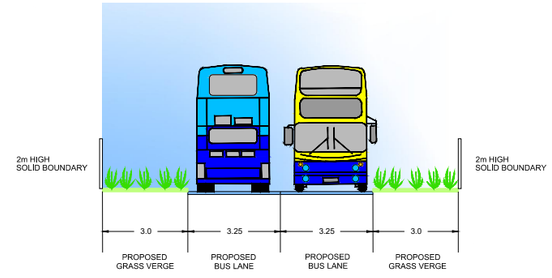
MATCH

LINE

M11

MATCH

LINE

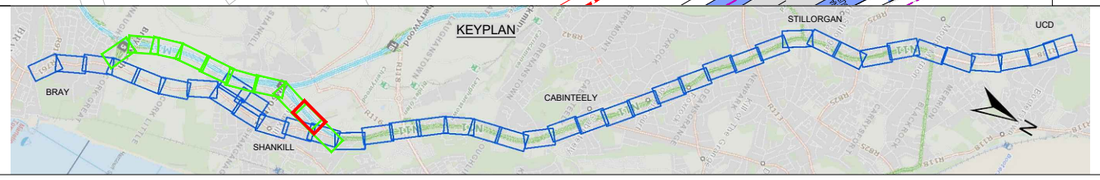


0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary
- Proposed 2m High Solid Boundary
- Proposed Retaining Structure

KEYPLAN



Bray to UCD CBC
Sheet 51 of 52

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A1

PARC NA SILLA RISE

M11

PROPOSED BUS-WAY ROUTE

PROPOSED TOUCAN CROSSING

MATCH

LINE

EXISTING TOUCAN CROSSING TO BE REMOVED

M11

LOUGHLINSTOWN ROUNDABOUT TO BE UPGRADED TO SIGNALISED ROUNDABOUT.

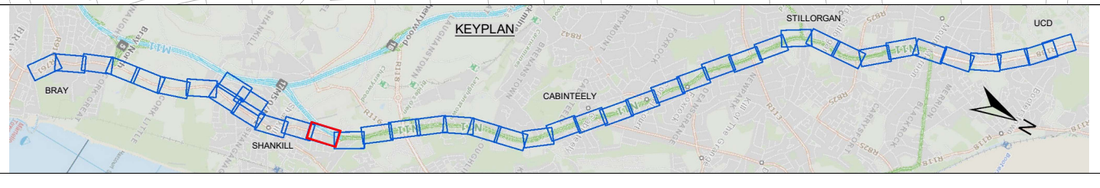
SEAVIEW PARK

0 5 10 20 Metres

LEGEND

- Bus Lane
- Cycle Lane
- Shared Surface
- Carriageway
- Footpath
- Bus Stop
- Possible Land Acquisition
- Existing Boundary

KEYPLAN



Bray to UCD CBC
Sheet 52 of 52

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