



Appendix A

Designer's Risk Assessment

<div>  </div>		Residual Hazard and Risk Log						
Design Stage		AECOM Project Name: Bussconnects - Clongriffin to City centre						
		AECOM Project No:						
Item No.	Feature, element, structures, process or activity considered	Severity	Probability	Risk Factor	Output Residual Hazard to Residual Hazard Log	Output Residual Risk to Residual Hazard Log	Environment/Persons at Risk?	Design input Control to Eliminate or Reduce Hazard and/or Reduce Risk
Construction Activity								
1	Road works and temporary traffic arrangements may pose a hazard to motorists, pedestrians, cyclists and site staff	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Where possible road works are kept to a minimum by using existing bus and cycle lanes as part of the CBC
2	Interaction with GAS utilities	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Site staff	Locations of major Gas infrastructure have been mapped and avoided by the design where possible. Appropriate utility authorities will be contacted before commencing work around utilities.
3	Interaction with high voltage utilities	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Site staff	Locations of major electricity infrastructure including substations and high voltage cables have been mapped and avoided by the design where possible. Appropriate utility authorities will be contacted before commencing work around utilities.
4	Interaction with Aviation Fuel Line utilities	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Site staff	Proposed locations of Aviation Fuel Line have been received and avoided by the design where possible. Appropriate utility authorities will be contacted before commencing work around utilities.
5	Felling of trees during road construction	1	3	3	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Appropriate traffic management and safety procedures shall be carried out for safety of road users. Roads may be temporarily closed if required.
6	Deep excavation during roadworks adjacent to live traffic.	4	2	8	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Appropriate traffic management and safety procedures shall be carried out to prevent persons falling from height, burial under earth-falls and engulfment in swamplands.
Operational Activity								
7	Conflict between cyclists and bus passengers at bus stops	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Bus stops have been designed in accordance with the National Cycle Manual. Where space allows island type bus stops have been used to eliminate the hazard
8	Conflict between cyclists and left turning traffic at junctions	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Junctions have been designed in accordance with the National Cycle Manual. For junctions with particularly high volumes of left turning traffic or where left turning bus priority is to be provided cyclists will cross using a toucan crossing instead.
9	Poor quality pedestrian facilities at junctions	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users, Pedestrians	Footpath access and dimensions vary throughout considering the local demographic and traffic volumes, designed according to current NTA thinking. When necessary roundabouts have been converted to signalised junctions.
10	Requirement of cyclists to share lanes with traffic or buses	2	4	8	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Alternate 'quiet routes' have been considered for cyclists, for e.g. the Marino diversion onto Haverty road to separate cyclists away from the general traffic; traffic calming measures have also been considered for Haverty road to reduce the speed and volume of traffic using these lanes.
11	Lack of pedestrian crossings at bus stops	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users; Pedestrians	Each bus stop location has been reviewed and bus stops have been moved or additional pedestrian crossings have been designed where required.
12	Poor facilities for right turning cyclists	3	3	9	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Each junction has been analysed to ensure provision for all right turning cycle movements; most junctions are redesigned as protected junctions for easier use and safety for cyclists. Signal cycles will be redesigned to allow cyclists to easily move in any direction required.
13	Construction of manholes along the proposed roadways.	2	2	4	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Manholes may be constructed along the roadways to provide access to utilities. Ideal locations for the manholes in order of most favourable to least preferred are on the verge, on the footpath, on the cycletrack, and on the carriageway. Where manholes appear along the cycle tracks, inlay manhole covers shall be provided. Where manholes appear along the carriageway, it will be endeavoured to locate the manhole covers outside the wheel track of traffic; this may lead to road closure whenever the manholes need to be accessed for maintenance of utilities.
14	Extensive interaction with live traffic on all sections of the routes during the project	3	5	15	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Appropriate safety procedures will be carried out by the construction team to reduce all risks; appropriate warning signs and lights will be put up during construction to protect the road users as well as the construction staff.
15	Extensive interaction with live traffic on all sections of the routes during the project	3	5	15	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Appropriate safety procedures will be carried out by the construction team to reduce all risks; appropriate warning signs and lights will be put up during construction to protect the road users as well as the construction staff.
16	Likely interaction with Aviation Fuel Line utilities at several locations along the routes (These have not been identified at this stage).	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Site staff	Appropriate authorities will be contacted in dealing with underground utilities. Appropriate procedures will be carried out by the construction team to reduce all risks.

AECOM		Residual Hazard and Risk Log							
		AECOM Project Name: Bussconnects - Clongriffin to City centre							
Design Stage	Prelim Design	AECOM Project No:							
Item No.	Feature, element, structures, process or activity considered	Severity	Probability	Risk Factor	Output Residual Hazard to Residual Hazard Log	Output Residual Risk to Residual Hazard Log	Environment/Persons at Risk?	Design input Control to Eliminate or Reduce Hazard and/or Reduce Risk	
17	Likely interaction with gas mains at several locations along the routes (These have not been identified at this stage).	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Site staff	Appropriate authorities will be contacted in dealing with underground utilities. Appropriate procedures will be carried out by the construction team to reduce all risks.	
18	Likely interaction with pressure mains at several locations along the routes (These have not been identified at this stage).	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Site staff	Appropriate authorities will be contacted in dealing with underground utilities. Appropriate procedures will be carried out by the construction team to reduce all risks.	

<div>AECOM</div>		AECOM Project Name: Bussconnects - Clongriffin to City centre			Residual Hazard and Risk Log			
Design Stage	Concept	AECOM Project No:						
Item No.	Feature, element, structures, process or activity considered	Severity	Probability	Risk Factor	Output Residual Hazard to Residual Hazard Log	Output Residual Risk to Residual Hazard Log	Environment/Persons at Risk?	Design input Control to Eliminate or Reduce Hazard and/or Reduce Risk
Construction Activity								
1	Road works and temporary traffic arrangements can pose a hazard to motorists, pedestrians, cyclists and site staff	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Where possible road works are kept to a minimum by using existing bus and cycle lanes as part of the CBC
2	Interaction with high voltage utilities	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Site staff	Locations of major electricity infrastructure including sub-stations and high voltage cables have been mapped and avoided by the design where possible
Operational Activity								
3	Conflict between cyclists and bus passengers at bus stops	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Bus stops have been designed in accordance with the National Cycle Manual. Where space allows island type bus stops have been used to eliminate the hazard
4	Conflict between cyclists and left turning traffic at junctions	2	3	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Junctions have been designed in accordance with the National Cycle Manual. For junctions with particularly high volumes of left turning traffic or where left turning bus priority is to be provided cyclists will cross using a toucan crossing instead
5	Poor quality pedestrian facilities at junctions	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users, Pedestrians	Pedestrian facilities at all junctions have been reviewed and improved in accordance with DMURS. When necessary roundabouts have been converted to signalised junctions. All bell mouths at minor junctions designed to standards in DMURS
6	Requirement of cyclists to share lanes with traffic or buses	2	4	8	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Where the cross section is not wide enough to provide dedicated cycle lanes, it may be necessary for cyclists to share a lane with buses or general traffic. This poses a risk to cyclists, particularly inexperienced cyclists. Where this situation arises an alternate “quiet route” has been designed or measures have been taken to reduce the speed and volume of traffic using these lanes
7	Lack of pedestrian crossings at bus stops	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users; Pedestrians	Each bus stop location has been reviewed and bus stops have been moved or additional pedestrian crossings proposed where required
8	Poor facilities for right turning cyclists	3	3	9	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Road users	Each junction has been analysed to ensure provision for all right turning cycle movements
9	Extensive interaction with live traffic on all sections of the routes during the project	3	5	15	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Standard site safety practices will be carried out by the site staff.
10	Work adjacent to the Luas line at Beresford Place	2	2	4	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Road users, Site staff	Standard site safety practices will be carried out by the site staff.
11	Likely interaction with gas mains at several locations along the routes (These have not been identified at this stage).	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Site staff	Standard site safety practices will be carried out by the site staff.
12	Likely interaction with pressure mains at several locations along the routes (These have not been identified at this stage).	3	2	6	No residual hazards from road works after demobilisation	No residual risks from road works after demobilisation	Members of the public, Site staff	Standard site safety practices will be carried out by the site staff.



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