Submission No.	261
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Letter Re: Railway Order Application - Metro North: Estuary through Swords, Dublin Airport, Ballymun, Glasnevin and City Centre to Charlemont, Co. Dublin				
1	Summary - Glasnevin interchange	2	We express our support for the MetroLink project, a significant and long overdue contribution to the provision of a world class urban transit for Dublin. We note with thanks that the Metro Link team has incorporated the Glasnevin interchange previously ruled out as technically infeasible by the former Metro North team. This will become a critical modal interchange for Dublin in years to come. We are however obliged to call attention to the fact this proposal is a compromised solution with poor integration. It will not only be inconvenient to passengers but plain embarrassing that for several billion spent, we ended up with a disjoint and poorly integrated solution.	TII wish to thank you for your submission and support for the delivery of MetroLink. EIAR Chapter 04 (Description of the MetroLink Project) details the urban realm and landscaping design of Glasnevin Station, including its integration with the Iarnród Éireann station. As detailed, the Glasnevin station box will be constructed under both the Western Commuter and the South-Western Commuter Lines. The Glasnevin underground station will have five levels comprising the Iarnród Éireann platforms, concourse, mezzanine and platform levels. The arrangements give access from the Cross Guns Bridge on Prospect Road to maximise pedestrian access to the Iarnród Éireann and MetroLink stations. The station will include a pavilion providing a shared entrance to both MetroLink and Iarnród Éireann stations, as well as clear wayfinding to both modes. Access to the station from street level will be from Prospect Avenue where passengers will enter the new station building and go either directly to the Iarnród Éireann services at level 1 or to MetroLink services at level 2. A common paid area is provided for both heavy railway lines, with separate gate lines for each. This provision allows the Iarnród Éireann part of the station to operate independently of MetroLink once passengers have passed through the gate lines. Internally, the South Concourse will operate as an intermodal space below the railway track and platforms, used by passengers from MetroLink who wish to join Iarnród Éireann services. The underpass also has stair and lift access from the Iarnród Éireann platforms. Given the forecast number of passengers and interconnection with Iarnród Éireann, two escalators and one stairway will provide access between the mezzanine and each platform, facilitating an integrated solution. TII believe the proposed design will allow for efficient passenger interchange between Irish Rail and MetroLink.
2	Summary - DART Underground project	2	The failure to progress the DART Underground project has resulted in the awkward diversion of the Metro via Tara Street.	Chapter 07 (Consideration of Alternatives) details the decision-making process that has led to the development of the proposed Project, including the route alignment and station locations. A station at Tara Street provides good interchange opportunities, serves important key trip attractors in the study area with high potential passenger trips. This option also takes a direct and short route through areas of high demand in the centre of the study area. As Dublin's public transport network grows through the implementation of higher capacity bus routes, more frequent heavy rail services and coverage, and the expansion of the light rail network it is critically important that to achieve the full benefits and capitalise on these investments that they are integrated fully where appropriate to attain "the network effect". High quality interchanges can significantly broaden the transport offer for their catchment and add to the appeal and attractiveness of sustainable transport by ensuring that people can easily change services to access a wider range of places by these modes, and each scheme should be designed to ensure that these are as seamless as possible.
3	Integration	2	All interchanges except Glasnevin are "out of station" and require passengers to exit, cross public footpath and in the case of Dublin Airport interact with road traffic. This is unacceptable. This has accessibility impacts by complicating the connection. Claims that others will "fix" these issues later are not acceptable.	The EIAR Chapter 6 (Operations & Maintenance) describes how the proposed Project will interface with existing and future transport services. Each of the proposed stations has been designed to provide a high-quality environment at the station approach to ensure easy access from the existing pedestrian footpath network surrounding the station. The Transport for London Pedestrian Comfort Guidance for London (Transport for London 2010) was used as a reference during the design development process to guide the design of access to each station to ensure that pedestrian footpaths and road crossings are appropriate to the volume and type of users accessing the stations. The proposed Project has been designed on the principle of Access for All. The design has been developed to meet all legislative requirements relevant to accessibility including the Disability Act 2005 and in turn the Sectoral Plan for Accessible Transport under the Disability Act 2005 (DTTAS 2012). The approaches to the station entrances are positioned to provide convenient access with minimal changes in level. Design features to facilitate safe access to the station entrance include signalised crossings, 'raised tables' within the roadway to reduce traffic speed at pedestrian crossings and dropped kerbs on pavements on both sides of the crossing to remove a trip hazard and aid wheelchair users and people with wheeled luggage. Tactile paving surfaces will warn pedestrians with visual difficulties of the absence of a kerb and guide them in the direction of the crossing. The pedestrian routes to the station will be logical and clear to understand. They will have a generous clear width, which will be sufficiently wide to allow adequate space for wheelchair users and be free of obstacles. Wheelchair ramps will provide an alternative to avoid steps. All passengers will be able to pass easily though the station entrance and via stairs, escalators or lifts and walkways to the platforms. These features have been designed sufficiently wide to be accessible for wheelchair users as well as accommodate other design parameters such as emergency evacuation.

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4	Accessibility	2	A minimum of two lifts should be provided at each station entrance, and for the transition from each platform to mezzanine level. Given the frequency of service and passenger numbers two lifts will be needed and this provides redundancy in event of breakdowns.	The EIAR Chapter 6 (Operations & Maintenance) describes accessible design of stations, including the provision of lifts at all stations. Flow assessments by static analysis and modelling of the busiest station were developed to size the stations and its vertical connections. Dublin Airport Station, due to its particular characteristics and the passenger profile, required 6 elevators. However, this was not the case in other locations once their expected demands were considered over 30 years. The underground stations are served by public lifts, generally with one lift connecting the street to concourse level, and two lifts from concourse to platform level. More lifts are proposed at stations forecast to experience a higher footfall or to serve two entrances, such as at Northwood and Tara Street Stations. The lifts are sized to carry either 13 or 33 passengers depending on lift size. Passenger lifts will provide access to all levels within the station and to both the northbound and southbound platforms from street level. In the event of lift failure, staff at the Operational Control Centre or within the station will be warned by an alarm, and a staff member will be directed to the station. In the event of public lifts undergoing maintenance, the intervention lift will be in operation.
5	Single Bore Tunnels	2	The choice of single bore tunnel is at odds with normal practice globally. Twin bore has significant safety and operational benefits as engineering works on one track do not impede traffic on the other. In a worst case scenario of a fire or derailment the single bore option offers considerably worse outcomes for both passengers and infrastructure. Twin bore provides for a central island platform and thus the station box required is narrower also savings can be made in terms of number of escalators and lifts. This is the most common design used in modern systems e.g. Munich, Stockholm, Prague, Amsterdam, Vienna, Budapest.	The EIAR provides the rationale and benefits of a single bore tunnel. In the development of the EPR, a comprehensive tunnel configuration study was undertaken to determine the most appropriate tunnel type for the proposed Project (This report can be reviewed at www.metrolink.ie). A detailed comparative analysis of twin versus single bore tunnel has been undertaken, including a review of other successfully operated single bore configuration metros such as Barcelona Metro, Cross Rail, High Speed 1, and Lyon Metro, among others. In the development of the EPR, a comprehensive tunnel configuration study was undertaken to determine the most appropriate tunnel type for the proposed Project (This report can be reviewed at www.metrolink.ie).EIAR Chapter 7, section 7.7.2.2.1 Overall Conclusions, notes that this analysis identified that a single bore tunnel option offered significant benefits for the proposed Project when compared to the twin bore solution that was proposed at the Emerging Preferred Route (EPR) stage. These benefits include: <u>Passenger Evacuation and Incident Management (such as fire or derailment):</u> • The single bore configuration enables safer and faster passenger evacuation from the ends of the train directly onto tracks, rather than more challenging lateral evacuation on to an elevated walkway along the sides of the tunnel required for a twin bore configuration. • The single bore provides increased space for emergency services access and working space adjacent to a train in the tunnel. • Conditions can be created within a larger single bore diameter tunnel that facilitates smoke stratification at a high level in the bore for a longer period of time when compared to that in a twin bore configuration. Therefore, the single bore configuration facilitates enhanced evacuation conditions and provides better tunnel visibility during fire events when compared to the twin bore solution. • The single bore configuration offers a more flexible system throughout the life cycle of the asset in that it allows operational adjustments such as additional track crossovers without the need to build new infrastructure / tunnels. <u>Programme and Cost</u> - A single bore tunnel can be constructed at lower cost and quicker than a twin bore configuration due to: • The overall reduced volume of structure to be constructed i.e. twin bore tunnels will require more concrete and steel, and an overall greater volume of excavation. • Not only can the single bore tunnel itself be constructed more quickly, and hence reduce the construction programme as less overall volume of material needs to be excavated (referenced in MetroLink Tunnel Configuration Study, ARUP) but also there is no requirement for cross-passages, which are slow to construct and need to be mined as separate construction activities after the main tunnel has been built, adding time to the programme and a complex activity dependency to be managed. • There is no requirement to construct extra mined/cut & cover sections required to accommodate track crossovers since these can be accommodated in the single bore tunnel, that the twin-bore cannot accommodate. (It is recognised that the single bore configuration unlike the twin bore arrangement means there is a need for intervention shafts where the distance between stations is greater than 1000m. This only occurs at one location on the Project between Griffith Park and Collins Avenue stations and overall is offset by the benefits listed.) • As there is only one TBM to drive or pull through stations under construction, the station programme durations are reduced together with schedule interface risks with other programme critical construction activities.

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			Response (5) continued.	Environment • The reduction in excavation means spoil, quantities, handling and disposal is reduced and hence traffic on the roads and the follow on volume of land fill disposal is reduced. • The reduction in concrete and steel that will be used to manufacturer the tunnel lining precast segments will be reduced for a single bore tunnel and will therefore reduce the traffic on the roads. • There is an overall reduced environmental impact since the construction programme is quicker, less materials are needed for construction (reduced use of natural resources and traffic to transport materials to site), less excavation (spoil disposal volumes are reduced resulting in less traffic on the roads and reduced landfill), and an overall reduction in embedded carbon as a result of the reduced volume of material (steel and concrete) required compared to a twin bore configuration.
6	Train Length	2,3	64m is restrictive and is well below the length of typical metro trains elsewhere which are typically around 100m. This is a one way decision, platform extensions are not a later option which has badly impacted metros elsewhere. As we are building for the next 100+ years starting with the assumption that 90 minute headways are going to be by design is not a good starting point. It is likely in the fullness of time there will be a Metro West branching off the route south of the airport and a possible Green line upgrade and south west metro to Tallaght. We have consistently under specified capacity in Dublin, noting the original Green line was specified for 30 metre trams, later revised to 40m and now 52m. Station platforms of a minimum of 80m should be built to allow for future scope to expand.	The EIAR Chapter 4 (Description of the MetroLink Project) provides a detailed description of the proposed Project, and all of the infrastructure and systems required to deliver the MetroLink Project. All station platforms will be 65m in length (slightly longer than the trains of 64m) and at least 3m wide. The design for the width of the platforms is based on the predicted number of passengers, assumptions about the distribution of passengers along the platform, and the position of other features such as the stairs and escalators. This approach follows Station Planning Standards and Guidelines, Transport for London, 2012 and Station Capacity Planning, Transport for London S1371. With the assessment considered to be appropriate, 100m platforms are not required. The trains for the proposed Project will comprise bi-directional, high floor trains capable of providing the required demand of up to 20,000 passengers per hour per direction (pphpd). Doors on either side of the train will be used according to the direction of travel. The 20,000 pphpd is achieved by providing 40 trains per hour, each with a capacity for 500 passengers. This is equivalent to 100 seconds operational headway. The service pattern developed around this headway is explained further in the Section 6.5.4 of Chapter 6 (Operations & Maintenance).
7	Charlemont Station	3	The reversing section at Charlemont appears to be able to store only a single train while allowing one track for reversing. As the metro will be fully automated it would be operational helpful to be able to store several trains at Charlemont to dynamically manage frequency so the stub section would need to be 140 - 150m long not that current ~70m. Proximate is not integrated. Single flight of stairs to provide connection to Luas at Charlemont is insufficient in capacity terms given we expect a large turnover of passengers at this location given lack of integration at St Stephens Green. Dedicated separate lifts and stairs should be provided for each Luas platform side to Metro station mezzanine level below, avoiding the need to walk on the street.	The turn-back section south of Charlemont is approximately 250m long, and facilitates 4 train positions to allow the turn-back frequency to be achieved. A detailed analysis of the operations and service pattern is provided in Chapter 06 (MetroLink Operations and Maintenance). Appendix A9.2-B presents a Traffic and Transport Assessment of Charlemont Station during the Operational Phase, including pedestrian assessments. A microsimulation VisWalk model has been developed for the immediate area surrounding Charlemont Station, including the Luas stop. Observations show that the existing street layout and Luas access facilities provide a low level of service for pedestrians. In order to accommodate forecast demand from the Project station, a new staircase with 2.4m stair width is proposed at the south-east corner of Charlemont Luas stop. An elevator will also be provided at this location. In addition, it is proposed that the pedestrian crossing on R111 Grand Parade be repositioned to the front of the Hines Building. With this pedestrian infrastructure in place, the model indicates that pedestrian movements around Charlemont Station will have an acceptable level of service.
8	St Stephens Green	3	Single pedestrian entrance is insufficient given significant demand from Lesson Street end, a second entrance should be provided. It's confusing that Charlemont gets two entrances yet St Stephens Green which clearly will have a greater flow of passengers has only one.	Passenger forecasts together with Access for All design guidelines have been used to design the size and layout of the public areas used by passengers, including the entrances, as detailed in Chapter 06 (MetroLink Operations and Maintenance). At Charlemont Station, high passenger numbers are anticipated, with an anticipated passenger flow of 223 passengers per minute. Good practice should assume one escalator may stop due to maintenance, and in such instances, the northern entrance would be reduced to two escalators only. In such an instance, the single exit would not be sufficient to support an anticipated passenger flow of 223 passengers per minute. The addition of a second entrance/exit allows for a total of five escalators to be facilitated, with is sufficient to support the anticipated passenger flow. Therefore, two entrances are required at this particular location due to the passenger numbers expected. Other stations may have three escalators to mezzanine level as they have lower anticipated passenger numbers, and therefore do not require additional entrances/exits.

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9	Tara Street Station	3	Zero integration with Irish Rail at Tara Street. Given the curved platform at Tara Street it is a poor location for high volume interchange of passengers. No amount of work will address the Irish Rail platform interface issues at Tara Street. Stating it is future work for Irish Rail is not acceptable, everything needs to be included in the works order to avoid issues and to minimise the duration of construction on site. With the long term plan to build DART underground, Glasnevin and St Stephens Green would provide connections to all rail routes and thus Tara Street would not be needed at all as an interchange. There are significant long term benefits to not connecting at Tara Street: 1. Remove one station and a provide a more direct alignment cost and construction time saving 2. Shorter alignment and fewer stops, fewer trains required to maintain frequency 3. Shorter alignment and fewer stops, shorter end to end journey time which drives passenger demand and modal transfer 4. Eliminates significant and disruptive residential and commercial property demolition 5. Reduced construction impact on city 6. Eliminates subsidence risk or other construction risk on Loop line viaduct, see recent incident in Berlin at Alexanderplatz on line U2 where nearby construction has shut the line as an example.	Appendix A9.2-O presents a Traffic and Transport Assessment of Tara Street Station during the Operational Phase. A micro-simulation VisWalk model has been developed for the immediate area surrounding the Tara Street Station, including the full extent of the publicly accessible station area, and the Irish Rail station. The model indicates that the proposed design for the station is expected to perform with an acceptable level of service. The proposed public plaza offers a high level of service regarding pedestrian routing. The north side of Townsend Street experiences relatively high levels of pedestrian demand, however the proposed design to widen Townsend Street at this location (at the Moss Street junction) facilitates improvements to pedestrian congestion and the crossings at this location. Please refer to response item (2) above in relation to the need for the Project to serve Tara Street. As part of the Transport Strategy for the GDA 2022-2042, DART Underground will not be delivered until a period after 2050, and therefore its benefits will not be received during part of the MetroLink's operational years.
10	O'Connell Street	4	Provision for direct access from the Luas platform into the Metro station is desirable. A simple stairwell at the end of the platform would suffice. The south end of the platform would appear logical.	The provision of additional access stairs by the southern side is not feasible as the area will be occupied by a new development to be constructed above the station. In addition, three buildings and the full façades from North to South at O'Connell Street must be preserved because they are considered as part of the architectural heritage of Dublin. Moreover, the inner arrangement of the station would be highly impacted by including an entrance on the southern side. Interchange with the Luas Green Line is facilitated at Charlemont Station through the provision of a stairwell and a lift.
11	Dublin Airport	4	Zero integration at Dublin Airport for arriving or departing passengers, external walk requiring interaction with vehicular traffic is required to reach the station which is unacceptable for integration and accessibility purposes. This is not best practice and represents a substandard solution. Stating it will be the DAA's problem is not a solution. Options for an underground walkway from both T1 and T2 need to be considered to ensure good integration and to avoid pedestrian interaction with road traffic. T1 seems feasible given the existing basement/Area 14. T2 will require an option exercise likely option is to leverage the existing bridge to the short term car park and build access via the T2 short stay car park.	TII's latest version of the VISWALK model is based on the approach agreed with DAA in April 2022. The model has been prepared for future year scenarios of 2035, with forecast pedestrian demand based on ERM and vehicle demand based on daa projections. This model indicates that the airport road network will operate with adequate capacity for vehicles and pedestrians, even with the addition of MetroLink passengers. All the crossings in the immediate vicinity of MetroLink and the GTC operate efficiently for both pedestrians and vehicles, with no excessive vehicle queuing or pedestrian crowding evident. The TII VISWALK model demonstrates that signal timings can be implemented that would accommodate both pedestrians and vehicles, vehicles can be accommodated without excess delay and that an appropriate LoS would be provided for pedestrians. The VISWALK assessment also demonstrates there is sufficient capacity to accommodate vehicles on the Airport network with no queuing back to the motorway occurring. TII confirm that current pedestrian modelling does not justify the need for an additional walkway, either above or underground and as such the design does not include for such a walkway.