IN THE MATTER OF AN APPLICATION TO

AN BORD PLEANALA

For Approval of the Railway (Metrolink – Estuary to Charlemont via Dublin Airport) Order [2022]

ABP-314724-22

ORAL HEARING

STATEMENT OF EVIDENCE

on

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme

(ii) Errata

(iii) Agreements presented to the Oral Hearing

(iv) Updates to the EIAR

By

Ronan Hallissey

19 February 2024

MetroLink Oral Hearing
Brief of Evidence of Ronan Hallissey

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme (ii) Errata (iii) Agreements presented to the Oral Hearing (iv) Updates to the EIAR

1 Qualifications and Role on the MetroLink Project

1.1 I am employed by Jacobs as a Senior Associate Director of Environment and have over 20 years' experience in the environmental sector. I hold a BSc (Hons) in Environmental Biology and a PhD in Environmental Engineering. I am also a Chartered Environmentalist with the Institute of Environmental Sciences. I have worked in environmental consultancy for over 20 years, and during this time, I have worked on a wide variety of projects, ranging from rail projects to highways to electricity generation and transmission, to water and wastewater projects.

1.2 I have worked on the MetroLink project since 2018 leading on the Environmental team in the preparation of the Environmental Impact Assessment Report, the Natura Impact Statement and all associated documentation.

1.3 My evidence is concerned with:

1.3.1 Amendments to the Railway Order and Schedules / drawings and modifications to the scheme;

1.3.2 Presentation of the Errata document;.

1.3.3 Agreements presented to the Oral Hearing; and

1.3.4 Updates to the Environmental Impact Assessment (EIAR);

2 Errata

TII would like to submit to the Inspector a draft Errata document to the EIAR. This will be updated during the Oral Hearing process and a final revision will be submitted at the end of the Oral Hearing.

3 Agreements presented to the Oral Hearing

TII would like to submit to the Inspector details of agreements reached with DCC,FCC,DAA.

4 Schedule of Mitigation

TII would like to submit to the Inspector the following schedules of mitigation measures, in addition to those presented in the EIAR.

Any further mitigation measures arising out the Oral Hearing process will be submitted at the end of the Oral Hearing process.

5 Updates to the EIAR

5.1 TII would like to bring to the Inspectors attention a number of updates to the EIAR and associated documentation that have been introduced since the MetroLink Draft Railway Order was lodged in September 2022 .. The updates are presented here in order of the EIAR chapters that are affected. This includes the following updates:

5.1.1 Chapter 4 Description of the MetroLink Project

(a) Assessment of the proposed changes to the landscape design along the R132 to include the re-instatement of existing walls;

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme (ii) Errata (iii) Agreements presented to the Oral Hearing (iv) Updates to the EIAR

In the draft Railway Order, a continuous linear landscaped area was proposed in proximity to Ashley Avenue, Estuary Court and Seatown Villas (Refer to Drawings ML1-JAI-ARL-SC01_GF-DR-Y-00003 and ML1-JAI-ARL-SC02_GF-DR-Y-00004. The existing boundary walls and vegetation were to be removed to facilitate the enabling works required for the creation of MetroLink. Following construction, a number of footpaths would be created with associated landscaping to create a continuous landscaped park through this area.

However during the Statutory Consultation period for the draft Railway Order application, residents of Ashley Avenue, Estuary Court and Seatown Villas expressed concern at the loss of existing boundary walls that in their view will have a negative impact on their privacy, security, visual amenity, and safety.

TII acknowledges these concerns and has continued to work with local resident's groups following the lodgement of the draft Railway Order application to address concerns that have been expressed. Following this engagement TII are proposing the following to address the concerns of residents:

- The existing boundary wall that is present along the R132 will be removed prior to construction and reinstated following the completion of the works. It will be of the same scale and material as the present boundary wall.

- The existing landscaping that is present along the R132 will be cleared prior to construction and reinstated following the completion of the works. Trees and landscaping will be reinstated as far as is practicable. It may be the case that new planting will also be provided, which will take time to mature to the level of the existing landscaping.

On this basis, TII would like to submit to the Board a revised drawing pack that will illustrate the amendments to the proposed design.

In addition, TII have undertaken an additional assessment of the potential environmental effects of this design change. This entailed a qualitative assessment to identify if there are any significant differences between the potential environmental effects presented in the MetroLink EIAR, and those resulting from an option where the existing boundary wall and landscaping is reinstated at Estuary Court, Seatown Villas and Ashley Avenue.

A two-stage environmental review was undertaken to identify any potential for significant environmental effects not already assessed in the MetroLink EIAR:

- **Stage 1 Scoping:** As a result of reinstating the existing landscape rather than creating the proposed landscaped area, a review of the potential for additional environmental effects not previously considered by the MetroLink EIAR.

- **Stage 2 Assessment:** A review of the potential environmental effects determined at stage 1 to determine whether these are significant or not.

Stage 1 – Environmental Effects Scoping

The environmental scoping exercise undertaken, identified the environmental subjects that have the potential for additional Significant Effects above those already assessed in the EIAR where they are not mitigated.

This scoping exercise identified that further analysis should be undertaken at Stage 2 under the following headings:

- Human Health
- Population and Land Use
- Biodiversity;
- Land Take; and
- Landscape and Visual;

In addition the proposed amendments to the design in the draft Railway Order were considered in the context of their compliance with planning objectives.

Stage 2 – Environmental Assessment

Potential for Human Health Impact

- Potential for Human Health impacts could arise due to changes in the receiving environment having regard to Air Quality, Noise & Vibration, Access and Amenity use and overall physiological effects. Section 10.5.1.1 of Chapter 10 (Human Health) *"identifies a generally negligible or slight negative impact on air quality in the vicinity of the proposed project during the Construction Phase post mitigation. No exceedances of air quality standards are predicted, therefore, no significant adverse human health impacts are predicted".* There is not considered to be any additional human health impacts as they relate to air quality resulting from the reinstatement of the existing boundary wall and landscaping.

- The EIAR has identified that with the implementation of selected noise barriers/walls, there will be no significant noise effects on properties in these areas due to the proposed Project. It should be noted that the noise barriers are proposed not to mitigate against MetroLink, but rather to mitigate road noise from the R132..In the event that the walls along the R132 are reinstated there will be no additional negative effects on the noise environment in the vicinity of these properties.

- MetroLink will provide rapid and efficient public transport which increases access to services for the entire population. These benefits will be particularly felt by those without access to private transport. Section 10.5.2.10 of Chapter 10 (Human Health) states that "transport is an important facilitator of social inclusion and wellbeing, which can affect economic and social outcomes, and therefore inequality". The methodology section highlights positive socioeconomic development as "one of the greatest influences on positive health outcomes". Reinstating the existing boundary wall and landscaping will not affect the positive impacts of access to services, equity or socioeconomic development. Returning the landscaping and boundary wall to the existing condition will mean linkages through the area not created as envisioned in the draft RO application and therefore permeability and access to the R132 will not improve. However, this is no change from the baseline conditions and therefore MetroLink causes no impact on access to services and development.

- Overall, the reinstatement of the existing boundary wall and landscaping will not lead to additional impacts on human health than as presented in the Railway Order application, with respect to air quality, noise and vibration, psychological effects and access to services, equity and socioeconomic development. However, returning landscaping and boundary wall to existing condition will mean that new linkages are not created, and therefore permeability and access to the R132 will not improve. However, this is no change from the baseline conditions and therefore MetroLink causes no impact on access to services and development.

Potential for Population and Land Use Impact

- Section 11.5.3.4.3 of Chapter 11 (Population and Land Use) states that 'the proposed Project will also restore, enhance, or create open spaces and green spaces at stations and along the proposed Project route across the study area. This includes extensive landscaping along the R132 in Swords. It is designed to provide continuous connectivity through the landscape park from north to south, but also to provide connections to the adjacent neighbourhoods and across the R132, connecting areas in the east and west of Swords across the R132. It will provide new planting, high-quality landscaping and new plazas also on the R132. Overall, the impact on open space, leisure, recreation and sports facilities is considered to be a positive, moderate, permanent effect at the neighbourhood, local and regional level during operation of the proposed Project. If the existing boundary wall and landscaping is reinstated to its current condition, the significance of the impact on open space, leisure, recreation and sports facilities will reduce to positive, slight, and permanent at this location.

- Section 11.5.3.5.2 of Chapter 11 (Population and Land Use) states that 'Stations will be designed to enable local connectivity and linkages, and the provision of a new linear open and green space on the R132 will enhance linkages. As a result, the overall impact on severance at a local level within the Study Area is assessed as a permanent, slight and positive effect. 'If the existing boundary wall and landscaping is reinstated to its current condition, the significance of the impact on severance will reduce to positive, neutral, and permanent at this location. Across the Project, there will be a positive, very slight, permanent effect on severance.

- Overall, if the existing boundary wall and landscaping is reinstated to its current condition, the significant positive effects of the landscaped area will not occur. However, a negative impact is not anticipated, the Project will simply have a neutral effect on green spaces, severance and landscaping at this location.

Potential for Biodiversity Impact

- The baseline environment at all three areas will be reinstated after construction. Therefore, there will be no net difference in biodiversity once the landscape has been reinstated to its original state. There will be no additional impact to birds, mammals, amphibians or reptiles because they are accustomed to the baseline environment. There will be no impact to rare and protected plant species.

Potential for Land Take Impact

Elements of the potential works that have the potential to impact on land take requirements:

- Change from permanent to temporary land take at Estuary Court, Seatown Villas and Ashley Avenue as areas are reinstated to existing conditions and the landscaped area is not created as part of the proposed Project.

If the existing boundary wall and landscaping is reinstated to the current conditions, the areas will be utilised for a period of time to facilitate the construction of the proposed Project but will then be returned to their former usage. This is therefore a temporary land take, instead of permanent.

Table 21.6 Construction Phase Land Take Impact Assessment states that there is a Very Significant effect on land take at Estuary Court, Seatown Villas and Ashley Avenue, due to the permanent loss of green urban space and vegetation required to support construction of the alignment. The land take at these locations is deemed to have a High impact magnitude. There would be no additional negative impacts on property as all land take would occur during construction.

There is no additional impact expected if the existing boundary wall and landscaping is reinstated to its current condition. The land take would change from permanent to temporary.

Potential for Landscape and Visual Impact

As part of the submitted Railway Order application for MetroLink, Environmental Impact Assessment Report (EIAR) Chapter 27 (The Landscape) presents an assessment of the proposed Project's impact on the landscape and visual elements.

As detailed in Chapter 27 EIAR, the proposed Project will provide an integrated series of small local parks complete with play facilities, seating and planting, adjacent to the residential areas and which interconnect to form part of the longer green ribbon proposed alongside the Fingal County Council's R132 proposals. The extensive landscaping is proposed over the cut and cover sections and linking around open cut sections, following the alignment but also extending into the existing open spaces as appropriate in order to provide a comprehensive recreational facility for the adjacent residential communities.

Reinstating the existing boundary wall will remove the landscape connectivity benefits of the existing plan for residents in the affected areas, increasing journey times to public transport and public areas. However, it will not significantly impact the landscape and visual benefits of the proposed plan in surrounding areas which will still see an enhancement of landscape condition and connectivity.

Potential Planning Compliance

The promotion of green infrastructure and in particular the connections made between various open spaces within Fingal, through projects such as provision of parks, is a key overall objective of the current FDP.

The proposed change will reduce the level of connectivity and integration of green infrastructure within Swords. However, this will not lead to non-compliance with policy, rather it will be a reduction in the level of consistency that is achieved.

In combination with other key projects such as the R132 Connectivity Project the achievement of increased access and permeability for pedestrians and cyclists in Swords will be achieved between the proposed stations and across the R132.

The needs of the residents are a key factor in the way the policies and objectives of the FDP are achieved and therefore the engagement between TII and residents in terms of the boundary treatment along the R132 would align with this approach.

Overall, it is considered that proposed reinstatement of the boundary/landscaping **at loactions** along the R132 would not pose a significant additional environmental effect**s or** in terms of overall compliance with planning policy.

(b) Assessment of the inclusion of a drop off point for those with disabilities at Grand Parade just north of the proposed Charlemont station.

Following a public consultation, a drop off for passengers with reduced mobility has been proposed for Charlemont Station. The PRM drop off will require an abutting footpath will overhang the canal by approximately 3.25m. To avoid impacts with the canal structure or its ecology, it is proposed that the footpath is a cantilevered structure constructed solely from Grand Parade and not from within the canal. To accommodate this, a minipile foundation will be constructed landside. Upon completion of construction, kerbs and safety barriers will be installed.

Environmental Assessment Overview

An environmental assessment was undertaken to review any potential for significant effects associated with these proposed minor works. The findings of the assessment are as follows:

- As the proposed minor structure will have no elements in or attached to the Grand Canal itself there is no potential for significant effects on this element of industrial heritage.
- A habitat survey undertaken for this location identified that the habitat at this location consisted of a grassy verge, with the tall-herb swamp habitat further into the canal. There is no ecologically valuable habitat at this location and any potential habitat loss will be minimal considering the very limited extent of the works. As a result any effects are not considered significant.
- There will be no element of construction works undertaken in the canal and works along Grand Parade will be undertaken in line with the CEMP prepared for the MetroLink project. As a result, it is not considered that there will be a significant effect on the hydrology of the canal.
- The provision of a PRM drop off at this location will have a significant positive effect allowing people with reduced mobility to access MetroLink more easily.
- A stage 1 Road Safety Audit has been undertaken and its recommendations have been incorporated into the design. Accordingly, the operation of the Charlemont should have minimal impact on traffic safety in this area.
- Overall, This review has identified that no additional impacts as a result of the MetroLink Project as a consequence of the provision of a PRM Drop-Off at Charlemont.

5.1.2 Chapter 5 MetroLink Construction Phase

(a) The proposed reduction in the vertical upward limits of deviation.

Chapter 5 of the EIAR presents details of the construction methodology and programme for the proposed project. TII wish to make a single amendment to this chapter in regard to the proposed Limit of Deviations

Limits of Deviations

In the Draft Railway Order for MetroLink Limits of Deviation (LODs) are proposed and these LODs are the same as those approved by the Board for "Old Metro North" and "Dart Underground". (Refer to Tables below)

Project Element	Vertically (upwards) (m)	Vertically (downwards) (m)	Horizontally (in all directions from centre line) (m)
Surface works (not impacting on public roadways)	2	2	5
Surface works (impacting on public roadways)	1	1	2.5
Tunnel Alignment	5	10	15

Project Element	Vertically (upwards) (m)	Vertically (downwards) (m)	Horizontally (in all directions from centre line) (m)
Retained Cut and Cut and Cover Alignment	1	2	2.5
Station Box Locations	5	10	2

However a number of submissions received from the statutory consultation process raised concerns with regard to the LODs, particularly those that allowed for movement upwards as it was identified that there was potential for increased impact on buildings should the LOD upwards be allowed.

In response to this, TII proposed to modify the proposed LOD to restrict any potential deviation upwards to just 1m.

These new limits will further reduce potential impacts above the alignment, specifically on:

a) Settlement Effects;

b) Groundborne Noise & Vibration;

c) Effects on future site development potential.

5.1.3 Chapter 7 Alternatives

(a) Presentation on the Collins Avenue Station: Environmental Assessment Report of the Options.

Chapter 7 of the EIAR presents an overview of the decision making at all stages of the proposed Project leading to the proposals that are the subject of this draft Railway Order.

As requested by An Bord Pleanála in Appendix 1 to the Oral Hearing Agenda, TII has now submitted a copy of the Collins Avenue Station: Environment Assessment Report of the Options. This was a preliminary document produced and shared with residents after they requested this. It contained a high level review of the potential environmental effects associated with several location options identified for a station in the Emerging Preferred Route. This assessment was undertaken in order to extract the potential environmental effects in further detail associated with a number of options in the area that were developed and assessed in the New Metro North Alignment Options Report. This was done because the sensitivity of the station location was recognised.

The assessment identified significant potential for environmental effects if not mitigated at the preferred station location:

"*A station at this location would be requiring temporary and permanent land take from Our Lady of Victories Church grounds. There would be potential direct impacts of noise, visual and dust disturbances during the construction phase on sensitive receptors such as the above mentioned church, nearby schools and residents etc. There could be disruption to traffic along R108 during construction thereby causing access impacts to local population. There is the potential for impacts on the setting of buildings with architectural heritage value, and potential for damage to possible buried archaeological assets during construction. The location is within an urban area with some roadside vegetation of limited biodiversity value. This option avoids the significant traffic disruption associated with some of the other options. The location is not within a flood zone or close to any surface waterbodies; however there is a historic river running north-south beneath the church building, although no impacts are predicted."*

As set out in Collins Avenue Station: Environment Assessment Report of the Options, all of the options contained specific sensitivities and had significant effects on surrounding sensitive receptors including the requirement to demolish a number of properties.

The least impactful environmental option identified in the report was a station at Albert College Park. However, this option was not preferred overall for the following reasons:

- This was not the preferred strategic location for a station as it does not achieve the optimum passenger demand, which options closer to Collins Avenue achieve;
- This location was further removed from Collins Avenue and as a result was deemed to provide a substandard interchange opportunity to other public transport routes; and
- This location of a station at Albert College Park would still require extensive construction in this area (i.e to provide an intervention shaft to the north of Albert College Park).

The presentation of environmental effects in the Collins Avenue Station: Environment Assessment Report are those that would arise in the absence of mitigation. It is understandable that residents reading the above mentioned report would have concerns with regard to the environmental effects locally. However with mitigation applied these effects are significantly reduced as set out in the relevant EIAR chapters [Chapter 9 Traffic & Transport, Chapter 10 Human Health, Chapter 13 Airborne Noise & Vibration and Chapter 16 Air Quality] and as summarised in Chapter 31 Summaries of the route wide mitigation measures of the EIAR.

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme (ii) Errata (iii) Agreements presented to the Oral Hearing (iv) Updates to the EIAR

5.1.4 Chapter 9 Traffic & Transport

(a) Assessment of the effects of the Greater Dublin Area Transport Strategy 2022 – 2042 on the analysis presented in the MetroLink EIAR.

Since the draft Railway Order was lodged in September 2022, the Transport Strategy for the Greater Dublin Area 2022-2042 has been published. This strategy document outlines how the transport networks throughout the region will be developed over the period 2022 until 2042.

This strategy document replaces the existing Transport Strategy for the Greater Dublin Area 2016-2035 due to the requirement under the Dublin Transport Authority Act 2008 for the National Transport Authority (NTA) to review its transport strategy every 6 years.

The Greater Dublin Area 2022-2042 Transport Strategy has identified new strategy objectives:

- To create a better environment and meet our environmental obligations by transitioning to a clean, low emission transport system, increasing walking, cycling and public transport use, and reducing car dependency.
- To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling.
- To support sustainable economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to, and facilitating the efficient movement of goods.
- To provide an Inclusive Transport System To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.

Due to the amended strategy that included revised project delivery assumptions in addition to some amendments to projects proposed under the strategy, revised traffic and transport modelling was undertaken to ensure that the basis of the assessments presented in the EIAR are still valid. The following remodelling was undertaken:

- Remodelled Metrolink with the new GDA Strategy for the years 2050, and 2065 and compared to results presented in the EIAR;
- Reviewed the changes in flows for zones along the length of the Metrolink Alignment
- Rerun the ENEVAL model to identify the impact on climate with the new GDA Strategy for 2050 and 2065

On the basis of this analysis, an update document has been prepared and it will be presented to the Board to inform the Environmental Impact Assessment. In summary new modelling for 2050 identified that:

- The profiles are very similar for each time period in the New GDA compared to the Prior GDA;
- In the AM peak the maximum line flow is approximately 13,000 (SB) in the new GDA , compared to 11,000 in the Prior GDA

- The LT and SR periods have similar line flows
- In the PM peak, the maximum line flow is approximately 7,000 (NB) in the new GDA compared to 8,000 in the Prior GDA

In summary new modelling for 2065 identified that:

- The profiles are very similar for each time period in the New GDA compared to the Prior GDA;
- In the AM peak the maximum line flow is approximately 16,000 (SB) in the new GDA , compared to 14,000 in the Prior GDA
- The LT and SR periods have similar line flows
- In the PM peak, the maximum line flow is approximately 9,000 (NB) in the new GDA compared to 9,500 in the Prior GDA

Key Findings of the analysis:

a) ***Fitness for Appraisal:*** Both the original and new GDA models are deemed suitable for the Metrolink appraisal, ensuring robust analysis and decision-making. The latter version shows better level of convergence than the former one.

b) ***Consistency in Passenger Distribution:*** The distribution of passengers through metro stations remains consistent in both GDA scenarios, providing stability in expected travel patterns.

c) ***Impact of New GDA Changes:*** The modifications introduced in the new GDA contribute significantly to non-car modes, presenting favourable implications for the Metrolink project.

d) ***Noise & Vibration:*** The GDA figures were reviewed and did not result in any increase in traffic noise levels across the project.

e) ***Air Quality:*** Addressed in Air Quality Section.

f) ***Climate:*** Addressed in Climate Section.

5.1.5 Chapter 9 Traffic & Transport

(a) Assessment of the effects of the Census 2022 and the Pobal Deprivation Index data on the assessment presented in Chapter 11 of the EIAR. Clarification on the Operational Stage impact of the proposed Project on development potential

Chapter 11 of the EIAR uses key Census data as part of its baseline assessment of population and its associated demographic and socio-economic characteristics along the route. This data is from the published 2016 Census, which was the most recent at the time of the submission of the EIAR. However, Census 2022 data has been incrementally published, largely in 2023, with updated statistics available. As a result, the analysis presented within Chapter 11 of the EIAR has been reviewed in the context of this new data.

In Section 1/AZ1, the percentage change from 2016 to 2022 was plus 11% with a total population change of plus 1,972 individuals. This section comprises the Estuary, Seatown, Swords Central and Fosterstown Stations. In Section 2/AZ2, the percentage change from 2016 to 2022 was negative 7% with a total population change of negative 84 individuals. This section is made up of the Dublin Airport Station. Population decline here is largely due to a reduction on an already small base, coupled with changes in census geography.

Section3/AZ3 saw an increase of 274% in the 2022 Census data with a total of 5,944 more individuals. This area includes the Northwood Station. Significant growth here is due to residential development since 2016. This section also benefits from changes in SAs slightly. In Section 4A/within AZ4 the percentage change between 2016 and 2022 was negative 5% with a total reduction of 1,037 individuals. This section comprises the Ballymun Station and the decline here is likely due to the temporary vacancy of on-campus student accommodation in DCU during the Covid-19 pandemic.

Section 4B/ within AZ4 experienced a 0% change with an increase of 99 individuals. The nominal increase here is likely attributable to a temporary vacancy of on-campus student accommodation during Covid-19. This section includes Collins Avenue, Griffith and Glasnevin. Section4C/within AZ4 had an 18% percentage change with a total population change of positive 17,733 individuals. This section includes the Mater, O'Connell Street, Tara, St Stephen's Green and Charlemont Stations. Growth in this section is 8% above the national average despite likely lower on-campus occupancy during the pandemic, indicating significant change.

Overall, the levels of population in absolute terms along the whole route has increased by approximately 8% since 2016. Consequently, the scheme's delivery will provide benefits to an even greater number of people that was predicted before. Conversely, a greater number of people will be potentially impacted by the effects of the scheme during the Construction Phase. However, this still remains subject to mitigation, as has been assessed in all chapters. Therefore, all EIAR conclusions are therefore still applicable in their entirety.

The Pobal-HP Deprivation Index assigns a score to each Census small area (SA) or neighbourhood in the country. A higher score suggests a higher level of deprivation, while a lower level indicates a more affluent area. The Index was updated in November 2023 to reflect the latest Census 2022 results.

An analysis was undertaken to review observed change since the 2016-era Index, used in EIAR chapter 11. Overall, the levels of deprivation recorded have increased along the alignment since 2016. As a result, the population will stand to gain even more from Metrolink in both construction and operation phases through direct and indirect means.

5.1.6 Chapter 14 Groundborne Noise & Vibration

(a) Ground borne noise – Errata provided to clarify a small number of errors and omissions in Chapter 14 of the EIAR.

TII would like to notify the Board of an error in Chapter 14 Groundborne Noise & Vibration. A full analysis was presented in the chapter and associated figures and appendices of the potential impacts arising from both the construction and operation phases of the project.

Groundborne Noise & Vibration results during the construction phase of the project have been presented for every building impacted along the alignment in Appendix A14.5 with noise and vibration contours presented in Volume 4 Chapter 14 Figures.

However, in error, a number of locations where residual impacts were identified in the analysis and presented in the Appendices and Figures were not transcribed into the relevant Tables in Section 14.6 of the Chapter. As a result, and for clarity updated residual impact tables are available to the inspector for the purpose of the Environmental Impact Assessment.

- Significant effects associated with Mechanical Excavation at additional residential properties close to Glasnevin Station, Tara Station, and at the non-residential receptor St Josephs Catholic Church close to Mater Station were not reported in the summary tables in the main Chapter. Predicted values had been correctly tabulated in App 14.5.

- Predicted groundborne noise and vibration magnitudes associated with the construction of the intervention tunnels at Charlemont had not been presented in App 14.5. No residual significant effects identified.

- Predicted TBM groundborne noise levels south of Eden Quay updated. Generally the effects have reduced, but a new Significant Effect arises at one property along Eden Quay.

- Significant residual construction groundborne vibration effect from the passage of the TBM at National Concert Hall incorrectly identified in chapter. Now removed.

- Additional assessment of groundborne noise and vibration during Mechanical Excavation at Seatown Station, and during the construction of Seaton Pumping Station undertaken. No significant effects identified.

- Significant Effects associated with blasting at Dartmouth Road not reported in main chapter. The requirement to control blasting at the Oversite Development at Charlemont, means that there no significant effects.

- Additional lengths of Floating Slab Track included to remove significant effects at 2 no. non-residential properties in AZ1, and 20 residential properties in AZ4.

- Previously incorrectly reported operational vibration significant effects at the National Museum and National Gallery removed from the summary tables.

- Drawings added to show the extents of the Floating Slab Track, including additional lengths referred to above.

5.1.7 Chapter 16 Air Quality

(a) Updates to Chapter 16 Air Quality to reflect new Air Assessment Guidance from TII and new Ambient Air Quality Standard Regulations (SI. No. 739 of 2022).

After the lodgement of the EIAR in September 2022, TII published new guidance documents and standards for the EIAR with respect to Air Quality (December 2022);

- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (TII 2022a) and
- PE-ENV-01107: Air Quality Assessment Standard for Proposed National Roads (TII 2022b).

The 2011 Air Quality Standard Regulations (S.I. No. 180 of 2011) were the appropriate standards within the Air Quality Chapter at the time of submission of the EIAR.

However since the lodgement of the draft RO, these have been revoked and superseded by the 2022 Ambient Air Quality Standard Regulations (S.I. No. 739 of 2022).

The potential effects of these new guidance and legislation have been assessed in full and explained in detail by our Air Quality expert, Avril Challoner.

5.1.8 Chapter 17 Climate

(a) Update to Chapter 17 Climate to reflect the requirements of the Climate Action Plan 2023 & The draft Climate Action Plan 2024, the updated traffic from the Greater Dublin Area Transport Strategy 2022-2042 and updated.

An Addendum Document to Chapter 17 Climate has been prepared in order to address updates in policy/strategy in addition to new guidance:

- The Climate Action Plan 2023 & The draft Climate Action Plan 2024;
- Updated Traffic data from the Greater Dublin Area Transport Strategy 2022 – 2042 (NTA 2023);
- PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (offline & Greenways) – Overarching Technical Document, and
- PE-ENV-01105: Climate Assessment of Proposed National Roads – Standard

The outputs of these assessments are explained in the witness statement of Climate expert, Avril Challoner. She also details further commitments which TII will make to mitigate climate impacts.

5.1.9 Chapter 22 Infrastructure and Utilities

(a) Update to Chapter 22 Infrastructure and Utilities to provide an additional assessment of the proposed Seatown Pumping Station;

An update note was prepared for Chapter 22 to address:

- An update to the proposed Overflow from the Seatown Pumping Station following discussions with Uisce Eireann; and
- To provide some additional analysis of the environmental effects associated with the Pumping Station (N&V);

(i) An update to the proposed Overflow from the Seatown Pumping Station following discussions with Uisce Eireann;

The utilities drawing for Seatown presented within the draft RO Utility Details Book 1 of 4 (Fingal County Council) shows a proposed emergency overflow to the Ward River from Seatown Pumping Station. However based on consultation with Irish Water a new design for the overflow has been developed:

- The emergency overflow from the pumping station has been redesigned to connect into an existing sewer that conveys the flow to the existing Swords Wastewater Treatment Plant.

(ii) To provide some additional analysis of the environmental effects associated with the Pumping Station (N&V);

Additional analysis is presented on the potential impact associated with the excavation of this pump station:

- No significant Groundborne N&V effects:
- No Significant Airborne Noise & Vibration Effects;

5.1.10 ***Chapter 24 Material and Waste Management***

(a) *Update to Chapter 24 Material and Waste Management – updated assessment having regard to the fact that there has been no decision on Art 27 notification. ,*

Updates have been made to Chapter 24 of the EIAR to reflect the following:

- More up to date data on landfill capacity became available in 2022;
- While the notification pursuant to Article 27 has been made to the EPA, it has not been determined. As a precautionary approach, an additional analysis has been undertaken.

Additional assessment of the unlikely scenario in which the notification to the EPA pursuant to Article 27 is not successful has been undertaken i.e. Where material is designated as a waste and is disposed of to soil recovery facilities (SRF) to manage surplus excavated material, as outlined in the EIAR.

Prior to mitigation measures being implemented if all waste was to be sent to inert and non-hazardous landfill, it is likely to reduce national landfill capacity void in Ireland by 24%. This is considered a significant effect. Once mitigation is implemented through the use of SRF thus diverting more waste from landfill the reduction of national landfill capacity is reduced considerably to 4.1%. However, this is still considered a significant effect (moderate or large).

The mitigation measures, as set out in paragraph 24.6 of Chapter 24 remain valid. The aim of the mitigation measures are to minimise the impact to the environment through good material resource efficiency practices. If during the peak generation year (year 5) all SRF compliant material was to be sent to soil recovery facilities, the proposed Project would take up approximately 23% of annual capacity at soil recovery facilities in the counties surrounding the proposed Project.

Scenario	Description	Sensitivity of the Receptor	Magnitude of Impact	Significance of Effect
No mitigation	All material is landfilled	Very High	Major	Very Large
Mitigation	80% of material is recovered through SRF and 20 % goes to landfill	Very High	Minor	Moderate or Large

5.1.11 Chapter 26 Architectural Heritage

(a) Update TO Chapter 26 Architectural Heritage to address the addition of Santry Lodge to the Fingal Development Plan 2023 – 2029.

Santry Lodge has been added to the Fingal Development Plan 2023-2029 and TII have now reviewed the assessment presented in Chapter 20 of the EIAR to review outcomes in light of the "designation".

A charter school was established on this site in 1740s and continued in use until the 1890s. After the school's closure, the front part of the building complex was demolished, and the remaining school buildings were occupied as two houses. These two houses were named Santry Lodge and Tower House. Tower House was demolished in the 1980s. There is no documentary evidence to indicate when the surviving building known as Santry Lodge was constructed, though the style of the surviving windows suggests some time from about 1820s.

In the previous assessment, Santry Lodge was accorded a 'Medium level of significance' after discussions were held with the Conservation Officer in Fingal County Council. The gate lodge and the former Tower House were considered to have a lower significance and were accorded a Level 4 significance ('Very Low, negligible or of no architectural heritage value'). The reassessment of the potential impacts on Santry Lodge has concluded that the original level of impact as 'significant' would remain unchanged.

Reassessment of the potential impacts on the two gate lodges now concludes that the impact would be 'profound', which is greater than the original impact assessment. This is due to designation now including the curtilage. The proposed mitigation is to record the two buildings, the gate lodge of Santry Lodge to English Heritage level 2, while the derelict lodge was to be recorded by the lesser method of photographs and written description. No change is proposed to the mitigation measures for the gateway and front boundary wall which was to relocate them on the new front boundary line. This mitigation will be implemented in consultation with Fingal County Council.

Appendix 1

Errata

Appendix 2

Agreements

Appendix 3

Schedule of Mitigation

MetroLink Oral Hearing
Brief of Evidence of Ronan Hallissey

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme (ii) Errata (iii) Agreements presented to the Oral Hearing (iv) Updates to the EIAR

List of Additional Mitigation Measures

This document presents a Work in Progress (WIP) list of additional mitigation measures to be provided over and above those listed in the Environmental Impact Assessment, Natura Impact Assessment and associated documents.

1. Traffic and Transport

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
OLV Schools, Ballymun Road	In order to further mitigate impacts on sensitive and vulnerable students at these schools.	Provision of temporary school bus services for Our Lady of Victories Schools;

2. Human Health

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Charlemont	Improved access for PRMs to Charlemont Station	Provision of drop off facility at Charlemont for PRMs
OLV Schools, Ballymun Road	In order to further mitigate impacts on sensitive and vulnerable students at these schools.	Change of location for outside learning area at Schools

3. Population and Land Use

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Seatown Villas, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Seatown Villas
Estuary Court, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Estuary Court
Ashley Avenue, Swords	In order to retain the existing green space in front of this housing estate, as requested by residents.	Reinstatement of R132 walls at Ashley Avenue

4. Electromagnetic Compatibility and Stray Current

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Trinity College Dublin	To mitigate the effects of MetroLink operations on highly sensitive equipment	Installation of Active Cancellation Systems at TCD Equipment

5. Airborne Noise and Vibration

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Mater Hospital		Trigger Noise Action Plan for the Mater Hospital
OLV Schools, Ballymun Road		Trigger Noise Action Plan for the Our Lady of Victories Schools

6. Ground-borne Noise and Vibration

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Trinity College Dublin	To prepare an advance plan with TCD for the management of noise due to the advancement of the TBM to minimise effects.	Trigger Action Plan for TCD
Trinity College Dublin	To mitigate the effects of MetroLink operations on highly sensitive equipment	Installation of base slab under TCD equipment as required
The Abbey Theatre	To prepare an advance plan with the Abbey Theatre for the management of noise due to the advancement of the TBM to minimise effects.	Trigger Noise Action Plan for the Abbey theatre
Rotunda Hospital	To manage potential future effects on the operation of future proposed hospital operations at this site.	Extended Floating Slab track underneath the Rotunda Hospital
Gate Theatre and Ambassador Theatre	To prepare an advance plan with the Gate Theatre and the Ambassador for the management of noise due to the advancement of the TBM to minimise effects.	Trigger Noise Action Plan for the Gate theatre/Ambassador
Rotunda Hospital	To manage potential future effects on the operation of future proposed hospital operations at this site.	Trigger Noise Action Plan for the Rotunda Hospital
Mater Hospital	To prepare an advance plan with the Mater Hospital for the management of noise due to the advancement of the TBM and other construction works to minimise effects.	Trigger Noise Action Plan for the Mater Hospital
Our Lady of Victory Schools, Ballymun Road	To prepare an advance plan with the schools at this location for the management of noise	Trigger Noise Action Plan for the Our Lady of Victories Schools

	due to construction works at Collins Avenue station.	
Airside Business Park	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track
Grove Commercials	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track
Botanic Avenue & Daneswell Road	To further mitigate groundborne noise during the operational phase	Provision of Floating Slab Track

7. Biodiversity

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Glasnevin	To ensure Otter Passage during construction works	Temporary structure to allow safe otter passage through the works site at Glasnevin Station

8. Climate

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
N/A	Reduction in GHG emissions to achieve compliance with CAP23/24	Corporate Power Purchase Agreement (CPPA) to use electricity generated from renewables for 100% of construction stage power which includes the energy to power the tunnel boring machine;
N/A	Reduction in GHG emissions to achieve compliance with CAP23/24	CPPA to use electricity generated from renewables for 100% of operational power (the EIAR committed to 90%);
N/A	Reduction in GHG emissions to achieve compliance with CAP23/24	The use, where practicable, during construction of low carbon concrete with an embodied carbon equivalent to a 50% GGBS replacement;

N/A	Reduction in GHG emissions to achieve compliance with CAP23/24	The use in construction plant and equipment of sustainably sourced Hydrotreated Vegetable Oil (HVO) as a 100% replacement of fossil fuels;
N/A	Reduction in GHG emissions to achieve compliance with CAP23/24	Procurement only from suppliers that meet the industry reduction requirements within the CAP for 10% reduction in embodied carbon by 2025.

9. Architectural Heritage

Location	Pre-mitigation issue	Description of Mitigation and/or Monitoring Measures / Environmental Commitments
Santry Lodge	To minimise impacts on Santry Lodge	Enhanced planting between Santry Lodge and the alignment including both native tree species planting and some screening trees
Santry Lodge	To minimise impacts on Santry Lodge	Re-establishment of elements of the existing gates and supporting piers at the entrance to the property.
Santry Lodge	To minimise impacts on Santry Lodge	Establishment of a property wall design in agreement with FCC to include elements of the existing wall i.e capping
Santry Lodge	To minimise impacts on Santry Lodge	Use of black colour mesh fencing surrounding ponds.

(i) Amendments to the Railway Order and Schedules / drawings and modifications to the scheme (ii) Errata (iii) Agreements presented to the Oral Hearing (iv) Updates to the EIAR

MetroLink Oral Hearing
Brief of Evidence of Ronan Hallissey

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Appendix 4

Assessment of the proposed changes to the landscape design along the R132 to include the re-instatement of existing walls

Appendix 5

Assessment of the inclusion of a drop off point for those with disabilities at Grand Parade just north of the proposed Charlemont station.

Appendix 6

Impact on the Preliminary Design Building Damage Assessment Results due to Imposition of Limits of Deviation.

Appendix 7

Impact of MetroLink with New GDA Transport Strategy

Appendix 8

Supplemental Note #1 Census 2022 Change

Supplemental Note #1 - Census 2022 Population Change

1. Summary

- Chapter 11 of the EIAR uses Census data as part of its baseline assessment of population and its associated demographic and socio-economic characteristics along the route.
- This data is from the published 2016 Census, which was the most recent at the time of the RO submission.
- Census 2022 data has been incrementally published, largely in 2023, and naturally there has been change in the intervening years.

2. Purpose of this note

- This note sets out observations on noted Population change since the Census 2016-era.
- A commentary for each section assessed in Chapter 11 along the study area has been provided.
- Recall that Chapter 11 uses custom sections consistent with the scheme-wide AZ / Assessment Zone approach 1-4. This is due to the variability of population along the route.
- The significant differences are in the grouping of AZ2 and AZ3 (though split out in summary here), and the splitting into three of AZ4 (Sections 4A, 4B and 4C).
- As each section comprises many Census small areas (SAs), a general sense of change is provided in the commentary.
- Furthermore, due to changes in how the small areas for Census 2022 were defined, a direct comparison is not possible. The boundaries have changed as a result of the CSO's methodology for preserving anonymity and roughly similarly sized SAs.
- Maps of 2016 and 2022 are provided after the commentary in this note and will also be available through an interactive web map to examine in more detail.

3. Conclusion

- **Overall, the levels of population in absolute terms along the route (all sections) has increased (by approx. 15%) since 2016**.
- Consequently, the scheme's delivery will provide benefits to an even greater number of people than before (including across wider Dublin and commuters beyond). Conversely, a greater number of people will be impacted by the effects of the scheme in construction phase, though this remains subject to mitigation as all chapters of the EIAR have assessed. All conclusions are therefore still applicable in their entirety.
- These statistics not only highlight the varying growth rates in play across different sections but also provide insight into the absolute population shifts in each area.
- Two particular highlights of note:
    - *Section 2* (AZ2) experienced a decrease in both percentage and total numbers. This is largely a result of small changes to a low population base, and the impact of changes in small area census geography in comparison.
    - *Section 3* of our study area (AZ3) stands out with a substantial percentage increase given sizable housing development in the intervening years.

4. Section commentary

Section 1 / AZ 1:

- Percentage Change (2016-2022): +11%
- Total Population Change: +1,972 individuals

This section comprises the Estuary, Seatown, Swords Central and Fosterstown Stations. Growth here is higher than the national average (8%) and is largely seen in a densification of population proximate to the proposed Swords Central and Fosterstown Stations.

Section 2 / AZ 2:

- Percentage Change (2016-2022): -7%
- Total Population Change: -84 individuals

This section comprises the Dublin Airport Station. Population decline here is largely due to a reduction on an already small base, coupled with changes in census geography.

Section 3 / AZ3:

- Percentage Change (2016-2022): +274%
- Total Population Change: +5,944 individuals

This section comprises the Northwood Station. Growth here has been significant due to residential development since Census 2016. It does benefit from changes in SAs slightly.

Section 4A / within AZ4:

- Percentage Change (2016-2022): -5%
- Total Population Change: -1,037 individuals

This section comprises the Ballymun Station. The decline here is likely attributable to the temporary vacancy of on-campus student accommodation during Covid in DCU specifically.

Section 4B / within AZ4:

- Percentage Change (2016-2022): 0%
- Total Population Change: +99 individuals

This section comprises the Collins Ave, Griffith, and Glasnevin Stations. The nominal increase here is likely attributable to a temporary vacancy of on-campus student accommodation during Covid in DCU specifically.

Section 4C / within AZ4:

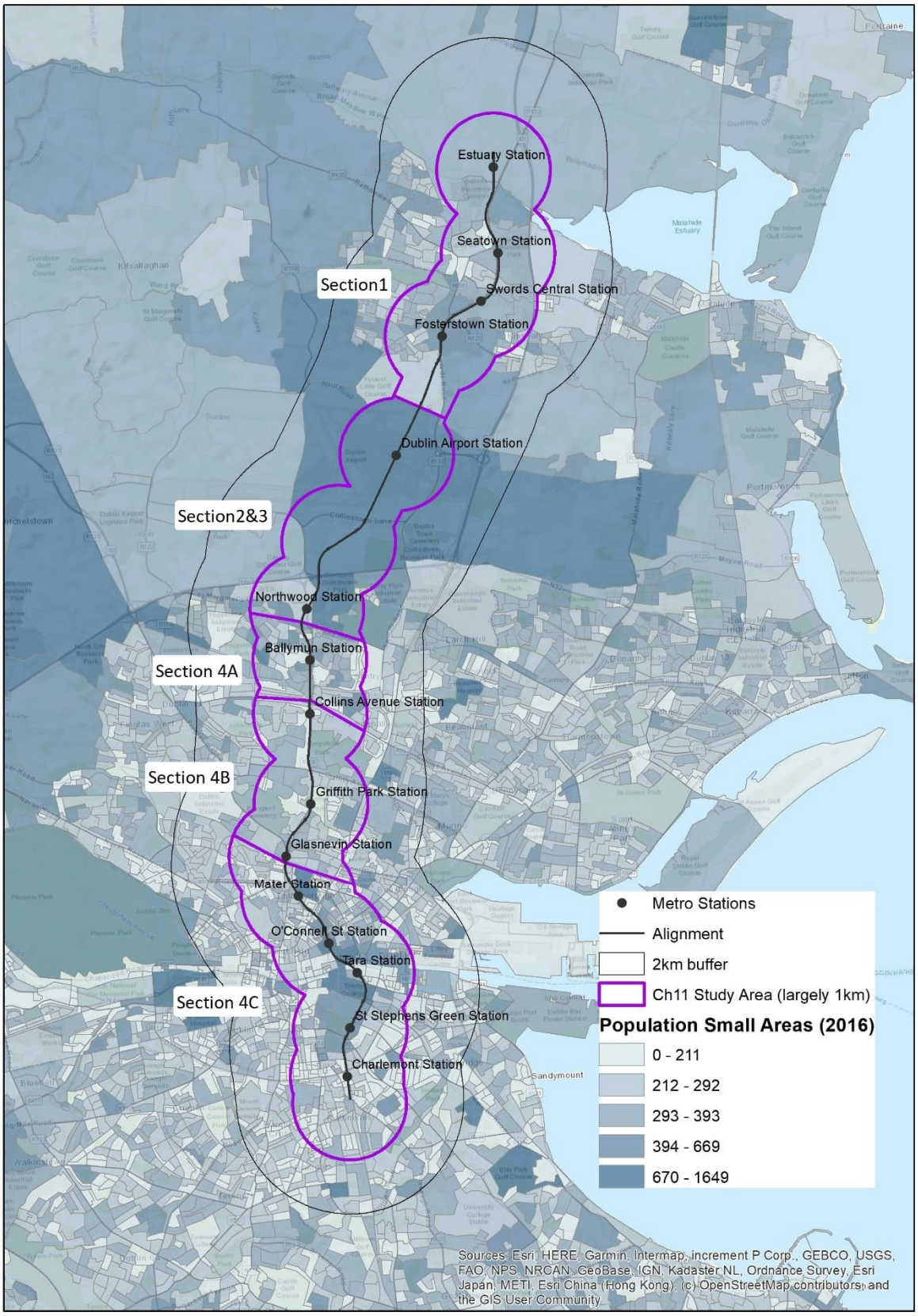
- Percentage Change (2016-2022): +18%
- Total Population Change: +17,733 individuals

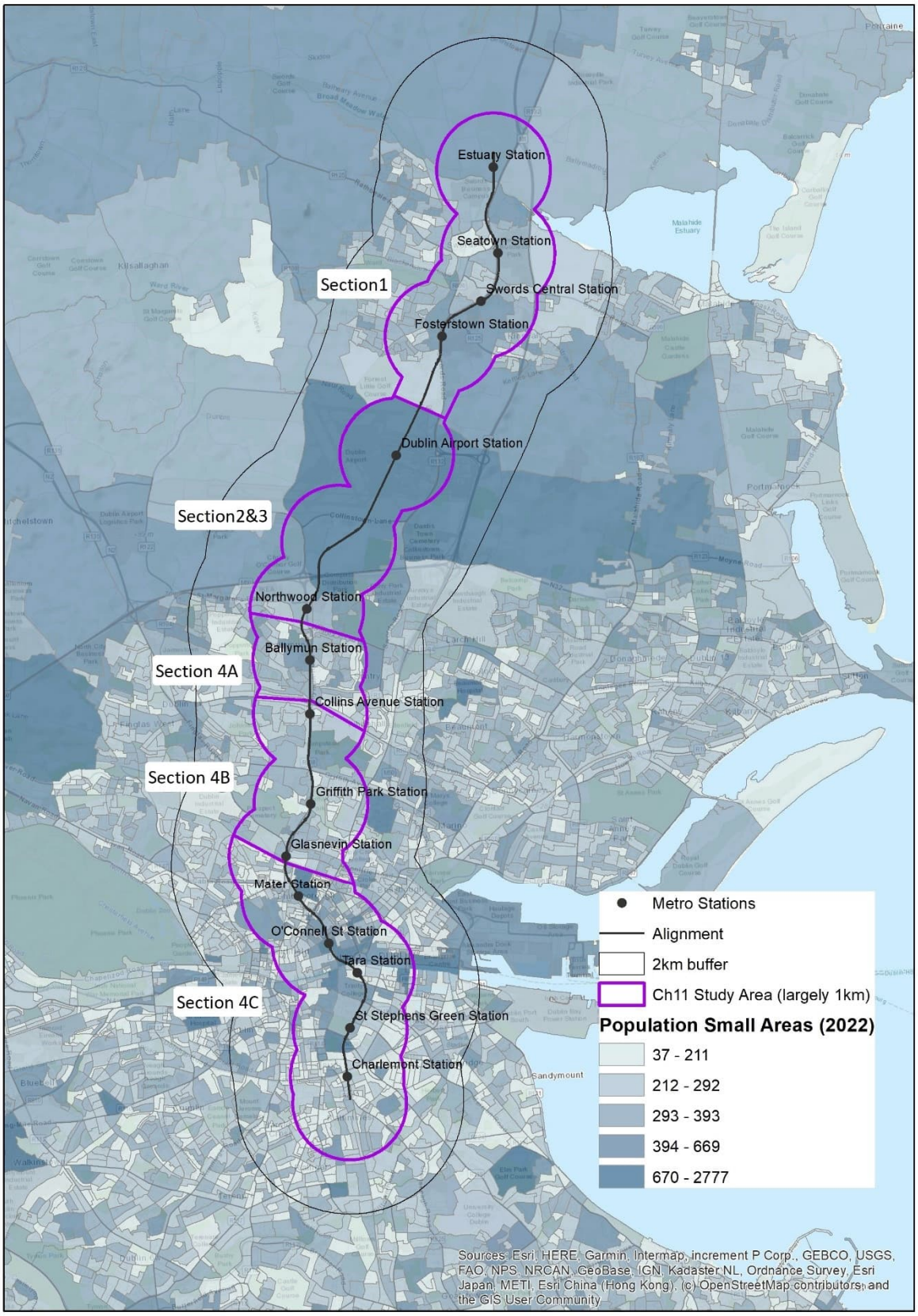
This section comprises the Mater, O'Connell St. Tara, SSG and Charlemont Stations.
Growth is significantly above the national average here (8%), indicating considerable change since Census 2016, even despite likely lower on-campus occupancy during Covid for students.

Alignment-wide / Total:

- Overall Percentage Population Change (2016-2022): +15%
- Overall Total Population Change: +24,627 individuals

Overall growth along the alignment (the study area) has been strong in the 6 years between 2016 and 2022. As this analysis accounts only for residents, it underplays broader day-time and night-time presence from the wider commuter and tourist cohorts.


Estuary Station
Seatown Station
Swords Central Station
Fosterstown Station
Section1
Dublin Airport Station
Section2&3
Northwood Station
Ballymun Station
Section 4A
Collins Avenue Station
Section 4B
Griffith Park Station
Glasnevin Station
Mater Station
O'Connell St Station
Tara Station
Section 4C
St Stephens Green Station
Charlemont Station
Metro Stations
Alignment
2km buffer
Ch11 Study Area (largely 1km)
Population Small Areas (2016)
0 - 211
212 - 292
293 - 393
394 - 669
670 - 1649
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community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Section 4B
Griffith Park Station
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Mater Station
O'Connell St Station
Tara Station
Section 4C
St Stephens Green Station
Charlemont Station
Metro Stations
Alignment
2km buffer
Ch11 Study Area (largely 1km)
Population Small Areas (2022)
37 - 211
212 - 292
293 - 393
394 - 669
670 - 2777
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix 9

Supplemental Note #2 Pobal Deprivation Index Change

Supplemental Note #2 – Pobal-HP Deprivation Index Change

1. Summary

- The Pobal-HP Deprivation Index assigns a score to each Census small area (SA) or neighbourhood in the country. A higher score suggests a higher level of deprivation, while a lower score indicates a more affluent area.
- The Index is used by policymakers, researchers, and community organisations to identify areas in need of targeted interventions, allocate resources effectively, and track changes in socio-economic conditions over time.
- The Index was updated in November 2023 to reflect the latest Census 2022 results.

2. Purpose of this note

- This note sets out the observed change since the 2016-era Index, used in the RO.
- A commentary for each station (and surrounds) running North to South is provided for both periods noting the effective change in general terms.
- As each area comprises of many SAs, this general sense is indicative but representative.
- Maps of 2016 and 2022 are provided thereafter and will also be available through an interactive web map to examine in more detail.

3. Conclusion

- **Overall, the levels of deprivation have increased along the alignment since 2016**. Conversely, the population will stand to gain even more from Metrolink in both construction and operation phases through direct and indirect means, as elaborated in Chapter 11, sections 11.5-11.7, in terms of operational phase impacts.

4. Station commentary

1. Estuary Station:
- 2016: Marginally below average to the west, affluent to the east.
- 2022: All areas degraded; affluent area to the east is now marginally above average, southwest area disadvantaged.

2. Seatown Station:
- 2016: Marginally below average to the west, above average to the east.
- 2022: West area disadvantaged; east area marginally above average.

3. Swords Central Station:
- 2016: Largely marginally above average.
- 2022: Eastern part marginally below average.

4. Fosterstown Station:
- 2016: Largely above average, proximity to affluent areas.
- 2022: Eastern part marginally below average, affluent areas to the south marginally above average.

5. Airport Station:
- 2016: Affluent.
- 2022: Mainly marginally above average, large east section becoming disadvantaged.

6. Dardistown Station:
- 2016: Immediately affluent, bounded by disadvantaged areas.
- 2022: Area has changed to being marginally above average.

7. Northwood Station:
- 2016: Within marginally below average areas, bounded by affluent areas to the east.

- 2022: Affluent areas to the East are now a mixture of marginally above average and marginally below average, with areas to the west being very or extremely disadvantaged.

8. Ballymun Station:
- 2016: Bounded by very disadvantaged areas.
- 2022: Majority of areas very or extremely disadvantaged, one exception to the west marginally above average.

9. Collins Station:
- 2016: Largely marginally above average.
- 2022: Largely the same, one south area becoming affluent.

10. Griffith Station:
- 2016: Largely affluent areas.
- 2022: Similar situation, slightly less affluent areas to the west.

11. Glasnevin Station:
- 2016: Largely affluent areas, close to marginally below average areas.
- 2022: Similar situation, largely affluent areas.

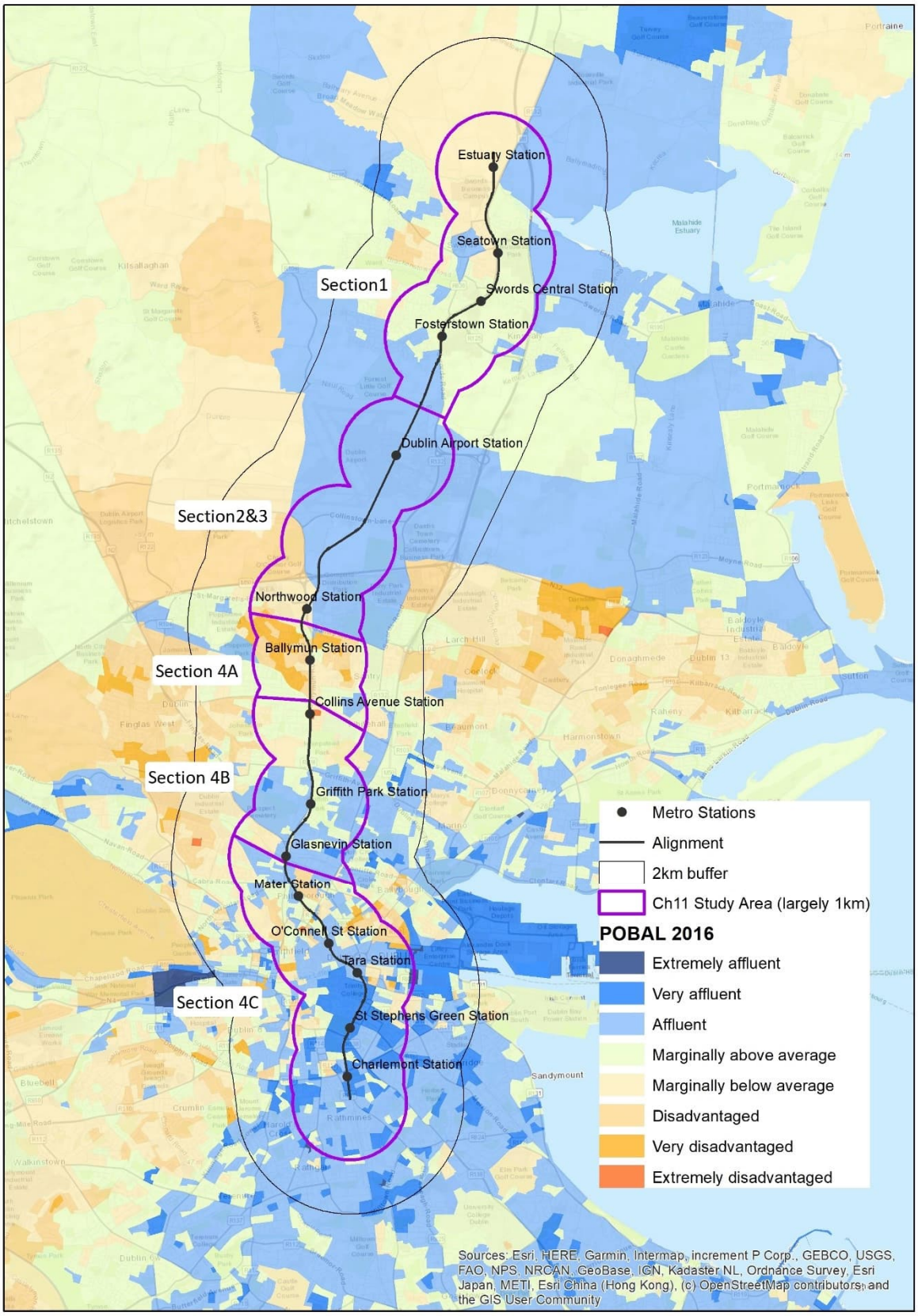
12. Mater Station:
- 2016: Mixture of marginally above average and instances of disadvantage.
- 2022: Similar situation, a mixture of marginally above average, instances of disadvantage, and affluent areas to the west.

13. O'Connell Station:
- 2016: Immediately affluent, proximity to significant disadvantage areas.
- 2022: Noticeable increase in deprivation in Dublin city centre, a mix of marginally above average, marginally below average, and few affluent areas.

14. Tara Station:
- 2016: Mostly affluent or very affluent, near areas of significant disadvantage.
- 2022: Increase in deprivation, more areas marginally above average than affluent, Tara station area still very affluent.

15. SSG Station:
- 2016: Noted as very affluent, to the west dips to marginally above and disadvantaged.
- 2022: Increase in deprivation, from very affluent to affluent and from affluent to marginally above average.

16. Charlemont Station:
- 2016 – Largely affluent and very affluent around future station but to the north west this dips to marginally above and below average and even disadvantaged
- 2022: Increase in deprivation, from very affluent and affluent to a mix of affluent and marginally above average.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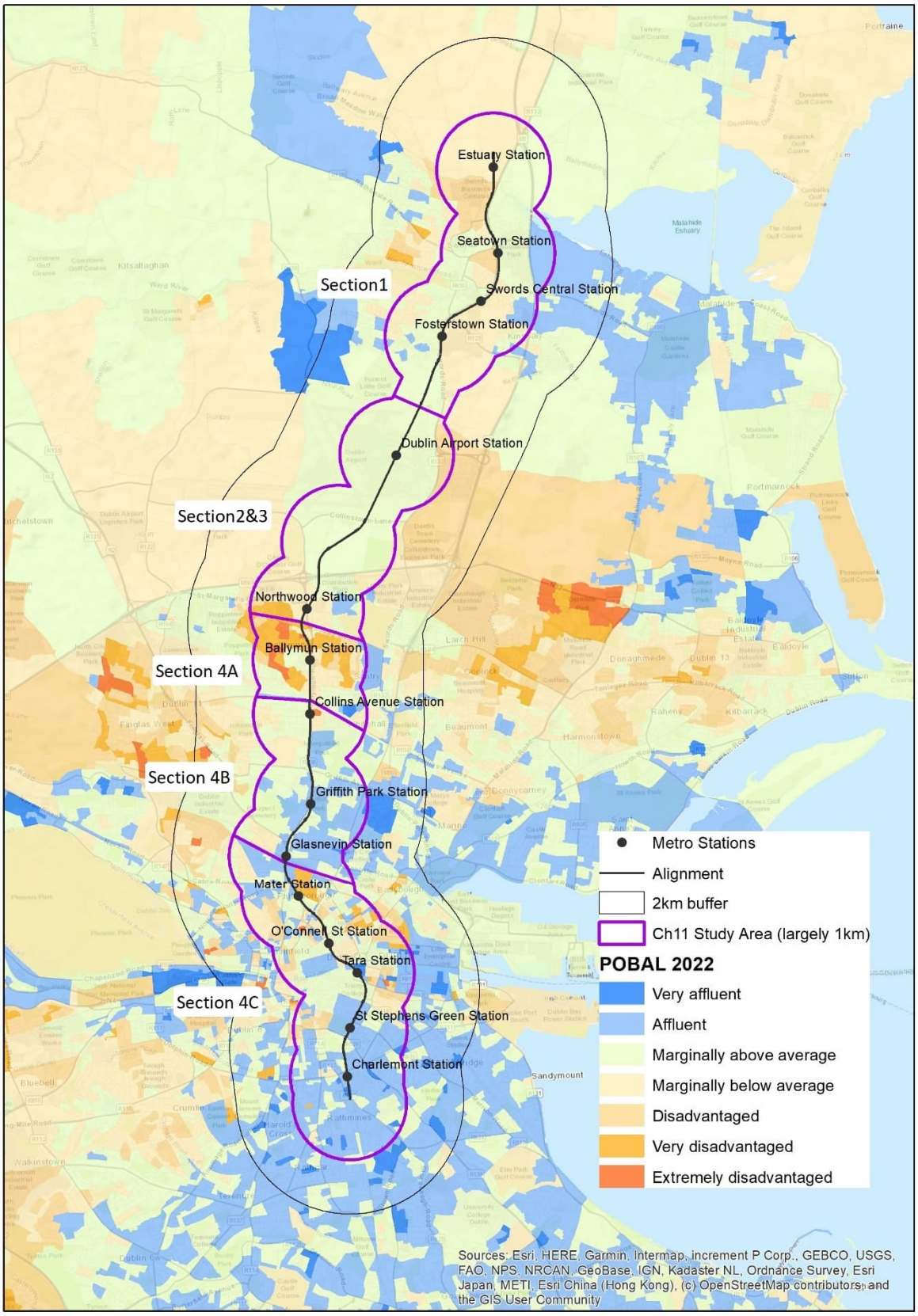
O'Connell St Station
Tara Station
St Stephens Green Station
Charlemont Station
Section1
Section2&3
Section 4A
Section 4B
Section 4C
Metro Stations
Alignment
2km buffer
Ch11 Study Area (largely 1km)
POBAL 2016
Extremely affluent
Very affluent
Affluent
Marginally above average
Marginally below average
Disadvantaged
Very disadvantaged
Extremely disadvantaged
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community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St Stephens Green Station
Charlemont Station
Metro Stations
Alignment
2km buffer
Ch11 Study Area (largely 1km)
POBAL 2022
Very affluent
Affluent
Marginally above average
Marginally below average
Disadvantaged
Very disadvantaged
Extremely disadvantaged
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix 10

Update to Chapter 11_Operational Stage Impact on Development Potential

Appendix 11

Addendum to Chapter 24 of the EIAR