Intermodal Logistics Park North Ltd

INTERMODAL LOGISTICS PARK NORTH (ILPN)

Intermodal Logistics Park North (ILPN) Strategic Rail Freight Interchange (SRFI)

Project reference TR510001

Preliminary Environmental Information Report (PEIR)

Appendix 17.2 Climate Projections Risk and Resilience Assessment

October 2025

Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Intermodal Logistics Park North (ILPN) project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Intermodal Logistics Park North Ltd. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

https://www.tritaxbigbox.co.uk/our-spaces/intermodal-logistics-park-north/

This feedback will be taken into account by Intermodal Logistics Park North Ltd in the preparation of its application for a Development Consent Order for the project.

Appendix 17.2 ◆ Climate Projections Risk and Resilience Assessment

INTRODUCTION

1 This appendix to Chapter 17: Climate Change of the Preliminary Environmental Information Report (PEIR) summarises potential changes in climatic parameters at the Proposed Development location and considers whether there is potential for likely significant environmental effects in construction or operation.

2 The climate change risk assessment methodology outlined in the UKGBC 'A Framework for Measuring and Reporting of Climate-related Physical Risks to Build Assets' (2022)1 has been used to determine the potential for significant effects arising from a future changing climate.

3 In addition to the direct climate risks to the Proposed Development itself, there are potential inter-relationships between climate change and several other environmental topic areas, explored further in Appendix 17.3 and assessed in the respective PEIR topic chapters as applicable.

CLIMATE CHANGE PROJECTIONS

4 The Met Office Hadley Centre (MOHC) publishes both probabilistic climate change projections and downscaled global circulation model outputs for the UK at various spatial scales. This is called the UKCP18 dataset, first published in November 2018 and at v2.14.0 (MOHC, 2025[2]) at the time of writing. The projections are based on representative concentration pathway (RCP) scenarios used by the Intergovernmental Panel on Climate Change, thereby giving a low-high range in potential global GHG reduction initiatives and resulting rate of climatic effects over a given time period.

5 The UKCP18 dataset publishes climate change anomalies for a range of spatial scales and global GHG emissions pathway scenarios: for the purposes of this assessment, a 25km grid square spatial scale has been used, which shows a range of projection values that reflect uncertainty in modelled outcomes. Given the longevity of the Proposed Development's operational lifetime, probabilistic climate change anomaly projections have been provided for the time periods 2030-2059 and 2070-2099.

[1] UKGBC (2022): A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets. [Online], available at: https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2022/02/09114419/UKGBC-Measuring-and-Reporting-Physical-risk-Report.pdf, last accessed 14/07/25.
[2] MOHC (2025): UK Climate Projections User Interface. [Online], available at: https://ukclimateprojections-ui.metoffice.gov.uk/ui/home, last accessed 24/06/25.

6 The UKCP18 dataset used in this assessment is the probabilistic climate change anomaly projections. Probabilistic climate variable anomalies refer to the difference of a future climate variable compared to a past or present climate. Anomalies can be expressed in absolute values (e.g. degrees Celsius change) or relative values (e.g. percentage change for precipitation). For the purpose of this assessment, temperature, precipitation and humidity anomalies have been considered. The Proposed Development is not in a coastal location, so sea level change and storm surge have not been relevant to consider. Fluvial and pluvial flood risk has been assessed quantitatively in the Flood Risk Assessment appended to the PEIR, with allowance for climate change, and is not repeated here.

7 In general, as detailed in the UKCP18 'Science Overview Report' (2018)[3], the UK will experience a trend of warmer, wetter winters and hotter, drier summers, though natural variations in that pattern from year to year will persist. Changes to wind speeds and storminess cannot be easily predicted and the data currently published cannot make projections for local conditions and wind gusts. However, it is expected that the frequency and intensity of storms will increase in the future and so this has qualitatively been taken into account in this assessment.

8 Table 1 and Table 2 show climate change anomaly projections from the UKCP18 probabilistic dataset for each of the respective 2030-2059 and 2070-2099 time periods, relative to the 1981-2010 baseline for the 25 km grid square in which the Site is located. As a conservative (worst-case) approach to assessment, the data presented here is for the 'business as usual' global emissions pathway RCP8.5.

9 In summary, the data within Table 1 and Table 2 shows increased intensity in seasonal precipitation trends: precipitation is predicted to decrease during the driest season, and increase during the wettest season and month. However, precipitation is predicted to increase in the driest month, potentially an indication of higher thunderstorm frequency in this location. Temperatures are anticipated to increase annually relative to the 1981-2010 baseline, both during the coldest and hottest seasons and months. Finally, humidity is also expected to increase during both the summer and winter, and hence the annual average will increase.

Table 1 Climate change parameter projections 2030-2059

Parameter*	Unit	10th Percentile	Median Value	90th Percentile
Precipitation – annual average	%	-6.35	-0.31	5.92
Precipitation – driest season	%	-10.84	-0.52	10.78

[3] UKCP18 (2018): UKCP18 Science Overview Report. [Online], available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf, last accessed 14/07/25.

Parameter*	Unit	10th Percentile	Median Value	90th Percentile
Precipitation – wettest season	%	-7.75	6.95	23.52
Precipitation – driest month	%	-7.29	8.10	24.44
Precipitation – wettest month	%	-11.88	12.05	36.47
Temperature – annual average	ºC	0.62	1.29	2.01
Temperature – hottest season average	ºC	0.49	1.54	2.59
Temperature – coldest season average	ºC	0.26	1.17	2.11
Temperature – hottest month maximum	ºC	0.08	1.85	3.64
Temperature – hottest month average	ºC	0.33	1.68	3.08
Temperature – coldest month minimum	ºC	-0.04	1.22	2.57
Temperature – coldest month average	ºC	0.06	1.24	2.49
Humidity – annual average	%	1.42	7.26	13.36
Humidity – winter	%	-0.18	7.74	15.92
Humidity – summer	%	0.45	7.17	14.69

**daily mean, maximum or minimum, as applicable, averaged over time period specified. Values are for the 10th and 90th percentile and median values for scenario RCP8.5*

Table 2 Climate change parameter projections 2070-2099

Parameter*	Unit	10th Percentile	Median Value	90th Percentile
Precipitation – annual average	%	-8.70	0.23	8.85
Precipitation – driest season	%	-18.93	-2.65	16.94
Precipitation – wettest season	%	-9.99	12.96	40.04
Precipitation – driest month	%	-9.39	17.38	46.08
Precipitation – wettest month	%	-9.80	25.41	65.65
Temperature – annual average	ºC	1.86	3.40	4.97
Temperature – hottest season average	ºC	2.02	4.37	6.76
Temperature – coldest season average	ºC	0.99	2.80	4.69
Temperature – hottest month maximum	ºC	1.96	5.62	9.46
Temperature – hottest month average	ºC	2.00	4.99	8.12
Temperature – coldest month minimum	ºC	0.47	3.13	6.05
Temperature – coldest month average	ºC	0.64	3.14	5.80
Humidity – annual average	%	9.44	19.72	30.94
Humidity – winter	%	5.45	21.27	37.28
Humidity – summer	%	6.07	18.33	32.09

**daily mean, maximum or minimum, as applicable, averaged over time period specified. Values are for the 10th*

and 90th percentile and median values for scenario RCP8.5

CLIMATE CHANGE EXTREMES

10 The section above showed projections of climate change on a monthly, seasonal and annual average basis, which is useful for long-term planning for what may become typical values. However, climate risks to developments also arise from shorter-lived extreme values. Looking at extreme values can also give a sense of how particular heatwave or rainstorm events may be experienced within the monthly or longer trends.

11 As an extension to the UKCP18 probabilistic dataset, the Met Office publishes Probabilistic Projections of Climate Extremes[4] for various global emissions scenarios and time periods. Return periods can be selected to generate the projected extreme value at a given frequency or likelihood per year.

12 Table 3 shows temperature and precipitation values for an RCP8.5 scenario in 2040 and 2080 (selected as being the mid-year of the 2030-2059 and 2070-2099 time periods) for a return period of 1 in 20, which is equivalent to a 40% chance of occurring per decade.

Table 3 Climate change extreme values under a RCP8.5 scenario

Year	Parameter	Unit	10th Percentile	Median Value	90th Percentile
2040	Precipitation – 1 day total precipitation	mm	44.2	49.4	55.3
	Temperature – Maximum air temperature	ºC	31.3	33.0	35.2
2080	Precipitation – 1 day total precipitation	mm	48.1	55.5	64.5
	Temperature – Maximum air temperature	ºC	31.9	36.1	40.8

13 As shown, in the 25 km grid in which the DCO Site is located, peak temperatures could reach

[4] Murphy J., Brown, S. and Harris, G. (2020): UKCP Additional Land Products: Probabilistic Projections of Climate Extremes, Met Office. Summary factsheet available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_factsheet_probabilistic_projections.pdf (accessed 03/03/25) and data through the UKCP18 UI referenced above.

above 35°C in 2040 and 41°C in 2080. To put this into context, the highest temperature under a 2020 climate is currently 32°C. In terms of precipitation, total rainfall in one day could reach over 55 mm in 2040 and over 60 mm in 2080. A heavy rainfall event in 2020 is currently 47 mm over 24 hours.

14 While an increase in temperature and precipitation have been identified in Table 1 and Table 2, the results of the extreme values analysis indicate that there is additional risk from the increasing frequency of high peaks in temperature or rainfall, and increasing likelihood of these peaks becoming more extreme.

15 Extreme temperature and precipitation events can have severe consequences to people and infrastructure. Relevant consequences from extreme temperature include an increase in excess mortality rates, increased demand for NHS services, rail services severely disrupted due to tracks buckling and overhead cables sagging, and significant increases in water demand. Consequences from extreme rainfall events include flooding, road closures, water ingress in poorly maintained buildings, subsidence of embankments and river bank erosion, outage for water supply, energy, and ICT systems due to flood damage, and significant social and economic costs due to indirect impacts on businesses and communities. This therefore emphasises the importance of mitigation and adaptation to these extreme events as well as to seasonal and monthly averages.

CLIMATE RISK ASSESSMENT METHOD

16 Based on the information available for the Proposed Development, a high level risk assessment has been undertaken using the UKGBC 'Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets' guidance. As per the guidance, the severity of climate-related risk is based on the probability of a risk occurring and the consequences of such a risk. Tables 4 and 5 defines each of these terms.

17 Given the variability in the nature of the potential effects of climate change on the development, receptors have been identified on a risk-specific basis, whereby all receptors relate to the continued safe and effective operation of the Proposed Development. The classifications of consequence have therefore been adapted from the UKGBC guidance to add consequences for workers health, safety and wellbeing.

18 By considering the good practice design measures incorporated into the Proposed Development, professional judgement is used in determining whether the potentially significant effects would result in significant adverse or beneficial effects.

Table 4 Classification of risk probability (UKGBC, 2022)

Probability: reflects both the range of possibility of climatic parameter changes illustrated in CP18 projections and the possible changes would cause the impact being considered.	
Classification	**Definition**
Unlikely	Circumstances are such that it is improbable that an event would occur even in the very long term.
Low likelihood	Circumstances under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place and is less likely in the shorter term.
Likely	It is probable that an event is not inevitable, but possible in the short term and probable in the long term.
High likelihood	The hazard event appears very likely in the short term and almost inevitable over the long term.

Table 5 Classification of risk consequence (UKGBC, 2022)

Consequence: the likely consequences and severity of such consequences of the impact should it occur.	
Classification	**Definition**
Minor	Impact to the built asset likely to result in no or very low levels of damage to business/property. No or limited business interruption that may result in no or negligible financial loss or expenditure to resolve. Built asset has negligible exposure to a potential loss. Efforts have been made to strengthen resilience of built asset. Damage to buildings/structures/services or the environment rendering limited areas of the building unsafe to occupy on a very short-term basis.

Consequence: the likely consequences and severity of such consequences of the impact should it occur.

Classification	Definition
	Damage to vulnerable buildings/structures services or the environment. No or limited behavioural adaptation needed for workforce or interruption to work. No material effect on health or safety.
Mild	Impact to the built asset likely to result in low levels of damage to business/property. Limited business interruption or direct damage resulting in limited financial loss or expenditure to resolve. Built asset has some exposure to potential loss. Efforts have been made to strengthen resilience of built asset. Damage to vulnerable buildings/structures/services or the environment. Damage to buildings/structures/services rendering limited areas of the building unsafe to occupy on a short-term basis. Straightforward behavioural adaptation needed for workforce and limited interruption to work. Mild effect on health or safety not constituting a lost time injury/incident.
Medium	Impact to the built asset likely to result in high levels of damage to buildings/property, substantial re-build or substantial reduction in asset value. Business interruption or direct damage resulting in substantial financial loss. Insurance premiums on asset rises substantially. Built asset has substantial exposure to a potential loss. Limited effort to strengthen resilience of built asset. Damage to key buildings/structures/services or the environment rendering asset unsafe to occupy. Notable behavioural adaptation needed for workforce causing material interruption to work. Effect on health or safety potentially constituting a lost time injury/incident with no long-term health consequence.

Consequence: the likely consequences and severity of such consequences of the impact should it occur.

Classification	Definition
Severe	Impact to the built asset likely to result in catastrophic damage to building/property. Business interruption or direct damage resulting in total financial loss. Asset becomes uninsurable. Built asset has substantial exposure to a potential loss. No or negligible effort to strengthen resilience of built asset. Damage to buildings/structures or services or the environment rendering asset unsafe to occupy. Behavioural adaptation by is not possible and work is severely disrupted or facility cannot operate. Effect on health or safety potentially constituting a serious lost-time injury or with long-term health consequence.

19 The definitions in Table 6 combine the probability of hazard and the consequences to indicate the level of risk. Where there are two possible levels of risk defined, judgement is used to select that which is best applicable. As per the significance effects thresholds, a risk rating of 'Moderate risk' to 'Very high risk' is deemed significant in EIA terms.

Table 6 Definition of risk (UKGBC, 2022)

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High likelihood**	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

RISK ASSESSMENT

20 Table 7 shows the climate change risks to the Proposed Development that have been identified and the impact of those risks.

Table 7 Climate change risk assessment for the Proposed Development during construction and operation

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
Flooding of the DCO Site or access routes	Pluvial and fluvial flood risk is assessed in Chapter 14: Surface water and flood risk with allowance for climate change in accordance with EA guidance.					
During construction, workforce affected by high temperature and / or humidity conditions	(Short term) Likely	(Short term) Medium	n/a	n/a	Moderate risk	Workforce health and safety policy. PPE and monitoring of working conditions to prevent workforce overheating. Further details of mitigation measures are provided within the CEMP.
During construction, increase in construction dust caused by increased temperatures and drought conditions	(Short term) Likely	(Short term) Minor	n/a	n/a	Low risk	Dust mitigation measures included within the CEMP (e.g. reduce dust emissions through the effective transport and storage of materials).
During construction, programme disruption as a result of poor weather	(Short term) Likely	(Short term) Mild	n/a	n/a	Low risk	Not considered to differ significantly from conditions experienced at present, which construction contractors are

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
conditions, e.g. snow / ice, high wind or waterlogged ground						routinely adapted
Overheating of electrical and other equipment caused by increase in peak summer temperature	Unlikely	Mild	Low likelihood	Mild	Low risk	Procuring equipment and cooling systems specified for operating envelope encompassing higher temperature extremes.
High temperatures leading to increased energy demand for cooling	Likely	Minor	High likelihood	Minor	Low risk	Building design to follow energy hierarchy, minimise excessive solar gain and include adequate natural ventilation to reduce energy demand. Solar panels included within design to accommodate a portion of energy demand. Green infrastructure within DCO Site has the potential to reduce urban temperatures.
High temperatures and temperature	Low likelihood	Mild	Likely	Mild	Moderate / low risk	Road surface selected in line with best practice design standards.

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
fluctuations causing thermal contraction and expansion of road surfaces, resulting in cracking						Undertake regular maintenance of surfaces within the DCO Site to identify damage or deterioration.
High temperatures and dry conditions leading to increased risk of fire	Unlikely	Medium	Low likelihood	Medium	Moderate / low risk	Establish a fire safety manual and ensure emergency response plans.
Structural damage caused by extreme storm and wind events	Low likelihood	Medium	Low likelihood	Medium	Moderate / low risk	Building Regulations for structural design with safety margin. Undertake regular maintenance of assets to identify damage. Prepare and rehearse an Emergency Plan for responding to flooding and other storm damage.
Slope/embankment failure caused by extreme rainfall or	Low likelihood	Mild	Low likelihood	Mild	Low risk	Landscape planting to be included on embankments to improve stability. Drainage

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
storm and wind events						infrastructure considered within PEIR Chapter 14. Prepare and rehearse an Emergency Plan for responding to flooding and other storm damage.
Disruption to road network surrounding Site caused by extreme storm events	Low likelihood	Mild	Low likelihood	Mild	Low risk	Prepare standard operating procedures in the event of necessary road closure and/or traffic diversion. Proposed Development is not at a remote location and multiple access points to the Site exist. Implement a road user warning system in areas exposed to high winds.
Disruption to rail network due to speed or movement restrictions resulting from tracks expanding and overhead cables sagging caused by	Likely	Medium	High likelihood	Medium	High risk	Tracks and overhead cables on DCO Site to be selected in line with best practice design standards. Prepare standard operating procedures in the event of necessary rail closure.

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
extreme heat						
Shrinking and swelling of soils due to excessive rainfall and drought cycles, leading to subsidence. Mainly affects clay soils.	Unlikely	Medium	Low likelihood	Medium	Moderate / low risk	Appropriate geotechnical investigation and design prior to construction. Compliance with Building Regulations for structural design.
Heat stress to building structures, fixtures and fittings from high temperatures can lead to expansion and buckling or to electrical equipment failure	Low likelihood	Medium	Low likelihood	Medium	Moderate / low risk	Compliance with Building Regulations for structural design with safety margin. Specification of exterior equipment and pipework for operating envelope encompassing higher temperature extremes. Specification of electrical equipment for higher operational envelope or with thermal enclosures and cooling.

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
Decline in water resource supply or quality caused by drought and reduced abstraction availability	Likely	Mild	High likelihood	Mild	Moderate risk	United Utilities has an obligation to have a 25-year plan for customer supplies. SuDS and water efficiency measures to be incorporated in Proposed Development.
Building fabric damage due to condensation / mould from increased rainfall and humidity	Unlikely	Mild	Low likelihood	Mild	Low risk	Mechanical ventilation system to be installed where applicable to prevent condensation / mould accumulation. Undertake regular maintenance of assets to detect deterioration or damage.
Workforce affected by high temperature and / or humidity conditions	Likely	Mild	High likelihood	Medium	High risk	Ventilation, mechanical cooling and solar control glazing for buildings. Canopies and use of natural shading from landscape planting in external working areas. Workforce health and safety policy. PPE and monitoring of working conditions to prevent workforce overheating. Prepare and rehearse an Emergency Plan

Hazard	Medium Term (2030-2059)		Long Term (2070-2099)		Risk rating (highest)	Mitigation
	Probability of risk occurring	Consequence of risk occurring	Probability of risk occurring	Consequence of risk occurring		
						for responding to extreme heat conditions and any related illness to workforce, i.e. identifying and treating sunstroke symptoms.
Landscaping/habitat failure or increased watering or maintenance requirements	Low likelihood	Minor	Likely	Minor	Low risk	Landscaping design to include climate-resilient species that can adapt to the changing climate. SuDS system to incorporate rainwater storage.

SUMMARY AND CONCLUSIONS

21 The main risks identified in Table 7 are those associated with extreme weather events and summer heatwave conditions. Short-term extreme weather events, and the long-term climate trend of increased peak summer temperatures, could therefore present a risk to the Proposed Development. However, these risks are capable of being influenced or mitigated through design and the preparation of emergency response and contingency plans.

22 Although the degree of climatic change during the construction period are likely to be lesser than the operational period studied, there is also potential for health and safety risks to the construction workforce (e.g. in heatwave conditions), the public (e.g. from increased construction dust in drought conditions), or risk of programme disruption (e.g. due to prolonged heavy rainfall). However, it is considered that near-term climatic changes are likely remain similar to present-day weather extremes, which are routinely planned for and managed by construction contractors.

23 During operation, particularly if the operating life of the Proposed Development extends beyond mid-century and a high global climate change scenario eventuates, risks to the development could be greater. These risks are present both at the development itself, but also in the rail and road networks its operation relies upon (plus electricity supply and telecoms); the rail network in particular is vulnerable to speed restrictions and disruption during high temperatures.

24 With regard to on-site risks, given the physical labour in warehouse operations together with operating plant outdoors, this is a key aspect to be addressed through mitigation to ensure workforce safety and wellbeing. The Energy Strategy has identified the importance of solar control glazing and balanced g-values for translucent elements to manage heat gain in summer and ensure optimised internal conditions in both the winter and summer months. It also identified the need for external solar shading, which could include solar PV canopies over car parking areas, use of the site landscaping to provide shading around roads and external working areas, and shading canopies for warehouse loading docks.

25 Extreme storm, wind and rainfall events could result in structural or building fabric damage, subsidence, slope/embankment failure and disruption to the road network. Regular maintenance, compliance with Building Regulations incorporating a safety margin for structural design, preparation of an Emergency Response Plan for responding to flooding and storm damage, and implementation of a road user warning system are all ways these risks can be mitigated.

26 Decline in water resource supply or quality can be managed through SuDS and water efficiency measures including rainwater storage on site for landscaping, although United Utilities does have an obligation to have a 25-year plan for customer supplies.

27 With regard to off-site risks, these can be influenced to a limited degree by the Proposed Development itself. The main mitigation is preparedness with operating plans in place for traffic and freight diversion. The on-site Energy Centre with PV and battery storage also offers the opportunity to design for resilience to temporary electricity supply disruption.

28 Overall, it is considered that the risks screened in Table 7 do not in general represent wholly new or unexpected issues, but must be planned for in design if the Proposed Development is to be climate resilient. Good practice for the design of the Proposed Development, in addition to establishing and rehearsing specific emergency plans, can mitigate against the likelihood of significant adverse effects, thereby reducing the effect to a non-significant level in the majority of cases.