Limerick-Shannon Metropolitan Transport Strategy

Final Limerick-Shannon Metropolitan Transport Strategy: Strategic Environmental Assessment - SEA Statement

November 2022

National Transport Authority

Final Limerick-Shannon Metropolitan Transport Strategy

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List of Abbreviations

Term	Definition	Term	Definition
AA	Appropriate Assessment	NPWS	National Parks and Wildlife Service
CAF	Common Appraisal Framework	NTA	National Transport Authority
CCC	Clare County Council	pNHA(s)	Proposed Natural Heritage Area(s)
CCDP	Clare County Development Plan	PRoW	Public right of way
CFRAM	Catchment Flood Risk Assessment and Management	RBD	River Basin District
CSO	Central Statistics Office	RBMP	River Basin Management Plan
DAFM	Department for Agriculture, Food and the Marine	SAC	Special Area of Conservation
DECC	Department of Environment, Climate and Communications	SEA	Strategic Environmental Assessment
DHLGH	Department for Housing, Local Government and Heritage	SEOs	Strategic Environmental Objectives
DTCAGSM	Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	SFILT	Strategic Framework for Investment in Land Transport
DoT	Department of Transport	SPA	Special Protection Area
EPA	Environmental Protection Agency	SuDs	Sustainable Urban Drainage
EC	European Commission	TII	Transport Infrastructure Ireland
EIA	Environmental Impact Assessment	UN	United Nations
EU	European Union	UNESCO	United Nations Educational, Scientific and Cultural Organisation
FRMP	Flood Risk Management Plans	WEC	Western European Countries
GSI	Geological Survey Ireland	WFD	Water Framework Directive
IGH	Irish Geological Heritage	WHO	World Health Organisation
LCCC	Limerick City and County Council		
LCDP	Limerick County Development Plan		
LSMA	Limerick Shannon Metropolitan Area		
LSMATS	Limerick Shannon Metropolitan Area Transport Strategy		
MCA	Multi Criteria Assessment		
NDP	National Development Strategy		
NHA	Natural Heritage Area		
NIS	Natura Impact Statement		
NPF	National Planning Framework		

Glossary

Glossary Term	Definition
AA Screening Report	The report which provides information on and assesses the potential for the proposed Strategy to impact on European sites within the Natura 2000 network.
Natura Impact Statement	A document which summarises the findings of the AA and how they were factored into the plan, the reason for choosing the preferred Strategy in light of alternatives considered and to state the likely significant effects.
Appropriate Assessment	An assessment required under the Habitats Directive when a Strategy or project has the potential to affect a European site.
Baseline Environment	The state of the environment in the absence of the Strategy.
Catchment	The total area of land that drains into a watercourse.
Cumulative effect	The combined effects from several plans, programmes or policies.
SEA Environmental Report	The SEA report that documents the effects of investment priorities outlined in a plan.
Invasive species	Non-native species that out-compete native species to the detriment of an ecosystem.
Mitigation	The implementation of measures designed to reduce the predicted effects of a Strategy or project on the environment.
RAMSAR site	An international designation for an important wetland site under the Ramsar Convention.
SEA Screening Report	The report which determines whether the proposed Strategy requires SEA.
SEA Scoping Report	The SEA report that sets the scope and objectives of the SEA.
SEA Post Adoption Statement	The document which details how environmental considerations have been integrated into the plan, how the environmental report and consultation responses were taken into account, the reasons for choosing the Strategy as adopted in light of reasonable alternatives considered and the measures to be taken into account to monitor or mitigate the likely significant effects.
Special Area of Conservation	An international designation for habitats and/or species under the EC Habitats Directive.
Special Protection Area	A site of international importance for birds, designated as required by the EC Birds Directive.
Strategic Environmental Objectives	Methodological measures against which the effects of the Strategy can be tested.

1. Introduction and Background

1.1 Background to the Limerick Metropolitan Area Transport Strategy (LSMATS)

The National Transport Authority (NTA) is a public body set up under statute and established in December 2009. The role and functions of the NTA are set out in three Acts of the Oireachtas; the Dublin Transport Authority Act 2008, the Public Transport Regulation Act 2009 and the Taxi Regulation Act 2013. In August 2015, the Department of Transport, Tourism and Sport (DTTaS)[1] published its policy document "Investing in our Transport Future - Strategic Investment Framework for Land Transport" (SIFLT). Action 4 of that framework states that: *"Regional transport strategies will be prepared by the NTA and provide an input to regional spatial and economic strategies".*

Having regard to its role in relation to transport, and the action placed upon it in the DTTaS[1] policy document, the NTA, in collaboration with Limerick City and County Council (LCCC) and Clare County Council (CCC), has developed a Transport Strategy for the Limerick Shannon Metropolitan Area (LSMA) covering the period 2020 to 2040. The Strategy provides a framework for the planning and delivery of transport infrastructure and services in the LSMA over the next two decades. It also provides a planning policy for which other agencies can align their future policies and investment priorities.

1.1.1 Relationship between LSMATS and other plans and programmes

Figure 1.1 illustrates the relationship between the Limerick Shannon Metropolitan Area Transport Strategy (the LSMATS or the Strategy) and other key national, regional, county, and local level land use, economic and transport plans, and programmes. These existing plans and programmes have been subject to their own environmental assessment processes as relevant and provide for many of the measures incorporated within the draft Strategy. The Strategy aligns with these documents.

In addition to compliance with higher level (e.g., national, and regional level) plans and programmes, individual transport projects undertaken under the LSMATS and/or lower-level strategies are subject to their own project level environmental assessment processes which may include Environmental Impact Assessment (EIA), Appropriate Assessment (AA), Water Framework Directive (WFD) compliance assessments and Flood Risk Assessments (FRAs).

[1] Now known as the Department of Transport (DoT)

	Land Use/Economic	Transport	Climate change
	Combined land use/economics and transport		
National (Tier 1) ↕	National Planning Framework 2040 *(SEA complete)*	Strategic Framework for Investment in Land Transport (SFILT) *(SEA complete)*	Climate A Climate Action and Low Carbon Development Act 2015 and Amendment 2021
	National Development Plan 2018 - 2027		Climate Action Plan 2021 National Energy and Climate Plan 2021-2030
		Climate Change Adaptation Plan for the Transport Sector	
	National Investment Framework for Transport in Ireland (NIFTI) (*SEA complete)*		
Regional (Tier 2) ↕	Regional Spatial and Economic Strategy (RSES) for the Mid-West *(SEA complete)*		
	Mid-West Area Strategic Plan (2012-2030) (MWASP) *(SEA complete)*		
	Limerick Shannon Metropolitan Area Strategic Plan (LSMASP) *(SEA complete)*	LSMATS – (SEA Statement provided in this report)	
County ↕	Limerick County Development Plan (LCDP) 2010-2016 (*SEA complete)* Emerging Limerick Development Plan (LDP) 2022-2028 *(SEA not yet complete)*	Limerick Metropolitan Cycle Network Study (*SEA complete)* Emerging Clare CCDP 2022-2028 *(SEA not yet complete)*	Draft Climate Change Adaptation Strategy 2019-2024 (Limerick City and County Council (LCCC), 2019b); Climate Change Adaptation Strategy 2019-2024 (Clare County Council, 2019);

	Limerick City Development Plan (LCDP) 2010-2016 (*SEA complete)* Clare County Development Plan (CCDP) 2017-2023 (*SEA complete)* Shannon Municipal District – Volume 3 (b)] (Clare CCDP) Southern Environs Local Area Strategy 2011-2017 (extended to 2021) (*SEA complete)* Shannon Town and Environs Local Area Plan 2012-2018 (*SEA complete)*	Limerick Metropolitan District Movement Framework Study (LCCC, 2015).
Local	Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary (2013-2020) (SIFP Steering Group, 2013) (*SEA complete)* Castletroy Local Area Plan 2019-2025 (LCCC, 2019b) (*SEA complete*)	

Figure 1.1 Relationship between the LSMATS and other plans and programmes

1.2 Purpose of this Environmental Statement

1.2.1 Strategic Environmental Assessment (SEA)

The LSMATS will influence future projects to be identified down the line, but which are likely to have a significant effect on the environment, and therefore falls under the scope of the European Directive 2001/42/EC *"on the assessment of the effects of certain plans and programmes on the environment*" (known as the 'SEA Directive"). The SEA Directive is implemented in Ireland via the European Communities (EC) (Environmental Assessment of Certain Plans and Programmes) Regulations 2003, as amended by the EC (Environmental Assessment of Certain Plans and Programmes) (Amendments) Regulations 2011 (known as the 'SEA Regulations').

The SEA process involves the following:

- Collecting and presenting information on the environmental baseline and problems, and their likely future evolution;
- Predicting significant environmental effects of the Strategy or programme, including those of strategic alternatives and including cumulative effects within the Strategy and with other plans and strategies or proposed developments;
- Addressing adverse environmental effects through mitigation measures;

- Consulting the public and authorities with environmental responsibilities as part of the assessment process; and
- Monitoring the environmental effects of the Strategy during its implementation.

1.2.2 Purpose and structure of the SEA Statement

This SEA Statement has been prepared following the finalisation of the Environmental Report and is the output of stage four of the four-stage SEA process (detailed in

Table 1-1 below). The report takes account of comments received during the public consultation process and final LSMATS and is an update to the Environmental report submitted with the draft LSMATS.

Stage	Purpose and Requirements	Output
Stage 1: Screening	Prior to starting the SEA process, a Strategy or programme undergoes 'screening" to determine whether it requires SEA (also if SEA is to be undertaken on a voluntary basis).	SEA Screening Statement – NTA (as the responsible authority) determined that SEA would be undertaken for the LSMATS.
Stage 2: Scoping	Consideration of the context and objectives of the SEA, provides information on baseline data, identifies relevant environmental issues and trends, and defines the parameters of the scope of the SEA for the purpose of consultation.	SEA Scoping Report.
Stage 3: Identification, Prediction, Evaluation and Mitigation of Potential Effects	Within the context and parameters identified at the Scoping Stage, identification and evaluation of likely significant effects of the LSMATS is carried out, including consideration of alternatives and determination of measures to mitigate and monitor residual effects.	SEA Environmental Report.
Stage 4: Consultation, Revision and Post-Adoption **Current Stage in the SEA**	Consultation with statutory consultees and the public. This may require changes to the revised Strategy in light of responses. Statement on how the SEA and consultation process has influenced the final Strategy. The statement is required to include an environmental monitoring Strategy - this is intended to provide feedback on significant environmental effects. This will also aid any future review / revision of the LSMATS and the SEA.	SEA Statement – this report. Implementation of the monitoring programme.

Table 1-1 SEA process

The purpose of this SEA Statement, in accordance with SEA Regulations is to document how environmental considerations, the views of the consultees and the recommendations of the Environmental Report have been taken into account in the final LSMATS. Therefore, this statement includes the following information in line with the SEA Regulations:

- How the submissions and observations expressed in response to the consultation on the draft LSMATS and the Environmental Report have been taken into account (chapter 3);
- How environmental considerations and the Environmental Report's recommendations have been integrated into the final LSMATS (chapter 4);
- The reasons for choosing the final LSMATS as adopted, in light of the other reasonable alternatives dealt with (also in chapter 4); and
- The measures that are to be taken to monitor the significant environmental effects of the implementation of the LSMATS (chapter 5).

1.2.3 Appropriate Assessment (AA)

In addition to compliance with the SEA Directive, the preparation and implementation of the LSMATS must meet the provisions of the EU Habitats Directive (92/43/EEC) and transposing regulations (European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)) (Birds and Natural Habitats Regulations 2011).

The Habitats Directive requires that:

"*Any Strategy or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the Strategy or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public. (EU Habitats Directive, Article 6-(3))*".

This process has four stages:

- Stage 1: Screening for AA/Test of Significance — the process which identifies the likely impacts upon a European site from a project or plan, either alone or in-combination with other projects or plans and considers whether these impacts are likely to be significant.
- Stage 2: Appropriate Assessment — the consideration of the impact on the integrity of the European site from the project or plan, either alone or in-combination with other projects or plans, with respect to the site's structure and function and its Conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.
- Stage 3: Assessment of Alternative Solutions — the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. All reasonable alternatives must have been considered and assessed, and the least damaging option selected, to progress to Stage 4.
- Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)/Derogation – Assessment where no alternative solutions exist, and adverse impacts remain. Assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

The requirements as stipulated in the Birds and Natural Habitats Regulations are considered in the Natura Impact Statement (NIS) which has been published alongside this document.

2. LSMATS scope and content

2.1 Scope of the LSMATS

The LSMATS considers all land transport modes, with the objective of providing a long-term strategic planning framework for the integrated development of transport infrastructure and services in the LSMA. It will be used to inform transport investment priorities over the short and long term and will inform sustainable integrated land use and transport policy formulation at the metropolitan and local level.

The LSMATS has been developed by the NTA in collaboration with LCCC, CCC and Transport Infrastructure Ireland (TII). It has also been informed by pre-consultation submissions from a number of stakeholders.

The LSMATS represents:

- The transport sector's response to the LSMA's requirements in relation to climate change;
- An integrated transport strategy for walking, cycling, bus, rail and road to support planned growth up to 2040;
- A strategy to facilitate compact growth;
- A framework for the planning, investment and delivery of transport infrastructure and services to guide the LSMA's development up to 2040 in line with the National Planning Framework 2040, National Development Plan 2018-2027 and the Regional Spatial and Economic Strategy for the Southern Region;
- A flexible strategy with the ability to scale up public transport capacity and frequencies as necessary in response to changing circumstances; and
- A framework plan with which other agencies involved in land-use planning, environmental protection and the delivery of other infrastructure and services such as water, housing and community facilities can align their plans and investment priorities.

Each of the considerations below are included within the draft LSMATS:

- Public transport infrastructure and service proposals (rail and bus);
- Measures to facilitate and promote walking;
- Measures to facilitate and promote cycling, including cycling infrastructure;
- Traffic management policies including potential changes to traffic circulation in Limerick City centre;
- Demand management measures including policies related to parking and tolling;
- Behavioural change measures;
- Measures to promote integration between all modes;
- Policies related to the management of freight; and
- Road infrastructure.

2.2 Geographical scale of the LSMATS

The geographical area of the LSMATS has been defined by the Department of Housing, Local Government and Heritage (DHLGH) to include the continuous built-up area of Limerick City and Suburbs (as defined by the CSO - Central Statistics Office) and Shannon in Co. Clare (see Figure 2.1). It also includes the following settlements:

- Annacotty;
- Castleconnell;
- Patrickswell;
- Clarina;

- Mungret in County Limerick;
- Sixmilebridge;
- Ardnacrusha;
- Clonlara;
- Cratloe;
- Ballycannan; and
- Bunratty in County Clare.

The population of the LSMA is over 132,420 (CSO, 2016) and covers 387km^2.

Limerick City is the largest urban centre in Ireland's Mid-West region and the country's third largest city. Shannon is a significant employment centre with assets such as Shannon International Airport and Shannon Free-Zone international business park. Limerick City and Shannon are interdependent upon each other, with their complementary functions contributing to a combined strength which is a key economic driver for the Mid-West Region.

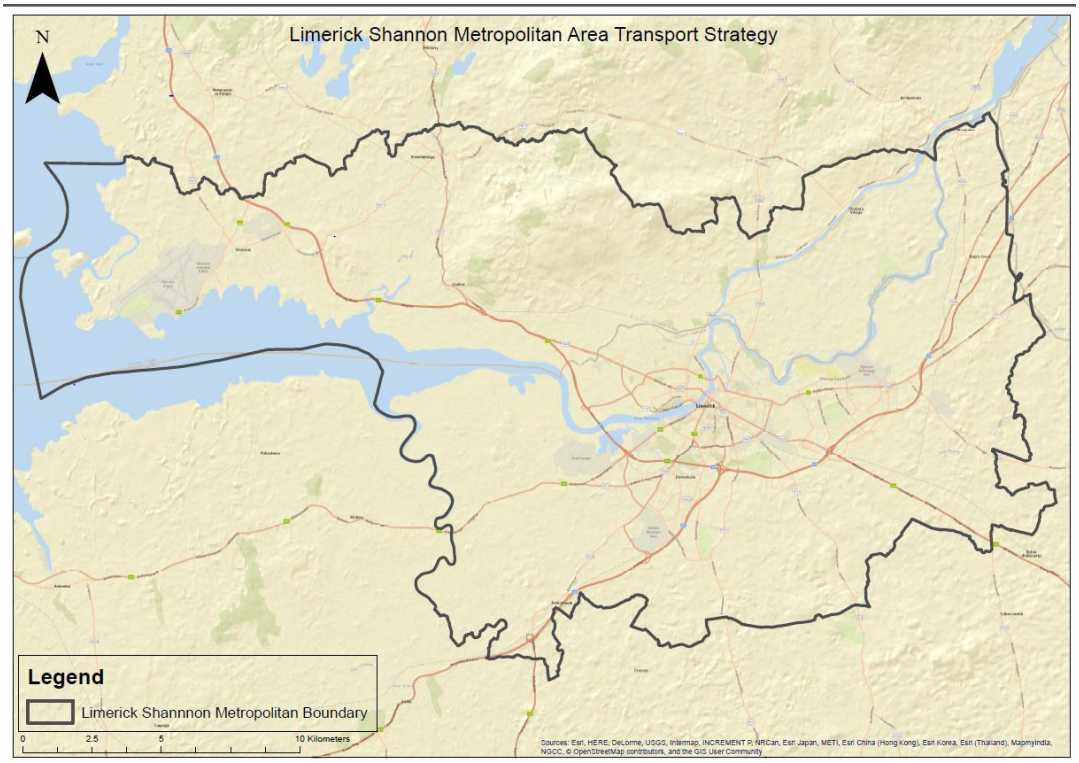

Figure 2.1 Limerick Shannon Metropolitan Area Boundary

Limerick City is home to two major third-level education institutions, University College Limerick (including Mary Immaculate College) which is located to the north-east of the City Centre and Limerick Institute of Technology (including Limerick School of Art and Design) which is located to the west of the City Centre. The City and its Metropolitan Area is served by commuter and intercity rail services; city, regional and expressway bus / coach services; and Shannon International Airport is located approximately 20km to the north-west of the City Centre.

2.3 Temporal scope of the LSMATS

The LSMATS provides a strategic vision for transport within the LSMA between 2020 and 2040. Taking this into account and in line with the SEA Directive, short, medium and long-term impacts (including reference to secondary, cumulative, synergistic, permanent and temporary, positive and negative effects) will be considered during the assessment.

3. How the SEA Environmental Report and consultation comments were taken into account

Public consultation and stakeholder engagement is a key element in ensuring stakeholders and members of the public have an opportunity to contribute to the development of plans and projects in Ireland. NTA has undertaken an extensive consultation and engagement process with stakeholders and members of the public throughout the development of the LSMATS.

3.1 Consultation 1 Scoping Stage

A SEA scoping report was consulted on in line with Article 9(5) of the SEA Regulations (S.I. No. 435 of 2004), and was made available to the following statutory Environmental Authorities for consultation for a four-week period between 10 September and 11th October 2019:

- Environmental Protection Agency (EPA);
- DHLGH (formerly the Department of Housing, Planning and Local Government);
- Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (DTCAGSM) (formerly the Department of Culture, Heritage and Gaeltacht);
- Department of Agriculture, Food and the Marine (DAFM); and
- Department of Environment, Climate and Communications (DECC) (formerly the Department of Communications, Climate Action and Environment).

The following interested parties were also consulted:

- Geological Society for Ireland (GSI).

The scoping consultation closed on the 11th October 2019 and comments received have been considered in the approach to the SEA and the development of the Strategy. The main themes from the comments received were:

- Climate mitigation / emissions reduction needs further consideration as part of the SEA and in preparing the Strategy.
- The scope and remit of the Strategy, where it sits in the transport planning hierarchy and how it will be implemented, should be clearly set out.
- National and regional level commitments with respect to landscape and visual amenity within the National Planning Framework and the Southern Regional Assembly Regional Spatial and Economic Strategy should be considered within the landscape baseline.
- A number of additional plans and policies were identified as requiring inclusion within the baseline, such as the Shannon Foynes Integrated Framework Plan, Shannon Foynes Port Company Masterplan, county and regional Greenway strategies, Local Economic and Community Plans for local authorities and recent tourism plans/programmes under preparation by Fáilte Ireland.
- The SEA should consider potential impacts on underwater archaeology.

3.2 Consultation 2 Draft LSMATS and SEA Environmental Report

The draft LSMATS and SEA Environmental Report were made available online for a period of 8 weeks between 2nd September and 16th October 2020. In addition, the statutory environmental authorities listed in section 3.1 were sent a copy of the draft LSMATS and SEA Environmental Report by email. The environmental authorities, stakeholders and members of the public were invited to submit comments and observations by email to the NTA. A summary of the comments and observations received relevant to the SEA Environmental Report, along with actions taken to address them, is provided in Table 3-1.

Table 3-1 Summary of SEA Environmental Report consultation comments

Consultee	Key Comments	Actions Taken
EPA	Additional plans for consideration should include UN Agenda 2030 for Sustainable Development, Ireland's National Sustainable Development Goals Implementation Plan 2018-2020, Climate Action Plan 2019, draft National Investment Framework for Transport Investment (NIFTI), draft National Energy and Climate Plan and Developing Resilience to Climate Change in the Irish Transport Sector, Southern Regional Spatial and Economic Strategy, EU Biodiversity Strategy for 2030, EU Green Deal, updated National Biodiversity Plan, finalised RBMP and CFRAMS flood risk management plans, draft Seascape Character Assessment.	The newly developed 2020 State of the Environment Report, EU Biodiversity Strategy for 2030, NIFTI, EU Green Deal and draft Seascape Character Assessment have now been included within the SEA Environmental Report and Strategy where appropriate. All other plans identified were included within the SEA Environmental Report which accompanied the draft LSMATS.
	Suggestion to include a graphic showing strategy in hierarchy of related plans and programmes and ensure that strategy is aligns with the National Planning Framework and Southern Regional Spatial and Economic Strategy.	This was provided in section 1.1 of the SEA Environmental Report for the draft LSMATS.
	Commitments for delivery of sustainable modes of transport should include measurable targets and time frames for delivery.	Mode share targets for walking and cycling have been included in the revised LSMATS, with targets relating to car and public transport use to be added following completion of further analysis being undertaken with the Department for Transport. Detailed delivery details will be more appropriately be included within the implementation plans and programmes included within the LMSATS.
	The plan should recognise the need to develop infrastructure to support uptake of electric cars in line with the National Planning Framework on Alternative Fuels.	The draft and revised LSMATS include measures to support the uptake of electric cars.
	The Strategy should consider the exposure and vulnerability to weather and climate events, and the range of projected scenarios and changes to these scenarios due to climate change. Consideration should also be given to other impacts in addition to flooding.	The SEA for the draft and revised LSMATS recommends that the design or new and improved infrastructure reflects likely worst-case climate projections in terms of resilience to wind speeds, precipitation, flood risk and increases in air temperature over the full design life of the infrastructure.
	Impacts on air quality should be monitored and evaluated as part of the SEA.	Impacts on air quality are assessed in section 7.3 and 7.4, and monitoring proposals relating to air quality are provided in chapter 8 of the SEA Environmental Report for the draft LSMATS.
	The Strategy should consider measures to protect designated quiet areas in open country and creating a preventative management strategy for noise.	There are currently no designated quiet areas within the LCCC and CCC jurisdictions. The SEA for the revised LSMATS includes an additional mitigation requirement for consideration of any designated areas identified in future planning cycles.
	The Strategy should include a separate chapter on 'Environmental Considerations'.	The final LSMATS includes an Environmental Considerations chapter.
	Commitment to develop an LSMATS Natural Heritage Strategy should be reworded to 'develop and implement a LSMATS Natural Heritage Strategy' and should include timeframe and duration of proposal.	Wording amended. Detail regarding timeframe and duration provided in sections 7.3 and 7.4 of the SEA Environmental Report for the draft LSMATS.
	Cumulative impacts associated with the emerging LDP 2022-2028, emerging CCDP 2022-2028 and the Climate Action Plan 2019 should be considered.	Section 7.4 Inter Plan Cumulative Impacts of the SEA Environmental Report for the draft LSMATS has been updated to take account of these documents.

Consultee	Key Comments	Actions Taken
	SEA related monitoring measures should be included in any strategy implementation/monitoring reviews undertaken.	The SEA monitoring plan will provide basis for quantifying and recording the environmental impacts of the current LSMATS and inform the development of future revisions.
GSI (DECC)	Inclusion of County Geological Sites (CGSs) within the baseline is welcomed. Information provided regarding various potential sources of baseline information with regards to groundwater flooding, geological mapping, geohazards and natural resources, the marine environment. Request to be provided with any site investigation data and for significant bedrock cuttings to remain exposed.	Noted. Provision of site investigation data (where available) and exposure of bedrock cuttings has been included as mitigation for potential impacts on geology and soils in section 7.3 of the SEA Environmental Report for the draft LSMATS.

3.3 Consultation 3 Revised Draft LSMATS

The consultation on the Revised Draft LSMATS ran from 26th April to 10th June 2022. The Revised Draft LSMATS was publicised throughout the LSMA in local newspapers and via social media. The NTA hosted two online public webinars during the consultation period and a number of other stakeholder engagements.

The Revised Draft LSMATS was available to view in the NTA's offices and the following documents were displayed on the main strategy consultation portal on the NTA's website:

- Revised Draft LSMATS (Irish, English, Easy to Read and Accessible versions);
- SEA Environmental Report;
- Appropriate Assessment Natura Impact Statement;
- Strategy Development and Modelling Report;
- Preliminary Equality Impact Assessment;
- Draft LSMATS Public Consultation Report;
- Rail Assessment and Cost Benefit Analysis; and
- Transport Modelling Assessment Report.

Members of the public and stakeholders were directed to an online portal to make submissions and to a feedback form to give their views. In addition, a small number of written submissions were accepted.

The NTA received 90 submissions made up of 87 public and stakeholder submissions via the online portal and 3 received via email.

The main issues raised were as follows and are detailed in Table 3-2:

- Limerick Northern Distributor Road;
- Investment in Rail;
- Cycling;
- Walking;
- Bus;
- Limerick City Centre;
- Targets, Metrics and Timelines; and
- Climate Action Plan.

The NTA Strategy Team reviewed each submission. The submissions were then summarised using the online portal, focussing on those elements of each submission which sought a specific change to the transport strategy. These suggested changes were considered, and a response drafted to each.

This exercise informed the finalisation of the LSMATS. The Public Consultation report has been prepared alongside the strategy, focussing on the main issues raised. The responses to the written submissions are set out in Appendix 1 of the Summary Report on the Public Consultation on the Revised Draft LSMATS. Appendix 2 to that report sets out the responses of the NTA Strategy Team to the range of matters raised by respondents, categorised according to each chapter of the transport strategy, and Appendix 3 addresses those issues raised by the environmental authorities on the SEA and AA.

As such, the LSMATS comprises a comprehensive approach to transport planning in the LSMA for the strategy period based on a high level of technical and policy-based analysis and incorporating feedback from the public consultation process.

3.3.1 Comments and responses on the revised draft Strategy

The consultation comments and responses on the Revised Draft LSMATS are summarised by theme in table 3-2 below.

Table 3-2 Main issues raised during the consultation on the Revised Draft LSMATS and NTA responses

Main Issue Raised	Issue Description	NTA Response
1. Limerick Northern Distributor Road (LNDR)	The removal of the LNDR from the revised draft was a major concern for a broad range of individuals and organisations. The main issues raised in this regard were as follows: - Alignment with the Regional Spatial and Economic Strategy; - Alignment with the Clare and Limerick Statutory Development Plans; - Impact of its removal on the potential to remove traffic from the city and suburbs and provide for sustainable transport measures; - Need for direct connectivity from Shannon and Clare to the NTP and UL; - Congestion issues at Corbally; and - Congestion issues at Mackey Roundabout M7 Junction 28. There was also considerable support expressed for the removal of the LNDR, primarily on the following grounds: - Community severance of towns and villages in South Clare caused by the route; and - Environmental Impact including flooding and emissions.	In finalising the LSMATS, the NTA and local authorities undertook considerable further analysis of the impact of the LNDR across all areas of transport planning: traffic flow; mode share; emissions; journey times; availability of alternatives etc. in order to gain a full understanding of its effects at a local and strategic level. In line with the Minister's recommendation contained in the letter received by the NTA in February 2022, and subsequent to further discussions with the Minister's Office after the second round of public consultation, the LNDR does not form part of the final LSMATS. All the issues raised during this consultation period have been central to the deliberations on this matter in the final LSMATS. As such, it remains the intention to address two major issues which impact on the movement of public transport and on the provision for comprehensive, safe and attractive walking and cycling facilities on major corridors into Limerick City, namely: - Traffic management and road safety at the Mackey Roundabout, Junction 28 on the M7; and - Significant constraints for the provision of bus priority and cycle facilities on the Corbally Road corridor. Accordingly, the local authorities, in conjunction with the NTA and TII (where impacts on the national road network have been identified) will develop and deliver schemes to address these issues. This is reflected in a new measure RS5 being included in the final LSMATS.
2. Investment in Rail	The potential for suburban rail to play a significant role in transport in the LSMA has been to the fore in the development of the LSMATS. Initial analysis by the NTA in the making of the original draft LSMATS indicated that it would play a limited role due to an absence of demand, based on the legacy population and employment distribution patterns and forecast patterns based on the policies and objectives of the regional and local authorities. Due to the response to the original draft, the NTA undertook, with the cooperation of Irish Rail, a	The LSMATS proposes to develop the LSMA rail network in accordance with measure RL3 and LSMATS Chapter 19 as the most appropriate response to the rail assessments and transport planning exercises undertaken by the NTA throughout the preparation of the LSMATS. The main priorities for rail investment in the LSMA, arising out of the LSMATS work, are as set out in Phase 1. In the event that circumstances change, the NTA will take that into account in the review of the LSMATS in the coming years. Furthermore, the LSMATS is not

Main Issue Raised	Issue Description	NTA Response
	comprehensive assessment of the potential for rail in the LSMA for the first time. The outcome of this assessment was similar to that from the original draft, however the NTA were satisfied to set out a pathway to more significant (Phase 2) investment on the condition that a radically different approach to land use development would be applied by the planning authorities. Notwithstanding this approach, a large number of respondents are of the view that the more ambitious Phase 2 programme should be delivered in the short-medium term. The other main issues raised related to rail were as follows: - Flooding at Ballycar; - Better services on the Ballybrophy Line; - Opening the Foynes Line for passengers in advance of the Ryder Cup in 2027; and - Need for dual-tracking of the entire network.	intended to preclude elements of Phase 2 being brought forward in advance of that review if they are found to be viable and meet the objectives to engender a mode shift away from the private car and reduce emissions. A number of amendments have been made to the text on foot of the consultation to account for issues raised, including the following: - The findings of the N/M20 scheme work; - Text on the infrastructural safeguard for the Shannon rail line; and - Rail freight at Limerick Junction.
3. Cycling	A number of additional routes were identified by respondents for inclusion in the cycle network and refinements suggested for others. The matter of E-bikes and micro-mobility was also raised. In general, there was broad support for the substance of the LSMATS, however, a high degree of dissatisfaction was expressed in relation to the pace of delivery of cycle infrastructure.	The Cycle Network map has been updated taking into account the submissions seeking clarification and inclusion of additional routes. The text of the Cycling has been subject to a number of changes to account, inter alia, for the following: - Removal of Clancy's Strand and the addition of O'Callaghan Strand into the network; - Integration of National Cycle Network; and - New section on Electric Bikes. Delivery and timelines are dealt with in 7.
4. Walking	A number of localised issues relating to the potential inclusion of certain schemes in the LSMATS were raised, as was the potential pedestrianisation of O'Connell Street. A number of measures were proposed to support the walking mode in the LSMA. Generally, there was support for the LSMATS overall direction which is to significantly enhance the pedestrian environment.	In relation to O'Connell Street, the position is unchanged since the original draft, i.e., it has been identified by the NTA and LCCC as the preferred option for delivering the maximum numbers of people to city centre workplaces, businesses and other activities. The routeing shown in the LSMATS is indicative and will be subject to the outcome of public consultation on a revised Limerick bus network. Changes to the report have been made to account for suggestions, including the following: - Safety and personal security issues; - Links between towns and villages; and - Inclusion of other major destinations for consideration for improved pedestrian facilities.
5. Bus	The issues raised related to bus included support for greater levels of priority, but also some questioning the rationale for doing so. Many problems were identified with bus service quality in the LSMA and the matter of bus using O'Connell Street was also raised under this topic. The proposed dedication of Sarsfield Bridge to this higher capacity mode was also an issue.	The bus chapter in the LSMATS is a means of framing a more detailed, specific and localised set of measures to be brought forward under BusConnects Limerick and Connecting Ireland. As such, it would not be fully meaningful or useful to be overly prescriptive in the LSMATS about the specific details. Many of the issues raised are covered under the overarching LSMATS measures. O'Connell Street is dealt with under 4. The final LSMATS includes the following changes in the Bus Chapter: - Inclusion of interchange with Rail as a consideration; and - TUS and UL included as destinations for Shannon services.

Main Issue Raised	Issue Description	NTA Response
6. Limerick City Centre	Issues which affect the city centre were raised across the various chapters of the LSMATS, including: - Potential positive and negative impacts of the LNDR; - O'Connell Street; - On-street parking; - Traffic Management and One-Way system; - Need for a City Centre plan; - Cycle parking; and - Consultation with businesses.	O'Connell Street is dealt with under 4. The majority of the issues related to the City Centre will be subject of the Limerick City Centre Traffic Management Plan, to be undertaken by the Council and NTA after the finalisation of LSMATS. Overall, the thrust of the LMSATS is to set the framework for the local authority and other stakeholders, supported by the NTA, to enable a balance to be struck between access for essential services and deliveries and the need to foster development of the city centre and wider metropolitan area. This will be achieved by realising the potential for increased activity by providing the footfall via sustainable modes, and by making the centre more attractive by providing a significantly enhanced public realm. No specific changes to the LSMATS were made in relation to the city centre.
7. Targets, Metrics and Timelines	As in the previous draft, the manner in which the LMSATS is proposed to be implemented and monitored and the level of detail contained in the report has been a major issue. This relates to: scheme delivery; mode share; emissions; inclusivity; road safety targets; and the reduction in car parking.	The LSMATS is a long-term high-level regional strategic plan whose function is to set out the framework for all actors in the transport and land use planning sector to align their investment and policy platforms. It is a matter for all of those agencies, including the NTA, to take responsibility for those elements they must deliver and incorporate the findings of the LSMATS into their implementation plans. In relation to mode share, the targets for cycling are ambitious, in particular given the negligible numbers cycling at present, but they are not a limit, and the infrastructure the NTA will seek to deliver will facilitate a significantly higher mode share than that which emerged from the modelling exercise included in the LSMATS materials. The manner in which the phased implementation of LSMATS is presented is appropriate given the uncertainty in the design; planning; public consultation; decision-making; tendering and construction processes associated with each individual scheme. Every year the NTA and local authority publish their intended implementation programme in detail and endeavour to deliver this in the context of design complexities and opposition to measures such as roadspace reallocation and parking removal. On-going monitoring of the impacts of the LSMATS at the local level is a matter for the local authorities and the NTA will input as required and maintain its role in monitoring impacts at the regional level. The NTA will also deliver the funding required for active travel in accordance with our objectives in the LSMATS. The public transport services and infrastructure schemes will be determined by the lower-level plans, such as BusConnects. Engagement will take place at the earliest stages in these plans. The following changes were made to the final LSMATS report to reflect some of the issues raised under this heading: - Addition of Air Quality monitoring; - Inclusion of attitudinal transport surveys under Monitoring; and

Main Issue Raised	Issue Description	NTA Response
		- Addition of new section on "Responsibility for Delivery".
8. Climate Action Plan	In relation to emissions, a number of respondents raised the fact that the measures contained in LSMATS alone are not forecast to lead to a reduction in transport emissions of 50%, as required by legislation. Conversely, some others are of the view that it is possible to avoid any additional punitive measures. Emissions were also linked with a number of aspects of the LSMATS, such as the LNDR and cycling investment.	The NTA undertook comprehensive modelling assessments of the LSMATS throughout 2021 and 2022 as it related to emissions. This work demonstrated clearly that significant measures outside the remit of the NTA and the LSMATS would be required to be implemented in order to reach the 50% target. An alternative to this would be to incorporate extremely punitive traffic management measures into the LSMATS which would apply only in the LSMA and which would not likely be acceptable from an accessibility and equality point of view. The additional measures will include further demand management measures to be determined by national policy, and changes to fuel, in particular changes to the fuel technology used for long distance HGVs. This is all set out in Chapter 17.

3.3.2 Comments and responses on the revised SEA Environmental Report and NIS

The consultation comments and responses on the SEA Environmental Report and NIS for the Revised Draft LSMATS are summarised by theme in table 3-3 below.

Table 3-3 Main issues raised during the consultation on the SEA Environmental Report and NIS and responses

Main Issue Raised	Issue Description	NTA Response
1. Dependence of future assessments	Department is conscious that this Strategy is a high level plan and that many matters in it can only be fully clarified by subsequent lower level plans. Where progression of the Strategy is dependent on matters to be established in future assessments it is important that this plan acknowledges that and provides for the possibility that certain assessments could be negative and that in those circumstances certain aspects of the Strategy should not proceed or could only proceed in certain prescribed circumstances (e.g. Article 6(4)).	SEA and NIS have been updated to further clarify that progression of projects and plans included with the LSMATS would be dependent on project level assessments and in the case that these project level assessments identify AESI that an alternative solution will be sought which avoids/reduces the impact to a level that ensures the integrity of the designated site remains unaffected. The NIS also clarifies that at a project level should issues arise under Article 6(3) of the Habitats Directive, despite the implementation of avoidance/mitigation measures, and there remains a risk of AESI of a European site, the project will not be progressed unless an alternative solution cannot be identified, or additional measures implemented which avoid the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.

Main Issue Raised	Issue Description	NTA Response
2. Mitigation hierarchy	In relation to Strategic Environmental Objective 3 "Prevent damage to, maintain and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species." it is clear that even at this early stage prior to route selection, potential significant negative effects of the plan have been identified and a range of SEA mitigation is proposed. It is this Department's view that before mitigation is considered avoidance should be the priority. Examples of the proposed Limerick to Shannon cycleway and other proposed cycleways along the river Shannon are given where there is concern that mitigation may be found not to be sufficient to conclude no significant effects and alternative solutions would need to be found.	SEA and NIS have been updated to add emphasis on the application of mitigation hierarchy and that avoidance should be a priority and a prominent aim within the strategy. A definition of the mitigation hierarchy has been added to the SEA to clarify the meaning of mitigation in the assessment. The SEA also refers to the commitment outlined in the NIS to the process as outlined above.
3. Commitment to protection process for national designated sites and other ecological interest	Need for a commitment in relation to other ecologically important site where if an adverse effect to a Natural Heritage Area (NHA), proposed NHA or other area of ecological interest, not just European Sites, cannot be avoided by mitigation then finding an "alternative solution" would be required.	The SEA includes the national level designations in the requirements for the application of the mitigation hierarchy and these are referred to within all the assessment tables alongside the European sites. Mitigation sections in the SEA have been updated to reflect the wording within G1 (i.e. "should issues arise under Article 6(3) of the Habitats Directive at the design stage and the assessment at that stage determines that there are likely to be adverse effects on the integrity of a European site, an alternative solution shall be required") within the relevant mitigation section for specific habitats and species.
4. Weighting of potential benefits against impacts	In the SEA the Department considers that the weighting of the potential impacts on SEO 3 are not proportionately represented in Table 7.5 and various other tables. The potentially positive effects of the plan listed as "Reduction in transport related emissions of air pollutants including nitrogen oxides (NOx), particulate matter (PM) and sulphur dioxide (SO2)" while welcome and desirable. Also the potential that mitigation listed may not be as effective in all cases and that at this early stage where routing is not confirmed it would not be possible to justify weighting potential benefits as greater than impacts for SE03	SEA assessment for SE03 has been updated reflect that the risks to habitats and species from construction is not balanced by potential improvements in air quality or opportunities for habitat enhancement. The scoring but to include negative (-) and post mitigation to neutral to negative (0/-) to reflect that mitigation uncertainty remains.
5. Uncertainty on mitigation	In relation to 7.3.2 "Summary of Preferred Approach Assessment" and the overall conclusions of the SEA, while acknowledging the substantial mitigation proposed, it is this Department's view that at this early and high level stage, uncertainty remains regarding the degree to which mitigation identified for implementation at project level assessment would be successful in offsetting potential negative effects for nature conservation.	SEA Environmental Report wording has been amended to reflect the approach in the revised NIS and need to prioritise avoidance of impacts. The NIS and SEA have been revised to further highlight the approach in terms of prioritising avoidance in the mitigation hierarchy by considering alternative solutions where needed and to apply project level appropriate assessment.
6. Clarification of term minimise	Clarification on the use of term in relation to mitigation to minimise effects as this vague need to clarify that activities would only proceed if it is established that they will not have AESI.	Wording in the NIS section 5 has been updated. Wording of the NIS throughout Section 5 and Table 5.1 has been amended to address this comment

Main Issue Raised	Issue Description	NTA Response
7. Clarification of mitigation	Clarification on mitigation for E01, E04, LHB1, B3	Wording in the NIS has been updated with a statement to clarify that: *At a project level should issues arise under Article 6(3) of the Habitats Directive, despite the implementation of avoidance/mitigation measures, and there remains a risk of AESI of a European site at a project level, the project will not be progressed unless an alternative solution cannot be implemented which avoids the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.*
8. Strategy revision assessment	Revisions to the draft Plan and where any identified have potential to have significant effects and what the proposals are to address these. Any revisions having significant effects or conflicting with national environmental policy or planning policy should be justified	The SEA identifies the additional plan alternative considered with the amendments compared to others and identifies how taking this alternative forward in the draft Plan has changed the assessment - see Section 7.2 and section 7.3. The Plan revisions are assessed as reducing potential for significant adverse environmental effects. Amendments are summarised sections 4 and 5 in the SEA Statement addressing how consultation and the assessment have influenced the final plan.
9. Integration of SEA recommendations with the strategy	The Plan, prior to its adoption, should also consider and integrate the recommendations of the SEA.	The Strategy includes a section on the environmental assessments and their findings and also specific commitments to implement the SEA recommendations and monitoring plan.

3.4 Consultation with the Department of Housing, Local Government and Heritage

As part of meeting regulatory requirements the updated SEA Environmental Report and NIS were submitted to the Department of Housing, Local Government and Heritage for consideration. Additional comments received and responses are summarised below.

Table 3-4 Additional issues raised during the consultation with the Department Housing, Local Government and Heritage on the Draft Final LSMATS, NIS and SEA Environmental Report

Main Issue Raised	Issue Description	NTA Response
LSMATs commitment	Recognition of the NIS and Appropriate Assessment setting out the procedures to be implemented to assess, then avoid or mitigate and not proceeding with projects which would have unavoidable adverse effects on site integrity however the Department requested that these commitments were expressed in specific sections of the LSMATs also.	Changes to the Strategy as follows: MEASURE WK4 – Local Amenity and Rural Routes Add new bullet point: - Undertake the planning, design and development of walking routes in full accordance with the Habitats Directive and transposing legislation; MEASURE CC1 – Develop a Comprehensive Strategic Cycling Network

Main Issue Raised	Issue Description	NTA Response
		Add new bullet point: - Undertake the planning, design and development of all cycling routes in full accordance with the Habitats Directive and transposing legislation; MEASURE CC2 – Shannon River Crossing Amend second bullet point - At the project level, an Appropriate Assessment will be undertaken in full accordance with the Habitats Directive and all transposing legislation. MEASURE RS3 – Principles for the Provision of New Roads Amend as follows Subject to the feasibility and environmental assessment processes, including the full application of the Habitats Directive and all transposing legislation, new roads, where provided, will be developed in accordance with the principles and measures outlined in this chapter.
NIS potential AESI	In relation to the NIS, within Table 4.4, 4.5 and 4.7. there are some areas where this Department believes potential Adverse effects on Site Integrity (AESI) have been underestimated and these were identified in relation to specific QI Habitat and species.	Table 4.4 within Chapter 4 of the NIS has been updated to further consider potential for AESI on the QI Habitat "Water courses of plain to montane levels with the Ranunclion fluitantis and Callitricho-Batrachion vegetation. Table 4.4 within Chapter 4 of the NIS has been updated to further consider potential for AESI on the QI Habitat Alluvial forests with Alnus glutinosa and Fraxinus excelsior. Table 4.4 within Chapter 4 of the NIS has been updated to further consider potential for AESI on Otter. Tables 4.5 and Table 4.7 within Chapter 4 of the NIS has been updated to further consider potential for AESI on QI bird species within Ballyallia Lough SPA and the River Shannon and River Fergus Estuaries SPA. The avoidance/mitigation measures as identified within Section 5 of the NIS are considered sufficient to address the potential for AESI in relation to the above QI.
RSES policy	The Department noted that the RSES Regional Policy Objective O1identifying that '*environmentally sustainable development*' has no adverse effects on the integrity of European sites and no net loss of biodiversity" and the RSES *seeks to protect, manage, and through enhanced ecological connectivity, improve the coherence of the Natura 2000 Network in the Southern Region.*" In addition the department highlighted the requirements of policies RPO 124(d) and RPO 201	The strategy has been updated to incorporate part of the text, adapted as appropriate, from the RSES into Chapter 18 on SEA and AA.

Main Issue Raised	Issue Description	NTA Response
	and requirements of walking and cycling facilities, greenway and blueway corridors should be based on rigorous assessments site/route selection studies and environmental including all necessary reports to assess the potential impact on designated European sites and on biodiversity outside of formal protections such that proposed development does not contribute to loss of biodiversity.	

These responses are incorporated into the final LSMATs, NIS and SEA Environmental Report as relevant.

4. How the SEA has influenced the Transport Strategy

4.1 SEA process and integration with Strategy development

The purpose of SEA is to enable plan-making authorities such as NTA to incorporate environmental considerations into decision-making at an early stage and in an integrated way throughout the plan-making process. Figure 4.1 below outlines the key stages of the development process for the LSMATS and illustrates how the SEA and AA processes have been integrated throughout. The development and assessment of transport options utilised the Mid-West Regional Model (MWRM) appraisal toolkit, which aligns with the DTTaS[1] Common Appraisal Framework (CAF) (DTTaS, 2016).

The approach to the SEA has aimed to:

- Contribute to the development of a preferred plan taking account of the full range of environmental protection and enhancement policy and regulatory requirements so that the plan provides a framework for meeting supply requirements while minimising environmental impacts;
- Embed principles governing sustainable abstraction, so the objectives of the LSMATS and NTA's biodiversity obligations can be achieved;
- Provide weight to the need to consider long term environmental resilience in water resource planning taking into account climate change; and
- Integrate environmental protection, enhancement and sustainability objectives into the plan implementation including the options assessment methodology to be applied through the LSMATS.

In addition to compliance with the SEA Directive, the preparation and implementation of the LSMATS must meet the provisions of the Habitats Directive (92/43/EEC) and transposing legislation. The Habitats Directive requires that if a plan, policy or programme is likely to have a significant effect on one or more European sites (that is, a Special Area of Conservation (SAC) or Special Protection Area (SPA), also referred to as the "Natura 2000" Network), either alone or in combination with other schemes, plans or projects, then it must be subject to AA. Figure 4.1 also shows how the development of the LSMATS and the SEA process was integrated with Stage 1 and Stage 2 of the AA process.

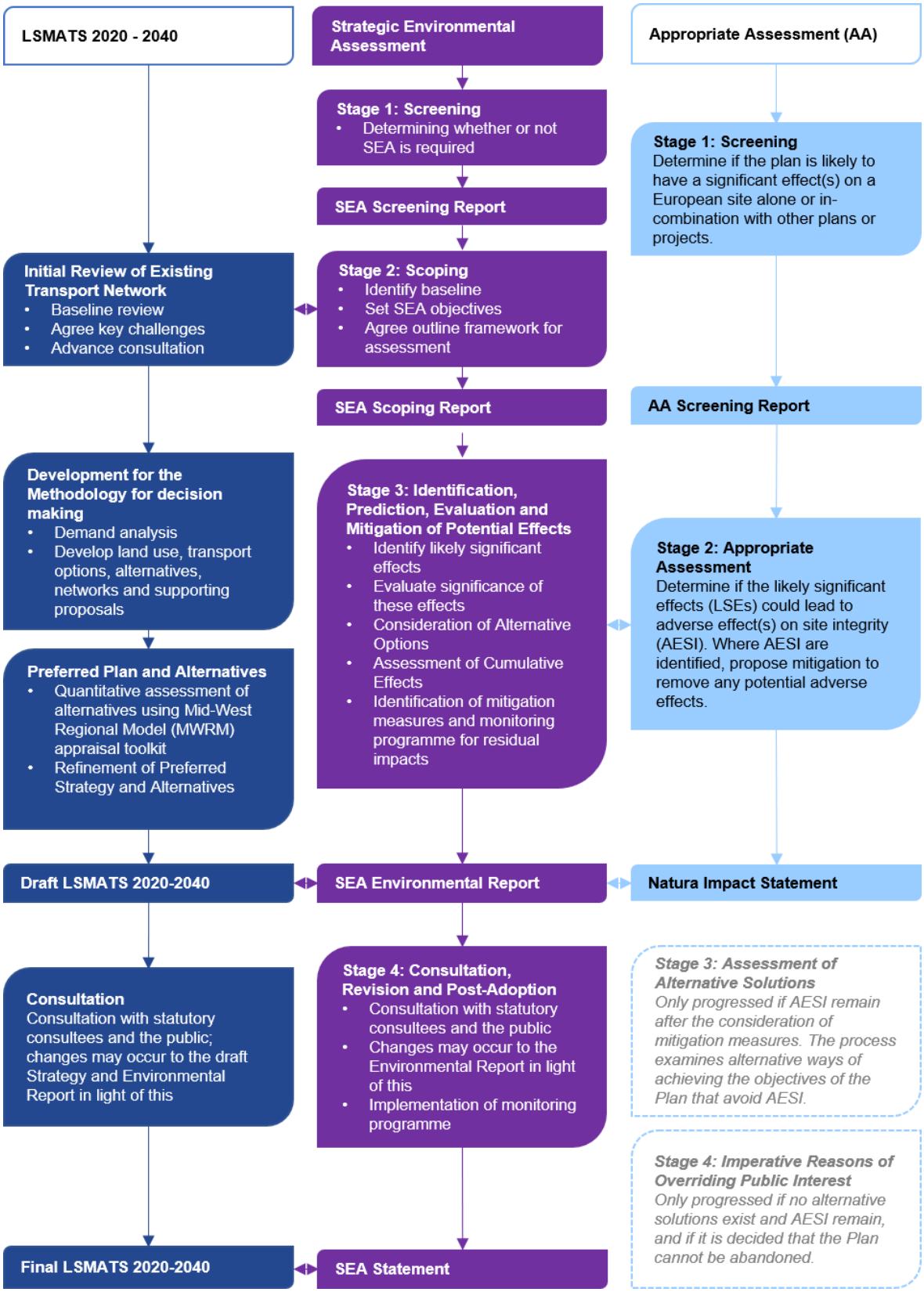

Figure 4.1 Development of the LSMATS and Integration of the SEA and AA

4.2 SEA and the Transport Strategy development

The SEA assesses each element of the Preferred Strategy against the strategic environmental objectives (SEOs) identified in Table 4-11.

The assessment of the effects that are expected to occur from the implementation of measures under each element of Preferred Strategy are based on technical judgement and knowledge of similar schemes. Where it is known that standard procedures are already in place to manage the impacts, or there is legislation in place to protect the receptor against the identified potential impacts, this is also recorded.

The methodology for the assessment was developed in accordance with the following EPA[2] guidance and research reports:

- Developing and Assessing Alternatives in SEA;
- Guidance on SEA Statements and Monitoring;
- Integrating Climatic Factors into Strategic Environmental Assessment in Ireland - A Guidance Note;
- Good practice guidance on Cumulative Effects Assessment in SEA; and
- Tiering of Environmental Assessment – The influence of Strategic Environmental Assessment on Project-level Assessment[3].

The assessment took the procedures or legislative protection identified below into account, since they would be implemented regardless of the SEA process:

- Studies and Surveys:
- Feasibility and scheme option studies aimed at avoiding adverse effects on designated sites and protected structures.
- Studies, surveys and consultation on environmental effects of development proposed under the LSMATS following relevant good practice guidance to inform design. Identify relevant mitigation and to support appropriate planning permission and licencing processes.
- Local residents provided with due notice of construction works.
- Ensure safe access along public right of way (PRoW) for pedestrians, cyclists and equestrians, proving diversions where necessary.
- Implementation of traffic management measures to minimise disruption to the highway network, including, where possible, limitation of works within peak periods or times.
- Any disruption to road and rail network to be agreed in advance through relevant transport authorities.
- European Protected Species Mitigation Licence (EPSML) to be obtained for all works which may affect a European protected species.
- A suitably qualified and experienced Ecological Clerk of Works (EcoW) to carry out site supervision works during activities that affect sensitive habitats and species, ensure that site specific mitigation identified following surveys is undertaken and that any previously unidentified impacts are managed and mitigated.
- Appropriate ordinary watercourse consents and environmental permits to be obtained for construction activities in or near water.

[2] Monitoring & Assessment: Assessment Publications | Environmental Protection Agency (epa.ie)

[3] Tiering of Environmental Assessment – The influence of Strategic Environmental Assessment on Project-level Assessment (August 2021)

- Best practice measures to control noise, air and water pollution and risks of Invasive Non Native Species (INNS) transfer in accordance with the relevant EPA guidance.
- Full restoration of PRoW, recreational areas, habitats, agricultural land and previously undeveloped land required for temporary works.
- All footpaths, cycleways and other recreational routes would be reconnected where severed by new road infrastructure.
- The following assumptions have also been made:
- Alignments/locations of new or improved infrastructure required to support objectives can be managed such that no loss or land take from built heritage assets or recreational facilities is required.

The SEA assessed each element of the Strategy against the SEOs identified in Table 4-1. Recommendations for specific mitigation to help avoid or reduce the potential impacts or to contribute to achieving objectives have been identified as part of the SEA assessment. An assessment of significance has been recorded with mitigation in place to address how the effects will change following implementation of the SEA mitigation recommendations and provide an assessment of the residual effects.

Table 4-1 SEA Objectives and Assessment Criteria

SEOs	Key Linked SEA Topics	Criteria
1 Protect and enhance quality of life in relation to transport while increasing accessibility to economic, employment and community facilities.	Population, Socio-economics, Access, and Human Health. Tourism and Recreation.	Is there potential to: ▪ Affect public health and quality of life in terms of improved access to transport to jobs, schools, shops and other community facilities? ▪ Avoid creation of barriers to access from linear infrastructure? ▪ Reduce journey times for commuting? ▪ Improve access for rural populations dependent on land transport? ▪ Improve quality of travel and access to information? ▪ Improve physical access for all mobility impaired people? ▪ Raise public awareness of opportunities for more sustainable transport or more active travel? ▪ Avoid impacts on public health and wellbeing from increased traffic related to congestion, noise and air quality? ▪ Support local economic development for employment and community facilities? ▪ Support resilience against effects of Brexit on the economy?
2 Avoid damage to recreation and amenity facilities through construction of new transport infrastructure and support and enhance access for tourism recreation.	Tourism and Recreation. Population, Socio-economics, Access, and Human Health. Land Use and Material Assets.	Is there potential to result in: ▪ Loss of or enhanced access to recreational amenity, footpaths or access to recreational amenity (including water-based recreation); ▪ Loss of or enhanced access to key tourism attractions in Ireland?
3 Prevent damage to, and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species.	Biodiversity, Flora and Fauna. Landscape and Visual Amenity. Geology and Soils. Land Use and Materials.	Is there potential to result in significant or adverse effects on: ▪ European; (Natura 2000) or species protected in Annex II and IV of Habitats Directive and Annex I of Birds Directive? ▪ Nationally designated sites NHA's and pNHAs? ▪ Local, county or national biodiversity including Irish Biodiversity Action Strategy objectives?

SEOs	Key Linked SEA Topics	Criteria
4 Safeguard the character and diversity of the Irish landscape and minimise the visual effects on sensitive, designated landscapes and public views.	Landscape and Visual Amenity. Cultural Heritage. Tourism and Recreation. Population, Socio-economics, Access and Human Health. Land Use and Materials.	Is there potential to: ▪ Affect sensitive landscapes such as seascapes, townscapes and river views or visual amenity, for example are there impacts to landscape protection zones or scenic views or routes?
5 Avoid damage to, and where appropriate enhance, cultural heritage resources and their setting.	Cultural Heritage. Landscape and Visual Amenity. Tourism and Recreation.	Is there potential to: ▪ cause direct damage to, or detract from the setting of, designated cultural heritage assets, or does this contribute to protecting them (including marine based archaeology, old bridges and railway corridors and undiscovered archaeology)?
6 Avoid conflicts with geological sites of value. Minimise loss of soil resources and contribute towards the appropriate management of soil resources and quality.	Geology and Soils. Biodiversity, Flora and Fauna.	Would there be any effects on: ▪ Any designated or non-designated geological features, valuable soils or contaminated land sites?
7 Contribute to the mitigation of air pollution issues as a result of transport and optimise potential benefits from reduction in air pollution.	Air Quality. Population, Socio-economics, Access and Health.	Is there potential to ▪ contribute to improvements to air quality or to increase air pollution? Is there a potential to breach air quality standards?
8 Contribute to the mitigation of noise pollution issues as a result of transport and optimise potential benefits from reduction in noise pollution.	Noise and Vibration. Population, Socio-economics, Access and Health.	Is there potential to: ▪ Reduce or increase the number of people exposed to high levels of transport related noise?
9 Prevent deterioration of the water quality status of surface water and groundwater bodies as appropriate to the WFD and avoid increasing risks from floods or increasing vulnerability to flood risk.	Water Environment. Biodiversity, Flora and Fauna.	Is there potential for: ▪ Non-temporary deterioration of waterbody status or conflict with or contribute to potential to achieve WFD objectives for achieving "*Good*" status (ground and surface water)? ▪ Is there a potential for the Strategy to increase flood risk or result in loss of flood plain?
10 Promote the sustainable use of natural resources (including land), encourage energy efficiency, reuse, recycling while encouraging the effective use of existing infrastructure.	Land Use and Material Assets. Geology and Soils. Water Environment.	Is there potential for: ▪ Conflicts with critical infrastructure, or does the Strategy conflict with existing business, planned land use or valuable agricultural land? Does the Strategy encourage: ▪ Reuse of existing transport infrastructure and/or brownfield sites? ▪ Energy security by reducing use of fossil fuels? Use of renewable energy fuel sources?
11 Minimise contributions to climate change (including greenhouse gas emissions) from construction of new/upgraded transport infrastructure or operation	Climate Change (Mitigation).	Will there be: ▪ High increase in the level of construction and operational carbon emissions or will proposals contribute to meeting future emission targets?

SEOs	Key Linked SEA Topics	Criteria
of existing and new transport networks, modal changes or new technologies.		
12 To ensure that the resilience to climate change is designed for existing transport network and new network and promote improved environmental resilience to climate change.	Climate Change (Adaptation). Population, Socio-economics, Access and Health. Land Use and Material Assets.	Will there be: ▪ Increased vulnerability or resilience of the environment and transport and other strategic infrastructure to climate change?

4.2.1 Strategy Alternatives

The SEA Directive requires the SEA process to identify and describe *"reasonable alternative"* means of achieving the objectives of the LSMATS. It states under Article 5(1) that:

"*Where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated*."

The reasons for selecting (a) the alternatives and (b) the preferred alternative must be documented, together with a description of how this assessment of alternatives was undertaken.

"*Within Strategy*" and "*Whole Strategy*" alternative scenarios have been assessed against the SEOs and clear justification for the selection of the alternative/combination of alternatives as the preferred strategy is provided.

4.2.2 Cumulative Effects

Cumulative effects can be described as the addition of many small impacts to create one larger, more significant, impact. They can be either:

- Additive effects: the addition of many minor or significant effects to create larger, more significant effects. Therefore, effects that arise, for instance, where several developments (such as multiple options) each have insignificant effects but together have a significant effect; or where several individual effects of the Strategy (for example noise, dust and visual) have a combined effect (in-combination effects).
- Synergistic effects: "*Where the resultant effect is of greater significance than the sum of its constituents*." Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance, a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species.

Both intra-plan and inter-plan cumulative effects have been considered within the SEA for LSMATS:

- Intra-plan cumulative effects - these arise from the interactions between different types of environmental effects resulting from a plan, programme, etc. The interrelationships between environmental components that help determine these effects are identified on
- Table 4-2 e.g., interrelationships between: human health and air quality; human health and water quality; air quality and vegetation; human health and flood risk; and ecology and water quality.
- Intra-plan cumulative effects have been considered within the assessment of the Preferred Strategy and provided in detail for each element of the Preferred Strategy in Appendix B of the SEA Environmental Report. For example, the assessment against SEO 1 (Population and Health) considers impacts

associated with changes in air and noise pollutant levels, access to recreational facilities, impacts other essential infrastructure and visual impacts associated with new infrastructure construction.

- Inter-plan cumulative effects - these arise when the effects of the implementation of one Strategy occur in combination with those of other plans, programmes, projects, etc. With regard to potential inter-Plan cumulative environmental effects, these occur as a result of the combination of; environmental effects which are identified by the assessment; and the effects arising from other policies, plans and programmes. Inter-plan cumulative effects have been assessed only as having a likely positive effect or likely negative effect base on professional judgment.

Table 4-2 Interrelated Strategic Environmental Assessment topics

Tourism and Recreation	Y									
Biodiversity, Flora and Fauna	Y	Y								
Landscape and Visual Amenity	Y	Y	Y							
Cultural Heritage (Archaeological and Architectural)	Y	Y	N	Y						
Geology and Soils	Y	Y	Y	Y	Y					
Air Quality	Y	Y	Y	N	N	N				
Noise and Vibration	Y	Y	Y	N	N	N	N			
Water Environment	Y	Y	Y	Y	Y	Y	N	N		
Land Use and Material Assets	Y	Y	Y	Y	Y	Y	Y	N	Y	
Climate Change	Y	Y	Y	Y	Y	Y	Y	N	Y	Y

	Population, Economy & Human Health	Tourism and Recreation	Biodiversity, Flora and Fauna	Landscape and Visual Amenity	Cultural Heritage (Archaeological and	Geology and Soils	Air Quality	Noise and Vibration	Water Environment	Land Use and Material Assets

4.2.3 Appropriate Assessment

All Natura 2000 sites (SPAs, SACs and Ramsar sites, including candidate and potential sites) are the subject of a separate strategic AA, in accordance with the Birds and Natural Habitats Regulations 2011. This has been carried out in parallel with the SEA and has fed into the SEA on International and European site issues, including the assessment of cumulative and in combination effects. The NIS has been published alongside the SEA Environmental Report as part of the consultation process and an AA Determination is provided for the final Strategy.

4.3 Summary of Preferred Plan and Alternatives

This chapter provides the summary environmental assessment of the draft LSMATS (the preferred Strategy) as well as:

- "*Within Strategy*" alternatives – different options considered for the various elements of the LSMATS; and
- "*Whole Strategy*" alternatives- alternative ways in which the "*Within Strategy*" options considered can be combined in a way which fulfils the brief of the LSMATS.

Likely positive and negative environmental effects associated with different "*Within Strategy*" and "*Whole Strategy*" alternatives are identified, and the development of the Preferred Strategy summarised with reference to the role of environmental considerations within decision making.

4.3.1 "Within Strategy" Alternatives

Demand analysis (Jacobs, 2019) shows that public transport is the transport mode which has greatest potential for improvement within the LSMATS. Therefore, the first step in development of the draft LSMATS was to consider the public transport network options. During initial demand modelling analysis, the LSMA was divided into several corridors based around the national and regional transport networks around a central city centre core. The demand corridors identified were:

- Corridor A: King's Island, Westbury and Parteen;
- Corridor B: The University, South Clare SDZ, Annacotty, Castletroy, Garryowen and Castleconnell;
- Corridor C: Roxboro;
- Corridor D: Dooradoyle, Raheen and Ballinacurra;
- Corridor E: Mungret and Ballinacurra;
- Corridor F: Moyross, Clareview, Caherdavin, Shannon, Bunratty, Sixmilebridge and Cratloe; and
- Orbital movements.

For each corridor (corridor D and E were considered as one for the purposes of the options appraisal process) and for orbital services, the following public transport alternatives were considered:

- Bus services;
- Bus rapid transit;
- Light rail transit; and
- Suburban rail.

A Multi Criteria Assessment (MCA) in line with the CAF was undertaken for each public transport alternative and corridor, which considered aspects including economy, environment, safety, integration and accessibility and inclusion. Further details regarding the process and outcomes of the MCA assessment are provided in the

LSMATS Transport Options and Network Development Report (NTA, 2020). The MCA concluded that that bus services were the preferred option for all corridors and for orbital movements for the following reasons:

- Demand is significantly below the capacity of light rail transit and suburban rail, and also below the demand capacity for bus rapid transit. Given the high construction and operating costs of these options, they would not provide value for money.
- Suburban light rail only enhances accessibility along existing rail routes, and whilst bus rapid transit and light rail transit provide better opportunities to improve accessibility than suburban rail, they are still subject to significant infrastructure constraints.

Table 4-3 provides an assessment of these "Within Strategy" public transport alternatives for all options.

Table 4-3 Assessment of "Within Strategy" public transport alternatives against SEOs

SEO		Bus services		Bus rapid transit		Light rail transit		Suburban rail	
		Effect	Narrative	Effect	Narrative	Effect	Narrative	Effect	Narrative
1	Protect and enhance quality of life in relation to transport while increasing accessibility to economic, employment and community facilities.	++	Likely reduction in transport related air and noise pollution as a result of modal shift towards public transport, with secondary benefit to public health from likely increase in active travel journeys. Higher safety rate associated with this option compared to private transport due to the segregation from other road users.	+	Similar positive impacts for public health as identified against bus services option, however accessibility likely to be limited for some areas of the LSMATS due to space constraints would mean degree of positive impact likely reduced relative to bus services.	+	As described against bus services option, but as for bus rapid transit, access in some areas will be limited due to the constraints of existing infrastructure resulting in reduced accessibility.	+	As described against bus services option, however improvements in accessibility limited to those populations who have access to existing rail network with limited options to improve accessibility through transport links to the wider LSMATS, especially with urban areas.
2	Avoid damage to recreation and amenity facilities through construction of new transport infrastructure and support and enhance access for tourism recreation.	-	Potential for negative impacts on recreational and amenity facilities primarily as a result of land take. However negative impacts anticipated to be least likely under this option as bus services could make use of existing highway infrastructure to a significant degree.	--	Increased potential for negative impacts on recreational and amenity facilities relative to bus services option as increased degree new infrastructure required.	--	As per bus rapid transit option.	--	As per bus rapid transit option.
3	Prevent damage to, maintain, and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species.	-	Potential for negative impacts on biodiversity primarily as a result of land take. However negative impacts anticipated to be least likely under this option as bus services could make use of existing highway infrastructure to a significant degree.	-	Increased potential for negative impacts on recreational and amenity facilities relative to bus services option as increased degree new infrastructure required.	--	As per bus rapid transit option.	--	As per bus rapid transit option.
4	Safeguard the character and diversity of the Irish landscape and minimise the visual effects on sensitive, designated	-	Bus service routes would predominately follow the existing highway network and therefore would have a minimal effect on visuals and landscape	-	Similar benefits to preferred option as bus rapid transit routes would predominately follow the existing highway network, however slight	--	Increased potential for negative impacts on landscape and visual due to the construction of the	--	As per light rail transit option.

SEO		Bus services		Bus rapid transit		Light rail transit		Suburban rail	
		Effect	Narrative	Effect	Narrative	Effect	Narrative	Effect	Narrative
	landscapes and public views.		due to the existing traffic present.		increased risk of negative effects as increased degree of new infrastructure required.		infrastructure needed to facilitate light rail transit.		
5	Avoid damage to, maintain, and where appropriate enhance, cultural heritage resources and their setting.	-	Bus service routes would predominately follow the existing highway network and therefore risks to known or unknown archaeology and integrity or setting of built heritage assets lowest under this option.	-	Bus rapid transit routes would predominately follow the existing highway network, however slightly increased risk of loss/damage to archaeology where increase to footprint of the existing road network is required and increased risk of negative effects on setting of built heritage assets.	--	Increased potential impacts to heritage and setting due to the greater requirement for new infrastructure and land take in order to facilitate light rail transit option.	--	As per light rail option.
6	Avoid conflicts with geological sites of value. Minimise loss of soil resources and contribute towards the appropriate management of soil resources and quality.	-	Bus service routes would predominately follow the existing highway network and therefore risks to known or unknown archaeology and integrity or setting of built heritage assets lowest under this option.	-	Bus rapid transit routes would predominately follow the existing highway network, however slightly increased risk of loss/damage to valuable soils where increase to footprint of the existing road network is required.	--	Increased potential for damage to geological sites of value and soil resources due to greater degree of new infrastructure required to facilitate light rail transit option.	-	Increased potential for damage to geological sites of value and soil resources where new rail infrastructure required to facilitate suburban rail option. However, within some areas there are existing disused rail lines that can be reopened which would have little impact on geological sites of value or soil resources.
7	Contribute to the mitigation of air pollution issues as a result of transport and optimise potential benefits from reduction in air pollution.	++	Likely reduction in transport related air pollutant emissions associated with modal shift form private car usage.	++	As per bus services option.	++	As per bus services option.	++	As per bus services option.

SEO		Bus services		Bus rapid transit		Light rail transit		Suburban rail	
		Effect	Narrative	Effect	Narrative	Effect	Narrative	Effect	Narrative
8	Contribute to the mitigation of noise pollution issues as a result of transport and optimise potential benefits from reduction in noise pollution.	++	Likely reduction in noise pollution associated with modal shift away from private vehicle to public transport.	++	As per bus services option.	++	As per bus services option.	++	As per bus services option.
9	Prevent deterioration of the water quality status of surface water and groundwater bodies as appropriate to the WFD and avoid increasing risks from floods or increasing vulnerability to flood risk.	0	Potential for increase in flood risk associated with additional impermeable infrastructure needed, however risk of adverse effects considered lowest under this option.	-	Slight increase in likelihood of negative effects on flood risk relative to bus services option due to increased requirement for road widening.	--	As per bus rapid transit option.	--	As per bus rapid transit option private vehicle use on the road.
10	Promote the sustainable use of natural resources (including land), encourage energy efficiency, reuse, recycling while encouraging the effective use of existing infrastructure.	-	Some degree of land take likely required to support this option, however requirements likely to be less than for alternative options.	--	Bus rapid transit option would likely require an increased level of new infrastructure construction to facilitate separate lanes for buses relative to the bus service option, as well as increased land take.	--	Increased level of new infrastructure and land take would be required to facilitate the light rail transit option, with greater degree of materials consumption and land take likely.	--	Increased level of additional infrastructure would be required to facilitate the suburban rail option in some areas, with greater materials consumption and land take likely. Some existing infrastructure could be reused however.
11	Minimise contributions to climate change (including greenhouse gas emissions) from construction of new/upgraded transport infrastructure or operation of existing and new transport networks. Contribute to the reduction in transport related GHG emissions	++	Modal shift away from private vehicle usage would likely reduce transport related carbon emissions. However, there would be a degree of embodied carbon emissions associated with new infrastructure construction. Embodied carbon emissions anticipated to be lowest under this option.	+	Implementation of the bus rapid transit would likely require an increased level of new infrastructure construction to facilitate separate lanes for buses relative to the preferred option. As for bus services likely reduction in GHG emissions associated with modal shift towards public transport.	+	Less benefit to preferred option as construction required to facilitate the light rail transit would contribute to climate change, As for preferred option, likely reduction in GHG emissions associated with modal shift towards public transport.	+	As per light rail transit.

SEO		Bus services		Bus rapid transit		Light rail transit		Suburban rail	
		Effect	Narrative	Effect	Narrative	Effect	Narrative	Effect	Narrative
	through modal changes or new technologies.								
12	To ensure that the resilience to climate change is designed for existing transport network and new network and promote improved environmental resilience to climate change.	0	No significant effect against this SEO considered likely.	0	No identifiable difference to bus services option.	0	No identifiable difference to bus services option.	0	No identifiable difference to bus services option.

4.3.2 "Whole Strategy" Alternatives

Following identification of the bus network option as the preferred public transport network option, modelling was undertaken using the NTAs Mid-West Transport Model (MWTM) to develop and refine the draft LSMATS including public transport, road, rail, cycling, walking and demand management measures to develop the preferred strategy network.

Prior to modelling, initial bus routes and frequencies for each of the transport corridors (including orbital routes) were developed to meet the maximum public transport demand identified through the LSMATS Demand Analysis Report (Jacobs, 2019). A number of other public transport options were also developed to try make best use of the existing available infrastructure, such as existing rail lines. The modelling was then undertaken iteratively with each run used to refine the inputs and assumptions for the next run. The outputs of these runs were used to inform the options assessment for each corridor and refine the bus routes and services initially developed.

Further detail regarding the options development process and modelling undertaken to support development of the draft LSMATS, including information regarding the land use, population growth and existing network assumptions, are provided in the LSMATS Transport Options and Network Development Report (Jacobs, 2020) and the LSMATS Transport Modelling Report (NTA, 2022). For further detail regarding objectives and measures under preferred Strategy see the draft Revised LSMATS.

During development of the draft LSMATS, four key alternative scenarios were initially considered:

- Alternative A: Do Minimum Scenario.
- Alternative B: Bus Network, City Centre Strategy and Roads (Model run AAH).
- Alternative C: Bus Network, Enhanced City Centre Strategy, Refined Roads Strategy plus Walking and Cycling Improvements and Supporting Measures ('Do Strategy').
- Alternative D: Bus Network, Enhanced City Centre Strategy, Refined Roads Strategy plus Walking and Cycling Improvements and Supporting Measures and Demand Management Measures ('Do Strategy +).
- Alternative E; Bus Network, Enhanced City Centre Strategy, Enhanced Rail, Refined Roads Strategy, without the LNDR, plus Walking and Cycling Improvements and Supporting Measures and Demand Management Measures ('revised Do Strategy +).

The key differences between these alternatives are outlined below:

In terms of comparing Alternatives A-D:

- D Alternative D would have the greatest positive impact on SEOs 1, 2, 7, 8 and 12, which is associated primarily with measures to encourage modal shift towards public transport is likely to contribute to reduced air and noise pollution, increased active travel rates, improve accessibility to community and recreational facilities and places of employment, and reduced transport related carbon emissions within the LSMATS. Alternatives B, C and D provide an opportunity to enhance the resilience of the transport network to future climate change (SEO 12) which is not afforded under Alternative A (Do Minimum).
- The 'Do Minimum' scenario has least potential for conflict with SEOs 3, 4, 5 and 9 relating to risks to designated nature conservation sites, habitats and wildlife, archaeology and landscape character and visual amenity associated with construction of new roads and other infrastructure. However, the proposed improvements to the public realm identified under Alternatives C and D would have a positive impact for townscape and visual amenity and there is also an opportunity to enact positive impacts for built heritage within the LSMATS through these works.
- Alternatives B, C, and D all have greater potential for significant adverse effects against SEO 9 than Alternative A (Do Minimum). This is because they would result in a net increase in area of hardstanding primarily associated with new road construction with resultant potential negative contribution to flood risk and to water quality.

Considering Alternative E compared to the other Alternatives:

- Alternative E has reduced potential for significant adverse effects against SEO 9 compared to Alternatives B, C and D. This is because it would result in a reduced net increase in area of hardstanding associated with new road construction with resultant reduced potential negative contribution to flood risk, and risk to water quality and biodiversity.

4.4 Preferred Strategy

The Preferred Strategy selected for the Revised Draft and included in the Final LSMATS is based upon Alternative E ('Do Strategy Plus') which includes the amendments to Alternative D following consultation on the draft Strategy as follows:

- Addition of new rail objectives including provision of new stations;
- Addition of specific objectives relating to better integration between land use planning and transport planning and improvements to the public transport offer and walking and cycling infrastructure in regeneration areas;
- Addition of a number of smaller scale measures such as support for micromobility modes;
- Additional demand management measures;
- Inclusion of walking and cycling mode share targets up to 2040; and
- Removal of the full LNDR development.

4.5 SEA recommendations influencing the final Strategy

Amendments to the Revised Draft and Final LSMATs have been assessed as not changing the overall SEA assessment in terms of potential significant adverse effects. The assessment included in the revised SEA Environmental Report as identified in chapter 4 was updated in relation to SE03 Biodiversity to reflect uncertainty in mitigation and potential for residual adverse effects.

The Final LSMATS includes a summary of the SEA, AA and EqIA in Chapter 18. Chapter 19 Implementation includes LSMATS commitment to implement the SEA, AA and EqIA recommendations on measures to avoid and mitigate potential significant adverse effects and to provide enhancement as appropriate. Chapter 19 also includes commitment to implement the final SEA Monitoring Plan.

5. Mitigation and Monitoring Plans

5.1 Mitigation Measures

A summary of the assessment outcomes for the preferred Strategy, along with SEA mitigation recommendations and residual effects is provided in Table 5-1. Individual assessment matrices were also prepared for each element of the preferred Strategy, i.e., walking, cycling, road, rail, freight, parking and supporting measures. These are provided in Appendix B of the SEA Environmental Report with a summary of the assessment scores prior to and following implementation of SEA mitigation in Appendix C. These assessment matrices also provide further detail on the specific measures and objectives assessed.

The modelling results on effects of the draft strategy (based on alternative E Do Strategy plus) are presented in section 9 of the Final LSMA Transport Strategy Appraisal (NTA, 2022). This identifies the following potential effects from implementing the draft strategy measures for 2040 compared to a 2016 base case:

- Climate change and greenhouse gas emissions: potential to achieve - a 53% reduction in CO_2 and 76% reduction in methane;
- Air quality - 82 % reduction in Nitrogen Oxides and 13 % reduction in particulates which are key air pollutants;
- Accessibility and social inclusion- comparing strategy with a do minimum shows a substantial improvement in public transport mode share to key health, employment and recreational facilities and an overall increase from 5.6% to 12.6 % peak public transport mode share across the metropolitan area for the with strategy scenario;
- Accessibility for deprived areas - modelling results indicated an overall change in public transport mode share increasing by 9.7 % for the very disadvantaged areas and a 6.9% increase across all area types;
- Road safety – significant savings in collision costs and reductions in casualties on the road network for the draft strategy compared to a do minimum scenario.

Key likely significant positive effects identified through the SEA of the draft strategy are:

- Improvements in public health associated with reduction in transport related air and noise pollution, improved safety, and increased rates of active travel as a result of modal shift towards public transport, walking and cycling. Reductions in air pollutant emissions would also benefit biodiversity;
- Reduction in transport related carbon emissions within the LSMATS as a result of modal shift towards public transport, walking and cycling;
- Improvements in townscape and visual amenity associated with public realm improvements and the construction of greenways and green-blue corridors and the World Class Waterfront Project;
- Opportunities to improve the resilience of the transport network within the LSMATS through implementation of infrastructure design standards which ensure resilience to projected future climate changes; and
- Opportunities to improve the setting of built heritage assets through public realm improvements.

Key potential significant negative effects of the preferred Strategy, in the absence of mitigation, include:

- Temporary and permanent habitat loss from indirect impacts associated with the N69/M21 Foynes to Limerick Road (with Adare Bypass) and N/M20 Cork to Limerick and also new walking and cycling infrastructure proposals in proximity to the River Shannon;
- Potential negative impacts on landscape character and visual amenity associated with new infrastructure construction (particularly new road schemes);

- Potential negative impacts on WFD objectives and flood risk associated with new infrastructure construction. The LNDR is of particular note regarding flood risk impacts as the proposed route bisects a flood plain; and
- Potential localised negative impacts on air quality and noise associated with measures such as Park and Rides (P&Rs), Mobility Hubs and new road infrastructure.
- The Preferred Strategy avoids the following impacts:
- Temporary and permanent habitat loss, including direct impacts on European and National designated sites a result of the construction of the LNDR are avoided; and
- Potential negative impacts on landscape character and visual amenity associated with new infrastructure construction (particularly new road schemes) are reduced; and potential negative impacts on WFD objectives and flood risk associated with the LNDR infrastructure construction are also avoided.

Mitigation identified to address the potential significant adverse effects has been identified and is outlined within Table 5-1. In addition, specific mitigation relating to the ecological aspects to protect European designated sites, is set out below in section 5.2 and Table 5-2.

Table 5-1 Summary of Preferred Plan Assessment

SEO	Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
	Positive	Negative			
1 Protect and enhance quality of life in relation to transport while increasing accessibility to economic, employment and community facilities.	Impact on public health associated with: ▪ Improvements to air and noise pollution associated with reductions HGV regulation in Limerick City centre and modal shift towards public transport, walking and cycling. ▪ Improvements to availability, accessibility and amenity of active travel and recreational walking routes. ▪ Measures such as bicycle sharing schemes, bicycling parking and end of trip facilities would help encourage modal shift towards cycling. ▪ Positive impacts on access to community services and facilities and places of employment through support for consolidation of development and limitation of urban sprawl, and improved public transport, walking and cycling access to regeneration areas.	▪ Potential disproportionate negative impact on certain vulnerable groups and/or on small businesses as a result of measures to reduce reliance on private vehicles and restrict or manage freight movement within Limerick City centre. ▪ Consideration of impact of converting areas currently designated for street parking to bus lanes on severance, with particular focus on routes in close proximity to locations of importance to vulnerable groups (e.g. schools, care homes, hospitals, and other community facilities).	+/0	▪ Undertake Equalities Impact Assessment (EqIA) for measures that aim to reduce reliance on private vehicles for social and commuting purposes and restrict freight movements and implement mitigation measures as identified (see separate EqIA and recommendations). ▪ Consultation with local communities to identify and mitigate temporary construction impacts given that extensive works planned on multiple transport routes and modes concurrently. ▪ Targeted consultation and consideration of inclusion of measures to support increased patronage of bus services by social groups which may be driven by safety and security or accessibility concerns, particularly at night. ▪ Implementation of public transport and other strategy measures to support modal shift towards public transport, walking and cycling with Limerick and consider alternative methods of improving access for communities on the northern outskirts of Limerick. ▪ Ensure micromobility rental schemes are inclusive for people with disabilities. ▪ Specific recommendations are identified in the EqIA report including developing more detailed baseline information to understand the potential impacts on specific local populations and vulnerable groups and to undertake additional engagement with representatives of different groups and to develop an equality toolkit covering the protected characteristic groups, as well as	+/0

SEO	Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
	Positive	Negative			
				additional information on compounding factors of disadvantage such as deprivation.	
2 Avoid damage to recreation and amenity facilities through construction of new transport infrastructure and support and enhance access for tourism recreation.	▪ Provision of a Tourist Walking Strategy, improvements to the public realm along the Old Bunratty Road, as well as general improvements within to the pedestrian realm within Limerick, would support and enhance access for tourists within the region. ▪ Improvements in access to tourist facilities as a result of greenways. ▪ A reduction in traffic volumes within the centre of Limerick City would help improve the amenity of the area for tourists and residents.	▪ Impact on tourist industry arising from disruption to highway and public transport routes during construction of new infrastructure.	**0**	▪ Consideration of impact of converting areas currently designated for street parking to bus lanes on severance, with particular focus on routes in close proximity to tourist locations. ▪ Consideration of whether beneficial impacts for the tourism industry (hop on hop off tours etc) can be realised through design and implementation of new bus lanes. ▪ Consider requirement for specific parking strategy for tourists, which may have a seasonal component. ▪ Consider inclusion of specific policies to (i) manage the potential impacts of disruption to existing rail services during construction of new infrastructure and (ii) improve tourist passenger experience, for example simplified ticketing, luggage space on trains, luggage storage at stations, specific tourist signage, travel plans for key tourist destinations.	**+/0**
3 Prevent damage to, maintain and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species.	▪ Reduction in transport related emissions of air pollutants including nitrogen oxides (NO_x), particulate matter (PM) and sulphur dioxide (SO_2).	Temporary or permanent habitat loss and/or mortality/disturbance to wildlife as a result of new infrastructure construction. This includes direct and indirect impacts on a number of designated sites (River Shannon SAC, River Shannon and Fergus Estuaries SPA, Askeaton Fen Complex SAC, Curraghchase Woods SAC, Tory Hill SAC, Ballyalllia Lough SPA, Lough Derg SPA, Knockalisheen Marsh pNHA,	**-**	▪ Consideration of opportunities for tree planting and green verges and improvements to habitat connectivity to be incorporated within new or amended walking routes. ▪ Application of mitigation hierarchy to first seek to avoid effects, for example through route selection and design, then reduce effects with the aim to avoid habitat loss within ecologically sensitive areas (particularly European and national designated sites) as far as practicable, reduce and/or provide compensatory habitat as determined necessary as a result of the regulatory processes. Land take from valuable habitats to support new infrastructure should be minimised as	**0/-**

SEO	Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
	Positive	Negative			
		Fergus Estuaries and Inner Shannon North Shore pNHA).		far as practicable. This approach will apply to European and national designated sites and high value habitats. Design of new pedestrian and cycle crossings should be sensitive to riparian habitats. ▪ Potential impacts on habitats and wildlife to be considered and mitigated through Environmental Impact Assessment (EIA) and Habitat Regulations Assessment (HRA) process down the line. ▪ Development of an LSMATS 'Natural Heritage Strategy' which would pull together aims and objectives in terms of habitat replacement and design principles and can link to enhancement objectives for landscape and cultural heritage. This could include looking at management of verges and open space associated with infrastructure to optimise habitat provision including for example the timing of verge cuttings and species mixes used.	
4 Safeguard the character and diversity of the Irish landscape and minimise the visual effects on sensitive, designated landscapes and public views.	▪ Positive contribution to visual amenity afforded by blue-green corridors within Limerick City Centre. ▪ Improvements to the public realm within urban areas in Limerick and metropolitan towns realised through improvements to existing walking, cycling and highway infrastructure and improvements to wayfinding would make a positive contribution to townscape and public views.	Temporary or permanent impacts on landscape and townscape as a result of construction of new infrastructure.	+/-	▪ Sensitive design of new infrastructure, in collaboration with local councils, to ensure that existing landscape and townscape character is maintained and where practicable enhanced. ▪ Potential impacts on landscape and townscape as a result of new infrastructure to be considered and mitigated through Environmental Impact Assessment (EIA) process down the line. ▪ Consideration of opportunities for tree planting and green verges to be incorporated within new or amended walking routes.	+/-

SEO		Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
		Positive	Negative			
5	Avoid damage to, maintain and where appropriate enhance, cultural heritage resources and their setting.	Potential opportunity to enhance settings of built cultural heritage assets through public realm improvements identified and increase accessibility to heritage assets through reopening of Black Bridge, Limerick to pedestrians.	Potential for temporary and permanent impacts on built heritage assets and known and unknown archaeological remains as a result of new infrastructure. Potential adverse impacts on Black Bridge, Limerick if works needed to make safe for pedestrian access are not undertaken in sensitive manner.	0/-	▪ Design of new infrastructure, and routing of new Shannon Commuter Rail network to be sensitive to the presence of known heritage assets. ▪ Proposal to reopen Black Bridge, Limerick to be developed in conjunction with and agreed with Limerick CC Heritage Officer and The Heritage Council. ▪ Public realm improvements to seek to increase the accessibility and improve the setting of build heritage assets. ▪ Potential impacts on known and unknown heritage as a result of construction of new infrastructure to be considered and mitigated through Environmental Impact Assessment (EIA) process down the line.	0
6	Avoid conflicts with geological sites of value. Minimise loss of soil resources and contribute towards the appropriate management of soil resources and quality.	None identified. The Strategy however supports development consolidation and limits risk of urban sprawl and therefore can act to minimise additional soil loss from other development.	Loss and/or sterilisation of soil resources and may disturb areas of ground contamination as a result of new infrastructure construction.	0/-	▪ Ensure new infrastructure does not conflict with IGHS sites. Ensure appropriate site specific geotechnical and contaminated land risk assessments are undertaken and any remediation recommendations adhered to. ▪ Potential impacts on valuable soils and geology as a result of new infrastructure construction to be considered and mitigated through Environmental Impact Assessment (EIA) process down the line.	0
7	Contribute to the mitigation of air pollution issues as a result of transport and optimise potential benefits	Reduction in transport related air pollutant emissions associated with: ▪ HGV regulation in Limerick City centre and decarbonisation of the freight industry.	Measures such as Park and Rides and freight consolidation centres, as well as measures to discourage traffic flows through built up areas, may worsen air quality locally through changes in traffic patterns in proximity to	+/-	▪ Ensure that Freight Consolidation Centres do not have a significant adverse effect on receptors sensitive to air quality outside of Limerick City by concentrating HGV movements within specific areas. This may be achieved through careful siting amongst other measures.	+/0

SEO		Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
		Positive	Negative			
	from reduction in air pollution.	▪ Measures to support modal shift towards public transport and active travel modes. ▪ Transfer public transport fleet towards low carbon and/or zero emission alternatives. ▪ Electrification/retrofitting of existing train fleet.	the chosen locations. New road schemes would likely have adverse effects on air pollution levels for local communities.		Where significant changes in traffic patterns are anticipated as a result of measures to discourage traffic flows through built up areas, air quality modelling should be undertaken to ensure they do not result in unacceptable impacts on outlying communities. ▪ Potential impacts on air quality as a result of construction of new road and rail infrastructure to be considered and mitigated through Environmental Impact Assessment (EIA) process down the line. This may be achieved through careful routing to minimise direct impacts on sensitive receptors.	
8	Contribute to the mitigation of noise pollution issues as a result of transport and optimise potential benefits from reduction in noise pollution.	Reduction in noise emissions associated with the transport sector in the LSMA: ▪ HGV regulation in Limerick City centre and decarbonisation of the freight industry. ▪ Measures to support modal shift towards public transport and active travel modes.	Measures such as Park and Rides and freight consolidation centres and new railway lines may worsen noise pollution locally through changes in traffic patterns in proximity to the chosen locations. New road schemes would likely have adverse effects on noise pollution levels for local communities.	**0/+**	▪ Ensure that Freight Consolidation Centres do not have a significant adverse effect on receptors sensitive to air quality outside of Limerick City by concentrating HGV movements within specific areas. Where significant changes in traffic patterns are anticipated as a result of measures to discourage traffic flows through built up areas, noise modelling should be undertaken to ensure they do not result in unacceptable impacts on outlying communities. ▪ Ensure new railway lines and stations do not have a significant adverse effect on receptors sensitive to noise located in close proximity to these new infrastructure developments. ▪ Potential impacts on air quality as a result of construction of new road and rail infrastructure to be considered and mitigated through Environmental Impact Assessment (EIA) process down the line. This may be achieved through careful routing to minimise direct impacts on sensitive receptors, amongst other measures.	**+/0**

SEO		Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
		Positive	Negative			
9	Prevent deterioration of the water quality status of surface water and groundwater bodies as appropriate to the WFD and avoid increasing risks from floods or increasing vulnerability to flood risk.	Reduction in water pollution associated with road run-off associated with: ▪ HGV regulation in Limerick City centre and decarbonisation of the freight industry ▪ Measures to support modal shift towards public transport and active travel modes.	▪ Increased area of hardstanding required for new infrastructure may have adverse impact on flood risk. ▪ The Ennis-Limerick line lies within areas at high risk of coastal and fluvial flooding ▪ Potential negative impacts on WFD objectives as a result of new pedestrian infrastructure spanning or adjacent to WFD watercourses including the Shannon, Blackwater, Abbey and Barnakyle.	-/0	▪ Ensure that the identified solution for the existing flood issue on the Limerick-Ennis line at Ballycar is designed to accommodate future predicted changes in flood risk as a result of climate change; Where additional land take is required to facilitate upgrades to the Ennis-Limerick line, siting and design should seek to minimise impingement on the flood plain and take count of future climate change; New river crossings for the Cratloe-Shannon line should be WFD compliant; ▪ Use of Sustainable Urban Drainage (SuDs) principles in new infrastructure design; and ▪ Potential impacts water quality and flood risk be considered and mitigated through EIA, WFD and FRA processes down the line.	+/0
10	Promote the sustainable use of natural resources (including land), encourage energy efficiency, reuse, recycling while encouraging the effective use of existing infrastructure.	Reduction in consumption of fossil fuels associated with: ▪ HGV regulation in Limerick City centre and decarbonisation of the freight industry. ▪ Measures to support modal shift towards public transport and active travel modes.	Construction of new infrastructure would require a degree of land take, although proposals seek to make use of existing highway infrastructure through repurposing of on street parking areas and road space as far as practicable.	+/0	New infrastructure design to minimise requirement for additional land take outside the existing highway boundary or railway corridor as far as practicable.	+/0
11	Minimise contributions to climate change (including	Reduction in transport related carbon emissions within the LSMATS associated with:	New infrastructure will result in carbon emissions during construction (both embodied and associated with	+/0	Consideration of opportunities for tree planting and green verges to be incorporated within new or amended walking routes.	+/0

SEO	Potential significant effects (without SEA mitigation)		Summary assessment (without SEA mitigation)	Recommended SEA mitigation	Summary assessment (with recommended SEA mitigation)
	Positive	Negative			
	greenhouse gas emissions) from construction of new/upgraded transport infrastructure or operation of existing and new transport networks. Contribute to the reduction in transport related GHG emissions through modal changes or new technologies.	▪ Decarbonisation of the freight industry. ▪ Measures to support modal shift towards public transport and active travel modes.	construction plant and traffic) and operation (lighting, heating, electric gates etc) (predominantly new Park and Rides, Mobility Hubs, railway stations).		Ensure that construction methodology for new built infrastructure is undertaken with consideration for the European Union (EU) waste hierarchy and in line with relevant Irish Green Building Council (IGBC) guidance where relevant.	
12	To ensure that the resilience to climate change is designed for existing transport network and new network and promote improved environmental resilience to climate change.	None identified.	Any new built infrastructure required is vulnerable to future climate change, including changes in air temperature, precipitation rates and wind speeds.	**?**	Ensure that design of new infrastructure reflects likely worst case climate projections in terms of resilience to wind speeds, precipitation, flood risk and increases in air temperature over the full design life of the infrastructure. Consideration of how the changing climate with alter user's needs – for example increased seating and shaded areas on active travel routes and public transport interchanges.	**+/0**

5.2 Mitigation Hierarchy

The application of the mitigation hierarchy is a core SEA recommendation for the implementation of the LSMATS. The mitigation hierarchy is a well-established approach for addressing the impacts of development on particularly for biodiversity impact but the general principles can be more widely applied:

- First seek to Avoid adverse effect. This might be achieved through routing or site selection or design amendment;
- Second - consider how to Minimise or Reduce effects as far as possible;
- Third – Remediate or Restore where effects are immediately reversible;
- Fourth – Compensate or Offset residual effects to achieve objectives for example for no net loss or to provide enhancement;
- This approach is recommended to be applied for the European and nationally designated nature conservation sites. The term 'mitigation' is used to cover the range of these steps.

5.2.1 European designated sites

Table 5-2 sets out specific mitigation measures required to avoid unacceptable adverse impacts on European sites as set out in the assessment matrices in Appendix B of the SEA Environmental Report and discussed in further detail in chapter 5 of the NIS (published alongside the SEA Environmental Report). This primarily includes impacts associated N69/M21 Foynes to Limerick Road (with Adare Bypass) and N/M20 Cork to Limerick Road schemes, but also covers impacts associated with proposed new walking and cycling infrastructure. These measures provided in Table 5-2 align with the mitigation measures implemented/secured through the Policies and Objectives contained within the adopted LCDP and CCDP.

Table 5-2 High level site specific ecological mitigation measures

Ref	Detail of Recommended Mitigation Measure
General (design-level) measures	
G1	This NIS provides the information to inform the AA of the measures/projects to be delivered as part of the LSMATS at the plan level. At a project level should issues arise under Article 6(3) of the Habitats Directive, despite the implementation of avoidance/mitigation measures, and there remains a risk of adverse effects on Site integrity (AESI) of a European site, the project will not be progressed unless an alternative solution cannot be implemented which avoids the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
G2	In selecting the exact watercourse crossing locations within the preferred route corridor, there shall be full compliance with Article 6(3). At the project level should issues arise under Article 6(3) of the Habitats Directive, despite the implementation of avoidance/mitigation measures, and there remains a risk of AESI of a European site, the project will not be progressed unless an alternative solution cannot be implemented which avoids the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
G3	Baseline surveys shall be conducted by suitably qualified ecologists to ensure that the design-stage AA has a sufficient level of scientific data to inform the assessment.
G4	As required a full suite of geomorphological, hydrological and topographical surveys shall be required and provided at project design stage to inform the project-level AA.
G5	The Construction Method Statement shall form part of the overall project design together with the development of an Environmental Construction Management Plan (ECMP), which together shall be subject to AA as part of the overall project assessment.
G6	All permits and consents required as part of the project shall be addressed at project design stage and incorporated as part of the overall AA.
G7	Ongoing monitoring to assess the real-time environmental impact of all site preparation, construction and post-construction works shall be undertaken by suitably qualified ecologists.

Ref	Detail of Recommended Mitigation Measure	
G8	The design of any in-stream structure shall not lead to any alteration of the channel morphology, flow regime, depositional patterns or interfere with habitat continuity.	
G9	Crossings of the River Shannon will be constructed at a sufficient height to allow for the development of riparian habitats.	
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation - Lower River Shannon SAC		
WC1	Direct physical loss/damage to habitat	At the project design stage, all works shall be carefully designed to ensure no direct loss of habitat.
WC2	Indirect disturbance	Detailed, targeted surveys will be required and shall be provided to determine the extent of this habitat type and inform working areas/development footprints in order to maintain or increase (subject to natural processes) the overall habitat area and distribution within the SAC.
WC3	Indirect disturbance or loss of habitat	Any potential impacts on water quality which may lead to an indirect effect on the concentration of nutrients, or the typical vegetation composition shall be avoided through best practice construction methods.
WC4	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternative solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) – Lower River Shannon SAC		
MM1	Direct physical loss/damage to habitat	At the project design stage, all works shall be carefully designed to ensure no direct loss of habitat.
MM2		Detailed, targeted surveys will be required and shall be provided to determine the extent of this habitat type and inform working areas/development footprints in order to maintain or increase (subject to natural processes) the overall habitat area and distribution within the SAC, particularly in areas which were previously unmapped
MM3	Invasive Non-native Species	Invasive species surveys (for species listed on Schedule 3 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)) will be undertaken. If invasive species are found to be present, an Invasive Species Management Plan will be prepared to outline the control and or removal measures. These measures will ensure such species are not spread during construction or operation of measures outlined within the draft LSMATS. All works relating to invasive species will be implemented in line with relevant national guidelines.
MM4	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternative solutions are identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) – Lower River Shannon SAC		
AF1	Direct physical loss/damage to habitat	At the project design stage, all works shall be carefully designed to ensure no direct loss of the Annex I priority habitat.
AF2	Indirect disturbance	For areas with the potential to develop into this habitat type, measures shall be taken at both design and project implementation stages to ensure that it will continue to develop as such, subject to natural processes.
AF3	Indirect disturbance or loss of habitat	There shall be no alteration to the hydrological regime necessary for maintenance of alluvial vegetation. Periodic flooding is essential to maintain this habitat type.

Ref	Detail of Recommended Mitigation Measure	
AF4	Biological disturbance	The project design stage shall ensure that negative indicator species, particularly non-native invasive species, remain absent or under control.
AF5	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternative solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Calcareous and Alkaline Fens - Askeaton Fens Complex SAC and Tory Hill SAC		
CAF1	Direct physical loss/damage to habitats	Detailed hydrological studies surveys shall be required and provided for in order to fully understand and mitigate for this risk at design stage. Mitigation measures set out in section 7.2 of the NIS will minimise the risk of changes in ground water flows and quality.
CAF2	Indirect disturbance or loss of habitat	Detailed hydrological studies surveys shall be required and provided for in order to fully understand and mitigate for this risk at design stage. There shall be no alteration to the hydrological regime necessary for maintenance of fen vegetation.
CAF3	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternative solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on calcareous and alkaline fen habitat within Askeaton Fens Complex SAC and Tory Hill SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Sea Lamprey, Brook Lamprey and River Lamprey – Lower River Shannon SAC		
LA1	Direct physical loss/damage to habitat	The mitigation measures set out in Sections 5.2 and 5.3 of the NIS and the implementation of best practice measures outlined in NRA (2006) and IFI (2016) will minimise the risk of harmful ecological effects arising from habitat loss and deterioration, in particular that arising from pollution and sedimentation.
LA2	Loss of habitat connectivity	On all lower order watercourses, all culverts shall be designed in accordance with NRA (2006) and IFI (2016) so as not to impede distribution and accessibility.
LA3	Indirect disturbance or loss of habitat	Any potential impacts on water quality that may lead to an indirect effect on the extent and distribution of spawning or juvenile habitat shall be avoided. Juvenile habitat may occur in marginal areas of the Shannon River at the proposed crossing point: appropriate surveys shall be undertaken at the crossing location prior to construction works to establish the presence or absence of this species and, where necessary, these areas shall be salvaged.
LA4	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternative solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Atlantic Salmon – Lower River Shannon SAC		

Ref	Detail of Recommended Mitigation Measure	
AS1	Direct physical loss/damage to habitat	The mitigation measures set out in Section 5.2 below and the implementation of best practice measures outlined in NRA (2006) and IFI (2016) will minimise the risk of harmful ecological effects arising from habitat loss and deterioration, in particular that arising from pollution and sedimentation.
AS2	Loss of habitat connectivity	On all lower order watercourses, all culverts shall be designed in accordance with NRA (2006) and IFI (2016) so as not to impede distribution and accessibility.
AS3	Indirect disturbance or loss of habitat	Any impacts on water quality that may lead to an indirect effect on the extent and distribution of spawning habitat shall be avoided.
AS4	Direct Disturbance	The use of high noise emission activities such as impact pilling and blasting (should it be required) shall be minimised. In-stream works using machinery and machinery working in watercourses shall be minimised. If project level assessments indicate that there is a residual risk of AESI in relation to disturbance, then this element of the project would not proceed unless an alternative solution can be implemented which avoids/reduces the impact to a level that the integrity of the SAC remains unaffected.
AS5	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternatives solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
European Otter – Lower River Shannon SAC		
EO1	Direct physical loss/damage to habitats	Detailed surveys shall be required and provided for in order to fully understand the distribution and habitats usage (i.e., location of sensitive location such as holts or natal dens). This information shall be used to inform project design stage to determine appropriate avoidance or mitigation measures.
EO2	Direct physical damage to mobile species	Temporary mammal-proof fencing shall be erected around the construction envelope to prevent Otters from entering the works area. A riparian corridor for Otter movement shall be maintained at all times during construction.
EO3	Indirect disturbance or loss of habitat	The use of high noise emission activities such as impact pilling and blasting (should it be required) would be avoided where possible. Speed limits shall be enforced for all plant used during construction. A Code of Conduct shall be enforced to avoid disturbance to this species at construction sites and in transit to construction areas.
EO4	Direct disturbance	Given the need for movement of this species along riverbanks, any temporary obstruction to connectivity during construction works between the main Shannon and Mulkear rivers and the Tailrace Canal, where commuting routes may occur, shall be alleviated through the installation of appropriately designed mammal passes, which shall be routinely checked throughout the duration of the works.
EO5	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternatives solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on the Lower River Shannon SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Lesser Horseshoe Bats - Curraghchase Woods SAC		
LHB1	Direct physical loss/damage to habitats	Surveys conducted to date have shown that the proposed route will not have any impact on known Lesser Horseshoe Bat roosts. Where there is the potential or actual

Ref	Detail of Recommended Mitigation Measure	
		bat movement in the area of the proposed route, provision will be made to avoid impeding bat flight paths by the design of appropriate vegetative landscaping and underpasses. If project level assessments identify the risk of AESI in relation to impeding bat flight paths then that aspect of the project would not proceed unless alternative solution can be identified, or additional measures can be implemented.
LHB2	Indirect disturbance or loss of habitat	LHBs avoid areas of high human activity. During the construction phase the use of high noise emission activities such as impact pilling and blasting (should it be required) shall be avoided where possible. Lesser Horseshoe Bats avoid artificial lighting and therefore all project related lighting should be turned off at night if not required. During operation lighting should be designed to reduce impact on bat activity. A Code of Conduct shall be enforced to avoid disturbance to this species at construction sites.
LHB3	Direct disturbance	Given the need for movement of this species along vegetation lines of hedgerows and trees, any temporary obstruction to connectivity during construction works can be mitigated by the erection of temporary bat bridges/lines. During operation, where Lesser Horseshoe Bat flight-lines are interrupted, all embankments and river crossings, shall incorporate appropriate underpasses with vegetated approaches to assist bats in commuting between foraging, roosting and breeding sites.
LHB4	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternatives solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI on Curraghchase Woods SAC. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.
Disturbance/displacement of Special Conservation Interest Bird Species - Ballyallia Lough SPA, Lough Derg (Shannon) SPA and River Shannon and River Fergus Estuaries SPA		
B1	Disturbance/displacement effects associated with any element of a proposed development	At the project level it will be a requirement for any future development included within the LSMATS that has the potential to result in adverse effects to the populations of special conservation interest bird species of an SPA, that an appropriate level of assessment (AA) and survey will be required to identify if, and how, such bird species utilise habitat areas potentially affected by disturbance/displacement effects associated with any element of a proposed development.
B2		Where disturbance or displacement effects are predicted, appropriate mitigation measures as outlined in Section 6.2 of the NIS will be required to ensure that development will not adversely affect the conservation status of special conservation interest bird species and the integrity of related SPAs, either alone or in- combination with any other plans or projects, via this impact pathway.
B3		If, despite the implementation of mitigation measures, there remains a risk that disturbance or displacement at a project level then the project will not be progressed unless an alternative solution can be implemented which avoids/reduces the impact to a level that the integrity of the related SPA remains unaffected.
B4	General	General avoidance and mitigation measures will be implemented unless project level environmental assessments or project level AA indicate that they are not required or not appropriate. At a project level should issues arise under Article 6(3) of the Habitats Directive then the project will not be progressed unless alternatives solutions cannot be identified, or additional measures implemented which would avoid the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.

5.2.2 Summary of Preferred Approach Assessment

Following implementation of the recommended SEA mitigation, it is anticipated that the only potential residual significant negative effects would be associated with landscape and visual amenity as at this early and high-level stage there remains uncertainty regarding the degree to which mitigation identified for implementation down the line at project level assessment would be successful in offsetting the identified potential negative effects.

5.3 Inter-Plan Cumulative Effects

Other plans and programmes with greatest potential to interact with the draft Strategy are the legislation and policy documents as well as those plans and programmes which relate to transport or land use within the LSMA.

With regards to interactions with other plans and programmes relating to transport or land use planning, the potential cumulative effects shown in Table 5-3 have been identified and an assessment of likely cumulative impact (either positive of negative) identified against the relevant SEOs.

In order to address the potential for negative cumulative effects on biodiversity, cultural heritage and landscape and visual amenity as identified in Table 5-3 it is proposed that a 'LSMATS Natural Heritage Strategy' is developed and implemented which sets out aims and measures to which development under the LSMATS should adhere, for example:

- Minimum standards for habitat replacement, and design principles which should be adopted at scheme level (for example, specifying species rich grassland seeding along new road verges);
- Principles of new infrastructure design that should be adhered to in order to benefit townscapes;
- Principles of new infrastructure design that should be adhered to in order to maintain or enhance the setting of build heritage assets; and
- Overarching strategy for managing any archaeological finds detected during construction of new infrastructure, which includes a commitment to facilitating public benefit through measures such as community engagement and/or provision of interpretation boards or other media as appropriate.

The Strategy would be developed within 12 months of adoption of the LSMATS and reviewed on an annual basis until 2040.

Further specific mitigation for potential negative cumulative effects would be best identified at project level through down the line EIA and AA processes as relevant and it is anticipated that these would be aligned with the LSMATS Natural Heritage Strategy discussed above as well as the measures identified against the LSMATS itself. This includes measures such as careful siting and design of new infrastructure to minimise risks of loss of habitat, effects on setting of built cultural heritage assets or landscape character and visual impact receptors as well as the use of SuDs principles where relevant.

Table 5-3 Potential cumulative effects with other plans and programmes

SEO(s)		LSMATS Residual Effect (Summary)	Nature of Cumulative Effect	Plans and Programmes
Potential positive cumulative effects				
1	Protect and enhance quality of life in relation to transport while increasing accessibility to economic, employment and community facilities.	+/0	Positive cumulative effects on public health relating to: To reduced air and noise pollution associated with modal shift towards public transport, walking and cycling. Increased activity levels associated with modal shift as identified above and improved walking and cycling recreational facilities. Accessibility to community facilities and services and places of employment and study facilitated through consolidated development and improved public transport availability.	NDP NPF 2040 SFILT Smarter Travel NIFTI adopted and emerging LCDP, LDP and CCDP Shannon LMASP RSES
7	Contribute to the mitigation of air pollution issues as a result of transport and optimise potential benefits from reduction in air pollution.	+/0	As identified under first bullet against SEO 1.	
8	Contribute to the mitigation of noise pollution issues as a result of transport and optimise potential benefits from reduction in noise pollution.	+/0	As identified under first bullet against SEO 1.	
10	Promote the sustainable use of natural resources (including land), encourage energy efficiency, reuse, recycling while encouraging the effective use of existing infrastructure.	+/0	Positive cumulative effects associated with modal shift towards public transport, walking and cycling and electrification and/or use of alternative fuels and/or modes in the rail and freight sectors and associated reduction in usage of petroleum derived fuels for transport within the LSMATS.	NDP 2040 NIFTI Smarter Travel National Energy and Climate Plan 2021-2030. National Policy Framework on Alternative Fuels Infrastructure for Transport in Ireland National Renewable Energy Action Plan. Climate Action Plan 2021.
11	Minimise contributions to climate change (including greenhouse gas emissions) from construction of new/upgraded transport infrastructure or operation of existing and new transport networks. Contribute to the reduction in transport related GHG emissions through modal changes or new technologies.	+/0	Positive cumulative effects associated with modal shift towards public transport, walking and cycling and support for the usage of electric vehicles and associated reduction in transport related carbon emissions within the LSMATS.	
Potential mixed or negative cumulative effects				
3	Prevent damage to, maintain and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species.	+/-	Negative cumulative effects on biodiversity resulting from loss of designated and non-designated habitats across the LSMA, reductions in water quality and flood risk resulting from increases in non-permeable surface area across the LSMA and landscape and visual amenity associated with and cultural heritage from other plans and programmes which support new infrastructure construction within the LSMA.	Other plans and programmes involving construction of new infrastructure within the LSMA, including but not limited to: Limerick Smarter Travel.
4	Safeguard the character and diversity of the Irish landscape and minimise the visual effects on sensitive,	+/-		

	designated landscapes and public views.			Water supply plans. Small scale housing development and commercial development. Limerick City Centre regeneration programmes.
5	Avoid damage to, maintain and where appropriate enhance, cultural heritage resources and their setting.	**+/0**		
12	Prevent deterioration of the water quality status of surface water and groundwater bodies as appropriate to the WFD and avoid increasing risks from floods or increasing vulnerability to flood risk.	**+/0**		

5.4 Appropriate Assessment

The NIS (Jacobs 2022) for LSMATs, identified seven European sites, Lower River Shannon SAC, the Curraghchase Woods SAC, the Askeaton Fens Complex SAC, Tory Hill SAC, Ballyallia Lough SPA, Lough Derg (Shannon) SPA and River Shannon and River Fergus Estuaries SPA, have the potential to be affected by the LSMATS.

The assessment of the LSMATS against the conservation objectives of each European site has indicated that, with the implementation of mitigation measures, it is anticipated that the potential for adverse effects on site integrity as a result of the LSMATS would be avoided/mitigated. Throughout this plan-level assessment it has been highlighted that individual measures/projects resulting from the LSMATS will require further assessment at a project level to determine potential for likely significant effects (LSE)/AESI and appropriate strategy to ensure that the conservation objectives of the sites are not compromised, and that site integrity can be preserved. Based on the AA prepared in support of the LSMATS suitable avoidance /mitigation measures have been included to address the potential for AESI in relation to a European site as a result of the implementation of the strategy.

At a project level should issues arise under Article 6(3) of the Habitats Directive, despite the implementation of avoidance/mitigation measures, and there remains a risk of AESI of a European site, the project will not be progressed unless an alternative solution cannot be implemented which avoids the potential for AESI. Where alternative solutions cannot be identified project level assessments utilizing the full provisions for AA as set out in the requirements of the EU Habitats Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora may be necessary.

The implementation of the LSMATS will focus on avoidance of LSE/AESI through an overarching commitment to applying the mitigation hierarchy at the plan level which would in turn inform the design/progression of projects and plans contained within the LSMATS. If required specific mitigation measures will be implemented to safeguard sensitive habitats and species listed as Qualifying Interests of the European Site.

In conclusion, subject to the full and proper implementation of the avoidance / mitigation measures detail in the NIS, there will be no adverse effects on the integrity of any European site(s), either alone or in-combination with other plans or projects as a result of progressing the LSMATS.

5.5 Monitoring and Implementation

The SEA regulations require that the significant environmental effects of the implementation of plans and programmes are monitored to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action. The environmental report is also required to provide a monitoring plan describing how the requirement to monitor will be implemented (Stage E of

Table 1-1). To meet this requirement indicators and targets have been set for each SEO, these are listed in Table 5-4. These will provide the basis for monitoring the effects of the Strategy against the objectives following implementation.

Monitoring and analysis of potential impacts are expected to be undertaken at appropriate milestones during the implementation of the Strategy. In terms of programme, the implementation of the major public transport and roads infrastructure projects of the LSMATS will be determined by the outcome of the current review of the NDP. However, an indicative implementation plan in the LSMATS divides delivery into three suggested phases – short (up to 2026), medium (up to 2031), and longer term (up to 2040). Monitoring and analysis of impacts will need to be undertaken periodically during these phases – for example, every two years - with results presented in a Monitoring Report including additional mitigation and recommendations where required.

The purpose of the monitoring plan is to enable a proactive approach by allowing review of the predicted impacts of the LSMATS and to undertake additional mitigation if required. It also encourages continual improvement towards the SEOs. The monitoring proposals for the LSMATS will also be updated following consultation on this Environmental Report and form part of this SEA post adoption statement is published with

the final Strategy. Commitment to the implementing mitigation measures and monitoring plan is included in the final LSMATS and will be integrated into the overall monitoring and implementation of the strategy.

Table 5-4 Monitoring and Implementation Plan

SEO	Potential significant negative effects identified through SEA process	Indicators	Targets	Sources (and frequency of monitoring)
Protect and enhance quality of life in relation to transport while increasing accessibility to economic, employment and community facilities.	▪ Disproportionate negative impact on certain vulnerable groups and/or on small businesses as a result of measures to reduce reliance on private vehicles and restrict or manage freight movement within Limerick City centre. ▪ Severance impacts associated with converting areas currently designated for street parking to bus lanes, with particular concern over routes in close proximity to locations of importance to vulnerable groups (e.g., schools, care homes, hospitals, and other community facilities) and protected characteristic groups.	▪ Significant adverse effects/disproportionate adverse effects on groups which fall under the nine protected groups identified under the Equal Status Acts 2004-2018 arising from implementation of measures or development under the LSMATS. ▪ Increase in health or social inequalities within the LSMATS. ▪ Targets and indicators as identified against SEOs for air quality and noise.	▪ No unmitigated significant adverse effects or disproportionate adverse effects recorded against any groups which fall under one of the nine protected grounds identified in the Equal Status Acts (2000-2018). ▪ No widening of health or social inequalities within the LSMATS.	▪ Assessments and reporting undertaken by NTA and local authorities under Section 42 of the Public Sector Equality and Human Right Duty (Irish Human Rights and Equality Commission Act 2014) (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). The preliminary EqIA included recommendations on additional more detailed analysis and engagement going forward which should be considered as part of the overall strategy monitoring and reporting. ▪ CSO and All Island Research Observatory (AIRO) data for relevant measures such as mortality differentials, income and poverty rates, unemployment statistics, life expectancy, road accident statistics (annually for CSO data, every 4 years for AIRO data).
Avoid damage to recreation and amenity facilities through construction of new transport infrastructure and support and enhance access for tourism recreation.	▪ Impact on tourist industry arising from disruption to highway and public transport routes during construction of new infrastructure.	▪ Significant adverse effects on public access and recreation facilities identified through lower tier environmental assessment.	▪ No temporary or permanent severance of existing footways, footpaths or cycleways. ▪ No permanent unmitigated significant adverse effects on recreational facilities through land take or changes in amenity (noise, dust, views) as a result of	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required - timescales currently unknown). ▪ Fáilte Ireland visitor number and experience monitoring and publications (annually).

SEO	Potential significant negative effects identified through SEA process	Indicators	Targets	Sources (and frequency of monitoring)
			development under the Strategy. ▪ Achievement of objectives, targets and indicators outlined in Healthy Ireland Implementation Plan 2016 - 2019.	
Prevent damage to, and where appropriate enhance, terrestrial, aquatic and soil biodiversity, particularly EU and national designated sites and protected species.	Temporary or permanent habitat loss and/or mortality/disturbance to wildlife as a result of new infrastructure construction. Designated sites of concern include: 1) Lower River Shannon SAC. 2) Ballycar Lough pNHA, Fin Lough pNHA, Knockalisheen Marsh pNHA. Woodcock Hill Bog NHA, River Shannon and River Fergus Estuaries SPA/Fergus Estuary Inner Shannon, North Shore pNHA. 3) Inner Shannon Estuary – South Shore pNHA.	▪ Conservation status of habitats and species as assessed under Article 17 of the Habitats Directive. ▪ Percentage loss of functional connectivity without remediation resulting from development under the LSMATS. ▪ Number of significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites resulting from development under the LSMATS. ▪ Number of derogation licences granted for developments under the LSMATS.	▪ Maintenance of favourable conservation status for all habitats and species protected under national and European legislation to be unaffected by implementation of the LSMATS. ▪ Avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites provided for by the LSMATS. ▪ No significant impacts on the protection of listed species. ▪ Full compliance with LSMATS Natural Heritage Strategy requirements.	▪ Lower tier environmental assessment and decision making by local authorities (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Department of Housing, Local Government and Heritage report of the implementation of the measures contained in the Habitats Directive- as required by Article 17 of the Directive (every 6 years). ▪ Department of Arts, Heritage and the Gaeltacht's National Monitoring Report for the Birds Directive under Article 12 (every 3 years). ▪ Consultations with the NPWS.
Safeguard the character and diversity of the Irish landscape and minimise the visual effects on sensitive, designated landscapes and public views.	Temporary or permanent impacts on landscape and townscape as a result of construction of new infrastructure.	▪ Number of unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of local authorities.	▪ No unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities.	Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown).

SEO	Potential significant negative effects identified through SEA process	Indicators	Targets	Sources (and frequency of monitoring)
			▪ Full compliance with LSMATS Natural Heritage Strategy requirements.	
Avoid damage to, and where appropriate enhance, cultural heritage resources and their setting.	Temporary or permanent impacts on built heritage assets and known and unknown archaeological remains as a result of new infrastructure and reinstatement of pedestrian crossing at Black Bridge, Limerick.	▪ Significant adverse effects on entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and their context of the above within the surrounding landscape where relevant) from significant adverse effects arising from the LSMATS. ▪ Significant adverse effects on entries to the Records of Protected Structures and Architectural Conservation Areas and their context from significant adverse effects arising from the LSMATS.	▪ No unmitigated conflicts with entries to the Record of Monuments and Places or Records of Protected Structures or Archaeological Conservation Areas. ▪ Full compliance with LSMATS Natural Heritage Strategy requirements.	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Consultation with Department of Arts, Heritage and the Gaeltacht (annually).
Avoid conflicts with geological sites of value. Minimise loss of soil resources and contribute towards the appropriate management of soil resources and quality.	Loss and/or sterilisation of soil resources and/or disturbance of areas of ground contamination during construction of new infrastructure.	▪ Significant adverse effects on IGHS sites. ▪ Development within greenfield land (ha). ▪ Development within agricultural land (ha).	▪ No significant adverse effects on IGHS sites arising from development under the Strategy. ▪ Maximise the use of brownfield sites. ▪ Soil Management Plans utilised to protect valuable soils from development under the Strategy as far as practicable.	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Corine land cover mapping (5 yearly).
Contribute to the mitigation of air pollution issues as a result of transport and optimise potential benefits from reduction in air pollution.	Local changes in air pollution levels associated with changes in traffic patterns arising from Park and Rides, freight consolidation centres and new railway lines.	▪ EPA air pollutant monitoring. ▪ Significant adverse effects on sensitive receptors identified through lower tier environmental assessment.	▪ To contribute towards compliance with legislative air quality limits and target values. ▪ No significant adverse effects on sensitive receptors as a result of development under the LSMATS.	▪ EPA monitoring and publications on air quality (annually). ▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the

SEO	Potential significant negative effects identified through SEA process	Indicators	Targets	Sources (and frequency of monitoring)
				LSMATS - timescales currently unknown).
Contribute to the mitigation of noise pollution issues as a result of transport and optimise potential benefits from reduction in noise pollution.	Local changes in noise pollution levels associated changes in traffic patterns arising from Park and Rides, freight consolidation centres and new railway lines.	▪ Population size within LSMATS exposed to Lden and Lnight exceedances. ▪ Number of Lden and Lnight exceedances within the LSMATS. ▪ Significant adverse effects on sensitive receptors identified through lower tier environmental assessment.	▪ No new or increased (in population size or degree of exceedance) unmitigated exceedances of Lden and Lnight thresholds arising from development implemented under the Strategy. ▪ No unmitigated significant adverse effects on sensitive receptors as a result of development under the LSMATS.	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Noise Action Plans prepared by local authorities (Clare County Council and Limerick City and County Council).
Prevent deterioration of the water quality status of surface water and groundwater bodies as appropriate to the WFD and avoid increasing risks from floods or increasing vulnerability to flood risk.	▪ Increased areas of hardstanding required for new infrastructure may have adverse impact on flood risk. ▪ Potential negative impacts on WFD objectives as a result of new pedestrian and rail infrastructure spanning or adjacent to the Shannon, Blackwater, Barnakyle, Fergus and other WFD waterbodies.	▪ Classification of Overall Status (comprised of ecological and chemical status) under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009). ▪ Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC. ▪ Compliance of lower tier assessments and decision making by local authorities with the Flood Risk Management Guidelines.	▪ No deterioration in the status of any surface water or groundwater or affect the ability of any surface water or groundwater to achieve "good status "by 2021. ▪ All lower tier assessments and decision making by local authorities to comply with the Flood Risk Management Guidelines.	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Data issued under the Water Framework Directive Monitoring Programme for Ireland (multi-annual).
Promote the sustainable use of natural resources (including land), encourage energy efficiency, reuse, recycling while encouraging the	▪ Land take from areas of greenfield land and agricultural land.	▪ Development within greenfield land (ha). ▪ Development within productive agricultural land (ha).	▪ Development within greenfield land (ha) minimised as far as practicable. ▪ Development within productive agricultural	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the

SEO	Potential significant negative effects identified through SEA process	Indicators	Targets	Sources (and frequency of monitoring)
effective use of existing infrastructure.			land (ha) minimised as far as practicable.	LSMATS - timescales currently unknown). ▪ Corine land cover mapping (5 yearly).
Minimise contributions to climate change (including greenhouse gas emissions) from construction of new/upgraded transport infrastructure or operation of existing and new transport networks, modal changes or new technologies.	Carbon emissions associated with: ▪ Construction and operation of new infrastructure. ▪ Changes in traffic volumes or patterns associated with new road infrastructure.	▪ EPA carbon emissions monitoring. ▪ Carbon emission data as provided through carbon emission calculators (embodied and operational) for development under the LSMATS.	▪ Reduction in greenhouse gas emissions from transport sector within the LSMATS. ▪ Positive contribution to Ireland's GHG emission targets.	▪ EPA monitoring and publications on greenhouse gas emissions (annually). ▪ Carbon emissions calculators maintained for development under the Strategy (as required for implementation of development and strategies under the LSMATS - timescales currently unknown). ▪ Internal NTA consultations and review of documentation (as required for implementation of development and strategies under the LSMATS - timescales currently unknown).
To ensure that the resilience to climate change is designed for existing transport network and new network and promote improved environmental resilience to climate change.	Resilience of new infrastructure to future changes in climate.	▪ New built infrastructure is compliant with the European Union (EU) waste hierarchy Irish Green Building Council (IGBC) guidance where relevant. ▪ All new infrastructure resilient to future changes in air temperature, precipitation, wind speeds and flood risk throughout full design life.	▪ All new infrastructure resilient to future changes in air temperature, precipitation, wind speeds and flood risk throughout full design life.	▪ Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents (as required for implementation of development and strategies under the LSMATS - timescales currently unknown).

6. Next Steps

SEA requirements and consultation comments have been taken into account in finalising the LSMATS. Consultation responses and how the SEA has been taken into account are reported in this SEA Statement published with the final LSMATS. Responses to the consultation are also reported in the Consultation Report.

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