Appendix D

In-Depth Check Reports

This appendix details the four in-depth check reports with respect to:

Foynes-Limerick Road Improvement Scheme

Redevelopment of Páirc Uí Chaoimh

Iarnród Éireann - Train Protection System

BusConnects - Route Selection & Option Study Programme

An Roinn Iompair,
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Quality Assurance Process 2017:

In-Depth Check

Foynes to Limerick Road Improvement Scheme

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September 2018

Prepared by the Department of
Transport, Tourism and Sport

www.dttas.ie

Document Purpose

This document sets out the template to be filled in by the evaluator, in conjunction with the division/unit/agency, while completing an in-depth check as part of the Quality Assurance Process. This document is drawn directly from the In-Depth Check Methodology document used by the Department of Transport, Tourism and Sport's (DTTAS) Strategic Research and Analysis Division (SRAD) to carry out the evaluation. It is split in to 5 sections in accordance with the 5 identified steps of the in-depth check process, as outlined in the Public Spending Code (PSC).

Document Format

Section A: Introduction

Section B: Evaluation

1. Logic Model Mapping
2. Summary Timeline of Life Cycle
3. Analysis of Key Documents
4. Data Audit
5. Key Evaluation Questions

Section C: Summary and Conclusions

Summary and Use

The templates, once completed, will be the in-depth check and will be attached as an appendix to the Department's annual Quality Assurance report. The Summary and Conclusions section, to be no longer than two paragraphs, will be copied in to the main report under the In-Depth Check section.

Section A: Introduction

This introductory section details the headline information on the Foynes to Limerick Road Improvement Scheme.

Project/Programme Summary	
Name	Foynes to Limerick Road Improvement Scheme
Description	Capital project to improve the road network in Co. Limerick in order to link the Tier 1 Port of Shannon Foynes to the E.U.'s TEN-T core network
Responsible Body	Mid West National Road Design Office (NRDO), Limerick City & County Council
Current Status	**Expenditure Being Considered**
Start Date	Project start: September 2013 Planned opening: 2024
End Date	Project end: 2054 (Review 30 years after projected opening year)
Projected Overall Cost	€320 million (Revised estimate received Dec 2018: €432 million)

Project Description

The Mid West National Road Design Office, in conjunction with Limerick City and County Council, has been tasked with planning and designing a high quality road to connect the Port of Shannon Foynes with the motorway network in the vicinity of Limerick. The proposed scheme is referred to as the 'Foynes to Limerick Road Improvement Scheme'.

The European Union (EU) Trans-European Transport Network (TEN-T) regulations, which came into effect on December 11th 2013, require "*maritime ports of the core network ... (to) be connected with the railway, road and, where possible, inland waterway transport infrastructure of the trans-European transport network by 31 December 2030, except where physical constraints prevent such connection*". TEN-T aims to remove bottlenecks, upgrade infrastructure and streamline cross-border transport operations for passengers and businesses throughout the EU by establishing Core and Comprehensive networks for transportation in Europe's single market. The TEN-T policy identifies Shannon Foynes port as one of four core ports on the island of Ireland, alongside Belfast, Dublin and Cork ports. The policy also identifies a Core road network link between Foynes port and Limerick City, and stipulates that the Core network must consist of either 'motorway' or 'express road' as defined in the relevant EU regulations (with an exemption possible only in cases where provision of motorway or express road cannot be justified in socio-economic cost-benefit terms). As neither the existing N69 nor N21 routes in the surrounding area linking Foynes port with the Core road network meet these requirements, improvements to the road network are necessary.

The need for the scheme is further established by the 2013 National Ports Policy—which identifies as a matter of reasonable priority the improvement of road and rail freight links to

Shannon Foynes port to connect to the core European rail and road network and ensure its status as a Tier 1 port—the Shannon Foynes Port Company business plan Vision 2041, and various other policy documents at the national, regional and local levels. In addition, existing deficiencies in the condition of the two existing national road corridors in the area (N69 and N21) are identified, including limitations in quality of horizontal and vertical alignment, road cross-section, journey times and traffic speeds, overtaking opportunities, pedestrian and cycle facilities, traffic flow due to junctions/accesses and built-up areas along the routes. Collision rates are also twice above the national average for the relevant road type at several points along the routes, which requires rectification as a priority under TII network safety standards. Future traffic growth along these routes would exacerbate these issues.

The project appraisal identifies a 'Do-Minimum' option and four 'Do-Something' options (alternative route corridors for a new road link). The Do-Minimum option is proposed to take the form of the existing road network from 2014 which is assumed to be maintained over time. Any committed infrastructure improvements in the study area over the appraisal period would have been included in this option, but the documents report that no such significant road improvements have been committed. Due to the fact that the existing network does not meet the requirements of the TEN-T policy or address the deficiencies identified on the N69 and N21 corridors, the Do-Minimum option is not taken forward to Detailed Appraisal.

For the Do-Something options, as part of the Stage 1 Route Selection process a large number of route corridor options were initially identified and reduced to four through a sifting process which took economic, environmental and engineering impacts into consideration. These four route corridor options were then appraised as part of the Stage 2 Route Selection Process. The options were based on the known natural constraints in the study area and where possible utilise the existing national road infrastructure to the greatest extent possible. The Phase 2 Business Case states that, given the level of capital expenditure anticipated, full consideration of any existing infrastructural deficits in the area with the aim of achieving full value for money is warranted, with congestion in the village of Adare and future planning requirements for road corridors to Cork and Tralee given as examples. The final preferred route corridor was selected as Option 3, which adjoins the existing N69 outside Foynes before heading south and travelling parallel to the Foynes to Limerick railway line to Rathkeale. From Rathkeale, the route runs east along the existing N21 before heading in a north easterly direction, bypassing Adare to the north and tying into the N21 before the M20 Attyflin Junction (J5). The chosen route is approximately 33 km in length.

The project has gone through Phase 1 (Concept and Feasibility) and Phase 2 (Options Selection) of the TII Project Appraisal Guidelines process, which are stated to correspond to the Preliminary Appraisal stage as identified in the PSC and Common Appraisal Framework. A full detailed appraisal is due at Phase 3 (Design and Environmental Evaluation) and thus is not required at this point in order for the project appraisal process to be PSC compliant. However, Phase 2 does involve exploration of options and selection of a Preferred Route Corridor through the Route Selection Report – this would align with the Detailed Appraisal stage at which selection of the preferred option is meant to take place.

Section B - Step 1: Logic Model Mapping

As part of this in-depth check, SRAD have completed a Programme Logic Model (PLM) for the Foynes to Limerick road improvement scheme. A PLM is a standard evaluation tool and further information on their nature is available in the Public Spending Code.

Objectives	Inputs	Activities	Outputs	Outcomes
To provide road connectivity between Foynes and Limerick to a standard that as a minimum fulfils the requirements of the TEN-T regulations. **Economy** • To reduce journey times and improve journey time reliability between Foynes and the existing TEN-T core road network; and • To support the economic performance of the wider region through the provision of improved transport infrastructure which will reduce the cost of travel for business and tourism and assist in reducing the overall cost of production thereby improving competitiveness. **Safety** • To reduce the collision rate along the national road network between Foynes and	€320.61m CAPEX to be financed from the Exchequer. (Note: Dec 2018 revised cost of €432.06m) Expenditure to include: - Main Construction Contract - Main Contract Supervision - Archaeology - Advance Works & other contracts - Residual Network - Land & Property - Planning & Design Associated staff and administration costs for Limerick City & County Council and Mid West NRDO	Scheme appraisal process in accordance with TII Project Appraisal Guidelines, Common Appraisal Framework and Public Spending Code. Public consultations. Land search & purchases. Advance works. Design. Construction. Supervision.	New road between the Port of Shannon Foynes and the national primary road network which complies with TEN-T core network requirements. Improved road cross-section, improved horizontal and vertical alignment. Limiting or removal of all direct access other than at junctions with other roads, continuous or generous opportunities for overtaking. Bypasses of towns and villages along the current road routes.	Improved driving conditions and reduced travel costs. Improved journey times and reduced delays for private and public modes of transport. Improved connectivity between Foynes and internal and external markets and associated improved efficiency of freight transit. Reduced bottlenecks and traffic delays on the overall road network. Improved journey time reliability and reduced stop/start conditions particularly for heavy goods vehicles on the overall network. Reduced frequency and severity of collisions along the national road network in

the existing TEN-T core road network to below the national average rate; • To reduce the severity of collisions along the national road network between Foynes and the existing TEN-T core road network; • To improve safety for all road users including pedestrians and cyclists along both the national road network and on the surrounding road network between Foynes and the existing TEN-T core road network; and • To support the RSA Road Safety Strategy 2013-2020. **Environment** • To reduce greenhouse gas emissions and in so doing reduce the impact on climate; • To improve air quality in the settlements along the N21 and/or N69 corridor, by the removal of through traffic and in particular HGV's ; and • To reduce the level of noise through the various settlements along the N21 and/or N69 corridor, by the removal of through traffic and in particular HGV's.				the area affected by the scheme and on the overall road network. Improved safety for pedestrians and cyclists. More constant speed of travel, avoidance of queues, and avoidance of emissions effects of braking and exhausts. Improved accessibility to places of employment, education and recreational activity.

Accessibility & Social Inclusion • To improve accessibility to key facilities, such as employment, education and healthcare for all road users, but in particular vulnerable groups; • To reduce travel costs in the region and thereby encourage and support investment and employment in the wider region; • To support the accessibility and social inclusion objectives of national, regional and local planning policy; and • To reduce levels of severance along the existing N21 and/or N69, particularly through the various towns and villages. **Integration** • To meet the requirements of the EU Regulations relating to the TEN-T network; • To support the integration objectives set out in European, National, Regional and Local Planning policy; • To support initiatives to bring investment into the Mid-West Region; and • To support transport integration within the wider region, maximising the				

benefits of previous investment in the TEN-T core network and improving access to Foynes Port.				

Description of Programme Logic Model

Objectives:

The objectives of the scheme are framed as recommended by the TII Project Appraisal Guidelines Unit 3.0 and thus follow the main criteria established in the 2016 edition of the Common Appraisal Framework: Economy, Safety, Environment, Accessibility & Social Inclusion, and Integration. Overall, the objectives are specific, measurable, appropriate and realistic. Under normal circumstances, any references to the creation of a new road could be considered too focused on a specific output rather than the achievement of a goal stated more generally, but in this instance the requirements of the TEN-T network policy (at EU level) and the 2013 National Ports Policy necessitate a new or improved road corridor linking Shannon Foynes port to Ireland's core road network.

Inputs:

The Option Comparison Estimate (OCE) for the Preferred Route Corridor was determined at Phase 2 of the appraisal process in accordance with the TII Cost Management Manual and is shown in the table below:

Cost Expenditure Heading	Cost (2016 Prices)
Main Construction Contract	€199.30m
Main Contract Supervision	€9.40m
Archaeology	€5.80m
Advance Works & Other Contracts	€2.90m
Residual Network	€3.30m
Land & Property	€41.10m
Planning & Design	€10.80m
Sub-Total	**€272.60m**
Total Inflation Allowance	€34.38m
TII Programme Risk	€13.63m
Option Comparison Estimate	**€320.61m**

The main inputs to the project will relate to the construction of the road. Other important inputs relate to the carrying out of associated works, which are discussed in further detail below under Activities.

We note that a December 2018 project update has indicated that the estimated costs have risen to €430.06 million. This increase is driven by an increase in Base Costs identified as part of the ongoing detailed appraisal process, and an accompanying increase in contingency costs following

the recommendations of risk assessments and workshops between TII, Limerick City & County Council and Technical Advisors.

Activities:

The main activities required for the scheme include:

- The scheme appraisal process itself (in conjunction with Roughan & O'Donovan-AECOM Alliance as engineering consultants);
- Extensive public consultations, which were undertaken by Limerick City and County Council in March 2015 to inform the public of the route corridor options under consideration and to afford an opportunity for them to engage with the process and to give feedback;
- Land searches will need to be carried out at the Design stage of the development to comprehensively identify ownership of the land in the vicinity of the preferred route. Ultimately, land will need to be purchased from private land holders in order to facilitate the scheme;
- Advance works for the construction of the preferred route corridor;
- Design of the final specification for the road in accordance with the TII Design Manual for Roads and Bridges, to include details such as road cross section, junction types and design speed, as well as final decision on the carriageway type(s) (Type 1/2 Single/Dual Carriageway); and
- The construction of the road and associated supervision.

Once the construction for the scheme has been completed and the road is operational, monitoring and management—including the collection of performance indicator data—will also be required.

Outputs:

The primary output of the scheme is a new road that provides connectivity between Shannon Foynes port and the national road network in the surrounding area near Limerick City, to a standard that as a minimum fulfils the requirements of the TEN-T regulations.

The Phase 2 Project Brief anticipates that the road will be designed in accordance with the TII Design Manual for Roads and Bridges Standards and will provide at a minimum an average inter-urban speed of at least 80 kph, which relates to a Level of Service D (i.e., stable flow condition as defined by the USA Highway Capacity Manual) during peak traffic flows in the Design Year of the project (15 years after the opening of the road). Continuous or generous opportunities for overtaking and limiting or removing all direct access other than at junctions with other roads are also stated aims of the scheme.

Outcomes:

The main outcomes of the scheme will be improvements to the primary road network between Shannon Foynes port and Limerick City, with additional impacts on the surrounding areas. The provision of a higher quality of road will reduce travel costs in terms of travel time and fuel use by improving journey times and journey time reliability for both public and private road transport.

The removal of bottlenecks via the bypassing of several settlements along the route will add to this effect, as well as reducing the frequency and severity of collisions along the route—with particular improvements for pedestrians and cyclists—and reducing emissions by achieving shorter travel times and reducing stop/start conditions with a more constant speed of travel. The scheme will also improve connectivity to and from the port of Foynes for the rest of Ireland, improve wider connectivity to internal and external markets, and improve accessibility to employment and education in the surrounding areas of the wider Mid-West region.

Section B - Step 2: Summary Timeline of Project/Programme

The following section tracks the Foynes to Limerick project from inception to conclusion in terms of major project/programme milestones.

September 2013	NRA instruction to progress the scheme through Stages 1 to 4
April 2014	Appointment of Roughan & O'Donovan – AECOM Alliance as Engineering Consultants by Limerick City & County Council
June 2015	Completion of Appraisal documents for Phase 1 of TII Project Appraisal Guidelines
June 2015	Request for NRA approval to proceed to Detailed Appraisal
March 2016	TII approval for Phase 1 Project Appraisal Guidelines Assessment and instruction to proceed to Phase 2 of the Scheme Assessment
June 2016	Completion of Route Selection Report documents
August 2016	Completion of Option Comparison Estimates document
October 2016	TII approval for publication of the Route Selection Report
November 2016	Completion and submission to SRAD of Project Appraisal Plan for Phase 1
March 2017	Completion of Appraisal documents for Phase 2 of TII Project Appraisal Guidelines
Future Targets	
Q3 2018	Completion and submission to DTTAS/DPER of Phase 3 Project Appraisal documents
2024	Planned opening year for the scheme
2039	Planned design year for the scheme
2054	Planned forecast year (end year of project appraisal analysis) for the scheme

Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation of the Foynes to Limerick road improvement scheme.

Project/Programme Key Documents		
No.	**Title**	**Details**
1	NRA Letter to Limerick Local Authorities	Letter requesting progression of the scheme through Phases 1–4 of development.
2	Phase 1 Project Appraisal Guidelines Deliverables	Phase 1 documentation: Preliminary Appraisal Report, Project Brief, Traffic Modelling Report, Economic Assessment and Feasibility Report
3	Mid West NRDO Letter to NRA	Letter accompanying Phase 1 Deliverables seeking approval to proceed to detailed appraisal.
4	TII Letter to Limerick Local Authorities	Letter conveying approval for Phase 1 of the scheme assessment and permitting progress to Phase 2.
5	Route Selection Report	Route Selection Report for the scheme, in three volumes (Main Text, Drawings and Appendices)
6	Option Comparison Estimates	Document showing cost estimates for four different options.
7	TII Letter to Mid West NRDO	Letter conveying approval for publication of the Route Selection Report.
8	Phase 1 Project Appraisal Plan	Project Appraisal Plan for Phase 1 of the scheme, submitted following completion of Phase 2 documents.
9	Phase 2 Project Appraisal Guidelines Deliverables	Phase 2 documentation: Business Case, Project Brief, Traffic Modelling Report (with appendices), Cost Benefit Analysis and Project Appraisal Balance Sheet.

Key Document 1: NRA Letter to Limerick Local Authorities

A letter dated 5th September 2013 from Paul Moran, South West Regional Manager of the National Roads Authority (NRA) to Paul Crowe, Director of Services for the Roads & Transportation Directorate of Limerick Local Authorities. The letter requests that, on foot of the publication earlier in the year of the National Ports Policy requiring upgraded access for Tier 1 Ports of national significance, Limerick Local Authorities "*through the (Mid West) NRO … progress the (Foynes to Limerick Road Improvement Scheme) sufficiently, to allow the Authority examine a business case and BCR for same*". The request recommends that the scheme be taken "*through Phases 1 to 4 of development to allow this assessment, after which a decision can be made on the timescales in which it can be progressed further.*"

Key Document 2: Phase 1 Project Appraisal Guidelines Deliverables

Preliminary Appraisal Report, Project Brief, Traffic Modelling Report, Economic Assessment and Feasibility Report produced by Mid West NRDO as necessary for Phase 1. The contents of the documents overlap to a large extent in certain areas. The fundamental need for the project is

established through the requirements of the EU TEN-T regulations for completion of the Core network by 2030, the national policy context, and the condition of the existing road network between Foynes port and Limerick. The objectives for the scheme are established under the five headings of the 2009 edition of the Common Appraisal Framework (Economy, Safety, Environment, Accessibility & Social Inclusion, and Integration) and three broad route corridor options are identified as 'Do-Something' options.

Indicative cost estimates for the options inform the preliminary appraisal, involving a preliminary cost-benefit analysis (CBA) which draws on a Local Area Model (LAM) for the road network affected by the project, Transport User Benefit Analysis (TUBA) software to calculate economic costs and benefits, and a bespoke methodology to estimate the benefits from collision reduction for each of the three route options. The Traffic Modelling Report shows the full detail of how the LAM was calibrated based on the NTA's National Transport Model and available traffic data in the area. Each of these aspects of the appraisal process was compliant with the guidelines in place at the time. As the PSC came into effect in late 2013, a discount rate of 4% rather than the PSC-specified rate of 5% was used in the CBA, following the recommended guidance of the 2009 edition of the Common Appraisal Framework and TII's own Project Appraisal Guidelines. Parameter values in these guidance documents were later updated to align with those presented in the PSC. The appraisal documents are also explicit in stating that the project is at an early stage and a fully detailed CBA is therefore not possible until the options are known in further detail. It is recommended that the project is progressed to Phase 2 on the basis of the TEN-T network requirements and the results of the preliminary appraisal.

Key Document 3: Mid West NRDO Letter to NRA

A letter dated 12th June 2015 from Vincent Murray, Assistant Director of Travel & Transportation at Mid West NRDO to the Secretary of the NRA, with copies enclosed of the five deliverables listed above (Key Document 2) for Phase 1 of the Project Appraisal Guidelines. The letter requested approval for Limerick City & County Council as the Sponsoring Agency from the NRA as the Sanctioning Authority to proceed to detailed appraisal for the road scheme.

Key Document 4: TII Letter to Limerick Local Authorities

A letter dated 3rd March 2016 from Alban Mills, Regulatory and Administration Unit, TII to Vincent Murray conveying the approval of TII for the Phase 1 Project Appraisal Guidelines assessment (as conveyed above) and granting permission for Limerick City & County Council to proceed to Phase 2 of the scheme assessment.

Key Document 5: Route Selection Report

This report contains three volumes: Vol. 1 contains the Main Text; Vol. 2 contains detailed drawings and maps related to elements of the scheme, e.g. showing utilities/community facilities in relation to the proposed route corridor options; and Vol. 3 contains appendices of public consultation documents and full impact reports under the main environmental impact headings.

The main body of the report serves as the culmination of Phase 2 of the appraisal process and describes the process by which the preferred route corridor for the scheme was selected. The

report provides information and directions for future appraisal stages on various steps to take regarding, e.g., land ownership and ground conditions (soil/rock) to look out for, and includes feedback from public consultation exercises. The report also discusses the collection of additional journey time data from October 2015 (Bluetooth traffic data for the village of Adare) and EuroRAP safety ratings for the existing road network.

The Detailed Assessment element of the process was carried out in accordance with TII's existing guidelines, including the Project Appraisal Guidelines. The report was completed in May 2016, at which time the 2016 CAF had been published but the TII PAG were not updated accordingly until October 2016. The decision on the preferred route corridor is made on the basis of a Multi-Criteria Analysis (MCA) involving unweighted scores on criteria across the five main CAF headings, of which CBA (using TUBA and COBALT software to calculate economic and safety benefits of the scheme) is a constituent part.

On the basis of the assessment carried out, Option 3 is recommended as the Preferred Route Corridor to be taken forward to Phase 3 (Design Stage). The report goes into detail on the attributes that distinguish Option 3 from Option 2, as these two options overlap for large sections of the route and therefore have very similar scores on all but a few of the appraisal criteria.

Key Document 6: Option Comparison Estimates

A one-page document dated 23rd May 2016 showing a table of cost estimates for four different route options. Details shown in the table include current year (2016), possible mid-construction year (2022), and inflation parameters for construction (2%), land & property (2%) and programme risk (5%). The table first establishes basic details of each route option (length, number of grade separated junctions, number of bridges and number of signature structures) and then shows estimates of base costs for each option including main contract construction and supervision, archaeology, advance works and other contracts, residual network costs, land and property & planning and design costs. These costs include VAT and risk contingencies. Finally, inflation allowance and NRA programme risk are added for the total estimates, which range from €325 million for Options 1 and 2 to €302 million for Option 4.

Key Document 7: TII Letter to Mid West NRDO

A letter dated 26th October 2016 from Natasha Crudden, Regulatory and Administration Unit, TII to Jari Howard, Senior Executive Engineer at Mid West NRDO conveying approval of TII for publication of the Route Selection Report.

Key Document 8: Phase 1 Project Appraisal Plan

The Project Appraisal Plan for Phase 1 of the scheme, containing information on Problem Definition, Study Area, Data Requirements, Modelling Methodology, Traffic Projections and Appraisal, was submitted to SRAD on 14th November 2016 as a 'Work-in-Progress' following completion of Phase 2 project appraisal stage and in advance of Phase 3. The document provides a record of the approach taken up to that point and sets out a methodology for appraisal going forward on the project.

The contents of the Problem Definition, Study Area and Data Requirements sections are in line with the equivalent sections in the documents from previous stages of the appraisal process. The methodology section states that as part of Phase 3, the validation and calibration of the local area traffic model, which had previously been undertaken in accordance with TII's 2011 guidelines, is to be repeated to ensure alignment with the updated 2016 guidelines, and that sensitivity testing will be undertaken on traffic projections to and from Foynes port. The appraisal section also states that the appraisal to be undertaken at Phase 3 will take cognisance of the updated guidance from the 2016 CAF and TII PAG and address any shortfall in appraisal requirements that may exist from Phase 2, and will therefore involve a fully detailed CBA incorporating economic, safety and environmental impacts, as well as additional detail in the Project Appraisal Balance Sheet.

Key Document 9: Phase 2 Project Appraisal Guidelines Deliverables

The Phase 2 appraisal deliverables were completed in March 2017 and consist of the Business Case document and its four appendices: the Project Brief, Traffic Modelling Report (with appendices of its own), CBA and Project Appraisal Balance Sheet. The Business Case describes the proposed project, establishes the rationale for it, outlines the alternatives and options considered and presents the appraisal process which lead to the identification of the Preferred Route Corridor (as established in full in the Route Selection Report). The document notes the requirement for compliance with the updated 2016 editions of the CAF and PAG. It is also noted that there is currently no non-Exchequer funding available for the project, with EU funding cited as the hypothetical alternative.

The Scheme Appraisal section of the Business Case reports the same MCA as presented in the Route Selection Report. The Preferred Route Corridor is determined on the basis of how each of the four options scores on various sub-criteria under the headings of the five main criteria from the CAF (i.e., Economy, Safety, Environment, Accessibility & Social Inclusion and Integration). Options are rated from 1 (highly negative) to 7 (highly positive) on each sub-criterion, with the scores on each sub-criterion ultimately added together to give a total score for each option. No explicit weighting is applied to the scores. This, combined with the imbalance of sub-criteria across the headings, means that headings with greater numbers of sub-criteria are implicitly given greater relative importance. However, it is also noted that the MCA represented only one mechanism used by the appraisal team to assess the route corridor options. A three-point (preferred, intermediate and least preferred) Options Preference Matrix incorporating the results of other qualitative assessments and outputs was also prepared as part of the Options Assessment process. The preferred option emerging from both matrices under each of the five assessment criteria was Route Corridor Option 3.

Each of the appendices to the Business Case goes into further detail on a specific element of the document: the Project Brief expands on the policy background and need for the scheme, the CBA report goes through each element in full detail, the Traffic Modelling Report outlines the development, calibration & validation for the local area traffic model, and the Project Appraisal Balance Sheet summarises the results of the various forms of assessment carried out during the option selection stage of the appraisal process.

Section B - Step 4: Data Audit

The following section details the data audit that was carried out for the Foynes to Limerick Project. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Journey time data for journeys between Foynes and the motorway network, and on the overall road network	To evaluate the effectiveness of the scheme in achieving the project's Economy objectives to reduce journey times and improve journey time reliability between Foynes and the existing TEN-T core road network.	Automatic Number Plate Recognition (ANPR) surveys, Automatic Traffic Counts (ATC), Junction Turning Counts (JTC) surveys, Traffic Monitoring Units (TMU), Bluetooth
Collision data: frequency and severity of collisions along the existing national road affected by the scheme and the overall network	To evaluate the effectiveness of the scheme in achieving the Safety objectives of reducing the frequency and severity of collisions.	Road Safety Authority (RSA) Personal Injury Accident (PIA) database, NRA Network Safety Ranking Standard HD, EuroRAP risk and star ratings
Data on safety for pedestrians and cyclists	To evaluate the effectiveness of the scheme in achieving the Safety objective of improving safety for pedestrians and cyclists	RSA's PIA database and An Garda Síochána records are available for review.
Data on greenhouse gas emissions from transport	To evaluate the effectiveness of the scheme in achieving environmental objectives.	Emissions data to be quantified within study area at Design Stage
Data on air quality in urban areas	To evaluate effectiveness of the scheme in achieving environmental objectives.	Data on air quality with particular focus on PM_{10} and NO_2 to be collected at most sensitive receptors within study area at Design Stage
Data on noise levels associated with turbulent traffic flow	To evaluate effectiveness of the scheme in achieving environmental objectives.	Baseline survey to be conducted during Environmental Impact Assessment. Predicted levels and mitigation measures to be subject to public submission and assessment by An Bord Pleanála.

Data Availability and Proposed Next Steps

As part of the development of the initial local area traffic model for the scheme, journey time data for the N69 corridor was collected from Automatic Number Plate Recognition (ANPR) surveys, using roadside cameras to capture and time-stamp vehicle registration plates as they pass in May and June 2014 at 17 sites in the study area. A Roadside Interview (RSI) questionnaire was also conducted with HGV drivers at Foynes Port on Thursday 22nd May 2014 to provide further Origin-Destination data. Traffic count data was also collected in May and June 2014 from Automatic Traffic Count (ATC) and Junction Turning Count (JTC) surveys, in addition to data available from 13 NRA/TII Traffic Monitoring Units (TMU). ATC and JTC data are capable of

classifying the flow of traffic past a given point on a road into different vehicle classifications including Heavy Goods Vehicles (HGV). Further journey time data was collected in October 2015 using Bluetooth traffic monitoring for the village of Adare.

Regarding safety, data on the location and severity (i.e., fatal, serious injury or minor injury) of road collisions and the numbers of casualties in those collisions on the N69 and N21 was available from the Road Safety Authority's (RSA) Personal Injury Accident (PIA) database for the period 2005–2012. NRA Standard HD information on the number of collisions per 100 million vehicle kilometres travelled on these roads was also available for the years 2012 to 2014, showing for example the sections of the road corridors that were twice above the national average for the equivalent road type. EuroRAP risk and star ratings for the roads were also available for 2008. The availability of data on safety for pedestrians and cyclists is unclear – it may be possible to use RSA PIA data to determine how many pedestrian and cyclist casualties occur.

Future evaluation of the scheme environmental objectives will be aided by the proposed collection at the Design stage (Phase 3) of air quality data at the most sensitive receptors within the study area. The project appraisal documents specify that these objectives are to be met by bypassing towns and villages thus achieving a more constant speed of travel and avoiding the effects of braking and queueing, where data on traffic flows on the new route and in existing urban areas will be compared and used to quantify changes in emissions levels. The same applies for noise levels, for which a specific source for baseline data could not be found.

In order to evaluate the effectiveness of the scheme in achieving the objectives specified in the table above, the Sponsoring Agency must ensure that data as specified above or equivalent data that is capable of serving the same purpose is available for the full time period of operation of the scheme i.e. throughout the operating lifespan of the project outputs. This means accessing data from the same sources used in the project appraisal documents if available for the relevant infrastructure over the new time period, or arranging for the collection of new data as necessary. The Sponsoring Agency should ensure that future evaluations are in a position to assess the effectiveness of the scheme in achieving its stated objectives, including those for which assessment using quantitative data may not be possible, e.g., contributing to economic and social cohesion, alignment with planning and land-use policy objectives, etc.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the Foynes to Limerick Project based on the findings from the previous sections of this report.

Does the delivery of the project/programme comply with the standards set out in the PSC?

The Foynes to Limerick Road Improvement Scheme has been carried out broadly in line with the requirements of the PSC. We note that early appraisal documentation was prepared prior to the publication of the PSC and was therefore based on pre-existing DTTAS and Sanctioning Authority appraisal guidance documents, that have since been updated to align with the PSC. The analysis undertaken to date by the Sponsoring Agency (Limerick City and County Council, Mid West NRDO) is sufficient for the requirements of the Preliminary Appraisal stage, which TII's Project Appraisal Guidelines specify as equivalent to Phases 1 and 2 of the appraisal process. The key appraisal documents provide full evidence of the work carried out at the necessary stages of the process and the related correspondence between the Sponsoring Agency and Sanctioning Authority (NRA/TII).

In order to ensure full PSC compliance going forward, the Sponsoring Agency must ensure that Phase 3 of the appraisal process is conducted in accordance with the latest guidance, and we recommend that additional details noted previously in relation to the Phase 2 documents (Route Selection Report and Business Case) are taken into consideration. In particular, while acknowledging that other qualitative assessments that lead to the development of an Options Preference Matrix formed part of the appraisal process, the MCA used to identify the Preferred Route Corridor at Phase 2 does not specify weighting for each of the five CAF criteria. While use of MCA for a project of this scale is permissible in the case where CBA has been carried out to the fullest possible extent and serves as an element within the MCA, establishing weighting for MCA ensures a greater level of transparency with regard to the relative importance of scores on each criterion. The Phase 3 detailed appraisal stage should also investigate the possibility of securing alternative funding streams and consultation with the NDFA.

Is the necessary data and information available such that the project/programme can be subjected to a full evaluation at a later date?

Data sources have already been identified and baseline data collected for the main scheme objectives under the headings of Economy and Safety. Data sources have also been identified for future data collection for the Environment objectives where baseline data has not yet been collected. Where the necessary data sources have not yet been specified (i.e., noise levels), the Sponsoring Agency has planned to conduct baseline surveys as part of the project's Environmental Impact Assessment and have indicated their commitment to meet all monitoring obligations arising therefrom. In these instances, for full compliance with the CAF, the Sponsoring Agency must ensure that data from the identified sources or equivalent data that is capable of serving the same purpose is collected at regular intervals over the full time period of operation of the scheme, i.e., throughout the operating lifespan of the project outputs.

What improvements are recommended such that future processes and management are enhanced?

In order to improve compliance on similar projects in the Department's portfolio, increased clarity could be provided with respect to the sequencing and submission of project documentation. Here, the Phase 1 Project Appraisal Plan (PAP) for this scheme was only submitted to DTTAS by TII following the completion of Phase 2. Ideally, a PAP should be submitted at the earliest scoping stage so that the Department, TII and the Sponsoring Agency can agree on the approach to be taken in terms of methodology, assumptions and the range of alternatives to be considered. We note that in this instance, TII cooperated fully with SRAD and engaged at the Phase 2 stage to ensure that redundant work was not carried forward to the Detailed Appraisal stage/Phase 3.

In this vein, SRAD will continue to update and improve CAF guidance notes and will communicate such changes to Sponsoring and Sanctioning Authorities to ensure optimal alignment with PSC requirements.

Section C: In-Depth Check Summary

The following section presents a summary of the findings of this in-depth check on the Foynes to Limerick Road Improvement Scheme.

Summary of In-Depth Check

The project appraisal process for the Foynes to Limerick Road Improvement Scheme has been carried out broadly in line with the requirements of the Public Spending Code. The proposed scheme involves a capital project to improve the road network in Co. Limerick in order to link the Tier 1 port of Shannon Foynes to the EU TEN-T Core road network and achieve compliance with TEN-T policy and national, regional and local policy in relation to transport connectivity to Shannon Foynes port and the surrounding area. The project has gone through Phase 1 and Phase 2 of the TII Project Appraisal Guidelines stages, equivalent to Preliminary Appraisal stage, with a fully detailed appraisal due at Phase 3. The Stage 2 appraisal identifies the preferred route corridor for the scheme on the basis of MCA evaluation incorporating a CBA of the economic, safety and environmental elements of the scheme. The analysis undertaken at all stages of the appraisal process and the related correspondence between the Sponsoring Agency and Sanctioning Authority (NRA/TII) are fully documented.

As the scheme has not yet progressed into implementation phase, several steps remain to be taken to ensure full PSC compliance over the project life-cycle. Data must be collected during the operation of the scheme, whether from the sources specified at the baseline or from equivalent new sources, in order to allow future evaluations to assess the effectiveness of the scheme in achieving its stated objectives. The analysis to be undertaken at Detailed Appraisal stage must also incorporate additional details and improvements noted in the Phase 2 Business Case and Route Selection Report, and must ensure compliance with PSC and CAF guidance on the conduct of MCA and CBA requirements with particular regard to relative weighting of appraisal criteria. If such recommendations are implemented, it is expected that the project will be compliant with all PSC requirements regarding Expenditure Being Considered.

An Roinn Iompair,
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Quality Assurance Process 2017:

In-Depth Check

Redevelopment of Páirc Uí Chaoimh

Naoise Grisewood

January 2019

Prepared by the Department of
Transport, Tourism and Sport

www.DTTAS.ie

Document Purpose

This document sets out the template to be filled in by the evaluator, in conjunction with the division/unit/agency, while completing an in-depth check as part of the Quality Assurance Process. This document is drawn directly from the In-Depth Check Methodology document used by the Department of Transport, Tourism and Sport's (DTTAS) Strategic Research and Analysis Division (SRAD) to carry out the evaluation. It is split in to 5 sections in accordance with the 5 identified steps of the in-depth check process, as outlined in the Public Spending Code (PSC).

Document Format

Section A: Introduction

Section B: Evaluation

1. Logic Model Mapping
2. Summary Timeline of Life Cycle
3. Analysis of Key Documents
4. Data Audit
5. Key Evaluation Questions

Section C: Summary and Conclusions

Summary and Use

The templates, once completed, will be the in-depth check and will be attached as an appendix to the Department's annual Quality Assurance report. The Summary and Conclusions section, to be no longer than two paragraphs, will be copied in to the main report under the In-Depth Check section.

Section A: Introduction

This introduction provides headline information on the project/programme under review.

Project/Programme Summary	
Name	Redevelopment of Páirc Uí Chaoimh
Description	Regional stimulus grant of €30 million to support the redevelopment of Páirc Uí Chaoimh and construction of an adjoining Centre of Excellence.
Responsible Body	Cork County Board of the GAA
Current Status	Expenditure Being Incurred
Start Date	September 2013
End Date	Final grant payment: Q4 2018 (expected)
Projected Overall Cost	€78.34 million, (Update: €86.4 million, exclusive of land cost and subject to finalisation) State contribution: €30 million

Project Description

This project refers to the redevelopment of the Páirc Uí Chaoimh (PUC) stadium and the construction of an adjoining "Centre of Excellence" in the Marina Park area of Cork City Docklands. An outline of the project rationale and major project milestones follows.

PUC was first constructed in 1976 with a capacity of 50,000, but after almost 40 years in operation, the stadium was deemed to no longer meet the needs of players, spectators, media or the GAA. In this time, the capacity of the stadium also experienced downward revisions—first to 43,500 and then to 32,128—in order to comply with health and safety regulations. Facing obsolescence and a lack of stadium capacity to accommodate major Championship games, in September 2013 the Cork County Board (CCB) of the GAA submitted a formal request for €30 million in State support to help finance a projected €70 million redevelopment of PUC to the Department of Public Expenditure & Reform (DPER) as part of a Regional Stimulus Proposal.

This allocation was approved in principle by Cabinet and announced as part of a wider €200 million stimulus package by the Minister for PER, Brendan Howlin, in May 2014. Following this announcement, oversight of the project reverted to DTTAS and its Sports Capital Programme (SCP) division, who were tasked with ensuring that the project satisfied PSC requirements and all additional requirements of the SCP programme.

Given the magnitude of the State's investment and the proposed redevelopment, the PSC appraisal thresholds made clear that a detailed Cost–Benefit Analysis (CBA) of the scheme

would be required. However, the initial project documentation provided to DTTAS by the CCB in December 2014 did not represent a PSC-compliant Business Case and the CCB were informed that significant revision would be required to satisfy PSC requirements before a formal grant approval letter could issue.

Over the following months, DTTAS engaged in regular communication with the CCB, their consultants, and the GAA Central Council—primarily through the SCP and Economic and Financial Evaluation Unit (EFEU) divisions—in order to clarify the detailed financial and economic appraisal requirements for full PSC compliance. While the appraisal process and Business Case development did not follow a typical project sequencing given the early Approval-in-Principle, the PUC Business Case was signed off as being PSC compliant in October 2015.

However, before a formal approval letter confirming grant allocation could issue to the CCB, DTTAS was obligated to notify the European Commission and its Directorate-General for Competition (DG COMP) of the Irish Government's intention to provide State funding to the CCB and satisfy DG COMP's criteria for the provision of State Aid. This process was initiated in October 2015 in consultation with the CCB and their consultants. In the course of preparing the required documentation for DG COMP, rising project costs also necessitated a revision of the previously approved Business Case and a review of the project's risks, contingency and funding strategy. The approved Business Case was therefore updated and assurance from the GAA Central Council guaranteeing that further funding would be secured and provided to the CCB to ensure the completion of PUC in the event of downside risks materialising was secured before finalising the submission to DG COMP in February 2016.

Throughout March–July 2016, DG COMP raised a number of queries regarding the proposed funding with DTTAS, including an objection to the proposed State Aid submitted to DG COMP from an Irish citizen. DTTAS continued to engage with the CCB and their consultants in responding to these queries and successfully satisfied all DG COMP concerns. Following the inquiry process, the European Commission notified Irish representatives of their decision not to object to the provision of State Aid funding in July 2016, clearing the path for DTTAS to formally confirm the allocation of funding towards the redevelopment of PUC. A formal letter of grant approval was finally issued in November 2016, following the preparation and signing of contracts.

As demolition and site-enabling work at PUC had already been completed, the main construction work proceeded through to September 2017 and PUC was officially opened in October 2017, just 5 months after the initially intended opening date of May 2017. To date, almost the entirety of the €30 million grant has been fully claimed, with DTTAS currently holding only the final €1.5 million retention payment, which is expected to be paid out in Q4 2018, following the conclusion of a defects liability period and sign-off by the Department's technical advisor. Furthermore, in November 2017 the CCB expressed their desire to establish a new company, *Stáid Cois Laoi*, to manage the commercial aspects of PUC. This process will involve some alterations to existing contracts between the CCB and the State and the CCB

have begun engagements with the Chief State Solicitor's Office (CSSO) to ensure that all legal obligations are observed.

Ultimately, while the redevelopment was completed successfully, it should be noted that the total actual cost of the redevelopment has risen by a further 10% to €86.4 million exclusive of land cost and subject to finalisation. While the proposed funding strategy accounted for a budget of in excess of €80 million, significant revision of the funding strategy was required as the amount raised through fundraising and the advance sale of long-term premium and club seats fell below the target set by the CCB. As a consequence, the CCB were required to take out a €19 million bridging loan in conjunction with the GAA Central Council and Croke Park to complete the project. It is planned to repay this loan through the disposal of CCB lands in Kilbarry, the sale of naming rights to the stadium, revenue generated by conferences and concerts held in PUC, and through a revised sale of long-term premium and club seat packages.

Section B - Step 1: Logic Model Mapping

As part of this in-depth check, SRAD have completed a Programme Logic Model (PLM) for the PUC redevelopment project. A PLM is a standard evaluation tool and further information on their nature is available in the Public Spending Code.

Objectives	Inputs	Activities	Outputs	Outcomes
To provide a high-quality, modern stadium with the capacity to host major Championship matches and the ability to attract other major events to the Cork/Munster region. To encourage increased participation in sport and to help develop inter-county, club and school-going players at all levels. To ensure PUC is developed in line with best health and safety practice and to support modern disability access. To achieve value-for-money and facilitate the operational efficiency and financial sustainability of PUC.	As per final Business Case: €78.34m in CAPEX costs, including €9.64m in VAT. • €30m Exchequer; • €48.34m GAA resources (Actual cost: €86.4m exclusive of land cost and subject to finalisation, with €56.4m borne by CCB/GAA) Estimated 103 job-years of direct employment over the project lifetime. Projected €26m OPEX repair and maintenance costs over the 30-year project operational phase. Associated staff and administration costs.	Demolition of obsolete stands and site-enabling work. Construction of a new 3-tier, roofed 13,000-seat South stand and a roofed 8,000-seat North stand. Refurbishment of existing 24,000-capacity terraces. Installation of an adjoining all-weather training pitch and public viewing area. Maintenance, landscaping, repairs and upgrades to stadium and surroundings. Sale of premium and club seat packages to secure project funding and future financial sustainability. Ongoing operation of concert, recreational and conference facilities.	Redeveloped floodlit modern stadium with capacity for 45,000 spectators. Provision and operation of a multi-functional concert and conference venue. Installation of an adjacent 155m × 100m all-weather floodlit training pitch with public viewing area. Supporting facilities including: changing facilities, medical rooms, function rooms, gym, restaurant, food & drink kiosks, museum, media/press facilities, electrical/IT facilities. Upgraded stadium entry/exit, pedestrian and vehicle site access and improved crowd management procedures in full compliance with E.U. safety regulations.	Increased frequency of major sporting fixtures, activities and concerts in PUC, benefiting the wider Cork/Munster region. Increased participation in sport and a wider recognition of sport's economic, health and social benefits and the role of sport in Irish culture and society. Better match-day experience for fans and premium ticket-holders, to drive increased attendance and future financial sustainability. Greater integration of PUC facilities with Marina Park, to support the renewal of the Cork Docklands area.

Description of Programme Logic Model

Objectives:

The project objectives experienced significant evolution between the initial Case-for-Funding and the final Business Case and DG COMP submission. The PSC makes clear that project objectives should be 'outcome' rather than 'output' focused and expressed in terms of the benefits they are expected to provide. Project objectives thus shifted from the output-focused construction of a modern stadium to wider outcome-focused objectives reflecting the potential impact of the redevelopment in the Cork/Munster region and additional benefits to the local community and financial sustainability of PUC. The objectives highlighted in the PLM above represent a condensed selection of the various objectives that were developed and communicated throughout the course of the detailed appraisal and assessment process.

Inputs:

The main inputs of the redevelopment of PUC were capital expenditure (CAPEX) to cover the demolition and construction work, the human labour input to complete and operate the redeveloped stadium/conference facilities—estimated in terms of 'job-years'—and the projected €26 million in operating expenditure (OPEX) to cover future repair and maintenance work over the 30-year operating project lifetime.

As noted above, the total construction cost as presented in the final Business Case included a VAT cost of €9.64 million, and the State's input was limited to the €30 million regional stimulus capital grant allocation. The remaining €48.34 million of capital expenditure was to be formed from a combination of the CCB's own financial reserves, GAA. Munster and Central Council funding, and revenue generated from the pre-sale of premium and club seat packages. However, as was noted in the Introduction, the redevelopment experienced further cost escalations with the actual CAPEX cost rising to €86.4 million exclusive of land cost and subject to finalisation.

Financial revenue generated by PUC's ongoing operations is expected to be reinvested to cover loan repayments and the future operational and maintenance costs.

Activities:

The main activities in the redevelopment of PUC included the demolition of existing stands, site-enabling works, and subsequent construction, refurbishment and installation work. Although the main construction work was fully tendered and agreed upon with the project contractor John Sisk & Sons in November 2015, contracts were not signed until after the publication of the DG COMP decision not to object to the proposed State Aid and after DTTAS' technical advisor had signed off on the redevelopment, i.e., August 2016. While project costs did escalate by a further 10%, the main construction work was essentially completed by September 2017 and PUC had its official opening in October 2017.

Ongoing activities include landscaping, maintenance and repair work, and the operation of franchise outlets and conference facilities within PUC. Finally, while fundraising and the sale of long-term premium and club seat packages formed an integral part of the proposed funding strategy, these activities are expected to continue in future years to ensure the financial sustainability of PUC.

Outputs:

The main output of the project is a modernised and multi-functional PUC with a stadium capacity of 45,000. The 3-tier roofed and seated South Stand has a capacity of 13,000, while the single tier roofed and seated North Stand has a capacity of 8,000. The refurbished terrace capacity at both ends remains unchanged at 24,000. The adjoining Centre of Excellence includes a 155 m × 100 m playing pitch and a cantilevered 760-capacity public viewing area on the south facade of PUC. The redeveloped facilities also provide 1,800 sq. metres of flexible conference space and a selection of function rooms and suites in the PUC Conference Centre, located on Level 2 of the new South Stand.

Furthermore, the stadium has been developed in full compliance with E.U. health and safety and crowd management regulations, and supports disabled access, with 220 spaces for disabled patrons and their companions. Other supporting facilities are noted in the PLM above.

Outcomes:

As deciding where to host major events is contingent on the availability of facilities with suitable capacity to meet expected demand, it is expected that the redevelopment of PUC and increase in its capacity will allow the Cork and Munster region to host major sporting and concert events on a more frequent basis. PUC's ability to attract major concerts has already been demonstrated to strong effect, with three consecutive Ed Sheeran concerts successfully staged in May 2018, which were reported to have attracted a combined attendance in excess of 120,000 people.

In addition to supporting the development of c.36,000 members across the 260 clubs and 67 independent teams (3,014 teams in total) affiliated with Cork GAA, showcasing Irish sport in a modern, high-quality stadium is expected to encourage increased participation and instil a wider recognition of sport's economic, health and social benefits and appreciation of the role of sport in Irish culture and society. The provision of an improved match-day experience and upgraded facilities are also expected to drive higher attendances, which will help to secure the future financial sustainability of PUC.

Finally, the greater integration of PUC into Marina Park forms the first phase of Cork City Council's Marina Park development plan and is expected to help drive the renewal of the Cork Docklands region.

Section B - Step 2: Summary Timeline of Project/Programme

The following section tracks the PUC redevelopment project from inception to conclusion in terms of major project/programme milestones.

July 2013	Cork City Council adopt Marina Park Development Plan, including provision for the redevelopment of PUC and the establishment of a Centre of Excellence.
September 2013	**Formal Project Start**: Submission for €30m towards the redevelopment costs presented to DPER as part of a Regional Stimulus Proposal by Minister Simon Coveney, and Ministers of State, Sean Sherlock and Kathleen Lynch.
October 2013	Planning permission application submitted to Cork City Council.
November 2013	Case for Funding and Technical Presentation presented to Minister Brendan Howlin (DPER) and Minister of State, Sean Sherlock.
April 2014	Cork City Council grant planning permission. Decision appealed to An Bord Pleanála by third parties.
May 2014	**Approval-in-Principle**: Cabinet announce €30m toward the redevelopment of PUC as part of a major €200m Government stimulus programme. Allocated funding noted to be subject to compliance with PSC requirements.
October–December 2014	GAA Central Council and Munster Council authorise €23.75 million in funding for the redevelopment of PUC. An Bord Pleanála grant planning approval (November). Project documentation, budget cost summary and proposed tender strategy provided to DTTAS for review (December).
January 2015	CCB informed by DTTAS that given scale of proposed redevelopment, a Cost–Benefit Analysis (CBA) and revised Business Case is required. DTTAS initiates contact with the NDFA.
February–August 2015	Continued engagement between CCB and DTTAS regarding Business Case and CBA requirements. Demolition and site-enabling works commenced (March). Tendering process for main contract works initiated (June). Revised Business Case received (August).
September 2015	DTTAS Economic and Financial Evaluation Unit (EFEU) approve revised documentation and submit to DPER.
October 2015	DPER confirm project's technical compliance with PSC requirements.

	DTTAS notify European Commission DG COMP of intended State Aid measure and meet to discuss requirements. CCB notified that grant cannot be confirmed until process is resolved.
November 2015	CCB announce John Sisk & Sons as project contractor. Signing of contract postponed while awaiting DG COMP decision.
December 2015	Rising project costs and need for clarity regarding project risk and contingency funding necessitate update of final Business Case.
January 2016	CCB forward updated costs and funding plan to DTTAS.
February 2016	Project documentation submitted to DG COMP for review. DG COMP notify DTTAS of an Irish citizen objection to the project and request further documentation. DTTAS retain technical advisors and engage with the Chief State Solicitor Office (CSSO). NDFA return high-level review to DTTAS noting limited scope for involvement due to advanced contract position.
March 2016	DTTAS return response to citizen objection and additional documentation to DG COMP.
April–July 2016	Supplementary queries and correspondence between DTTAS and DG COMP.
July 2016	DG COMP approve State Aid funding.
August 2016	DTTAS technical advisor approves redevelopment plans.
September 2016	Provisional allocation letter from DTTAS to CCB outlining terms and conditions of grant allocation.
November 2016	Deed of Charge with DTTAS signed. **Formal Approval**: letter from DTTAS to CCB confirming allocation of €30m grant.
January–September 2017	Ongoing construction work.
October 2017	Official opening of the redeveloped stadium.
November 2017	CCB request permission to establish a new company to allow PUC to operate as an individual commercial entity. DTTAS advise CCB to engage with the CSSO.
September–December 2018	Expected drawdown of final €1.5m retention payment following end of defects liability period.

Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation of the Páirc Uí Chaoimh redevelopment project.

Project/Programme Key Documents		
No.	**Title**	**Details**
1	Regional Stimulus Proposal and Case-for-Funding	Extract of the Regional Stimulus Proposal outlining the proposed project, and scanned copy of the subsequent Case for Funding presented to DPER.
2	Initial Project Documentation	Initial project documentation presented to DTTAS following Cabinet's Approval-in-Principle announcement.
3	Stadium Capacity Report	Stadium Capacity Report outlining the options considered at preliminary appraisal stage.
4	PUC Business Case	Final PUC Business Case approved by EFEU.
5	DG COMP State Aid Submission	Submission to DG COMP.

Key Document(s) 1: (a) Regional Stimulus Proposal extract; (b) Case-for-Funding presentation

(a) **Regional Stimulus Proposal extract** — Single page extract from a Regional Stimulus Proposal submitted to DPER in September 2013 by a Regional Stimulus Proposal Group including Minister for Agriculture, Food and the Marine, Simon Coveney, and Ministers of State, Sean Sherlock and Kathleen Lynch.

Section 5.6 of the Regional Stimulus Proposal details the CCB's first formal submission for €30 million in Government assistance for the redevelopment and modernisation of PUC to enable capacity for 45,000 spectators and the development of an adjoining Centre of Excellence and Marina Park. A brief project summary and initial cost estimate of €67 million is provided, however there is no breakdown of costs or benefits other than an estimate of the number of potential construction jobs considered. It is noted that the redevelopment is considered to be the first phase in the renewal of the Marina Area of the Cork Docklands and to have full support of Cork City Council and the Stimulus Fund Proposal Group.

(b) **'Case-for-Funding' presentation** — Scanned copy of 22 slides presented to DPER/Minister Howlin in November 2013 as part of the Regional Stimulus Funding bid.

The slides provide an overview of the project scope, planning process, timeline and key proposed features, in addition to an itemised budget cost estimate of €70 million. Expected funding streams are listed with the CCB and its membership stated to be investing €20 million through their own financial reserves and revenue from fundraising and an advance sale of long-term seat packages.

An additional €20 million is listed as to be provided through National and Provincial GAA sources, with the outstanding €30 million requested from the State.

In addition to creating a focal point for 'Sports Tourism' and supporting the Government's "Jobs Agenda", a projected return on investment to the State of €25.7 million is proposed as justification for Government investment, based on estimates of reduced social welfare costs, income tax and VAT intakes for the construction and indirect jobs generated over the design and construction period.

Overall, this documentation provided some clarity regarding the costs, funding streams and potential return on investment for the State, however, the Regional Stimulus Funding extract and Case for Funding did not represent a detailed project appraisal as defined in the PSC. The decision to grant 'Approval-in-Principle' thus proceeded on the basis of Cabinet's authority to approve projects independently of the PSC, with their decision noting that project oversight and responsibility for ensuring PSC compliance would return to DTTAS.

Key Document(s) 2: Initial Project Documentation

Initial Project Documentation — The allocation of the €30 million stimulus grant was approved and announced by Minister Howlin in May 2014. The CCB provided DTTAS with hard copies of their initial project documentation in December 2014, following planning permission for the project being granted by An Bord Pleanála in November 2014. This documentation included a 48-page (including appendices) '*Submission to DTTAS for the redevelopment of PUC'* document and an additional 8-page '*Additional Information for Sports Capital Programme*' document containing the CCB's response to a request from the SCP for further project details.

These documents provide details of the overall design and scope of the project, a summary of the proposed budget, evidence of planning permission for the proposed construction, the expected project timeframe and milestones, the funding strategy, the tender strategy, and partial evidence of title. The '*Additional Information*' document also includes a favourable benchmarking 'Value-for-Money' assessment in terms of the 'cost-of-build per spectator' vs. 'spectator capacity' in comparison to other Irish and Northern Irish stadia, and a further qualitative account of the scheme's benefits. In addition to the previously presented projected return on investment to the State, these benefits suggest an estimated boost of €12.5 million in the local economy per major match—which is not recognised as a displacement effect—and a possible additional national benefit of c.€80 million if the State's 2023 Rugby World Cup bid was to be successful, where PUC would be one of the national stadia supporting the bid.

However, as the CCB had not finalised the purchase of all lands required for the redevelopment, the evidence of title required for SCP grants to be approved was deemed insufficient. Furthermore, with regard to the project's tender strategy[1], although technically compliant with the Office of Public Procurement's guidelines since the value of the State's investment was below

[1]A restricted invitation to tender and two-stage competitive procedure.

the 50% threshold, the main construction contract did not fall under the Capital Works Management Framework (CWMF) which is generally used by contracting authorities involved in the expenditure of public funds on construction projects. In terms of risk, this meant that the final project cost was highly dependent on the accuracy of the contract drawings, bill of quantities, the quality of the contract administration and the scope of the project remaining unchanged.

Overall, while this material greatly clarified the proposed scope of the project, CCB were informed that a revised Business Case and full CBA would also be required for PSC compliance given the magnitude of the State's investment. Over the following months, the SCP and EFEU divisions engaged in regular communication with the CCB and their consultants to advise on the development of a PSC compliant Business Case.

Key Document(s) 3: Stadium Capacity Report

Stadium Capacity Report — A 15-page report submitted to DTTAS in August 2015. The report details the preliminary appraisal process that was undertaken prior to the CCB's initial submission for Regional Stimulus funding, and outlines the rationale for the project, the limitations of the existing stadium, the scope of the proposed redevelopment and the range of options that were considered in the planning stage.

The PSC makes clear that several options should be considered at preliminary appraisal stage before proceeding to detailed appraisal. While the initial project documentation received by DTTAS did not indicate that such a preliminary appraisal process had been followed, this report clarifies that seven options were considered by the CCB and subjected to preliminary appraisal consisting of a qualitative multi-criteria analysis (MCA) in 2013.[2] The options considered were as follows:

1. **Part-refurbishment and part-replacement of the existing stadium** — Upgrade of spectator access in line with current safety criteria for spectator attendance and the demolition and replacement of the South Stand to provide essential upgrades (capacity: 32,580; est. cost: €53.25 million).
2. **Part-refurbishment and part-replacement of the existing stadium with redevelopment to include premium seating and ancillary CCB requirements** — As per Option 1, with additional facilities to improve spectator comfort and generate revenue for the on-going future funding of the stadium (capacity: 34,780; est. cost: €62 million).
3. **Part-new build, part-refurbishment, spectator capacity of 50,000** — This option would restore spectator capacity to PUC's 1976 capacity of 50,000. New North and South Stands would be constructed and the existing Standing Terraces would be refurbished (capacity: 50,000; est. cost: €77.5 million).
4. **Part-new build, part-refurbishment, spectator capacity of 45,000 (Phased)** — A phased construction incorporating new North and South Stands and the refurbishment of the existing Standing Terraces (capacity, 45,000, est. cost: €75 million).

[2] All estimated costs inclusive of VAT, fees and land costs.

5. **Part-new build, part-refurbishment, spectator capacity of 45,000 —** As per Option 4, but without the phased development (capacity, 45,000, est. cost: €70 million).
6. **All-seated spectator stand —** Construction of an all-seated stadium with spectator capacity of 45,000 (capacity, 45,000, est. cost: €96.4 million).
7. **Three-seated stands and one standing terrace —** An alternative to Option 6 where only one terrace is converted to seating (capacity, 39,200, est. cost: €73 million).

Option 5 emerged as the CCB's preferred solution, satisfying the CCB's stipulation that the stadium accommodate at least 40,000 spectators, land for development being available, and minimising disruption to the ongoing and future operation of the stadium.

Key Document(s) 4: Final PUC Business Case

Final PUC Business Case — Although an earlier PUC Business Case had been signed off as PSC compliant by both DTTAS and DPER in October 2015, the CCB were tasked with updating the approved PUC Business Case following a fully tendered cost escalation of c.10% and to alleviate concerns over the overall deliverability of the project[3]. The final PUC Business Case received and approved by DTTAS was submitted in December 2015.

The 60-page document is largely built on the previously approved Business Case and incorporates summary CBA tables outlining key appraisal results. The same seven options noted in the Stadium Capacity Report are presented, but with further detail on the decision-making criteria and capacity/cost trade-off analysis used to conduct the preliminary appraisal. The four project objectives used to rank the options are stated to have been:

1. To provide high-quality stadium accommodation for the 21st century;
2. To minimise cost and achieve maximum value-for-money;
3. To provide for the future growth of attendances in Cork and Munster, and position PUC to attract major concerts and events; and
4. To facilitate operational efficiency and financial sustainability.

As noted, Option 5 (detailed above) emerged as the CCB's preferred option and was the only option brought forward for detailed appraisal, with the updated preferred option cost of €78.34 million now taken into account. While the gross cost to the Exchequer remains limited to the €30 million stimulus grant, Exchequer inflows from VAT on construction, labour taxes and social welfare payments avoided are stated to yield a notional net Exchequer cost of €14.6 million. It is noted that this analysis is limited to the delivery-phase only and further potential Exchequer inflow arising from greater spending due to higher match-day attendances and increased number of visitors are not included. The directly monetised benefits considered are those relating to payroll, value added from additional visitor spending and the reduction in the marginal excess burden of taxation (i.e., labour taxes and social welfare avoided), which are then

[3] While the successful tenderer was announced and costs were agreed, contracts were not signed pending the outcome of DG COMP's State Aid decision and formal approval of the grant allocation.

compared with the CCB's and GAA Munster and Central Councils' Willingness-to-Pay (WTP), yielding a Net Present Value (NPV) of €9.8 million.

The remainder of the Business Case considers additional benefits to society—e.g., PUC as a public good to stimulate participation in sport and deliver long-term health benefits—in a qualitative manner, before discussing funding streams, project risks and mitigation strategies. The revised funding strategy notes that while an increased amount will be sought through fundraising and advance ticket sales, the sale of CCB lands at Kilbarry is also listed as a funding source with total potential funding now stated to be in excess of €80 million. In addition, the GAA Central Council also provided a guarantee that additional funding would be secured and provided to the CCB in the event of downside risks materialising to ensure the overall deliverability of the project.

This final Business Case was signed-off as PSC compliant in January 2016 before finalising the State's submission to the European Commission.

Key Document(s) 5: Submission to DG COMP.

DTTAS was obligated to notify the European Commission and DG COMP of the Irish Government's intention to provide State funding to the CCB and satisfy their criteria for the provision of State Aid. This process was initiated in October 2015 with an early engagement notification and meeting with DG COMP. A detailed submission was then prepared in conjunction with the CCB and their consultants that was submitted in February 2016, with additional commentary and responses to queries supplied over the period March–July 2016. Following this inquiry process, DG COMP approved the provision of State Aid in July 2016, removing the last obstacle for a formal grant approval letter to be issued.

Submission to DG COMP — A 44-page submission to DG COMP outlining the State's position with respect to the criteria and regulations governing the provision of State Aid for sporting infrastructure, as outlined in Article 55 of the European Commission's General Block Exemption Regulations.

This document presents a detailed State response to ten DG COMP requests for information with respect to: the scope of the project; the role of the CCB in the implementation and ongoing operation of PUC; the procurement process; planned uses of PUC facilities; potential preferential access and rental agreements; total investment costs; confirmation that the required land will be acquired under market conditions; details regarding the funding strategy; a funding gap analysis; and an analysis of the project's compatibility with the terms of the E.U.'s internal market.

The responses to these queries confirmed that while the prime use of PUC will be GAA purposes, access to other sporting organisations could be facilitated with the approval of the Association's Governing Body and that the rental of PUC facilities will be provided in a fair, transparent manner at market rates. The funding gap analysis also confirms that over the life-time of the project, the difference between the eligible costs and the project's operating profit yields a funding gap ratio

of c.66%. The submission concludes with a discussion of the project's compatibility with the terms of the E.U.'s internal market[4], on the grounds that it:

1. Pursues a policy objective of common interest;
2. Is necessary and proportionate; and
3. Does not cause an undue distortion of competition.

This discussion highlights that the redevelopment of PUC fulfils the policy objective through its promotion of sport, culture and support for the role of women and equality in sport. In terms of being a necessary and proportionate intervention, the discussion highlights the amateur status of the GAA; that the infrastructure could not be provided through market forces alone; that the Business Case supports the proposition that without the €30 million investment, the project would not be economically viable; and that PUC was facing obsolescence and would become a high-risk safety hazard without intervention. The submission also confirms the Department's position the level of funding is required to achieve the wider socio-economic and sporting objectives of the project.

In terms of its potential distortionary effects, the document asserts that such effects are considered to be low or negligible, and the catchment area for users of the Stadium will remain unchanged by the proposed redevelopment and will remain primarily local in nature. Cross-border support is also noted through an appended letter of support from the GAA's Ulster Council noting that they do not have any objection to the proposed investment.

Finally, we note that as part of DG COMP's inquiry process, DTTAS also responded to an Irish citizen's objection to the redevelopment of PUC and fourteen further DG COMP queries of a mostly technical nature with regard to the assumptions and elements of the funding gap analysis; the appraisal, decision-making and monitoring processes; and further queries regarding rental of PUC facilities to non-GAA bodies. These responses and clarifications were accepted by DG COMP and the European Commission's decision to approve the State Aid funding was communicated to DTTAS in July 2016, finally clearing the way for the Department to issue a formal grant approval letter to the CCB.

[4] With reference to Article 107(3)(c) of the Treaty on the Functioning of the European Union (TFEU).

Section B - Step 4: Data Audit

The following section details the data audit that was carried out for the PUC redevelopment project. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Match-day, conference, and concert attendances.	To monitor ongoing facility use and to track the frequency of large-scale events in the Cork/Munster region.	Match-day attendances are reported in the media, and it is assumed that these records are maintained by the CCB.
No. of athletes and clubs making use of facilities.	To help gauge the level of sports participation in the region, coaching, and PUC's effectiveness in supporting high-performance development.	It is assumed that these records are held by the CCB.
Generated revenue and no. of long-term premium and club seat packages.	To monitor the financial sustainability of PUC, which requires strong attendance rates to be maintained.	It is assumed that these records are held by the CCB.
Vouched invoice and grant payment records.	To ensure the allocation of State monies proceeded as was agreed, and that project complied with PSC and SCP requirements.	Held by DTTAS. All invoices were reviewed and certified by a technical advisor and payments allocated in accordance with the Department's PIFCO guidelines.

Data Availability and Proposed Next Steps

Under the terms of the grant allocation, the CCB is obliged to retain all documentation relating to the redevelopment of PUC for a period of six years after the project is completed. As agreed with DG COMP, DTTAS will also monitor the use of PUC facilities over a period of at least 15 years.

DTTAS holds vouched invoices and grant payment records in order to ensure that the CCB's use of public money was fully compliant with the terms and conditions of the grant and PSC requirements. Each invoice submitted by the CCB was reviewed by the Department's technical advisor and grant drawdowns were conducted in accordance with the Department's Procedures for Internal Financial Controls (PIFCO).

In terms of evaluating the impact of the project, it is assumed that the CCB maintains records with regard to attendance and facility use. The number of athletes, coaches and clubs making use of the Centre of Excellence should also be tracked to assess PUC's impact in supporting high-performance development. Finally, it is also assumed that revenue generated through match-day gate receipts, conference and concert income, and the sale of long-term premium and club seat packages is also being tracked to ensure the future financial sustainability of PUC.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the PUC redevelopment project based on the findings of the previous sections of this report.

Does the delivery of the project/programme comply with the standards set out in the PSC?

The redevelopment of PUC experienced a number of PSC-compliance issues in the early stages of its project life-cycle owing to the atypical sequencing of the approval and detailed appraisal project phases. As Approval-in-Principle for the redevelopment of PUC was granted on the basis of a qualitative "Case for Funding", detailed financial and economic appraisal was only completed after demolition work had already begun, severely constraining the number of alternative options that could have been brought forward for consideration. However, it should be noted that the CCB committed to regular and extensive communication with DTTAS to revise the project's Business Case and ensure that the redevelopment project satisfied PSC and SCP requirements, in addition to the European Commission's DG COMP State Aid rules, before main construction work was undertaken.

Moreover, although the BCR and NPV values resulting from the economic appraisal suggest that the redevelopment of PUC had a marginal return, this analysis is limited to the directly monetisable benefits and unquantified social, cultural and economic benefits bore additional influence on the decision to support the project. For example, qualitative considerations such as PUC as a public good to stimulate greater participation in sport and in turn deliver long-term health benefits, and its role in the regeneration of the Cork Docklands and the area's subsequent ability to attract investment were not reflected in the economic appraisal.

Is the necessary data and information available such that the project/programme can be subjected to a full evaluation at a later date?

Overall, yes. There is a multitude of project documentation from the planning, appraisal and design phases available for review, including multiple Business Cases, technical reviews, correspondence with the CCB, GAA, CSSO, DG COMP and various other pieces of supporting documentation.

In reference to the project's implementation phase, DTTAS holds copies of vouched invoices and a record of payments, however, there is a significant decline in the number of records for the period following formal grant approval (i.e., January 2017 onwards). While such a decline in the records held by DTTAS is to be expected, it is assumed that the CCB are currently maintaining records for PUC attendance, financial revenue generated through match-day gate receipts, the sale of premium/club long-term seat packages, additional revenue generated through conferences, concerts, and franchise operations, and that they are also tracking the number of clubs and athletes benefiting from use of the facilities.

What improvements are recommended such that future processes and management are enhanced?

In this instance, it is likely that a number of PSC-compliance issues and delays could have been avoided had detailed option appraisal been conducted prior to the submission of the Regional Stimulus Funding bid. It is thus recommended that future Stimulus Grant bids should be accompanied by the submission of a PSC-compliant Business Case to avoid compliance issues that can arise as a result of atypical project approval or sequencing.

Moreover, given the difficulty of monetising additional public good and wider economic benefits that may be attributable to sporting activity and sports infrastructure, there is a strong argument for developing improved appraisal guidelines for large Sports Capital infrastructure projects and conducting further research on Irish citizens' willingness-to-pay for such facilities.

Section C: In-Depth Check Summary

The following section presents a summary of the findings of this in-depth check on the redevelopment of PUC.

Summary:

Overall, while the PUC redevelopment project is now in its final stages and the stadium is actively in use, it was necessary to address a number of PSC compliance issues and additional State Aid complications in the early stages of the project's life-cycle. These issues primarily stemmed from the fact that the process did not follow the typical sequencing as laid out in the PSC and detailed appraisal was only undertaken following the decision to grant Approval-in-Principle. A change in the European Commission's General Block Exemption Regulations with regard to the funding of sports infrastructure also meant that the redevelopment of PUC was subject to an additional level of State Aid scrutiny that delayed the implementation phase, which was not experienced in previous redevelopment projects of Irish stadia.

We also note that although the State's contribution was limited to a €30 million stimulus capital grant and was insulated from exposure to cost overruns, actual costs have exceeded the final Business Case estimate by c.10%, exclusive of land cost and subject to finalisation. As a result of a shortfall in the funding to be raised through the advance sale of long-term premium and club seat packages, the CCB were thus required to alter their funding strategy significantly and obtain a €19 million bridging loan in conjunction with the GAA Central Council and Croke Park to cover project costs. Revenues from the sale of additional CCB lands in Kilbarry, the sale of naming rights to the stadium and funding generated through concerts and conferences are expected to be sufficient to cover the repayment costs.

An Roinn Iompair,
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Quality Assurance Process 2017:

In-Depth Check

Iarnród Éireann—Train Protection System

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August 2018

Prepared by the Department of
Transport, Tourism and Sport

www.dttas.ie

Document Purpose

This document sets out the template to be filled in by the evaluator, in conjunction with the division/unit/agency, while completing an in-depth check as part of the Quality Assurance Process. This document is drawn directly from the In-Depth Check Methodology document used by the Department of Transport, Tourism and Sport's (DTTAS) Strategic Research and Analysis Division (SRAD) to carry out the evaluation. It is split in to 5 sections in accordance with the 5 identified steps of the in-depth check process, as outlined in the Public Spending Code (PSC).

Document Format

Section A: Introduction

Section B: Evaluation

1. Logic Model Mapping
2. Summary Timeline of Life Cycle
3. Analysis of Key Documents
4. Data Audit
5. Key Evaluation Questions

Section C: Summary and Conclusions

Summary and Use

The templates, once completed, will be the in-depth check and will be attached as an appendix to the Department's annual Quality Assurance report. The Summary and Conclusions section, to be no longer than two paragraphs, will be copied in to the main report under the In-Depth Check section.

Section A: Introduction

This introductory section details the headline information on the programme or project in question.

Project/Programme Summary	
Name	Iarnród Éireann – Train Protection System
Description	Capital investment project to upgrade and expand coverage of the Irish rail network's train protection system.
Responsible Body	Iarnród Éireann (IÉ)
Current Status	**Expenditure Being Incurred**
Start Date	February 2007 *IÉ Train Control System* study approved by IÉ Board
End Date	TBD – DTTAS awaiting revised Business Case. Target date for completion: late 2024
Projected Overall Cost	€156.5 million (incl. VAT)

Project Description

This project refers to the development and roll-out of an updated and expanded Train Protection System (TPS) for the Irish rail network. Iarnród Éireann's (IÉ) Infrastructure Manager and Railway Undertaking have formed a combined project team to roll out a wayside TPS system where none currently exists, in addition to providing a replacement on-board product for the existing Automatic Train Protection (ATP) and Continuous Automatic Warning systems (CAWS) that are currently deployed in the DART area and a number of other routes, respectively.

These systems provide additional safety features, beyond those provided by the driver in each vehicle, which mitigate the probability and severity of an accident on the network. It is also noted that in some areas of the network there is no supplementary TPS. TPS systems are typically deployed using two pieces of equipment—one on-board the train and one wayside—which communicate with one another to identify a train's location and its authority to proceed. The on-board equipment fitted to IÉ's fleet of trains is life-expired and parts for maintenance are becoming obsolete.

The obsolescence of parts for the existing TPS is becoming critical, and it is estimated that from 2018 the system will become un-maintainable and either:

a) the service will have to be dramatically reduced to enable safe operation with no TPS, or;
b) The on-board equipment must be replaced to maintain today's level of service at today's level of safety risk.

It had been decided that the latter option was the appropriate course of action and the TPS project was established with two main stages in its progress: development and roll-out. Moreover, it is expected that as part of the upgrade to the TPS, the system will be expanded to cover parts of the Irish Rail network not currently covered by the TPS.

Funding of the development phase was received, initially, from the Safety Investment Plan under the now discontinued *Transport 21* capital investment plan, and more recently, under a Multi-Annual Contract to enable design and testing to be completed. A commitment was given by DTTAS for €9.6m to fund the 2017 works.

The roll-out phase of the TPS project will include stages for procurement, approval, design before the updated and expanded TPS is deployed. It is expected that wayside installation of the TPS will commence in April 2019 with priority given to the routes with the highest safety risk category. On-board TPS updates are set to be deployed from September 2019. The target date for full project completion is October 2024.

Section B - Step 1: Logic Model Mapping

As part of this in-depth check, SRAD have completed a Programme Logic Model (PLM) for the TPS project. A PLM is a standard evaluation tool and further information on their nature is available in the Public Spending Code.

Objectives	Inputs	Activities	Outputs	Outcomes
Overall principle for managing risk on IÉ network *—to reduce risk to as low as reasonably practicable*. To develop a TPS solution from prototype to operational safety approvals stage. To procure and install TPS equipment onto the three fleets currently designed in the development phase. To design, procure, safety validate and install TPS wayside equipment nationally. To design, procure, safety validate and install TPS equipment onto seven train fleets.	c.€156.5m in CAPEX funding (incl. c.€24m in VAT) Associated staff and administration costs. Wayside maintenance costs of c.€200k per annum 4 new IÉ TPS staff members. 56 staff employed via the tender. 22 vans Business Case including economic appraisal alternative TPS upgrades compared to a Do-Minimum scenario by SNC Lavalin.	Procurement and tendering process for implementation of new TPS. Design and Safety Assurance stage (including testing and installation of prototypes). Installation of wayside TPS equipment along 16 train routes (incl. DART). Installation of on-board TPS equipment for 414 train cabs. Risk Analysis Capital Costing Cost Benefit Analysis Appraisal of different TPS installation strategies, relative to a Do-Minimum scenario.	Upgrade and expansion of existing TPs (the extent of which still to be decided). Full TPS functionality in the majority of IÉ's network, as a minimum. Wayside TPS equipment located on 16 IÉ train routes (incl. DART). On-board TPS equipment installed on 414 train cabs.	Reduced probability and severity of rail incidents. Reduction in withdrawal of services. Increase in passenger numbers due to improvement in service. Fewer incidents of "Signals Passed at Danger" (SPAD) – where a train passes a stop signal without authority to do so.

Description of Programme Logic Model

Objectives:

The stated objectives for the TPS project are very specific to a particular course of action (i.e., the replacement/upgrade and expansion of the TPS across the IÉ network). However, this is somewhat understandable given the function of the existing TPS and its current condition. The Business Case for this project notes that that the on-board ATP and CAWS systems are "*obsolete*", with spare parts now impossible to obtain and "*the future maintainability of the existing on-board systems is not possible*". The Business Case also notes that "*from an operating and safety perspective it is now critical that the current systems are replaced to ensure the delivery of the highest safety standards and to ensure continuity of the rail service to the travelling public*".

It is worth noting however that the overriding principle or objective for risk management on the IÉ network is to reduce risk to as "*low as reasonably practicable*". This emanates from the IÉ Railways Safety Programme (2009–2013), which focused on deploying the European Commission regulation on safety management[1], most commonly referred to as the Common Safety Method (CSM). The programme covered the renewal of degraded assets and strengthening human performance through a number of safety management initiatives.

The objectives identified in the Programme Logic Model are taken from the briefing document submitted to the Project Board in 2017 that updated the scope of the project. Those objectives are as follows:

- To develop a TPS solution from prototype to operational safety approval stage;
- To procure and install TPS equipment onto the three fleets currently designed in the development phase.
- To design, procure, safety validate and install TPS wayside equipment nationally; and
- To design, procure, safety validate and install TPS equipment onto seven train fleets.

Inputs:

Capital expenditure (CAPEX) for this project is projected to comprise approximately €51.1 million in on-board costs and €57.7 million in wayside costs (excl. VAT and escalation costs). In addition to these costs, there are €14.7 million in sunk costs incurred between 2007 and 2016. Therefore, the total capital cost, excluding VAT and escalation costs, is estimated to be €123.5 million. VAT and escalation costs are assumed to bring the total CAPEX spend to €156.5 million. Furthermore, wayside maintenance costs of €200k per annum are also expected.

It is expected that IÉ will require four new full-time staff (i.e., 3 Signal Engineers and 1 Testing and Commissioning Engineer) to support the operation of the updated and expanded TPS. Moreover,

[1] i.e., Commission Regulation (EC) No. 352 (2009).

56 staff will be employed via the tendered resource to design, trial, and implement the updated TPS. The Business Case also notes that 22 vans will also be required to undertake this project.

Activities:

The activities for this project include: assessing the current condition of the TPS, appraising options for improving/upgrading the TPS, seeking approval for funding of the project, putting out a tender for private contractors to assist in the design, trialling process and installation of the new TPS for both wayside and on-board locations.

The appraisal element will include Cost-Benefit Analysis, financial appraisal, capital costing and risk analysis. The installation stage will depend upon the level of expansion and upgrade selected based on the awaited update to the Business Case, however, some substantial level of upgrade and expansion to the IÉ network's TPS will be undertaken. Prior to the installation stage, there will also be a design and trial stage in which certain systems are rolled out for specific routes and/or train cabs. These stages will require support from external contractors employed via a tendering process.

Outputs:

The main outputs from this project will be the upgrade an installation of on-board and wayside equipment to update and enhance the TPS on IÉ's rail network. This will mean that there will be full TPS functionality in the majority of IÉ's network, as a minimum.

More specifically, the outputs from this project will include wayside TPS equipment located along 16 IÉ train routes (incl. DART), while on-board TPS equipment is to be installed on 414 train cabs.

Outcomes:

The expected outcomes from this project relate back to overarching principle referring to IÉ's risk management policy and reducing risk to as "*low as reasonably practicable*". These outcomes are identified as follows:

- A reduction in the probability and severity of rail incidents.
- A reduction in the number of train services withdrawn.
- An increase in passenger numbers due to an improvement in the service.
- Fewer incidents of "Signals Passed at Danger" (SPAD) – where a train passes a stop signal without authority to do so.

Section B - Step 2: Summary Timeline of Project/Programme

The following section tracks the TPS Project from inception to conclusion in terms of major project/programme milestones

Feb 2007	*IÉ Train Control System Study* approved at IÉ Board meeting.
Jan 2009	*IÉ Train Protection Strategy Report* states that existing TPS is now obsolete and a new system is required.
2011	IÉ awarded a framework contract to develop and supply an on-board TPS to replace the CAWS and ATP hardware systems
July 2012	*IÉ TPS Strategy* document submitted to IÉ Board. Further updates provided March 2014 and Dec 2016
Jan 2013	CIÉ Board approve €5.7m for the provision of a test track site, CME interface, safety assurance services, authorisation for *Placing-in-Service* process and IÉ project management costs.
Aug 2014	CIÉ Board approve €2.8m for expenditure on the TPS project to facilitate the release of trains in line with the Fleet Management Strategy and provide for significant additional safety approvals works.
Feb 2017	IÉ Board advised by *TPS Risk Evaluation* advisory paper
Mar 2017	Procurement for design, supply and installation of trackside TPS equipment
Jun 2017	Procurement for design, supply and installation of on-board TPS equipment
Jan 2018	Business Case appraising the extent to which the TPS upgrade rolled out submitted to DTTAS for assessment. DTTAS responded with queries; updated Business Case awaited.
April 2019	Full deployment of wayside TPS equipment to commence on the first route (Maynooth–Sligo)
Jun 2019	Installation of on-board TPS equipment to commence.
May 2024	Deployment of wayside TPS equipment to be completed.
Oct 2024	Installation process for on-board installation on train fleet completed

Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation for the TPS Project.

Project/Programme Key Documents		
No.	**Title**	**Details**
1	IÉ Train Protection Strategy (Jan 2009)	Document identifying the status of existing TPS along several routes; planned works to be undertaken; benefits derived; and costs incurred.
2	2016 TPS Advisory Paper	Paper presented to IÉ Board setting out the concept strategy for rolling out the TPS.
3	TPS Development Phase & Rollout Phase GANTT Charts	The GANTT charts provide detailed plans for all stages of the development and roll-out of the TPS project.
4	Business Case	Comprehensive document outlining the need for the project, the options available, appraisal of those options and recommendations on the next phase.
5	Business Case Financial Analysis and Cost-Benefit Analysis	Financial and Economic appraisal calculations undertaken as part of underlying analysis supporting the Business Case.
6	2017 TPS Submission re Roll-Out Phase	Paper seeking approval from IÉ Board for an additional €8.55m to commence roll-out phase of TPS project.

Key Document 1: IÉ Train Protection Strategy

Paper drafted in January 2009 presented an overview of the existing TPS for the rail network and identified where the network had neither a CAWS nor ATP in place. The paper also states that "*the present on board ATP / CAWS system is obsolete, spares are now becoming increasingly impossible to attain and the future maintainability of the existing on-board systems is not possible*". Therefore, it was decided that the only option was to plan a strategic replacement of the equipment in order to maintain the service.

The document identified seven planned works that would comprise the Strategic Plan:

1. Develop new dual ATP/ CAWS TPS which will have the combine functionality of the existing CAWS and ATP equipment with additional functionality specified in the development process.

2. Fit out the Diesel Multiple Unit (DMU) rolling stock operating through the DART area with the new TPS equipment.

3. Retrofit existing DART Electric Multiple Units (EMU) with new TPS equipment as existing equipment becomes obsolete.

4. Retrofit remaining DMU fleet with new TPS equipment.

5. Install lineside euro-balises at a test site to utilise the additional functionality of the TPS (balises at stop signals that can provide a “Train Stop” feature on lines where no CAWS or ATP exists).

6. Fit the remaining network that has no ATP system (areas covered by CAWS only) with “Train Stop” feature.

7. The system will be compatible with European Train Control System (ETCS) / European Rail Traffic Management System (ERTMS) and allow for changeover to these systems in the future.

The report outlined the benefits of this approach to the plan, including: provision of TPS for whole DMU fleet, provision of “Train Stop” feature where presently no TPS exists, paves road for future ETCS / ERTMS, and project can be rolled out over several years with no disruption to services.

The report concludes with an estimated timeline for the initial stages of the project and projected costs for these stages of c. €28m.

Key Document 2: 2016 TPS Advisory Paper

Advisory paper presented to the IÉ Board, outlining the concept strategy for rolling out the TPS project. This document provided an overarching summary of the project, noting the current stage and identifying inputs required. The paper included a background piece outlining the need for the project and a description of how the project was expected to progress from the ongoing design development stage to the proposed roll-out phase.

The document included diagrams illustrating how the TPS equipment is operated and utilised, and how detailing the various organisational structures for project management, equipment deployment and operation. The paper identified inputs and resources required for the successful installation and operation of the TPS including capital investment, staff and vehicles (i.e. vans).

Cash-flows and financial risks to the project are both identified before the next steps proposed for the TPS project are outlined.

Key Document 3: TPS Development & Rollout Phase GANTT Charts

Two GANTT charts providing detailed overviews of the planned development and roll-out of the TPS project. The documents included target dates, timelines and the expected duration periods for different stages and actions required for the project. The charts also disaggregated larger goals and objectives into smaller actions and work packages. This allows the reader to get a better

sense of what steps are required to complete an action point and what needs to be prioritised in order for the project to be completed in time.

Key Document 4: TPS Business Case

The Business Case document is dated November 2016 but was only received by SRAD in January 2018. Following an assessment by the SRAD, the Business Case was returned to IÉ with queries and suggested amendments. An updated version of the Business Case is awaited.

The original Business Case outlines the rationale for the TPS project, identifies the relevant costs and benefits, and undertakes an appraisal (incl. Cost-Benefit Analysis) of the three most "*Do-Something*" options relative to a "*Do-Minimum*" option. However, the objective of the overall project is never clearly defined, rather the objective refers to the purpose of the Business Case itself: "*The objective of this project is to establish the Business Case for the renewal of the IÉ Train Protection System, providing a robust interrogation of the viable options and to provide recommendations for taking the delivery of the project forward*".

The three "*Do-Something*" options are as follows::

1. Implement TPS coverage where there currently is none;
2. Upgrade the TPS in the CAWS area, in addition to implementing Option 1;
3. Upgrade the TPS in the ATP area, in addition to implementing Options 1 and 2.

The Business Case found that Option 2 had the highest BCR of the three options, however, the document also stated that "*there are likely to be further benefits for implementing the new TPS in the DART area, thereby improving the case for Option 3—in particular the cost and efficiency of maintaining just one system is likely to improve Option 3 to the point where the full implementation represents the best value for money*." Several un-quantified benefits were excluded at this time from the appraisal but are to be added "*as certainty in the deployment of the new system develops*".

The recommendations from the Business Case were as follows:

- IÉ should continue with the development of the TPS project and proceed with the trial deployment of TPS equipment on the network under existing authority for project expenditure.

- IÉ should work with the Project Board to identify the funding streams required for full project implementation and map the process for securing budgets for expenditure and authority to proceed with full project implementation.

- IÉ should seek to progressively improve the confidence in all cost and benefit assumptions in line with governance requirements.

Therefore, as the TPS project develops it will be determined whether the expansion includes the ATP area (i.e., the DART line). These recommendations would appear to suggest that further appraisal of these options will be required to ascertain whether or not to employ Option 2 or Option 3.

Key Document 5: TPS Business Case — Financial Analysis and Cost-Benefit Analysis

Excel spreadsheet comprising not only financial and economic costs and benefits for the TPS project but also figures relating to rail incidents, recovery time from incidents, number and frequency of services, passenger numbers, forecasts and station details.

Based on 2014 figures, the workbook would appear to state that the total CAPEX cost including VAT, escalation costs and sunken costs is €154 million. It is worth noting that the 2017 paper (Key Document 5) puts the figure at €156.5 million.

Key Document 6: 2017 TPS Submission re Roll-Out Phase

Submission from project manager to the IÉ Board seeking approval for €8.548m in additional funding to commence the roll-out phase of the TPS project. Document includes an overview of the project, the overall and short-term objectives, current status, financial information, procurement strategy and details of the Board's previous approvals for the project.

Section B - Step 4: Data Audit

The following section details the data audit that was carried out for the TPS Project. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Number, location and condition of TPS equipment (both on-board and wayside)	To assess the current status of the TPS and identify what level of upgrade and/or expansion is required	Assume held by IE, referenced in Business Case and 2016 Advisory Paper
Number of rail safety incidents on IE network per annum (including SPADs)	To evaluate the rail network's level of safety, identify risk factors and quantify the impact on the rail service.	Assume held by IE, safety reviews of the network are undertaken on regular basis.
Number of staff required to design, trial, install and operate new TPS	Required to ensure successful delivery of project.	Provided in 2016 TPS Advisory Paper
Estimated Project Costs and Benefits	To appraise alternative options for meeting objectives of project.	Available in Business Case and related Excel spreadsheet
Estimated future passenger levels	To estimate future demand on the rail network and the requirements an upgraded TPS will therefore need.	Available in Excel spreadsheet

Data Availability and Proposed Next Steps

The majority of data required for this audit was available in the documents provided for this In-Depth Check. In particular, the Excel spreadsheet that accompanied the Business Case document was a comprehensive data resource: providing information on key features and service levels in the current rail network, the expected costs and benefits of the TPS projects, risk factors and projections for future passenger levels.

However, it should be noted that while the 2009 Strategy report gives some detail as to the existing status of the network, more detailed data relating to the current condition of the TPS equipment would be beneficial in illustrating the rationale and scope for this project. An overview of this review, including data outlining the exact level of obsolescence, should be provided as part of this In-Depth Check as it is a key part of the whole rationale for the project.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the TPS Project based on the findings from the previous sections of this report.

Does the delivery of the project/programme comply with the standards set out in the PSC?

It is not possible at this stage to confirm that the TPS project fully complies with the relevant and applicable standards, as set out in the PSC, as updated appraisal documentation is currently outstanding. As noted above, an updated version of the January 2018 Business Case, incorporating comments and recommendations from the SRAD, is still awaited. Prior to this project advancing to the full Implementation Stage, the Business Case must be amended and re-submitted to DTTAS for assessment.

However, the initial stages of this project have generally adhered to the relevant guidelines, particularly in terms of: setting out the rationale and scope for the project; ascertaining the relevant costs and benefits; and identifying the main options for meeting the objectives. It is envisioned that once the amendments have been made to the Business Case it will be in compliance with the relevant guidelines.

Is the necessary data and information available such that the project/programme can be subjected to a full evaluation at a later date?

The majority of data and information required to undertake a full evaluation is available for this project. The only item that could have been provided, and is assumed to be held by IÉ, is an assessment of the current TPS-related equipment. It is assumed that this data, which verifies the rationale for the project, can be obtained if required.

What improvements are recommended such that future processes and management are enhanced?

In addition to the suggested improvements made in the SRAD's assessment of the TPS Business Case, the project would benefit from ensuring that its objectives are clear and relate more directly to the rationale outlined for upgrading the TPS. Furthermore, more detail could be provided in terms of the exact level of obsolescence specific elements of the TPS faces.

Overall, the project is being carried out in a commendably clear and logical manner with considerable effort being put in to the project management and planning side of this endeavour.

Section: In-Depth Check Summary

The following section presents a summary of the findings of this In-Depth Check on the TPS Project.

Summary of In-Depth Check

The overall conclusion from this In-Depth Check is that the TPS project comprises all the key elements required to ensure that it adheres to all relevant guidance and standards as set out in the Public Spending Code. However, the project is currently still in Appraisal Stage with an updated Business Case to be submitted to DTTAS. It is assumed that once the outstanding documentation is revised and re-submitted, the project will be fully in compliance.

The rationale for undertaking the upgrade and expansion of the TPS has been clearly presented, the feasible options for remedying this need are identified and the benefits and costs relating to these options are well developed. Moreover, risk analysis has been undertaken and the implementation planning and monitoring processes are well designed. However, this project would benefits from more clearly defined objectives and clarity around what level of upgrade and expansion is to be undertaken and how this is to be decided.

An Roinn Iompair,
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Quality Assurance Process 2017:

In-Depth Check

BusConnects—Route Selection and Options Study Programme

Dearbhla Quinn

September 2018

Prepared by the Department of Transport, Tourism and Sport

www.dttas.ie

Document Purpose

This document sets out the template to be filled in by the evaluator, in conjunction with the division/unit/agency, while completing an in-depth check as part of the Quality Assurance Process. This document is drawn directly from the In-Depth Check Methodology document used by the Department of Transport, Tourism and Sport's (DTTaS) Strategic Research and Analysis Division (SRAD) to carry out the evaluation. It is split in to 5 sections in accordance with the 5 identified steps of the in-depth check process, as outlined in the Public Spending Code (PSC).

Document Format

Section A: Introduction

Section B: Evaluation

1. Logic Model Mapping
2. Summary Timeline of Life Cycle
3. Analysis of Key Documents
4. Data Audit
5. Key Evaluation Questions

Section C: Summary and Conclusions

Summary and Use

The templates, once completed, will be the in-depth check and will be attached as an appendix to the Department's annual Quality Assurance report. The Summary and Conclusions section, to be no longer than two paragraphs, will be copied in to the main report under the In-Depth Check section.

Section A: Introduction

This introductory section details the headline information on the project/programme under review.

Project/Programme Summary	
Name	BusConnects Dublin – Route Selection and Options Study Programme
Description	Route selection and option studies component of the NTA's large-scale capital expenditure project to redesign and upgrade Dublin's bus network and to enhance cycling infrastructure
Responsible Body	National Transport Authority
Current Status	Expenditure Being Considered
Start Date	May 2017
End Date	2027 (estimated completion)
Projected Overall Cost	€438 million

Project Description

This project refers to the route selection and options study programme of BusConnects Dublin, which proposes a radical redevelopment and redesign of the Dublin bus network. Serving roughly two-thirds of public transport passengers, the Dublin bus network is a key service and this project seeks to identify and address problems with the existing network, and to redesign the network to meet the needs of a growing capital city.

Key components of this redesign include developing a new route network and improving bus and cycle infrastructure through the building of dedicated bus corridors along key routes. These reforms reflect policy priorities outlined in the Transport Strategy for the Greater Dublin Area 2016-2035, including the 'Development of the Bus Rapid Transit concept for Dublin' and 'On-going increases in the numbers of people cycling'.

As the total projected cost of the BusConnects project is estimated to be in excess of €2 billion, rather than considering the BusConnects project as a whole, this in-depth check reviewed the National Transport Authority's (NTA) route selection and option study sub-programme, which has an estimated programme cost of €438 million. As a preparatory study for a larger project, the NTA were not required to submit a Business Case for this sub-programme, however given the significant proposed level of expenditure, DTTAS aimed to ensure that the programme was in line with the PSC. The proposed expenditure is intended to cover the costs of route option studies, public consultation processes, engineering studies,

topographical surveys, traffic counts, tree surveying, analysis of compulsory purchase order requirements, and the preparation of detailed Business Cases out to 2027, in addition to including some provision for early construction and implementation work, subject to final Business Case approval.

As the BusConnects project is still in the '**Being Considered**' phase, a detailed Business Case for the proposed redesign is not yet available, and this in-depth check therefore focuses on ensuring the project's objectives and programme structures are in line with PSC guidelines.

The over-riding objectives of this route selection and option study project are:

- to carry out robust optioneering studies for each of the proposed bus corridors;
- to identify emerging preferred route options, incorporating public consultation;
- to consider the routing of different modes of transport; and
- to produce a comprehensive Route Options Report.

Other objectives included are:

- to provide bus-stop furniture such as bus poles, flags and Real-Time Passenger Information (RTPI) along the proposed bus corridors; and
- to replace old bus shelters where required.

It is also intended that each preferred route shall as far as practicable: deliver the on-street infrastructure necessary to provide continuous priority for bus movements along the Core Bus Corridor; and provide on-street cycle facilities along the route to the target quality of service specified in the Greater Dublin Area Cycle Network Plan (NTA, 2013). This will entail enhanced bus and cycle lane provision along each corridor and removing current delays in relevant locations to make public transport and active travel more attractive and efficient alternatives for road users.

The project plan includes extensive public consultation and strategies to anticipate and mitigate challenges posed by the likely disruption caused by construction works, particularly to people living along the planned bus corridor routes where construction will require the compulsory purchase of sections of front gardens to provide space for the dedicated road infrastructure.

The programme timeline runs until 2027 when it is expected that infrastructural construction along each route is due to be finalised and BusConnects enters its operational phase.

Section B - Step 1: Logic Model Mapping

As part of this in-depth check, SRAD have completed a Programme Logic Model (PLM) for the 'Route Selection and Option Study Programme' of the larger BusConnects Dublin project. A PLM is a standard evaluation tool and further information on their nature is available in the Public Spending Code.

Objectives	Inputs	Activities	Outputs	Outcomes
To carry out robust optioneering studies for each of the Radial Bus Corridors. To identify an Emerging Preferred Route Option and produce a comprehensive Route Options Report; including the consideration of the routing of different modes of transport. To prepare a detailed design and all the documentation required to submit a planning application, including Compulsory Purchase Order requirements and an Environmental Impact Assessment Report. Preparation of a detailed Business Case. Subject to both planning and business case approval, scheme implementation will be pursued.	Estimate: €438 million capital expenditure. Between 2 and 10 (depending on the project phase) full-time civil service staff, in addition to a project manager. Several teams of consultants and contractors for tasks relating to optioneering, topographical surveying, traffic counts and tree surveying along each of the bus corridors	Feasibility studies Option studies Engineering studies Topographical Surveying Traffic Counts Tree surveying Public Consultation process Drafting and implementation of Project Appraisal Plan and Business Case. Subject to approval, early construction/implementation	Dublin Area Bus Network Redesign Choices Report Core Bus Corridors Project Report June 2018 Dublin Area Bus Network Redesign Public Consultation Report Project Appraisal Plan and Business Case. Subject to approval, construction/implementation work incorporating installation of bus shelters, bus livery, and RTPI.	Plan is developed for the delivery of a Bus Network which incorporates both the objectives of the programme and the feedback gathered via public consultations. Bus Connects Dublin is ready to enter the next stage of Project implementation If early construction begins, then faster and safer transit may be delivered along some routes, encouraging modal shift

Description of Programme Logic Model

Objectives:

The stated objectives for this programme reflect the fact that it is a stage of a larger project rather than a discrete programme. Therefore the objectives are quite specific and output-focused, and include some that were drawn up in the context of decisions having already been reached on some key features of the new network, such as the provision high-quality radial corridors. An overview of the data and analysis guiding the choice of objectives is provided by the '*Dublin Area Bus Network Redesign Choices Report*'. This document analyses the existing network, identifying key causes of service shortfall and inefficiency and sets out four spatial characteristics that have the potential to facilitate or inhibit effective public transport provision: Density, Walkability, Linearity and Proximity/Continuity. In light of such evidence, the objectives include:

- to carry out robust optioneering studies for each of the Radial Bus Corridors;
- to identify an Emerging Preferred Route Option;
- to produce a comprehensive Route Options Report;
- to consider the routing of different modes of transport;
- to prepare a detailed design and all the documentation required to submit a planning application, including required Compulsory Purchase Orders and an Environmental Impact Assessment report;
- to prepare a detailed Business Case in advance of the Implementation phase; and
- to carry out required construction work, subject to both planning and business case approval, and funding being available,.

Inputs:

The NTA's project estimate of €438 million is intended to cover the costs of option studies, public consultation, engineering studies, and subject to Business Case approval, early construction and implementation work, in addition to the other activity and administrative costs highlighted in the PLM above for the period 2017–2027. Capital expenditure of €1,629,294 was incurred in 2017.

In terms of human inputs, the project has required 2-3 civil service staff in addition to the project manager over 2017 and 2018, but this is expected to increase to 8-10 staff from 2019 onwards. Several teams of consultants, contracted for tasks relating to optioneering, topographical surveying, traffic counts and tree surveying along each of the bus corridors have also been engaged. For example, a staff of 13 consultants, 2 sub-consultants and additional support staff were engaged to complete the options study for the proposed Bray–UCD corridor.

Activities:

The activities of this stage of the project consist primarily of the research, analysis and planning necessary to progress to construction and implementation of the later phases of BusConnects Dublin.

These include the:

- drafting and submission of a Project Appraisal Plan and detailed Business Case;
- implementation and running of the Public Consultation process;
- option and engineering studies;
- topographical surveying;
- traffic counts;
- tree surveying; and
- early construction and implementation work (subject to Business Case approval).

Outputs:

The outputs of the project in this phase primarily consist of reports. This stems from a programme primarily composed of research, analysis and planning related activities. These reports are: *Dublin Area Bus Network Redesign Choices Report*, *Core Bus Corridors Project Report* (June 2018), and the *Dublin Area Bus Network Redesign Public Consultation Report*.

Future outputs will include a project appraisal plan and detailed Business Case outlining each bus corridor of the redesigned network. Moreover, as was noted above, it is expected that outputs will also include the installation and replacement of bus shelters, Real-Time Passenger Information (RTPI) services and other road infrastructure along the finalised route options.

Outcomes:

The outcomes of BusConnects Dublin in its entirety cannot reasonably be achieved or assessed until a later stage of project implementation. As a result, the outcomes included within this PLM are primarily concerned with achieving a state of preparedness necessary to continue onto the next stage of the project.

These outcomes include:

- creating a developed plan for the delivery of a Bus Network which incorporates both the objectives of the programme and the feedback gathered via public consultations;
- ensuring that Bus Connects Dublin is ready to enter the next stage of the project life-cycle: implementation; and
- allowing, if construction occurs earlier than expected along some routes, that faster and safer transit may be delivered along some routes, encouraging modal shift.

Section B - Step 2: Summary Timeline of Project/Programme

The following section tracks the 'Route Selection and Option Study Programme' of BusConnects Dublin from project inception to conclusion in terms of major project/programme milestones:

2016/2017	Drafting and definition of Project Goals and Limits. Analysis of demographics and land use, existing network inefficiencies, and identification of geometric principles of high-patronage design and analysis of Dublin's geometry in light of these principles. Development of recommended design strategies.
May 2017	Launch of BusConnects plan by the Minister of Transport, Tourism and Sport, Shane Ross, and Chief Executive Officer of the NTA, Anne Graham.
June 2017	Publication of '*Dublin Area Network Redesign Choices Report*'. Public Consultation in the form of a paper and web survey on the Choices and Strategies detailed in the above report
July 2017	As the network plan was 80% developed by NTA, Dublin Bus and local government, workshops facilitated by a consultant team were held to further analyse and refine the network plan.
August 2017–June 2018	Further refining and analysis of workshop outcomes. Additional workshops on specific issues, e.g. peak-only services.
July 2018	Final analysis and publication of the recommended plan.
July 2018	Public Consultation: Feedback sought on the proposed network
September/October 2018	Public Consultation: Feedback sought on bus infrastructure proposals
2018-TBD	Preparation, appraisal and revision of detailed Business Case
2018-TBD	Preparation of detailed designs for all routes and compilation of documentation required to submit planning applications, including Compulsory Purchase Orders and an Environmental Impact Assessment Report.
Est. 2027	Subject to both planning and business case approval, and funding being available, completion of construction work.
End	Operational phase of the BusConnects Dublin Project

Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation of the BusConnects route selection and option study programme.

Project/Programme Key Documents		
No.	**Title**	**Details**
1	Dublin Area Bus Network Redesign Choices Report (June 2017)	Report analysing the existing Dublin bus network, identifying the geometric features that best facilitate effective and efficient route design and proposing strategies to incorporate these features into Dublin's new network.
2	Core Bus Corridors Project Report (June 2018)	Report outlining the plan, including both challenges and benefits, to build 16 radial core bus corridors and segregated bus lanes, a key infrastructural component of the BusConnects programme.
3	Dublin Area Bus Network Redesign Public Consultation Report Summary (July 2018)	This document describes the problems of the existing Dublin Bus network design and outlines the proposed network structure and its advantages.
4	Inventory of Expenditure 2017-Template 1 (NTA)	Document listing all National Transport Authority (NTA) expenditure on projects and programmes valued in excess of €500,000 during 2017.
5	Bray to UCD Core Bus Corridor Options Study: Project Execution Plan (NTA, Halcrow Barry June 2016)	Document outlining objectives, process, costs, consultant staff allocation and quality management controls, for the optioneering study for Bray to UCD Bus Corridor route.

Key Document 1: Dublin Area Bus Network Redesign, Choices Report

This report, published on the 6th of June 2017 identifies buses as the bulk of Dublin's public transport provision, serving roughly two-thirds of passengers. It identifies the need for redesign of the network due to space constraints and the pattern of the Dublin's city and suburban growth. Dublin's existing network is described as radial in design, with a limited number of infrequent and/or inefficient orbital routes. This means that while it is relatively easy to get from any suburb to the city centre, travelling from one suburb to another usually requires getting one bus into the city centre and another one out again to the final destination. This makes these trips unnecessarily long, encouraging private car usage and bringing most passengers to this one hub regardless of their destination, adds unnecessarily to city centre congestion.

The report goes on to contextualise the proposed route design as one component of the wider BusConnects programme and the longer term transport strategy for the Greater Dublin Area. Other reforms will include: 'next generation' bus corridors, a state-of-the-art ticketing system, a cashless payment system, a simpler fare structure, new bus stops and low emissions vehicles.

The new route design prioritises frequency of service so to facilitate connections, compensate for reliability shortfalls and encourage patronage. Frequency is facilitated through identifying geometrically favourable locations for bus stops and corridors within the context of the constraints and advantages of various Dublin localities. Density, Walkability, Linearity and Proximity/Continuity should be assessed and maximised in route design so to ensure the most useful service is provided. The report also points out that the advantages of locations that are geometrically favourable to public transport can be seen in higher numbers of zero car households, regardless of income level, in these areas.

Analysis of the demand for bus services demonstrates that demand reflects population density, there are morning and evening weekday peaks in demand due to school and work commutes, and weekend demand appears to be somewhat suppressed by poorer service provision.

The report concludes by proposing a redesign of the bus network in which travel time is improved through improving the frequency of buses by consolidating similar routes and replacing a large number of direct lines with feeder lines that converge at points of interchange. The report acknowledges that passengers are more likely to have to change bus during their journey, in return for a more frequent service. However, further proposed advantages of the redesign such as improving Dublin's orbital bus services to better serve passengers who do not need to travel all the way into the city centre and thereby helping to reduce city centre congestion and facilitating modal shift from private car use for these journeys, are also highlighted. The report also identifies behavioural trends that will need to be faced, i.e., that passengers tend to dislike changing buses and are often willing to accept a slightly longer travel time in return for staying in their seat for the duration of their journey. Strategies to minimise such perceived 'interchange penalties' are proposed, including removing fare penalties for interchange, the provision of adequate bus shelter, improved reliability and ensuring that walks between stops are short and safe.

The report concludes by summarising the redesign strategies and inviting readers to offer advice via a web survey on the BusConnects initiative.

Key Document 2: Core Bus Corridors Project Report

This report concerns the building of 16 radial bus corridors and parallel safe cycling facilities along core routes, a vital infrastructural component of the BusConnects programme. Public consultations are scheduled for July 2018 and September/October 2018, at which time fuller information on each of the corridors is to be provided, and public feedback sought.

The report outlines the need for reform in light of projected population growth in the Greater Dublin Area (GDA) and the resulting growth in traffic congestion. The proposed bus corridor plan would segregate buses from other vehicular transport and provide 230 km of continuous bus priority, to encourage increased use of public transport and enable the reformed bus network to operate with greater efficiency, reliability and punctuality through avoiding the congestion associated with sharing roads with other vehicles. Additionally, the accompanying roll-out of

200 km of segregated cycle-lanes aims to increase cyclist safety, as cyclists would no longer compete with buses and other vehicles for road space along the core route corridors.

The challenges facing this project are considerable. Roads will need to be widened, some roads will only be able to accommodate bus corridors necessitating the relocation of other traffic, on-street parking along these corridors will in some cases be reduced or abolished, trees will need to be felled and portions of front gardens acquired by compulsory purchase order. The report recognises the significance of these challenges and mitigation plans include the provision of landscaping services where gardens are reduced, the replanting of mature or semi-mature trees in or near locations that old trees must be felled, the provision of funding for other local amenities in affected areas and the provision of new parking spaces nearby where on street parking is lost or reduced.

Benefits to the project are also outlined, and these include: journey time savings of up to 40-50%, improving the "livability" of a growing Dublin, contributing to combatting climate change through encouraging modal shift via the provision of an improved alternative to private car use and ownership, and supporting economic growth through improving people's ability to get to work and other destinations, making Dublin a more attractive home for employers and workers alike.

The report finishes with details on the consultations and contact details which can be used to submit questions and comments in relation to the scheme, followed by an appendix of maps of each of the bus corridors and accompanying information.

Key Document 3: Dublin Area Bus Network Redesign Public Consultation Report Summary

This document was prepared following public consultation regarding the new route design. It begins by describing the problems evident in the existing routes, including the complexity of the network and the lack of orbital route provision. The project timeline is provided, detailing the process by which the new network was designed. Problems in the existing network are identified, these include: poor orbital service, complexity, low frequency and too many buses in the city centre.

The proposed solutions to address these problems are:

- to standardise service categories, making the most frequent services easy to identify;
- to simplify radial service using spines with frequent services located on each radial corridor;
- to build frequent orbital routes; and
- to grow suburban feeder networks (infrequent radial routes are replaced with frequent local routes that feed in to the high frequency radial spines.

The public response to the principles of this service redesign was overwhelmingly positive with approval ratings of over 80% for the various components of the strategy, including the possibility that interchanges will be more frequent in return for a better service overall.

The document then goes in to some more detail regarding what the network will look like including the service categories which range from 'high frequency routes' which run every 5 minutes or better to the lowest frequency routes which run every 60 minutes. Each service category is clearly identifiable of the map of the simplified system by colour. Additionally, the naming of routes is simplified through the use of a letter and number labelling system that categorises routes using the same high frequency spines with the same letter.

The document finishes by summing up the advantages of this plan, including access to 20-24% more jobs in 30 minutes or less for Dublin residents, and by inviting readers to contribute suggestions for improvement of the plan.

Key Document 4: DTTAS Inventory of Expenditure 2017

This document, prepared in accordance with the requirements of the Quality Assurance process stipulated by the Public Spending Code and according to a template provided by the Strategic Research and Analysis Division (SRAD), lists all National Transport Authority (NTA) expenditure on projects and programmes valued in excess of €500,000 during 2017. Projects are classified in terms of current or capital expenditure, and in accordance with the three stages of the expenditure life-cycle defined in Section A-04 of the PSC: **Being Considered**, **Being Incurred** and **Recently Ended**. The anticipated timeline, budget and a brief description of the Route Selection and Option Study programme is provided.

Key Document 5: Bray to UCD Core Bus Corridor Options Study: Project Execution Plan

This document is a Project Execution Plan for an options study for the Bray to UCD Bus Corridor, the development of which is anticipated as part of BusConnects Dublin.

This document includes:

- a project brief (description, objectives, milestones, costs, design standards);
- details of the project team members including their roles and responsibilities;
- details on communication and filing processes;
- development and implementation approaches, including identified deliverables;
- quality management strategies;
- risk management strategies;
- health, safety and environment related plans;
- change management procedures; and
- financial management arrangements.

This project execution plan confirms that detailed programme and financial management structures are in place.

Section B - Step 4: Data Audit

The following section details the data audit that was carried out for the 'Route selection and option study programme' BusConnects Dublin project. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Reports detailing the processes and results of the optioneering studies of the Radial Bus Corridors	To assess whether the necessary option studies were completed and reported upon	It is assumed that these will be completed and available by programme end
Data on journey times post programme implementation	To calculate the change in journey times post BusConnects Dublin implementation	Google maps data can be used to assess this
Comprehensive Route Options Report	Required to meet programme objectives	It is assumed that this will be completed and available by programme end, in line with stated programme objectives
Detailed Business Case	Required to meet programme objectives	It is assumed that this will be completed and available by programme end, in line with stated programme objectives
Detailed design and all documentation necessary to submit a planning application	Required to meet programme objectives	It is assumed that this will be completed and available by programme end, in line with stated programme objectives
Estimated Programme Costs and Benefits	To appraise alternatives for meeting programme objectives	It is assumed that this will be included within the Detailed Business case which is to be completed in line with programme objectives

Data Availability and Proposed Next Steps

Most of the documentation referenced above is not yet available due to the early stage in project implementation. The data required to evaluate this phase in the wider BusConnects project consists primarily of the documents listed in the programme objectives. In fact, it would be difficult to evaluate this phase in isolation from later phases in BusConnects Dublin, using final outcomes data following the complete implementation of the entire project. The outcomes, whether positive or negative, will be difficult to attribute to this or any other phase specifically. Therefore a process evaluation, concerned primarily with assessing that activities and outputs were completed as planned would be most appropriate. This could be supplemented with an analysis of journey time data following the complete implementation of BusConnects Dublin, to evaluate whether or not faster transit was delivered. However, as stated previously, it would be difficult to attribute these results specifically to this phase in the larger project.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the 'Route selection and Option Study Programme' of the BusConnects Dublin project, based on the findings from the previous sections of this report.

Does the delivery of the project/programme comply with the standards set out in the PSC?

It is not possible, at this early stage, to assess whether or not this programme complies with the PSC, as most of the relevant documentation detailing expenditure is not yet available.

However, the available documentation does suggest that the process has been guided by the principles of the PSC. In particular,

- Key Documents 1–3 indicate that a robust appraisal process has been initiated;
- Key Document 4 complies with standards outlined in Section A-04, which relates to the Quality Assurance process; and
- Key Document 5, which relates to the Bray to UCD Options Study indicates that the scope, objectives, option development, financial management processes are well defined for the corridor in question. Assuming that this document is representative of Project Execution Plans for other components of the programme, it indicates that existing programme management structures are in full compliance with the PSC.

Is the necessary data and information available such that the project/programme can be subjected to a full evaluation at a later date?

Due to the nature of this programme, it can be mostly evaluated on the basis of whether or not certain documents were produced, and if produced, whether the quality of these documents meets the required standards. The documentation produced to date is of high-quality and therefore it is envisioned that the necessary data will be available following programme end.

What improvements are recommended such that future processes and management are enhanced?

The documentation provided indicates that this programme has thus far been carried out in a professional manner and with due regard to the PSC. Given the limited documentation available at this early stage, it is not possible to make recommendations for future improvements.

Section: In-Depth Check Summary

The following section presents a summary of the findings of this In-Depth Check on the 'Route selection and Option study Programme' BusConnects Dublin project.

Summary of In-Depth Check

The overall conclusion of this in-depth check is that it is not possible using the documentation available at this stage to assess whether or not the 'Route Selection and Option Study Programme' BusConnects Dublin project is compliant with the PSC.

However, the quality of data and analysis evident in the reports (Key Documents 1,2 and 3) provided suggests that there has been, to this point, a thorough appraisal process, and the objectives stated in Key Document 4 (and included here in the Programme Logic Model) are clear and measurable.

Additionally, Key Document 5 (which relates to the management of an options study for one of the bus corridors) indicates that appropriate project management processes and controls are in place for this study. Assuming that similarly robust processes of risk analysis, quality management, change management and financial management are evident across other areas of this programme, it is assumed that this programme as a whole will be in full compliance with the PSC. A more detailed breakdown of the costs, incurred and projected, for this programme would have been of value in making a more definitive evaluation of PSC compliance.