
Appendix 3 – In Depth Checks

The following appendix sets out the In-Depth Checks undertaken by the Department for the 2015 Quality Assurance Report. The two projects/programmes selected for review are:

- Helicopter Search and Rescue Service (Page 146-158)

- Galway City Bypass (Page 159-176)

The In-Depth Checks were conducted by EFEU in line with a specific methodology developed in line with the guidance set out in the Public Spending Code and evaluation experience.



An Roinn Iompair
Turasóireachta agus Spóirt

Department of Transport,
Tourism and Sport

Economic and Financial Evaluation Unit

Quality Assurance – In Depth Check

Section A: Introduction

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

Programme or Project Information	
Name	Helicopter Search and Rescue Service
Detail	Provision of Search and Rescue (SAR) Helicopter Services for the Irish Coast Guard
Responsible Body	DTTaS
Current Status	Expenditure Incurred
Start Date	2012
End Date	2022
Overall Cost	€630.40 million

Project Description

CHC Ireland Ltd was contracted, in 2010, by the Department of Transport, Tourism and Sport to provide the Irish Coast Guard with five medium-lift Sikorsky S92 Search and Rescue helicopters deployed at bases in Dublin, Waterford, Shannon and Sligo in accordance with national and EU procurement guidelines. This also includes all necessary aircrew and support personnel as well as undertaking the operation and maintenance of the helicopters in order to perform the search and rescue service.

These aircraft are used to respond to emergencies at sea, inland waterways, offshore islands and in the mountains of Ireland. They can also be used for assistance in flooding, major emergencies inland, intra-hospital transfers, pollution, and aerial surveillance during daylight hours, lifting and passenger operations and other operations as authorised by the Coast Guard within appropriate regulations.

In addition, from an international perspective, having a global SAR service eliminates the need for each State to provide SAR services for its own citizens wherever they travel worldwide. Instead each country is divided into internationally agreed search and rescue regions, with each region having its own associated SAR services, which assist anyone in distress without regard to nationality, status or circumstances.

Section B - Step 1: Programme Logic Model

As part of this In-Depth Check, EFEU have completed a Programme Logic Model (PLM) for the Helicopter Search and Rescue Service. 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
<ul style="list-style-type: none"> • Provide an appropriate search and rescue service which will meet domestic needs and comply with international obligations; • Reduce injury and loss of life through the timely location and treatment of casualties; <ul style="list-style-type: none"> ○ Launch time of 15 minutes on urgent calls by day and 45 minutes by night all year round; ○ Deliver medical treatment by a qualified Paramedic to the scene of 70-75% of all incidents within one hour; • Provide other key services such as investigating possible marine pollution and acting as an emergency service for the communities on the islands off Ireland. 	<ul style="list-style-type: none"> • Contract Costs - €630.40m • Associated Staff Costs (to be estimated if a full evaluation is being carried out) 	<ul style="list-style-type: none"> • Location of persons in distress or imminent risk, providing them with immediate medical treatment where required, and moving them to a place of safety or appropriate medical treatment; • Contribute to Coast Guard activities for the protection of the environment, including from ship-sourced oil, containers or hazardous and noxious substances; • Operate such other helicopter flights as the Coast Guard may direct in support of their mission. 	<ul style="list-style-type: none"> • Number of missions completed; • Average response times; • Number of training days completed; • Number of persons assisted/saved; • Number of successful missions; • Helicopter availability levels. 	<ul style="list-style-type: none"> • Greater levels of helicopter availability; • Faster response times; • Reduction in fatalities; • Higher number of successful missions.

Description of Programme Logic Model

Objectives: The main objective of the Helicopter Search and Rescue Service is to reduce injury and loss of life through the timely location and treatment of casualties. The target is to be able to deliver medical treatment by a qualified Paramedic to the scene of 70-75% of all incidents within one hour. It also fulfils certain international commitments arising under a number of Conventions and coordinated through the International Civil and Aviation Organisation (ICAO) and the International Maritime Organisation (IMO). In addition, the SAR Service provides other key services such as investigating possible marine pollution and acting as an emergency service for the communities on the islands off Ireland.

Inputs: The primary input for the programme is the contract cost of €630.40m which are provided from the Department of Transport, Tourism and Sport to the operator of the Service, CHC Ireland Ltd. This cost relates to the provision and operation and maintenance of the helicopters. This includes a monthly standing charge, hourly flying charges, fuel costs, and ancillary costs. The other input to the programme are the associated staff costs involved with programme oversight at DTTaS. These costs are currently not quantified but should be assessed as part of any future full evaluation.

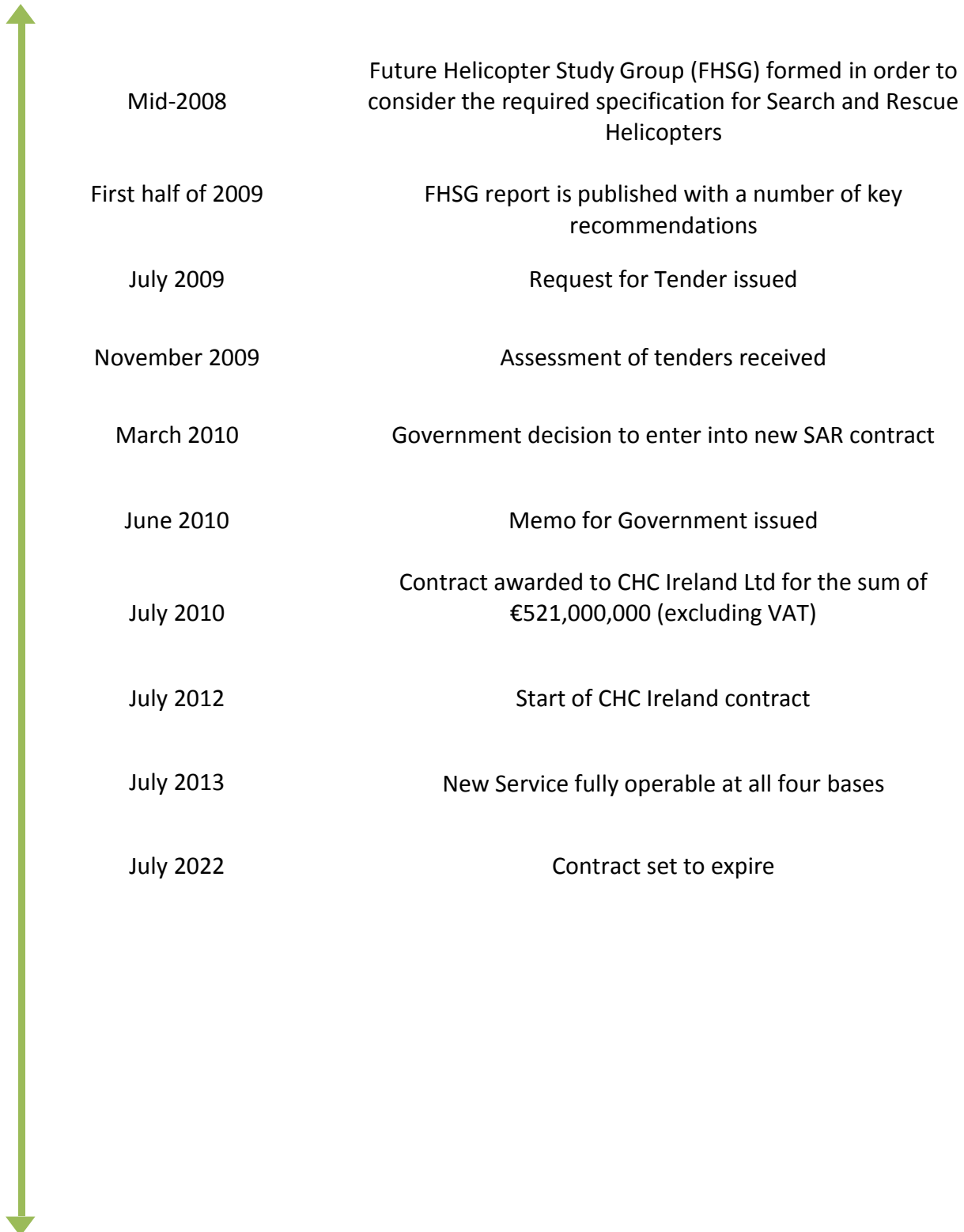
Activities: There are a number of key activities that are carried out by the Helicopter SAR Service. This includes locating and treating casualties or those in distress, investigating possible marine pollution events, providing an emergency service for the communities on the islands off Ireland and operating other helicopter flights as the Coast Guard may direct in support of their mission.

Outputs: Having carried out the identified activities using the inputs, the primary output of the programme is a modern helicopter search and rescue service throughout the Irish Economic Zone. Specific outputs of the programme include response times and availability levels of the helicopters as well as number of training flights and missions completed.

Outcomes: The envisaged outcomes of the programme are a more efficient and effective SAR helicopter service. This includes achieving a launch time of 15 minutes on urgent calls by day and 45 minutes by night all year round and delivering medical treatment by a qualified Paramedic to the scene of 70-75% of all incidents within one hour. Other key expected outcomes include faster response times, greater levels of availability, and a higher number of successful missions.

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

The following section tracks the Helicopter Search and Rescue Service from inception to conclusion in terms of major project/programme milestones.



Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation for the Helicopter Search and Rescue Service.

Project/Programme Key Documents	
Title	Details
Future Helicopter Study Group Report (2009)	An assessment of future requirements in order to inform the specification for the Search and Rescue (SAR) Helicopters Service.
Request for Tender (2009)	A Request for Tender for the provision of Search and Rescue (SAR) helicopter services for the Irish Coast Guard. It sets out the specifications and requirements for the SAR helicopter service for a contract term of ten years.
Memo for Government (2010)	A Memo for Government including details on the SAR helicopter contract to be signed.
Tender Contract Agreement (2010)	Contract agreement made between the Minister for Transport and CHC Ireland Limited. The Agreement is in effect for ten years from 1 st July 2012 and provides for five S92 helicopters to be located at four main bases (Dublin, Waterford, Sligo and Shannon).

Key Document 1: Future Helicopter Study Group Report

The Future Helicopter Study Group (FHSG) was formed in mid-2008 in order to consider the required specification for Search and Rescue Helicopters. In the past, the SAR helicopter service had not been shaped by any target or statement of requirement but had rather evolved over time in line with national and international obligations. The group's report

reviewed the existing level of service by examining search and rescue statistics and trends over the five year period 2004 to 2008. Predictions of future requirements both for routine incidents and for exceptional major emergencies were also considered through use of a survey. A SAR target was proposed which recommended that the helicopters should be able to deliver paramedic care to 70-75% of all incidents within the hour.

The report considered the type of helicopter that would best serve the requirement. It was deemed that although the S61 helicopter used to date had a good record, it was becoming increasingly obsolete, mainly due to safety concerns. For these reasons it was agreed that the S61 should be replaced under the new contract. However, if the S61 was replaced with six modern helicopters of similar size offering the same level of service, the price would be significantly higher. For this reason, a number of other options were assessed in the report.

The first option considered was to use smaller cheaper helicopters. However, this was discarded on the basis that these types of aircraft would not be capable of responding to marine incidents involving multiple casualties over 100 miles out in the Atlantic. A combination of large helicopters on the west coast and small on the east would also fail to recognise the considerable volume of shipping traffic in the Irish Sea and would reduce overall flexibility.

The next option assessed was a smaller fleet of helicopters. Due to the fact that modern helicopters require less maintenance and are more reliable, it was considered that the requirement could be met at an acceptable level of risk by five helicopters instead of the current six.

The final option looked at was a reduction of bases from four to three. It was considered that this would reduce Ireland's capacity to surge several helicopters to a single major emergency, to attend concurrent emergencies, and to cope with the loss of a helicopter to provide airborne safety cover for a long-range rescue by another helicopter. Therefore it was considered that a four base structure was optimal.

In general, the group's report was consistent with a number of the elements that should be included in a business case. This included identifying a clear objective for the programme, setting the scope, defining some key performance indicators, and considering a range of different options. However, the analysis would have benefited from a fuller appraisal of costs and benefits of the various options along with projected demand forecasts. Specifically, this would have included looking at monetised costs versus service levels. It is also important in the options appraisal that the 'do-nothing' or 'do-minimum' options are included even if they are being discounted.

Key Document 2: Request for Tender

The request for tender document for the provision of search and rescue helicopter services for the Irish Coast Guard was published in July 2009. It sets out the specifications and requirements for the SAR helicopter service for a contract term of ten years. This covers the helicopters, all necessary aircrew and support personnel for the operation and maintenance of the helicopters along with associated equipment and supplies, and the required accommodation, facilities and fuels needed for the operation of the service.

Three options were included that all tenderer's had to submit proposals against. Option A was five helicopters providing one prime helicopter and crew constantly at readiness at each of four bases and one spare helicopter. Option B was five helicopters providing one prime helicopter and crew constantly at readiness at each of three bases, one prime helicopter and crew at readiness for twelve hours every day at the fourth base, and one spare helicopter. Option C was five helicopters providing one prime helicopter and crew constantly at readiness at three bases and two spare helicopters.

Other key requirements related to the operation of the helicopters were outlined including the provision that the prime helicopters be maintained at a state of readiness of not more than 15 minutes by day and 45 minutes by night for each and every day of the year. Safety, management and aircrew experience requirements were also listed.

Key Document 3: Memo for Government

A Memo for Government was issued in June 2010, providing information on the new contract which was scheduled to be signed in the coming weeks. This included the cost of the contract, the transition arrangements that were being put in place before the new service commences in July 2012, details on the provision of the new helicopters and the bases from which they would operate from. Mention was also made of deferring a decision to proceed with the optional conversion of the helicopters to night vision equipment and in-flight de-fuelling with a number of reasons put forward as justification.

Key Document 4: Tender Contract Agreement

The tender contract agreement was signed in July 2010 between the Minister for Transport and CHC Ireland Limited. This Agreement is in effect for ten years from 1st July 2012 and provides for five S92 helicopters to be located at the bases as follows:

- A prime helicopter at Dublin within 15 minutes of or on Dublin International Airport
- A prime helicopter at Waterford Airport
- A prime helicopter at Shannon Airport
- A prime helicopter at Sligo Airport
- A back up helicopter based at Shannon Airport or such Airport as may be agreed between the parties from time to time

The helicopters are to be mostly operated throughout the Irish Economic Zone (EEZ). A summary of their key tasks include:

- Location of marine and aviation incident survivors;
- Evacuation of survivors from the sea, and medical evacuees from all manner of vessels;
- The evacuation of personnel from ships facing potential disaster;
- Search and/or rescue in mountainous areas, caves, rivers, lakes and waterways;
- The transport of offshore fire-fighters or ambulance teams and their equipment following a request for assistance;
- The provision of safety cover for other SAR units including other Marine Emergency Service helicopters;
- Pollution, casualty and salvage inspections and surveillance, and the transport of associated personnel and equipment;
- Inter-agency training in all relevant aspects of the primary role;
- Onshore emergency medical service, including evacuation and air ambulance tasks; and
- Relief of the islands and of areas suffering from flooding or deep snow.

Under the terms of the Agreement, the Contractor is obliged to bear the costs of operating and maintaining the helicopters, including the provision of aircrew and other staff, accommodation, and fuel costs. In return, the Contractor can invoice the Minister a monthly standing charge, flying hour charge, fuel costs, and ancillary costs at agreed rates. Reductions in performance and quality of services are to incur abatements to the monthly standing charge for that month. Monthly operational reports and interim reports are also to be provided to the SAR Ops Manager.

Although a robust analysis of the contract is beyond the scope of this In-Depth Check, and in some cases requires a technical knowledge of the area, it would form part of any future Value for Money Review, particularly in relation to the overall costs of the Service. Potential parts of the contract that may be looked at in further detail include the methodology for calculating charges as well as features such as the uplift to the hourly flying rate payable to the Back-Up Helicopter and the recovery of capital payments schedule in relation to a termination of the Agreement.

Section B - Step 4: Data Audit

The following section describes the data audit that was carried out for the Helicopter Search and Rescue Service. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Average response time	Assess if response time has improved and meets set requirement	Available
Number of rescue missions flown	Assess demand for the Service	Available
Number of persons saved/assisted	Assess the effectiveness of the Service	Available
Availability	Assess if availability has improved and meets set requirement	Available
Average Unit Cost per Mission	Assess the overall efficiency of the Service	Estimation Possible
Average Unit Cost per Mission per Base	Assess the efficiency of the Service at a base level	Estimation Possible
Demand forecasts	Assess future demand for the Service to inform resources required	Estimation Possible
Percentage of successful missions	Assess the effectiveness of the Service	Estimation Possible

Data Availability and Proposed Next Steps

The majority of the baseline data required is currently being collected through the Coast Guard's SILAS system. This includes number of missions flown and persons assisted/saved by base and time of day. The average response time to callouts and availability of the helicopters year round should also be made available as outputs in the same way in order to ensure that set targets for the Service are being met. As part of DTTaS's compliance with the Public Spending Code, a number of projects and programmes are selected to undergo a Focused Policy Assessment (FPA) or Value for Money Review (VfM) over a three year cycle. Thus, this programme may, at some point in the future, be subject to more detailed analysis. As such the data audit presented above sets out the type of information that would ideally be available. This includes unit costs and the percentage of successful missions on an annual basis. The availability of demand forecasts is also desirable in terms of informing the future needs of the Service and to determine resource requirements going forward.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the Helicopter Search and Rescue Service 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 Public Spending Code?

This programme pre-dates the Public Spending Code which wasn't introduced until 2013. Furthermore, the previous set of guidelines in place at the time only applied to capital expenditure and not current. Notwithstanding this, the In-Depth Check has shown that a number of the general tenets of appraisal were followed. Namely, a clear objective for the programme was defined and a range of options were considered as part of the Helicopter Study Group report. The analysis would have benefited from a more rigorous appraisal of the costs and benefits of each option and this is something that will need to be undertaken in any future appraisal of the programme. Although an assessment of the procurement process is outside the scope of this review, it appears standard procedures were followed. Subsequent compliance audits were also undertaken by an independent third party in relation to the contract awarded to the winning tenderer.

It is important to note that when the contract is next up for renewal it will need to comply with the new requirements set out for current expenditure under the Public Spending Code. All Departments and agencies must now appraise the options for new current expenditure proposals before a determination is made that the proposal is Approved in Principle. This includes a detailed economic appraisal such as a Cost-Benefit Analysis on short-listed options for proposals which involve a total budget of at least €20 million for the duration of the programme or an annual expenditure of at least €5 million. These new rules apply not only to the extension, renewal or re-orientation of an existing scheme, but also to a new delivery mechanism for existing services. As a rule, Government sanction is now required for projects costing more than €100 million. Post-project reviews for current expenditure programmes may also be needed, particularly where evaluations were not undertaken when the schemes were active or if the benefits would not be apparent for some time.

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

Quantifying the precise impact of the programme is a difficult task regardless of data availability. However, some of the baseline data required to undertake a full evaluation is currently being collected through the Coast Guard's SILAS system. This includes number of missions flown and persons assisted/saved by base and time of day. To assess the effectiveness of the programme in relation to its key objective will require looking at the counterfactual and determining in the absence of the programme, how many less persons would be assisted or saved. Generally this is performed either through a 'before and after' analysis or comparing it against a 'control group' where there was no policy intervention. As

the SAR is a nationwide programme, a 'before and after' analysis would be more appropriate in this case.

It is important that data in relation to key performance indicators is also being collected and monitored on an on-going basis. In this instance this would include data on average response times and helicopter availability where recommended targets have been set. A defined metric on the percentage of successful missions, controlling for external factors such as extreme weather events, would also provide another useful indicator. Other areas where data requirements will be needed for a full evaluation include unit costs such as cost per mission averaged over the year and disaggregated by base location as well as demand forecasts.

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

There is significant scope to improve the appraisal process and this is something that will be required if the contract is to be renewed. Although there were no formal guidelines in place at the time for a detailed economic appraisal, the analysis that was undertaken would have benefited from a fuller consideration of the quantified impact of the various options. This would then facilitate a more thorough comparison of the options, including a 'do-nothing-or 'do-minimum' option.

It is also recommended that a post project review be undertaken of the existing Service in sufficient time so that its findings can be taken on board prior to any future contract being put in place. This should include lessons learned and highlight potential areas where improvements can be made. The effectiveness of the Service in meeting its stated objective and the efficiency in which it does this are key considerations and this In-Depth Check has put forward some ideas for how these might be assessed. The review should include examining items such as data on performance metrics over a period of time, consider the methodology used for calculating charges and how this has worked in practice, look at the utilisation of existing bases and helicopters to ensure resources are being allocated optimally, as well as consider any governance issues that may be applicable.

Section C: In-Depth Check Summary

The following section presents a summary of the findings of this In-Depth Check on the Helicopter Search and Rescue Service.

Summary of In-Depth Check

The in-depth check of the Helicopter Search and Rescue Service revealed that overall the process and document preparation was generally in line with best practice. In particular, the process had a clear objective and a number of options were appraised. There was appropriate reporting between the programme management team and the Department and Minister of Transport at appropriate intervals to keep all interested parties fully informed. Standard procurement procedures were followed and a subsequent compliance audit on the delivery of contract requirements has been undertaken.

While EFEU are satisfied that the re-tendering of the SAR Helicopter contract was managed satisfactorily, a number of areas did emerge which have led to some recommendations for enhancing future best practice. These relate to the appraisal of the various options for delivering the Service and the need for collection of data and monitoring of performance indicators in order to ensure it is delivering value for money.

The Public Spending Code guidelines require projects and programmes to have an evaluation plan which detail how it will be measured after completion. This is a new requirement but should be incorporated into all projects and programmes into the future. It is recommended that a VfM policy review be carried out of the existing Service in sufficient time so that its findings can be taken on board prior to any future contract being put in place. This review when undertaken should be cognisant of the issues raised by this in-depth check.

Economic and Financial Evaluation Unit

Quality Assurance – In Depth Check

Section A: Introduction

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

Programme or Project Information	
Name	N6 Galway City Transport Project
Detail	Proposed construction of orbital road bypass north of Galway City to alleviate congestion,
Responsible Body	Transport Infrastructure Ireland, Galway City Council & Galway County Council
Current Status	Expenditure Being Considered
Start Date	First proposed in 1999. However, following partial approval from An Bord Pleanala, subsequent legal appeals and a final decision from the Supreme Court to quash the original approval; the recommencement of the process at feasibility and concept stage was November 2013.
End Date	Currently at Planning stage
Overall Cost	€519 million (including VAT)

Project Description

The N6 Galway City Transport project has sought to identify the most suitable corridor for a new orbital road scheme for Galway. The existing N6 is the national primary route which connects the M6 on the eastern side of Galway City to the N59 and R338 on western side. However, a large portion the traffic using the route does not fully bypass Galway City's environs but rather uses the route to travel in an east/west direction across the City. Due to the level of congestion on the N6/R338 many motorists in the urban areas use "rat runs" to connect to the various regions where possible, many of these routes transverse residential areas which are unsuitable for large volumes of traffic. Therefore, it was proposed that a new route, north of the N6, was required to, among other things; alleviate congestion, improve journey times and journey time consistency and support regional development.

The project has completed Phase 2 (Route Selection) of a seven phase framework for the development, management and delivery of major national road schemes as per the National Roads Authority's Project Management guidelines¹. The route selected as the emerging preferred route covers an approximate distance of 16.5 kilometres and will require the construction of a new crossing over the Corrib River as well as two tunnels.

In parallel with the N6 Galway City Transport project, the National Transport Authority has been engaged with Galway City Council in developing public transport and smart mobility components to the overall transport solution for Galway City. The N6 Galway City Transport project will form the road component of this solution which is known as the Galway City Integrated Transport Management Programme (ITMP) (now known as Galway Transport Strategy). Therefore, while options explored for the N6 project have included upgrading public transport, the main focus has been on exploring different routes or the upgrading of existing ones. The public transport element to the options explored will be considered under the other components of the ITMP.

¹ Phase1 – Scheme Concept & Feasibility Studies

Phase 2 – Route Selection

Phase 3 – Design

Phase 4 – EIA and Statutory Processes

Phase 5- Advance Works and Construction Documents, Tender and Award

Phase 6 – Construction & implementation

Phase 7 – Handover, Review and Closeout

Section B - Step 1: Logic Model Mapping

As part of this In-Depth Check, EFEU have completed a Programme Logic Model (PLM) for the N6 Galway Transport 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
<p>Congestion relief on major through routes</p> <p>Support sustainable transport policies for shorter commutes</p> <p>To maximise the economic efficiency of the transport network in Galway by reducing journey times & improving journey time reliability.</p> <p>Improve connectivity to the 'Gateway of Galway' thus supporting its economic performance by encouraging local, regional, national & international development.</p> <p>Removal of peak hour traffic delays to minimise fuel wastage & emissions</p> <p>Reduce road traffic collisions by segregation of the interface of through traffic from urban traffic.</p> <p>Improve accessibility to Galway City by improving the interconnection of Galway City and environs road network to the national motorway network and onwards to its main markets.</p>	<p>€519m capital funding</p> <p>Administration & staff costs</p> <p>ARUP Consultants</p> <p>Systra Ltd. Consultancy (re traffic modelling)</p>	<p>Traffic Modelling</p> <p>Road Safety Audit</p> <p>Ecological Constraints Report</p> <p>Cost Benefit Analysis</p> <p>Appraisal of Route Options</p> <p>Public Consultations</p> <p>Selection of Preferred route</p> <p>Route Design</p> <p>Environmental Impact Assessment</p> <p>Road Construction</p> <p>Tunnel Construction</p> <p>Bridge Construction</p>	<p>Feasibility & Constraints Studies</p> <p>Consideration of All Options (Preliminary Appraisal)</p> <p>Appraisal of Feasible Options & Selection of Preferred Option</p> <p>Route Selection Report</p> <p>Design of Selected Route</p> <p>Environmental Impact Assessment and Statutory Process</p> <p>Application to An Bord Pleanala</p> <p>Detailed Design and Land Acquisition (Pending ABP's decision)</p> <p>Construction of N6 Galway City Outer Bypass incl. two tunnels and one new bridge crossing of the River Corrib.</p>	<p>Improved access and movement across, and within Galway City and environs</p> <p>Improved accessibility to the west of County Galway.</p> <p>Improved journey times and journey reliability</p> <p>Reduced road traffic collisions</p> <p>High capacity linkages connecting east and west sides of County Galway</p> <p>Connectivity of high capacity to existing national and regional roads</p> <p>Improve accessibility of the Galway urban area to its main markets</p> <p>Improve the interconnection of the Galway City and environs road network to the national motorway network</p>

Description of Programme Logic Model

Objectives

The objectives of the N6 Galway City Transport project are categorised under the 5 key criteria set out for Multi Criteria Analysis in the 2009 version of the Department of Transport's Guidelines on Common Appraisal Framework. These are: Economy, Safety, Environment, Accessibility & Social Inclusion and Integration.

The project's objectives link in with the broader objectives of the Galway Transport Strategy and some of the more specific objectives under each heading for the N6 Bypass project are set out below:

Economy

- Encourage local, regional, national and international development
- Reduce journey times and increase journey time certainty
- Provide benefits to the transport infrastructure
- Improve linkages between the west and east sides of the county

Safety

- Segregate the interface of through traffic from urban traffic
- Reduce road traffic collisions
- Provide safer urban streets

Environment

- Minimise impacts on the integrity of all designated Natura 2000 sites.
- The proposed scheme will not be unduly detrimental to the architectural, cultural or linguistic heritage of the area.
- Seek to preserve existing well established communities.

Accessibility & Social Inclusion

- Improve accessibility to Galway City
- Improve the interconnection of the Galway City and environs road network to the national motorway network
- Improve accessibility of the Gaeltacht areas to the remainder of the county and country
- Improve urban environment of Galway City centre

Integration

- Integration of Galway City and environs (including western parts of Galway County) into the national economic development agenda
- Support balanced social and economic development at a national level
- Recognition of the role of Galway City as a gateway to the west and Connemara, and the consequent socio-economic benefits of enhanced connectivity of Galway City to national markets, enhanced tourism accessibility, and the national transport system
- Improvement of the TEN-T network to ensure connectivity of the west of Ireland to the single European market.

Inputs:

The primary input to this project will be the estimated €519 million capital funding to develop, construct and manage the new orbital road corridor.

Other inputs include hiring staff from engineering consultancy firm ARUP to provide multidisciplinary engineering consultancy services to include feasibility studies, route selection, examination of documents and earlier court rulings, detailed design and final submission of a planning application for the revised N6 Galway City Bypass scheme.

The project also utilised staff from the engineering consultancy firm Systra to carry out traffic modelling report in conjunction with ARUP.

Activities:

A number of key activities have so far been carried out for this project. These activities reflect the stage at which the project is currently at (i.e. completion of Phase 2 – Route Selection). These included Appraisal of Route Options, Selection of Preferred Route Traffic Modelling, a Road Safety Audit, Ecological Constraints Report and Cost Benefit Analysis.

However, the main activities which will be undertaken for this project relate to the construction of the outer bypass itself. This will include the construction of a bridge, two tunnels and the 16.5km orbital road itself.

Outputs:

Outputs already produced include Scheme Concept, Feasibility and Constraint studies which examined the existing transportation network and issues of Galway City and its environs and assessed the feasibility of potential transportation solutions. Following this, the potential solutions were considered by way of Preliminary Appraisal; the conclusion of which was that there was a strong justification for advancing a scheme which includes construction works to provide infrastructure to provide a solution to the transportation issues in Galway.

A Business Case was then submitted which assessed several potential routes for the N6 Galway City Bypass. From these an emerging preferred route was selected following a more detailed appraisal which included traffic modelling, demand forecasting, ecological constraints report, cost benefit analysis & a road safety audit. The resulting Route Selection Report was published which detailed the process and included appendices for all the appraisal and research undertaken. The Report provided an overview to the process of how the preferred route corridor was selected.

It is envisaged that the next steps in the process will require the following outputs: the design of the selected route, Environmental Impact Assessment, Application to An Bord Pleanála, Detailed Design and Land Acquisition (Pending ABP's decision) and finally the construction of N6 Galway City Transport Project (now known as N6 Galway City Ring Road) including two tunnels and one new bridge crossing of the River Corrib.

Outcomes:

There are several envisaged outcomes of the project. However, given the stage at which the project is currently, the outcomes are quite general as they lack specific timeframes and quantifiable targets. The stated outcomes include improved access and movement across, and within Galway City and environs, improved journey times and journey reliability, Improved accessibility to the west of County Galway and reduced road traffic collisions.

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

The following section tracks the N6 Galway City Transport Project from inception to conclusion in terms of major project/programme milestones

1999	Consultants appointed to undertake feasibility studies, route selection, design & planning for Galway City Outer Bypass scheme
2006	Resultant scheme including the Compulsory Purchase Order (CPO) and Environmental Impact Statement (EIS) submitted to An Bord Pleanala (ABP).
2008	The decision of ABP was split, with approval given for the eastern section of the route only.
2009	This decision was appealed to the High Court, which undertook a judicial review of ABP's decision. The High Court confirmed ABP approval but allowed an appeal to the Supreme Court.
2009	The Supreme Court sought the opinion of the Court of Justice of the European Union on an interpretation of the Habitats Directive
April 2013	The CJEU concluded that as the proposed scheme would have significant adverse impact on the integrity of the Lough Corrib Special Area of Conservation (cSAC) the correct planning process should be under Article 6(4) as opposed to Article 6(3).
April / May 2013	Following CJEU's decision, the Supreme Court quashed ABP's earlier decision & the process for developing a transportation solution for Galway City recommenced at Phase 1: Feasibility & Concept stage.
Nov 2013	ARUP consultants appointed to help provide feasibility studies, route selection, examination of documents and earlier court rulings, detailed design and final submission of a planning application for the revised N6 Galway City Bypass scheme.
May 2014	Scheme Feasibility Report - examined the existing transportation network of Galway City and its environs, & relating issues. Also examines the feasibility of potential transportation solutions

July 2014	Public consultation 1 – Comments sought as part of the constraints study.
October 2014	Preliminary Appraisal – assessed 5 options including Do Nothing and Do Minimum options as well as 3 alternatives ² . The conclusion was that the 3 alternatives should be investigated in more detail.
Jan / Feb 2015	Public Consultation 2 – outlining route options.
May 2015	Public Consultation 3 – displayed emerging preferred route corridor.
November 2015	Business Case (Phase 2: Route Selection) – provided a more detailed appraisal of the feasible options available. Set out alternative route options and assessed them.
November 2015	Project Brief - Updated from earlier Brief for route selection stage
March 2016	Route Selection Report detailed the process by which the designated route for the bypass was chosen and included appendices for all the appraisal and research undertaken.
April-Nov 2016	Phase 3 (Design) & Phase 4 (Environmental Impact Assessment & Statutory Process) are running concurrently.
July 2016	Public consultations sought on current design of project as part of the material alterations process to the draft Galway City Development Plan 2017-2021.
Dec 2016	Environmental Impact Statement and Compulsory Purchase Order ready to be published (subject to approval of final Business Case by DTTAS/DPER).
2021	Target date for commencement of construction of the N6 Galway City Ring Road.
2024	Target date for the opening of new N6 Galway City Ring Road.

² (i) - Upgrade existing road network and provision of additional public transport;

(ii) Maximise re-use of existing road network east of the River Corrib with the addition of another bridge crossing of the river, a new off-line alignment to the west of the River Corrib and improved public transport (as per option (i)) and;

(iii) combination of public transport provisions on the existing network and provision of an outer bypass along a totally off-line new alignment, again which would include an additional bridge crossing.

Section B - Step 3: Analysis of Key Documents

The following section reviews the key documentation relating to appraisal, analysis and evaluation for the N6 Galway City Transport Project.

Project/Programme Key Documents	
Title	Details
Project Brief (Phase 1)	Detailing the need for the scheme, its place in a strategic & policy context, the scope of the scheme, the physical, planning and archaeological constraints, the objectives of the scheme and its performance targets.
Scheme Feasibility Report	Report examined the existing transportation network of Galway City and its environs and the issues, constraints and conditions relating to this network. Report proposed that an alternative route was required to improve the network's capabilities. The report submitted cost estimates for the project and a safety report. The feasibility report also highlighted that the three "Do Something" options were all seen as feasible solutions to the issues highlighted in the report and required further evaluation.
Preliminary Appraisal	Assessed 5 options including Do Nothing and Do Minimum options as well as three "Do Something" options. The appraisal evaluated the five options under the five main objectives. The conclusion was that the three "Do Something" options should be investigated in more detail.
Project Brief (Phase 2)	Document is similar in content to previous Project Brief. This project brief was updated for Phase 2 of the project: Route Selection. The main addition to this brief was the inclusion of the six feasible route corridor options to be assessed as well as the emerging preferred route corridor itself. The emerging preferred route corridor being a combination of two of the six options.
Business Case	Provided a more detailed appraisal of the feasible options available. Assessed the six alternative route options and presented the analysis tools utilised as well as the methodology. A preferred route was selected and further analysis was carried out including CBA and a PABS. This document also encompassed not only the description,

	development and appraisal of the project but also the assessment of risks and an outline of proposed method of procurement and project implementation.
Route Selection Report	A comprehensive 782 page report which gave an overview of the entire process by which the rationale, objectives and options were identified and the preferred option, an amalgamation of three of the proposed six routes, was identified and selected. Additional documents to the report included a 50 page Executive Summary, Appendices for Preliminary Appraisal, CBA, Traffic Modelling, Ecological Constraint Reports, Alternative Route Options' Reports and a Safety Audit.
Traffic Modelling Report	Report undertaken to forecast traffic volume. It outlines the development of the base year of the model, the methodology of forecasting future travel demands and the testing of the scheme's six route options.
Cost Benefit Analysis	This output carried out an economic assessment of the costs and benefits of the alternative route options and the emerging preferred route as well as running comparisons against a Do Minimum option. The BCR for the emerging preferred route was 4.1 while all but one of the alternative routes scored greater than 3. The NPV for the emerging preferred route was calculated as €1.447bn. These calculations are based on a medium growth scenario.

Key Document 1: Project Brief (Phase 1)

The main areas of focus were the need for the scheme, the scheme's strategic fit, the scope for it and its objectives. The brief provides substantial data outlining why there is a need for investment in a new transport scheme and outlines how the scheme fits into the overall transport strategy policy at a local, regional, national and European level.

There are several objectives identified in the document under the 5 headings noted above. However, these objectives are quite broadly defined with no specific, quantifiable targets generated. The more detailed performance targets outlined in the conclusion also fail to provide measurable objectives.

Key Document 2: Scheme Feasibility Report

Report examined Galway City's transportation network and the issues, constraints and conditions relating to it. These issues included travel time delays, junction capacity versus traffic volumes, future traffic forecasts and modal split. The report stated that the existing issues identified would not improve without intervention to address the base problems and that any potential solution must meet the defined performance targets.

The report concluded that the three "Do Something Options" – (i) upgrade existing road network and provision of additional public transport services, (ii) upgrade portion of road network east of River Corrib and build new "off-line" alignment to the west of the river with new river crossing and (iii) a new totally off-line alignment road network with new river crossing; were all feasible options to investigate further. It should be noted that the "Do Something" options include improvements to the traffic management system of the existing route by replacing roundabout junctions with signalised ones.

Key Document 3: Preliminary Appraisal

Assessed the five options for intervention; summary appraisal was a Multi Criteria Analysis table which marked each option under the 5 main objective headings (Economy, Safety, Environment, Accessibility & Social Inclusion, and Integration) under a seven point scoring system from "Highly Positive" to "Highly Negative". Several criteria were evaluated under each of the five main objectives before a total evaluation for the objective was made.

The conclusion of the appraisal was that the options (ii) and (iii) were Moderately Positive while option (i) was Slightly Positive. The Do Nothing & Do Minimum options were ranked as both being "Slightly Negative".

Key Document 4: Project Brief (Phase 2)

Document set out the six feasible route corridor options to be assessed, these six routes adhered to options (ii) and (iii) as stated above. The report also provided the emerging preferred route corridor itself which was an amalgamation of two of the six routes. The emerging preferred route (Maroon Route) comprised of one route corridor (Yellow/Green Routes) for the section of the area between the R336 to the Galway City boundary (west of the city) and one route corridor (Pink Route) between the Galway City Boundary and the N6 (east of the city).

Key Document 5: Business Case

The first draft was delivered on the 09/07/15 and the final draft was delivered on 05/11/15.

The Business Case first presents the analysis tools and project context before providing more detailed analysis of the scheme's options and defining the preferred option from a list of the potential routes. The potential routes are assessed by Cost Benefit Analysis and Multi Criteria Analysis and from these it is observed that an amalgamation of two route corridors over two different sections of the network area provides the preferred route.

A Project Appraisal Balance sheet it also provided to evaluate the preferred route by quantifying the impact of the proposed road development on each of the five main objectives as well as a separate cell for recording non-quantifiable elements of the objectives.

Key Document 6: Route Selection Report

Comprehensive document containing: an Executive Summary, a 782-page Report, all maps and schematics utilised in options appraisal and route corridor design, and four appendices comprising Traffic Modelling Report, Preliminary Appraisal, Cost Benefit Analysis, Ecological Constraint Reports, Alternative Route Options' Reports and a Safety Audit.

The first draft of the report was delivered on the 28/08/15 and the final draft was delivered on 16/03/16. The report itself is split into two sections, the first section relates mainly to rationale for the scheme, the constraints and scope of the project before providing an overview of the consideration of options and preliminary assessment of options selected. The second section focuses on the development of the options and project appraisal leading to the selection of the preferred route. The second section of the report also includes a PABS which compares the different feasible route corridors and highlights how the preferred route was selected.

Key Document 7: Traffic Modelling Report

Arup consultants appointed Systra Ltd. to undertake the transport modelling elements of the project. Systra Ltd. provided a modelling report to forecast future year travel demand and testing this model against the different route options and the preferred route corridor. The model uses 2012 as base year and tests the options based on forecasts for the 2019 (original proposed opening year of the scheme) and 2034.

Each options performance is based on analysis carried out under five headings: Network Performance Indicators (i.e. Total Vehicle Distance, Total Network Travel Time, Total Network

Delay & Average Vehicle Speed), Journey Times, Traffic Patterns, Mode Share, Annual Average Daily Traffic (AADT).

Key Document 8: Cost Benefit Analysis

Economic assessment of the costs and benefits of the alternative route options and the emerging preferred route as well as running comparisons against a Do Minimum option. The parameters used are in line with the NRA's 2011 Project Appraisal Guidelines with a discount rate of 4%, time horizon of 30 years, 2009 base year and includes residual values. The Cost Benefit Analysis software used is TUBA v1.9.

The Benefit Cost Ratio (BCR) for the Emerging Preferred Route was calculated at **4.1** while each of the six route options had a BCR of greater than 2 and only one of those six scored below 3. The NPV for the emerging preferred route was calculated as €1.447bn. These calculations are based on a medium growth scenario. The CBA may benefit from running calculations under a low growth scenario.

The CBA needs to be updated to incorporate more current guidelines from the Public Spending Code and the Dept. of Transport, Tourism and Sport's Common Appraisal Framework Guidelines. This includes using a discount rate of **5%**, presenting costs and benefits in 2011 prices and applying shadow prices to Public Funds, Labour and Carbon.

Cost of emerging preferred corridor for the CBA is taken as €605m (incl. VAT). However, the Route Selection Report advises the cost as €519m (incl. VAT). The €605m figure includes €35m adjustment for inflation and €51.8m programme risk adjustment (i.e. a 10% increase in original advised costs).

Section B - Step 4: Data Audit

The following section details the data audit that was carried out for the N6 Galway Transport Project. It evaluates whether appropriate data is available for the future evaluation of the project/programme.

Data Required	Use	Availability
Average Annual Daily Traffic figures	Use for developing traffic modelling (i.e. forecasting future demand versus capacity)	Yes -November 2012 traffic counts undertaken by Galway City Council. Includes breakdown by vehicle type (i.e. car, LGV, HGV & Public Transport).
Delays to journey times	Assess the need for intervention to alleviate congestion, delays	Yes – Purchased Tom Tom data and complimentary information from 2011 Census and 2012 National Household Travel Survey.
Number and distribution of traffic collisions in Galway City and environs	Assess the need for intervention from a safety standpoint, assuming some attribution for collisions is due to congestion	Distribution of collisions between 2005 -2011 in Galway city and environs displayed in several documents and is available from RSA.
Junction Capacity	Assess the need for intervention to alleviate congestion and develop traffic demand forecasts	Yes – assessment of volume to capacity ratios at signalised junctions, roundabouts and other key junctions undertaken by Galway City Council.

Data Availability and Proposed Next Steps

The project has involved a substantial amount of data analysis to investigate the need for such a network, to establish a model to analyse future traffic demand and capacity, to assess the feasibility of different options and to appraise the feasible options in a more detailed manner. The data is well presented and the sources used are available.

Data collection carried out included the following:

- Traffic surveys: traffic counts were undertaken during Nov 2012 with 58 manual 12-hour Junction Turning Counts undertaken across Galway city and 58 temporary Automatic Traffic Counters installed for a seven day period.
- Traffic Signal Data: Journey time data was purchased from Tom Tom for observed flow weighted travel time of vehicles traversing each link of Galway City over the period Sept 2012 – May 2013. Galway City Council also provided traffic signal staging and green light times for all signalised junctions within the city.

Travel demand matrices were set up as part of the modelling system to represent the demand for travel between different areas within Galway City and its environs. Sources for the data utilised in the development of these matrices included the 2011 census data for place of work, school or college and the 2012 National Household Travel Survey

The main issue relating to data will be in the implementation and monitoring stage of the scheme when new data analysis will be required to assess what impact the new route has had, for example, in the areas of journey time, journey time reliability, volume to capacity ratios at junctions and the number of collisions due to congestion. Data on the impact the new route has on modal shift (i.e. changes in the number of people using public transport and sustainable transport) would also need to be observed.

Section B - Step 5: Key Evaluation Questions

The following section looks at the key evaluation questions for the N6 Galway Transport 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 Public Spending Code? (Appraisal Stage, Implementation Stage and Post-Implementation Stage)

This in-depth check has demonstrated that the assessment of the N6 Galway City Transport project does broadly comply with the standards set out in the Public Spending Code. However, it must be noted that the project is still only at Appraisal Stage with the actual implementation and monitoring of the project still quite far away and conditional upon other milestones being met. Bearing this in mind, the project has progressed through the prescribed stages of appraisal by; setting out the rationale for intervention and listing the project's objectives; exploring a number of options; carrying out a preliminary appraisal to source feasible options; undertaking more detailed appraisal techniques to select a preferred option. The appraisal has also included constraint studies, quantification of costs and risk analysis.

With regards, to the objectives chosen, the project as a whole would benefit from more specific, quantifiable objectives with defined timelines. For example the objective of reducing journey time delays needs to elaborate by how much and within what timeframe this should be expected. Furthermore, it is necessary to be clear about the relative importance of different objectives.

The expected date of delivery for the new route is 2024 but the project lacks a more detailed timeframe for the delivery and completion of different objectives in the interim; i.e. when is the submission to An Bord Pleanála to be made?

The Cost Benefit Analysis that has been undertaken needs to use the most up to date guidelines provided by the Dept. of Public Expenditure & Reform and the Dept. of Transport, Tourism and Sport. This includes using a discount rate of 5%, applying shadow pricing where necessary and presenting benefits and costs in 2011 prices.

While traffic management comprises part of the "Do Something" options (i.e. upgrade of existing route to remove roundabouts in favour of signalised junctions), it may be of value to explore traffic management solutions in more detail.

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

There is a substantial amount of data and information provided within the main documents for the planning and appraisal of this project. This information has been utilised in the traffic

modelling report and Cost Benefit Analysis as well as supporting the need for an intervention by examining the current transport network conditions and the ecological, geographical and population constraints the project faces.

As mentioned above, the main issue relating to data use and availability will be once the new route is delivered and an assessment of its impact on journey times, congestion, collisions, etc., is required. This will entail the undertaking of new data collection and analysis.

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

There is scope to improve and enhance the management of the process at the planning and appraisal stage. Improvements could be made to the process by:

- Ensuring that the objectives set out for the scheme are specific and quantifiable with clearly defined timelines. By establishing clearer defined objectives, the project can be better monitored and assessed post-implementation.
- Using the most up to date guidelines from the Department of Public Expenditure & Reform and the Department of Transport, Tourism & Sport when carrying out the Cost Benefit Analysis.
- Presenting an estimated timeline of the next steps in the planning, design and implementation of the new route. It is noted that the target date for the opening of the bypass is 2024 but several of the interim steps need to be assigned target dates to ensure project stays on schedule.

As noted above this project is still at an early stage of development and therefore the in-depth check is limited to evaluating the appraisal of developing this scheme. However, it is crucial that these initial stages are done correctly so that the implementation and post-implementation stages can be progressed effectively, efficiently and in accordance with the Public Spending Code.

Section C: In-Depth Check Summary

The following section presents a summary of the findings of this In-Depth Check on the N6 Galway City Transport Project

Summary of In-Depth Check

The overall process and documentation prepared for the N6 Galway City Transport project is generally consistent with prevailing guidelines as set out in the PSC and DTTaS's Common Appraisal Framework (2016). However, there are elements of the process which require amending or updating to ensure that the process more closely adheres to the guidelines. It should also be noted that the project is still at an early stage of its development with several steps to be taken before it is implemented.

While the overall process has been broadly in line with the prevailing guidelines there have been some areas which require attention; notably the Cost-Benefit Analysis report carried out in August 2015. This report does not use all of the most up to date parameters as set out in the current guidelines for carrying out such analysis. Similarly, the objectives presented in relation to this project are too broad and generic; more detailed, quantifiable objectives are needed in order to better appraise the different options and evaluate the project once implemented. Furthermore, there needs to be clarity over the current estimated cost of the project as the Cost-Benefit Analysis and the Route Selection Report advise significantly different costs figures.

While the options explored do make mention of improvements to the traffic management, it could be of benefit to explore in more detail traffic management measures which could be applied to the existing N6 route to alleviate congestion and improve journey times.

There has been substantial research and analysis of the transport network in Galway City and its environs to establish the existing conditions and issues within it. This research was carried out by Arup Consultants who were appointed by Galway City Council and Galway County Council to provide multi-disciplinary engineering consultancy services. Their research found that congestion at key junctions, journey time delays and lack of journey time reliability were significant issues within the network and in particular to the existing N6/R338 route north of Galway City.

Having set out the need for an intervention in the transport network the project set out a broad list of objectives under 5 main headings: Economy, Safety, Environment, Accessibility & Social Inclusion and Integration. These headings are taken from DTTaS's 2009 version of the Common Appraisal Framework for Transport Projects and Programmes as the key criteria for undertaking appraisals. More specific objectives and performance targets have been outlined in some of the key documents but the appraisals have used these five main objective headings as criteria in their assessment of the different options.

A number of the options were set out and evaluated by way of preliminary appraisal. The options which were determined to be feasible were then brought forward to be assessed in a more detailed manner. These options were six potential route corridors north of Galway City and included completely new routes, upgrades to existing routes and a combination of both. Following the detailed appraisal, which entailed Multi Criteria Analysis and a Cost Benefit Analysis, a preferred route was selected which comprised of portions of two of the six route corridors. The project is now progressing to the next two stages of its development process simultaneously; these are Design and Environmental Impact Assessment & Statutory Process.

The project has involved a substantial amount of data analysis to: (i) investigate the need for intervention in the existing transport network; (ii) establish a model to analyse future traffic demand and capacity; (iii) assess the feasibility of different options; and (iv) appraise the feasible options in a more detailed manner. The data is well presented and the sources used available. The main issue relating to data will be in the implementation and monitoring stage of the scheme when new data analysis will be required to assess what impact the new route has had on areas such as journey times, journey time reliability, modal shift, volume to capacity ratios at junctions and the number of collisions due to congestion.