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TII Publications



Project Appraisal Guidelines for National Roads Unit 12.0 - Minor Projects (€5m to €20m)

PE-PAG-02035

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Withdrawn

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**Updates to TII Publications resulting in changes to
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Amendment Details:

The scheme length requirements for online/offline improvements has been removed from Section 1.
Additional guidance in relation to project complexity added to Section 4 for clarity.

1. Overview

This Unit provides guidance on the appraisal of National Road Projects which are classified as Minor Projects costing between €5m and €20m. This category of project typically involves online/offline improvements, bypasses, junction/bridge improvements or a combination of link and junction improvements.

This Unit is not applicable to the appraisal of Minor Projects costing between €0.5m and €5m. Minor Projects costing between €0.5m and €5m are generally those which are defined under DN-GEO-03030 Guidance on Minor Improvements to National Roads. Guidance on the appraisal of Minor Projects (€0.5m to €5m) is provided in PAG Unit 14.0: Minor Projects (€0.5m to €5m).

TII have developed a template of a Minor Projects (€5m to €20m) Project Appraisal Report that can be downloaded from the “Downloads” section of the TII Publications website under section PE-PAG-02035_Unit 12.

2. Minor Projects (€5m to €20m) – Appraisal Deliverables

For Minor Projects (€5m to €20m) the following deliverables are required:

- Project Appraisal Plan (PAP);
- Project Brief (PB);
- Project Appraisal Report (PAR); and
- Post Project Review¹ (PPR).

Guidance on project appraisal deliverables is provided in PAG Unit 2.0: Project Appraisal Deliverables. Table 12.1.1 outlines the PAG deliverables for Minor Projects (€5m to €20m) at each project phase.

Table 12.1.1: Appraisal Deliverables for Minor Projects (€5m to €20m) by Project Phase.

National Roads Project Management Guidelines – Project Phase	PAG Deliverable			
	PAP	PB	PAR	PPR
Phase 1: Concept & Feasibility Studies	Y	Y		
Phase 2: Option Selection			Y	
Phase 3: Design and Environmental Evaluation			Y	
Phase 4: Statutory Processes			Y ²	
Phase 5/6: Contract Award and Construction			Y	
Phase 7: Closeout and Review				Y

¹ A Post Project Review is only required on a selection (5%) of all projects under €20m as per the requirements of the Public Spending Code.

² Generally not applicable but if the scope of a project is significantly changed then the Business Case may need to be updated.

3. The Project Appraisal Plan for Minor Projects (€5m to €20m)

The Project Appraisal Plan (PAP) functions as a scoping document for the appraisal and traffic modelling process – this can allow an understanding of the proposed methodologies before any significant data collection, modelling or appraisal decisions take place.

In essence, the PAP provides a summary of the approach that will be adopted for the appraisal of a project. It outlines what analysis tools will be used (e.g. transport model, cost benefit analysis model etc.) to appraise the project, what the proposed study area for the relevant transport model will be, what assumptions will be adopted in terms of traffic growth, what future years will be modelled and any non-standard assumptions that have been necessary in terms of transport modelling or cost benefit analysis.

The PAP should be submitted to Transport Infrastructure Ireland (TII) for review prior to undertaking the appraisal process. PAG Unit 2.0: Project Appraisal Deliverables provides guidance on the structure and content of the PAP.

In the context of this PAG Unit, the PAP, should:

- Classify the project as a Minor Project (€5m to €20m) and identify the project complexity;
- Outline how alternatives will be considered;
- Set out the relevant data requirements;
- Describe the modelling methodology – type of model, software to be used, projection years to be assessed and the complexity of the modelled network;
- Proposals for traffic growth projections;
- Outline proposals for appraisal methodology, including, the approach to Cost Benefit Analysis and Multi Criteria Analysis and software to be utilised.

Ultimately, the approach set out in the PAP which is sent to TII for approval will determine the type of modelling and appraisal approach to be adopted.

4. Project Complexity

The complexity of Minor Projects (€5m to €20m) will vary considerably. The upgrading of a short section of the National Road network may not require the same level of appraisal as the bypassing of a town or village. Therefore, the level of appraisal should be proportionate to the nature and complexity of the project.

Taking the above into consideration, TII has classified Minor Projects (€5m to €20m) into three broad categories to aid the appraisal process. The three categories are as follows:

1. Online or offline improvements – economic appraisal supported by ‘TII Simple Appraisal Tool’ and COBALT;
2. Bypasses – economic appraisal supported by an assignment model; and
3. Junction upgrades (including the optimisation of existing merge/diverge layouts) – economic appraisal supported by modelling proportionate to the upgrade.

5. Data Collection

PAG Unit 5.2: Data Collection includes guidance on the collection of traffic data for individual schemes which is not readily available. In addition the Unit provides guidance on the data available for use in the development of transport models which may reduce the need for data collection or traffic surveys.

In the context of Minor Projects (€5m to €20m), the quality and amount of data collected should be proportionate to the modelling task and be sufficient to inform the decision making process.

6. Transport Modelling Methodology

The nature of the scheme, e.g. junction improvement versus new road link, will provide the first indication of what type of modelling tool is required, although it will also be important to consider the location and the prevailing environment. As an example, a major junction improvement in a rural area with a sparse road network is likely to only require an isolated junction model. The same kind of scheme in a dense urban environment may cause significant re-routeing effects and even, potentially, impact on other modes or properties. As a consequence, an assignment model would be required to capture the impact of the diverted traffic on the surrounding road network.

Information on the various types of modelling tools available to inform the appraisal of national road schemes and the calibration and validation of same is provided in PAG Unit 5.1 – Construction of Transport Models.

Careful consideration should be given, before resources are committed to model building, to the project complexity referred to above, the nature of the options that are likely to be tested and the required level of detail of the analyses. The risks of using disproportionate time and resources can be minimised by specifying the model scope correctly from the outset.

7. Traffic Growth Projections

Guidance on the application of future traffic growth projections is provided in PAG Unit 5.3: Travel Demand Projections.

PAG Unit 5.3 provides detailed guidance on the preparation of future travel demand projections for use in scheme modelling and appraisal. The type of methodology chosen, that is, zone based or link based projections, depends on the functionality of the models being used.

For Minor Projects (€5m to €20m) the likely modelling approaches are either Simple Models or Assignment Models. PAG Unit 5.3 describes the criteria for projecting future demand for these models. Essentially, Simple Model approaches rely on link-based projections while Assignment Models require zone-based projections.

This Unit examines different methodologies for preparing future year traffic projections which reflect the functionality of the models being used.

8. Scheme Appraisal

This section provides an overview of the appraisal for Minor Projects (€5m to €20m), both from a quantitative and qualitative perspective based on the Common Appraisal Framework appraisal criteria headings:

- Economy;
- Safety;
- Environment;
- Accessibility & Social Inclusion;
- Integration; and
- Physical Activity (if applicable).

8.1 Cost Benefit Analysis (Economy)

For online/offline improvements on rural sections of the National Road network, the economic benefits (travel time savings and vehicle operating cost changes) of a project can generally be calculated using the 'TII Simple Appraisal Tool' which is detailed further in Section 9.

For more complex projects that require the development of an assignment model, the economic benefits of the project should, in general, be calculated using TUBA. However, it is worth noting that it may also be possible (depending on the project complexity) to utilise bespoke spreadsheet based methods for this analysis. However, these methods should be agreed with TII's Strategic & Transport Planning Section before the appraisal is undertaken (the PAP is the appropriate method for this).

TUBA is a computer program used for undertaking transport economic appraisals. TUBA draws information directly from transport models, and applies standard economic parameters to calculate benefits and costs associated with travel time, vehicle operating cost and emissions changes.

Guidance on using the TUBA programme is provided in PAG Unit 6.3: Guidance on Using TUBA.

8.2 Cost Benefit Analysis (Safety)

COBALT (Cost and Benefit to Accidents – Light Touch) is a computer program developed by the UK Department for Transport (DfT) to undertake the analysis of the impact on collisions as part of the economic and safety appraisal for a road scheme. An Irish specific version of the COBALT program has been developed by TII for use on road schemes in the Republic of Ireland and is referred to as COBALT – Ireland.

Guidance on using the COBALT programme is provided in PAG Unit 6.4: Guidance on Using COBALT.

8.3 Multi-Criteria Analysis

The Environment, Accessibility & Social Inclusion, Integration and Physical Activity elements of the appraisal process should be carried out in line with the requirements for Multi-Criteria Analysis (MCA) as set out in PAG Unit 7.1 – Multi-Criteria Analysis.

8.4 Project Appraisal Balance Sheet

The Project Appraisal Balance Sheet (PABS) is a summary appraisal of a project impacts based on the outputs of various forms of assessment carried out during the planning and design stages of project development. The PABS acts as a tool in summarising the expected impacts of proposed investment and provides a mechanism for prioritising schemes for investment. The Minor Projects (€5m to €20m) PABS template is available for download from the “Downloads” section of the TII Publications website under section PE-PAG-02035_Unit 12 and is also included as an appendix to this Unit.

9. TII Simple Appraisal Tool

TII have developed an automated spreadsheet based appraisal tool to allow analysts to undertake an economic appraisal for online and/or offline improvements to sections of the National Road Network, in areas where the reassignment of traffic due to the scheme is unlikely. This appraisal tool can be downloaded from the “Downloads” section of the TII Publications website under section PE-PAG-02035_Unit 12.

The simple appraisal tool calculates the change in journey time and vehicle operating cost as a result of the online and/or offline improvement and calculates the expected monetary benefits. Scheme benefits are compared against scheme costs to generate a Net Present Value (NPV) and Benefit to Cost Ratio (BCR) for the proposed scheme.

The automated spreadsheet specifies a number of questions to quantify the impact of the proposed upgrade in terms of economy and is made up of four sections as follows:

- **Part A (Overview):** This section requests some general background on the project being assessed such as a brief project description and project management information;
- **Part B (Scheme Information):** This section deals with the specific scheme information for inclusion as part of the economic appraisal.
- **Part C (Target Performance):** In this section the analyst inputs either/both the average (daily) journey time (minutes) and average speed (kilometres/hour) for both the existing conditions and target projections from the implementation of the scheme.
- **Part D (Projected Benefits):** This section generates the outputs of the spreadsheet tool including the NPV and BCR of the proposed minor project.

9.1 Scheme Specific Inputs

The scheme cost entered into the economic appraisal tool needs to be adjusted using the applicable TII Input Cost Spreadsheet prior to use. The TII Input Cost Spreadsheets adjust scheme costs to account for VAT, inflation and shadow pricing prior to use in Cost Benefit Analysis. These cost spreadsheets are provided as appendices to PAG Unit 6.2: Preparation of Scheme Costs.

9.2 Appraisal Period

In Part B, the appraisal period is in general specified to be a 30 year period (in line with the Common Appraisal Framework), however, for certain Minor Projects (€5m to €20m), such as the optimisation of merge/diverge layouts, the appraisal period may be considerably less. This may reflect the potential short term nature of a Minor Project. For appraisal periods chosen to be less than 30 years the spreadsheet does not consider there to be any residual benefits (again in line with the CAF requirement that for short lived assets of less than 30 years, the project is only evaluated over the life of the asset).

10. Content and Structure of the Project Appraisal Report

The Project Appraisal Report should be structured based on the sections presented in Table 12.1.2.

Table 12.1.2: Structure of Project Appraisal Report

Section	Title	Content
1	Introduction	<p>The first section of the PAR provides the background to the project, including its origins, previous relevant studies and their findings, together with the context of the current PAR.</p> <p>A statement should be provided in relation to the assumptions and parameters used in the appraisal of the project to confirm they are in line with central guidance and have been agreed with DTTAS's Economic Financial and Evaluation Unit (EFEU) as per the requirements of the CAF.</p> <p>A programme logic model (diagram) showing the linkages between the project inputs, activities, outputs and outcomes is required.</p>
2	Project Context	<p>The need for the scheme (i.e. the issues the proposed scheme is intended to address) should be presented in this section of the PAR. A review of European, national, regional and local policy which is applicable to the project should be provided to inform the need for the scheme.</p> <p>A set of project objectives should be defined based on the need for the scheme and the known constraints. They should be classed as follows:</p> <ul style="list-style-type: none"> • Economy; • Safety; • Physical Activity (if appropriate); • Environment; • Accessibility and Social Inclusion; and • Integration
3	Analysis Tools	<p>A description of the analysis tools used in support of the preparation of the PAR. Such tools may include traffic models and economic models. The development and validation of models should be described.</p>
4	Consideration of Alternatives & Options	<p>A description of the structured process undertaken to identify the preferred option for the project should be provided in this section and should cover the following:</p> <ul style="list-style-type: none"> • Narrowing of Options (Phase 2 Option Selection Stage 1); and • Appraisal of Options (Phase 2 Option Selection Stage 2). <p>Reference should be made to <i>PAG Unit 4.0: Consideration of Alternatives & Options</i> for guidance. A Multi-Criteria Analysis (MCA) approach should be adopted as per the guidance set out in <i>PAG Unit 7.0: Multi-Criteria Analysis</i>. Details of the cost of each option at Stage 2 should be provided in the PAR alongside expenditure profiles and</p>

Section	Title	Content
		funding sources. Any incremental analysis undertaken as part of the appraisal of options should be provided.
5	The Preferred Option	Introduction of the preferred option emerging from the Phase 2 Option Selection process. This section should provide information on the design standards used, and present demand projections for the preferred option. The chapter should also set out the detailed composition of scheme costs for the preferred option.
6	Scheme Appraisal	<p>An overview of the detailed appraisal of the preferred scheme, including the following:</p> <ul style="list-style-type: none"> • Economic Appraisal <ul style="list-style-type: none"> • Cost Benefit Analysis • Multi-Criteria Analysis • Financial Appraisal (where appropriate) • Sensitivity Analysis (project costs, transport demand, benefits etc.) <p>Project Appraisal Balance Sheet (PABS) for Minor Project (€5m to €20m)</p>
7	Risk Assessment	Identification of the key risks associated with the project that require consideration in any decision making process, and in subsequent stages of the project. Risks should include cost risks, programme risks, funding risks, affordability risks and acceptability risks. A risk mitigation strategy should be provided which outlines how risks were identified, evaluated, monitored and tracked.
8	Conclusion	A concluding chapter summarising the case for the scheme in terms of the anticipated monetised and non-monetised benefits likely to be achieved.



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