



Integrated Urban Drainage Modelling Guide

Appendix A

Pre-Feasibility / Scoping Stage

CIWEM Chartered Institution of
Water and Environmental
Management

CIWEM UDG Integrated Urban Drainage Modelling Guide

Appendix A – Pre-Feasibility Scoping Study

A1. Context

This section covers the scoping or pre-feasibility stage of an integrated modelling project. It includes a checklist / proforma which could be used to document and record the scoping process undertaken. Depending on the nature of the project, this stage may be omitted on some occasions and will vary in scale depending on the complexity of the project and any early or preceding works already undertaken. If a pre-feasibility study or scoping stage is undertaken it should precede **Section A3** which deals with the detailed definition of a project.

The key to a successful IUD modelling project is careful and detailed planning. An appreciation is necessary that the study will involve several partners and stakeholders with different backgrounds, and a number of technical disciplines relating to urban drainage. A Project Steering Group (PSG) will usually be required.

A2. Identify Partners and Stakeholders

The initial phase is to focus on drawing together the appropriate Partners and Stakeholders necessary to undertake or benefit from an integrated modelling project.

A **Partner** is an organisation with responsibility for some of the decisions or actions that need to be taken. Partners who will contribute to or co-fund the project and may include Government Departments, Regulators, Sewerage & Water Companies, Lead Local Flood Authorities, Local Authorities, Internal Drainage Boards and it is critical that they are engaged at the start of the process.

A **Stakeholder** is anyone affected by or having a valid interest in the problem or solution. They may be internal or external departments, individuals or organisations and may include the general public and community bodies.

A3. Liaison Meetings

The majority of Partners will be one or more Water and Sewerage Company, one or more Lead Local Flood Authorities and one Regulator (EA, SEPA, NRW or NIEA). It is frequently the case that there are regular liaison meetings between these organisations.

These liaison meetings are an ideal opportunity for all the organisations to set out what their priorities are, whether they have identified any specific projects, what the timescale is that they would like to work to and who would benefit from the work. This can lead to a discussion about which Partner organisations should be involved in specific projects.

It is frequently the case that individual Partners can revise their funding timescale such that funding can sometimes be brought forward for specific projects to deliver efficiencies through running together with other projects, while others might be deferred at no overall change in cost.

For liaison meetings to be productive it is recommended that a formal agenda item should include aspirations and ideas for future integrated modelling projects. This appendix includes a pro-forma which can be used as a checklist to help in identifying potential projects,

CIWEM UDG Integrated Urban Drainage Modelling Guide ***Appendix A – Pre-Feasibility Scoping Study***

the benefits and the potential organisations involved. It can also be used as a formal record of discussions and agreements.

Through the liaison meeting and the stakeholder mapping exercise undertaken at this stage, any other projects on-going or planned in the catchment / study area should be identified. As well as projects being undertaken by identified Partners and Stakeholders, this might also include projects being undertaken by Canal & Rivers Trust, Rivers Trusts, Wildlife Trusts, CaBa Partnerships and others which would have an influence on the catchment and flood risk.

A4. The Project Steering Group

At this early stage in a project it is worthwhile identifying which Partners and key stakeholders would be members of a Project Steering Group. This will enable PSG members to consider in detail if and when they can provide funding and what value they could bring to the project.

The PSG then would be responsible for the more detailed discussions to get the project started.

A5. The Modelling Team

IUD hydraulic modelling is a complex subject and it is essential that the appropriate skills and knowledge are held within the team. It is worthwhile considering at this early stage whether the required resources and skills are available within any of the Partner organisations or whether it will be necessary to bring external resources into the project. If the latter is the case it will be necessary to consider the timescale for preparing tender documents and seeking tenders.

A6. Purpose and Drivers

Before progressing further the intended purpose and final use of the model should be identified and recorded.

At this stage an understanding of the existing problems in the study area (or future drainage problems due to changing demands such as new development, urban creep or climate change) should be developed by the team. Much of this may already be available through previous modelling studies; however, other potential sources of data should be identified and explored.

The timeframe of the project should also be discussed. This refers to both any programme constraints linked to the funding which will drive the speed the project progresses and also the design horizon for the scheme being modelled. The design horizon of the scheme will need to consider any forecasted change in the catchment over this period, including any planned activities (short, medium or long term) from the Drainage and Wastewater Management Plan (**DWMP**), when published.

A7. Available Data Including Existing Models

During Scoping / Pre-Feasibility there should be some assessment made of the existing data available including previous studies, topographic data, flow data etc and it is suggested this is recorded in a checklist or form like that contained in this Appendix.

The scoping stage report or documentation should note whether there are any existing models which can be used or adapted to meet the project requirements. At this preliminary stage it is unlikely that reviewing or assessing existing models will be necessary, but it should be identified whether this will be required and sufficient time allowed in the project programme. The review would consider the original purpose of previous modelling and suitability for the proposed new project. At this early stage, such an assessment should also include matters regarding ownership of models, the re-production of existing results and the re-use of modelling files.

A8. Developing an initial understanding of the problem

To enable the IUD modelling strategy to be determined, an initial understanding of the problem is required. Analysis from an initial review of flood incident records and initial model runs (if available) may enable an early indication to be made of:

- flood mechanisms and interactions between different urban drainage systems;
- whether there is a pluvial (surface water) runoff element in the flooding mechanism;
- scale of the flooding (e.g. localised, town-wide or river catchment wide);
- frequency of the flooding;
- consequence of the flooding (e.g. degree of nuisance, cost).

The checklist / form at the end of this Appendix includes questions that can be considered to assist in understanding of the problem and developing the modelling strategy.

A9. Assessment of the likelihood of success

At the end of the Project Scoping stage an informed decision can be made about whether an integrated modelling project will be undertaken, allowing for consideration of the potential for success of the modelling project. An honest evaluation of the likelihood of success by the Partners and Stakeholders, based on previous project experience and catchment knowledge and understanding, should inform the decision on how to take the integrated modelling project forward. The assessment and evaluation of potential success must also consider the availability of data and remain focussed on approaches that are proportionate to the scale and complexity of the flooding issue being considered. At this stage an initial risk register for the project could also be prepared and documented so that all Partners and Stakeholders are entering the project with a common understanding of the situation and potential outcomes of the project.

CIWEM UDG Integrated Urban Drainage Modelling Guide
Appendix A – Pre-Feasibility Scoping Study

A10. Documentation

Documentation is key to the successful delivery of a modelling project. It is recommended that a scoping or pre-feasibility report should be produced. This would include the project objectives, the Partners and Stakeholders involved, the funding arrangements, the timescale and any other relevant information. This section of the Guide includes a checklist of the points which should be considered and agreed in this stage of defining the project. A completed checklist could form the core of the documentation for a project.

Project name / working title

What is this issue that has been observed / perceived?

- *Is there an observed history of flooding?*
- *What is the source of flooding? Are the pathways and receptors known?*
- *How is flooding transferred from the source to a receptor (the pathways)?*
- *What are the consequences of flooding? (Severity, impacts, costs) Where does the flood water gather and cause damage/risk (the receptors)?*
- *What is the probability / frequency of flooding?*
- *What is the area affected? (Scale of project and model) consider neighbouring areas / catchments and whether there might be potential for linking or combining two studies. Are there other locations within the WwTW/topographic catchment with flooding issues?*
- *What is known about the flood mechanisms and interactions between different urban drainage systems;*
- *Is there a pluvial (surface water) runoff element in the flooding mechanism and if so where are the contributing areas (the sources)??*
- *From which drainage systems does the flooding originate (the sources)?*
- *What are the key drainage system interactions that influence the flooding?*
- *Is the flooding mechanism a localised issue or related to hydraulic influences from elsewhere in the system?*
- *What range of input or boundary conditions for modelling (eg tide levels) influence the flooding problem?*
- *If there are multiple sources of flooding, what is known about the timing and coincidence of flooding from different sources?*
- *Consider Including a map of the study area / area of interest for geographical context*
- *Add references for data sources used in completing this form (e.g. flood incident reports, questionnaires, photographs, high water alarms, tide marks, MH surcharge lines*

Who is the main stakeholder in this project? Who are additional stakeholders?

- *Who has raised this issue and requested investigation?*
- *Think about the local Water and Sewerage company, the environmental regulator, the Lead Local Flood Authority, the Local Planning authority and any other interested parties (e.g. Wildlife Trusts, Canal & Rivers Trust, Highways Agency, CaBA partnerships...)*

Has this issue been investigated before? Do you have details of previous studies?

- *Is there anyone else working on flooding (or other hydraulic) problems in this catchment at the moment?*
- *Are details of previous studies available?*

What are the potential funding streams for this project and how have they been investigated?

- *Are there any funding limitations or investment opportunities?*
- *Can you see any possible stakeholders that may provide partnership funding?*
- *Are there any programme constraints associated with the potential funding streams?*

CIWEM UDG Integrated Urban Drainage Modelling Guide
Appendix A – Pre-Feasibility Scoping Study

Is there a longer term strategic plan that could draw on future funding streams?

What is the available data for the project?

- *Are there any existing hydraulic models of the catchment / study area? If so, what is known of them?*
- *Is there any monitoring data from the catchment?*
- *What survey data is already available?*
- *Is there any qualitative / quantitative data from previous flooding incidents?*
- *Has this data been assessed for quality / relevance to this project?*
- *Is there a requirement for more data in order to undertake the project?*

What is the time frame associated with the project?

- *Design horizon for the scheme?*
- *Are there any forecasted changes in the catchment?*
- *What are the planned activities over the short (<5 year), medium (5-25 year) and long term (>25 year) as set out in the Drainage and Waste Water Management Plan (DWMP) when published*

What is the likelihood success of an integrated modelling project helping solve this problem / issue?

- *After consideration of all the above, what is the probability of success in this project?*
- *Is it worth going ahead or are the benefits borderline?*
- *Is there potential to revisit and assess the benefits of using an integrated modelling approach for longer term business planning linked with catchment based planning?*
- *What would an alternative be (if any exists) if chances of success are considered low? (e.g. single source modelling, use of existing information?)*
- *If success is considered unlikely what needs to be done to increase the chance of success? E.g. collect more data, further understanding of problem, seek finance, alternative modelling methods*

Based on the above, what are the key elements of a project scope related to this problem and how does integrated modelling fit in with this scope?

(Start to make notes for a project scope that can be taken forwards)

Key Information

Form completed by: (including date)

On behalf of:

In consultation with:

And has been circulated to: