

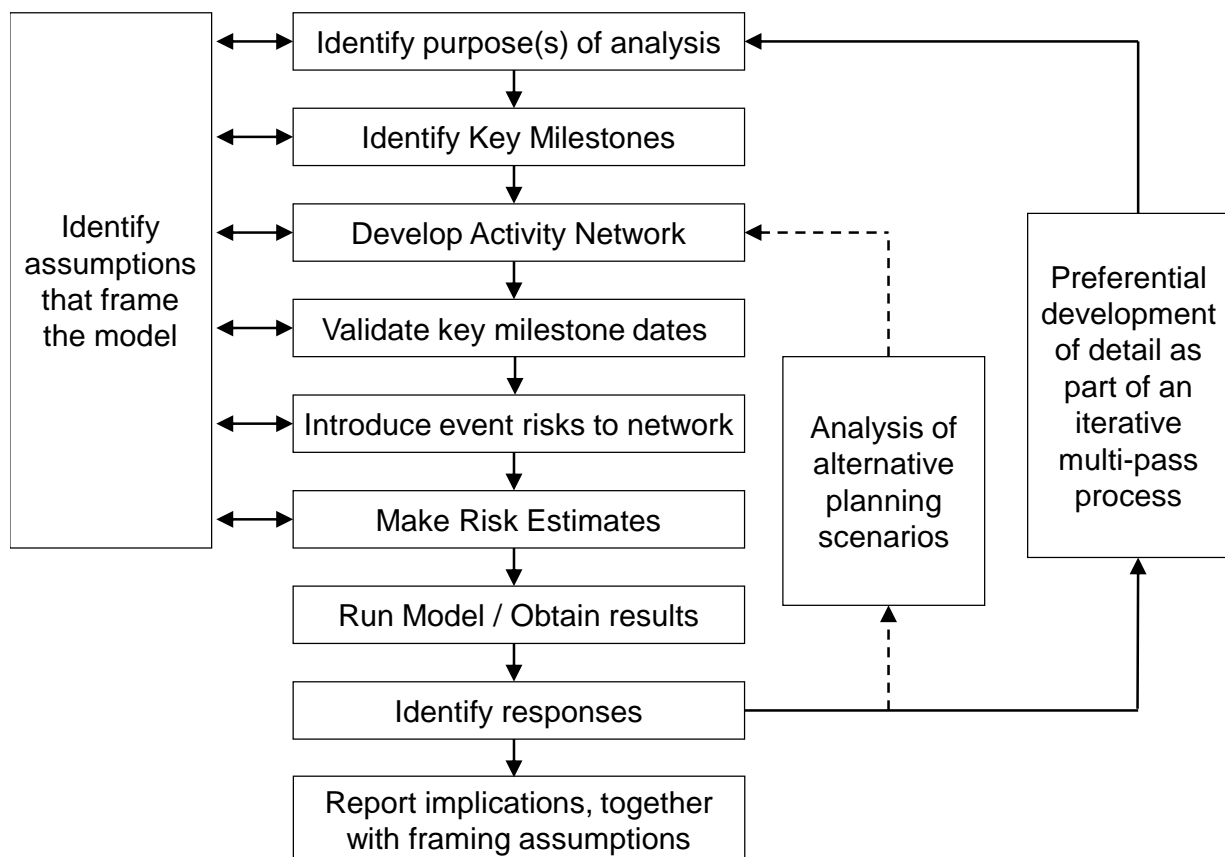
Practical Project Risk Management¹

A Process for Developing Schedule Risk Models: A brief guide²

Purpose

Provide a step by step process to develop schedule risk models of good quality. This guidance should be read in conjunction with the *Schedule Risk Analysis* guidance sheet (May, 2023)

A Recommended Process



¹ This series of articles is by Martin Hopkinson, author of the books “*The Project Risk Maturity Model*” and “*Net Present Value and Risk Modelling for Projects*” and contributing author for Association for Project Management (APM) guides such as *Directing Change* and *Sponsoring Change*. These articles are based on a set of short risk management guides previously available on his company website, now retired. See Martin’s author profile at the end of this article.

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Notes

Typical **purposes of analysis** are listed in the *Schedule Risk Analysis* guidance sheet (May, 2023)

A good starting point is to identify between four and ten **key milestones**. Ideally, these will be spread reasonably evenly over time, be known to be the type of milestone vulnerable to schedule slippage, mark points at which high risk activity paths converge and be of interest to key decision makers and stakeholders.

An initial simple version of the **activity network** can be built using the key milestones as a framework. Further detail can then be added by including more activities and dependencies where justified by the purposes of the analysis. Care should be taken to avoid modelling low levels of detail that are liable to change as events unfold during the project.

The activity network can be **validated** by comparing it to the deterministic version of the project schedule (which will typically be broken down into much more detail). Key milestones dates should align. The validation approach should also include a Modelling quality checklist.

The effect of **event risks** that have the potential to cause schedule delay can be modelled by linking them with dependencies into the activity network.

Risk estimates should be made for activity duration uncertainty and for event risk probabilities and impacts. Further advice can be found in the *Three Point Estimates* guidance sheet (Nov 2022). If event risks are included from a risk register, their estimates should be reviewed in the context of the schedule risk model. Correlation between activities may also be appropriate.

Acceptable **framing assumptions** will have to be made when developing the risk model and its associated estimates. Key assumptions should be recorded and disclosed with modelling results, particularly if decision makers might regard any of the assumptions as being at risk.

To **run the model**, use a Monte Carlo simulation tool. 5,000 iterations are usually sufficient. The **results** will include risk-based forecasts for key milestones (S-curves) and the identification of the activities and risks that are the most significant drivers of schedule performance. For the latter, see the *Schedule Risk Analysis Prioritization Results* guidance sheet (June 2023)

New **risk management responses** should be developed on the basis of insights arising from the modelling results. Risk reduction responses may be identified for individual activities or risks or for wider aspects of the schedule. Responses may also include the decisions to model **alternative planning scenarios** or to **develop more detail** within the risk model itself.

Common Faults

1. Using the project's detailed schedule to produce the activity network.
 2. Making unrealistic assumptions of certainty by including too much detail in the model.
 3. Diluting the quality of risk estimates as a consequence of having too many to make.
 4. Failure to identify and disclose key framing assumptions.
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About the Author



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Martin Hopkinson, recently retired as the Director of Risk Management Capability Limited in the UK, and has 30 years' experience as a project manager and project risk management consultant. His experience has been gained across a wide variety of industries and engineering disciplines and includes multibillion-pound projects and programmes. He was the lead author on Tools and Techniques for the Association for Project Management's (APM) guide to risk management (*The PRAM Guide*) and led the group that produced the APM guide *Prioritising Project Risks*.

Martin's first book, *The Project Risk Maturity Model*, concerns the risk management process. His contributions to Association for Project Management (APM) guides such as *Directing Change* and *Sponsoring Change* reflect his belief in the importance of project governance and business case development.

In his second book *Net Present Value and Risk Modelling for Projects* he brought these subjects together by showing how NPV and risk modelling techniques can be used to optimise projects and support project approval decisions. ([To learn more about the book, click here.](#))