Analysing Risk in a Novel Transport System

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Understanding Risk

- Requirement to assess risk to everyone exposed to the system. Including…
  - Passengers
  - Employees
  - 3rd parties

- Can be done **Qualitatively** or **Quantitatively**

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Quantitative Model

- Chosen method: Fault Tree Analysis (FTA)
- Builds on Hazard Analysis (HAZOP)
- *Risk = Likelihood x Average Consequence*
- Many aspects of the system operation are unique – makes data gathering challenging
- Model forms a key part of the System Safety Case

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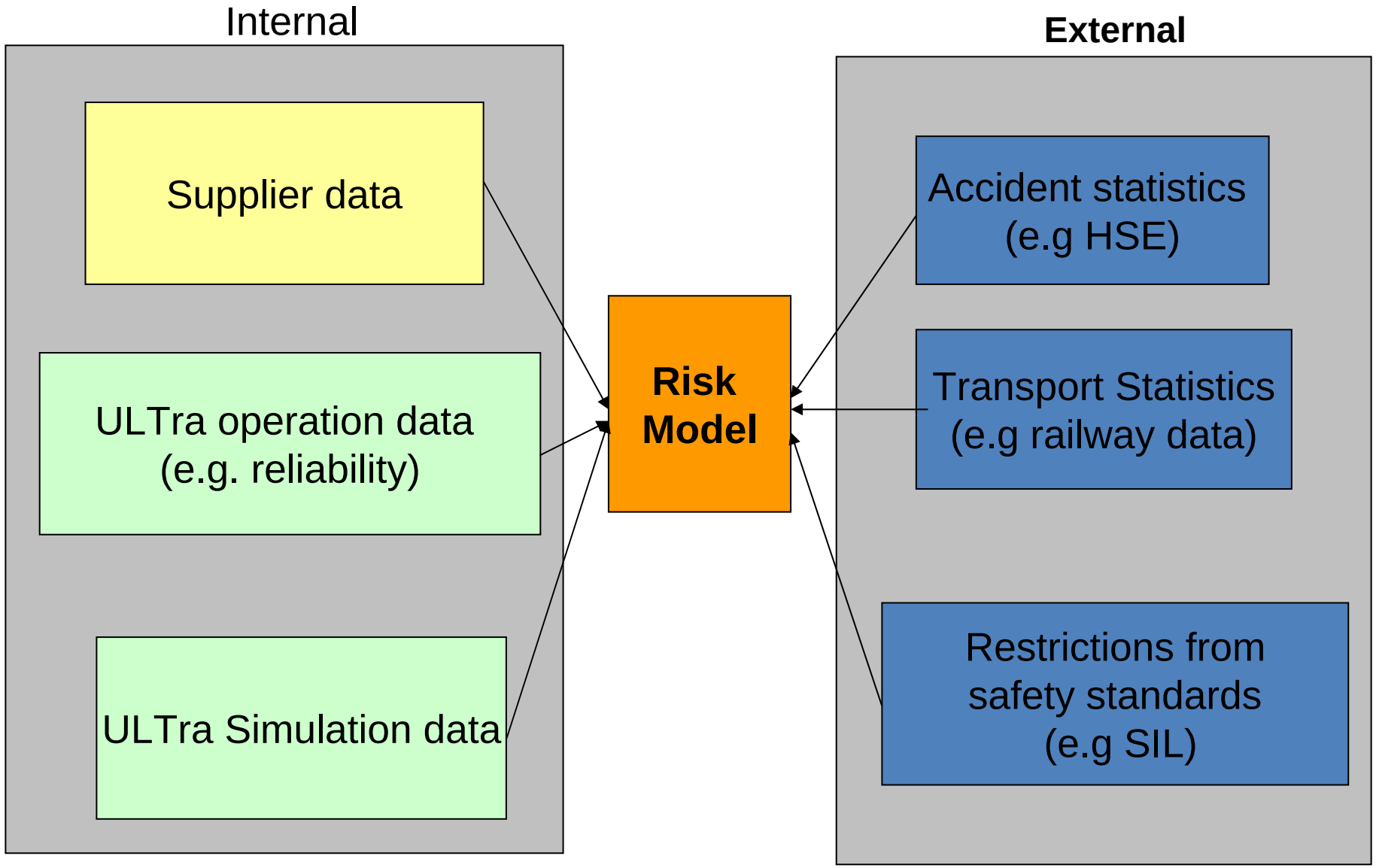
Obtaining Data



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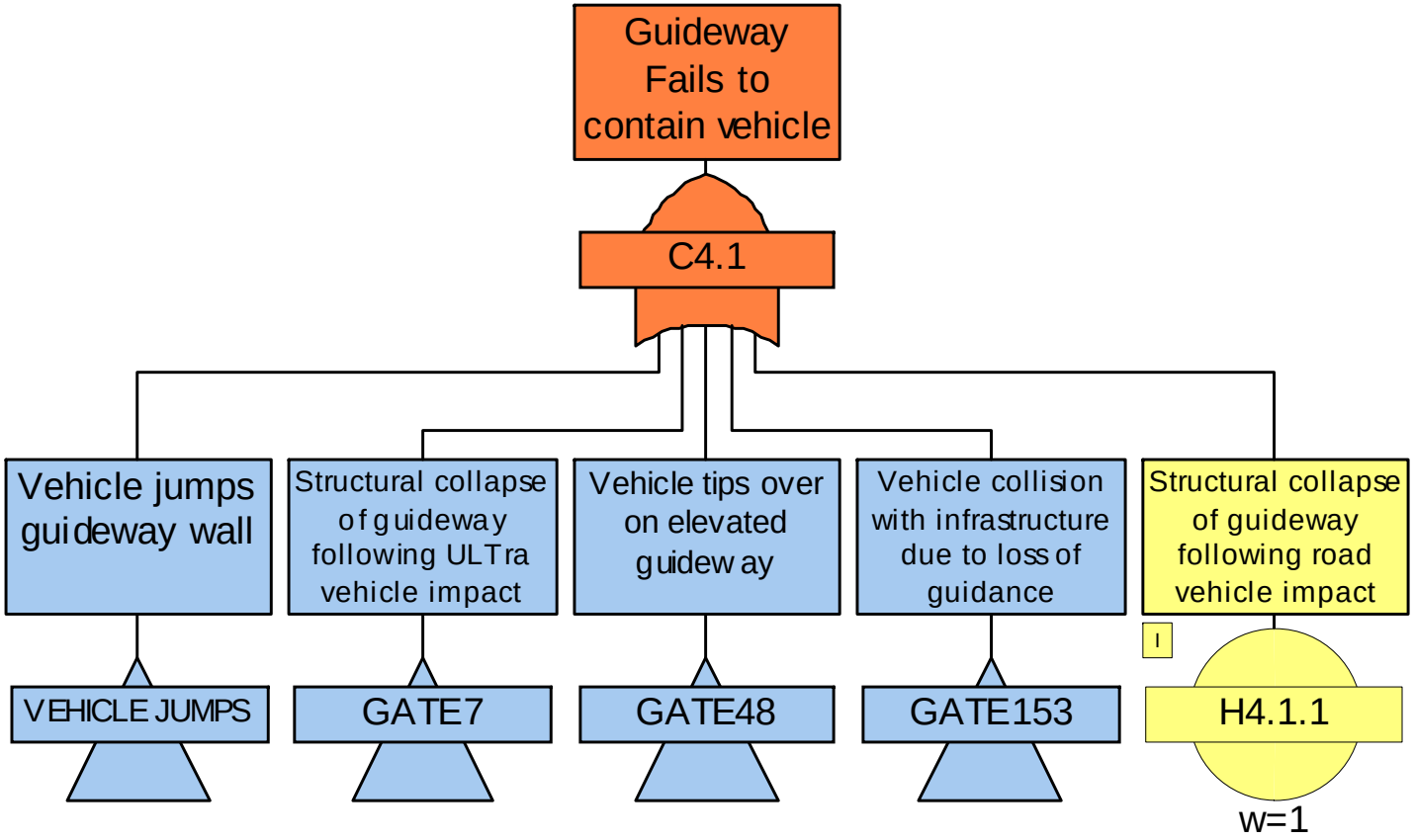
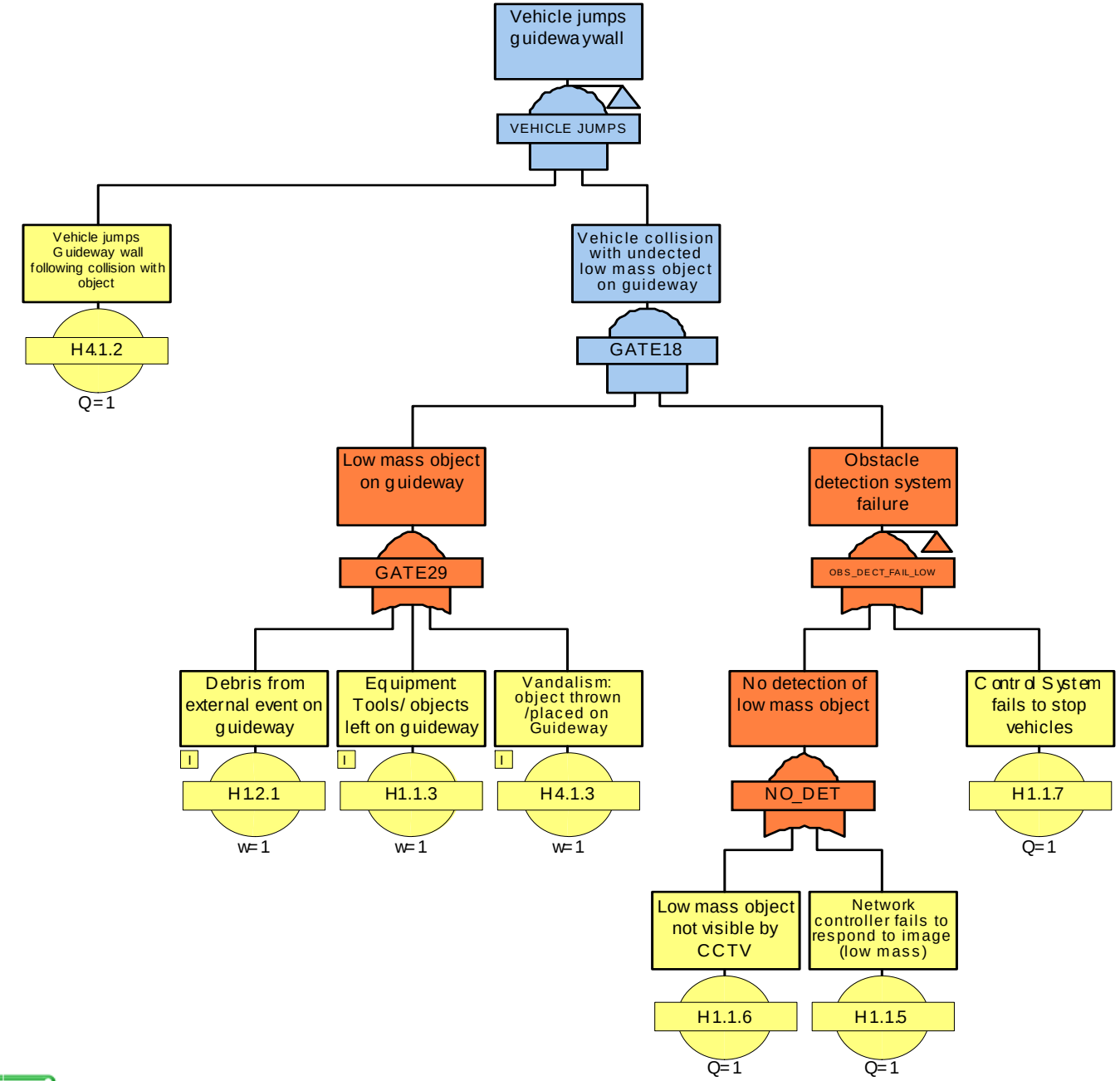
Example Fault Tree



Note: Example numbers and model structure shown here



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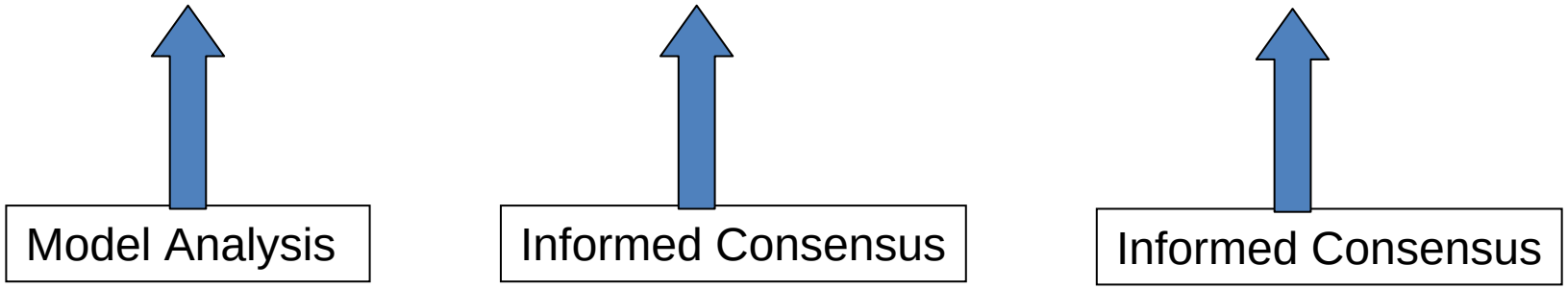
Risk based decision making

***Priority Value* =**

Sensitivity* x *Confidence* x *Controllability



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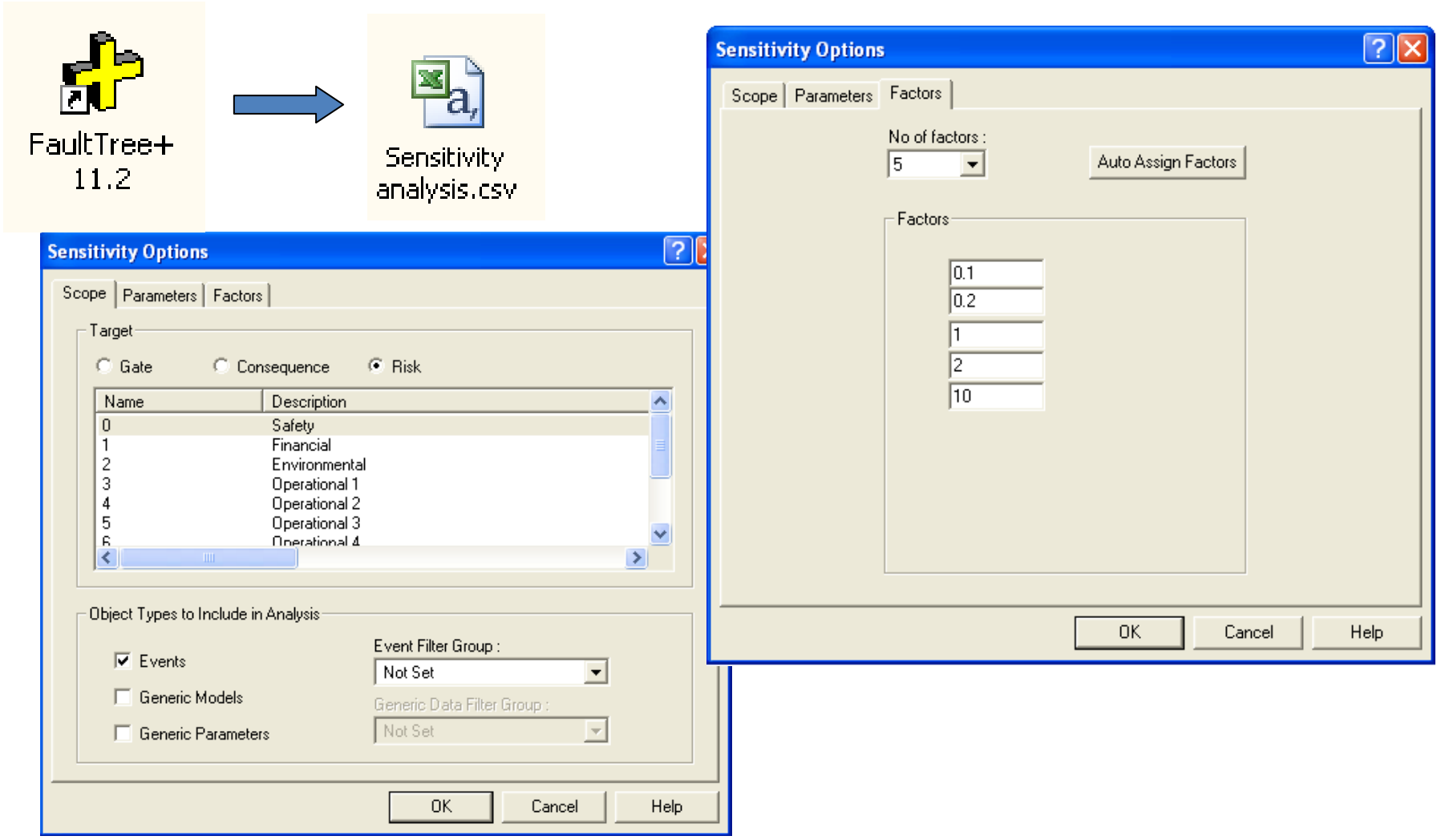
Sensitivity Analysis



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Assigning Confidence Values

Confidence Level	Qualitative Definition	Quantitative Definition
1	Very Low confidence	99% certainty that 'model value' is no more than 3 orders of magnitude worse than 'real' value.
2	Low confidence	99% certainty that 'model value' is no more than 2 orders of magnitude worse than 'real' value.
3	Medium confidence	99% certainty that 'model value' is no more than 1 order of magnitude worse than 'real' value.
4	High confidence	99% certainty that 'model value' is no more than 50% worse than 'real' value.
5	Very High confidence	99% certainty that 'model value' is no more than 5% worse than 'real' value.

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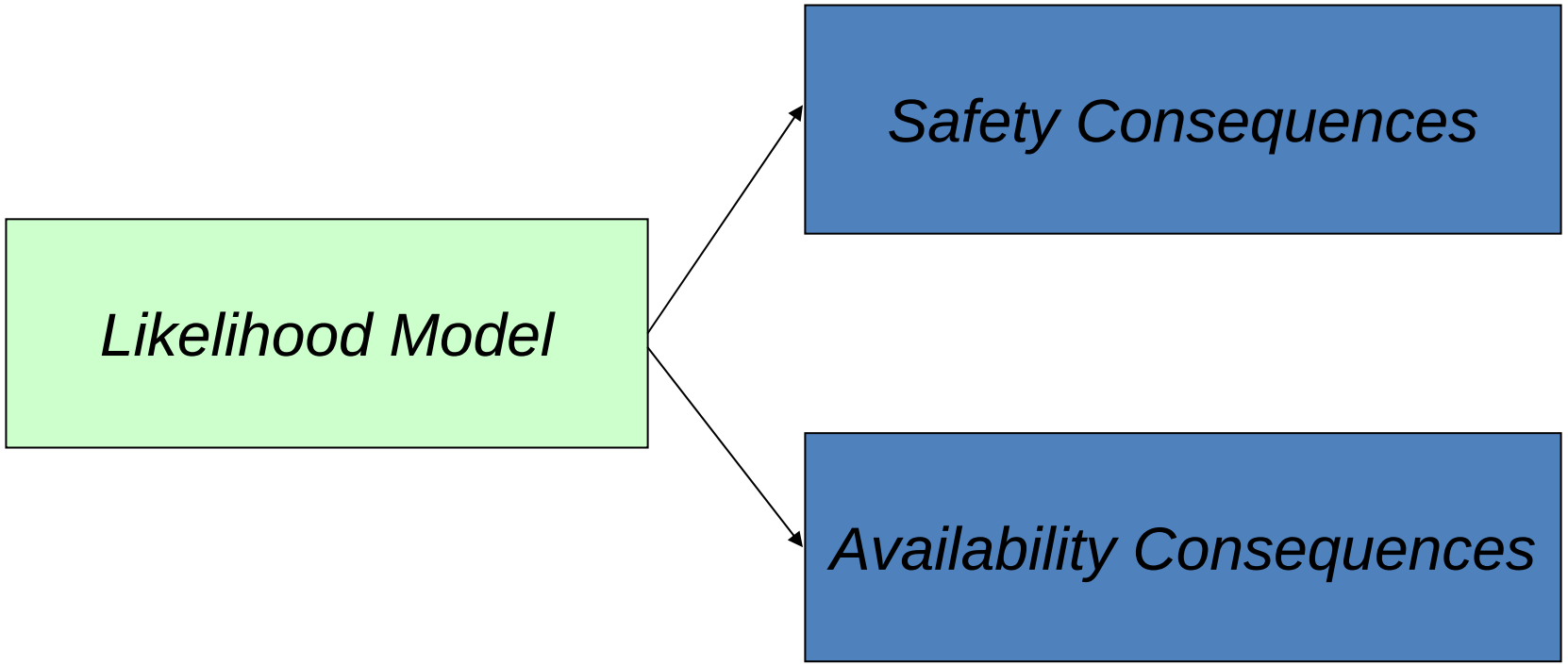
Using Risk Model to Understand Availability

- Define a second set of ‘Consequences’



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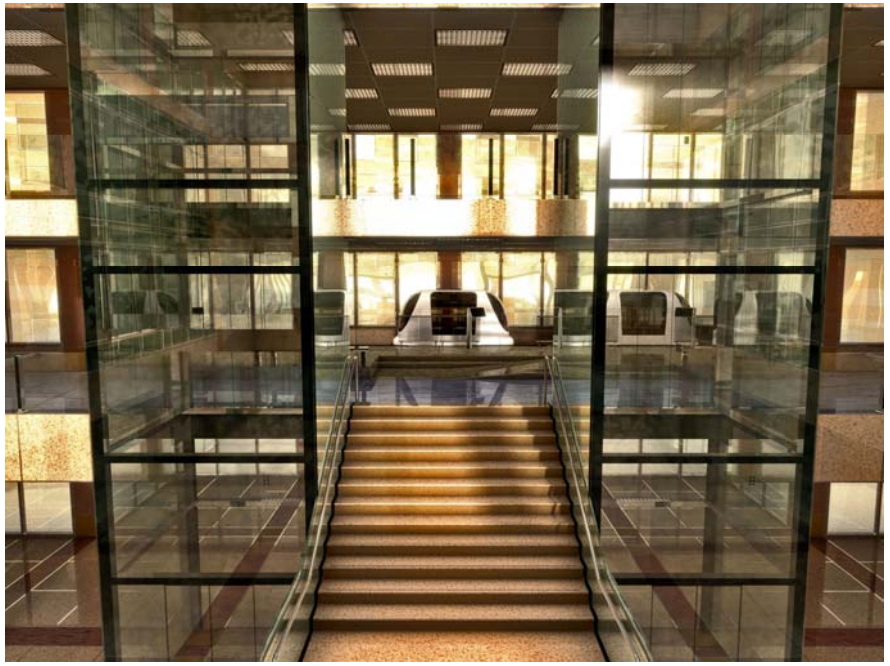
Going Forwards….

- 3 key principles:
  - Flexibleness
  - Efficient Communication
  - Regular updating of the model parameters



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