

Problem analysis

Åsa Fransson & Gunnar Gustafson

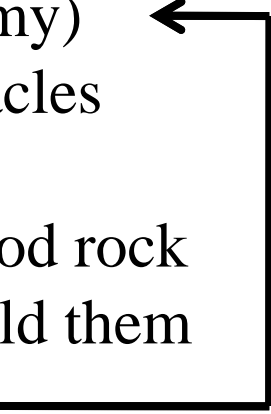
What makes a problem a problem?

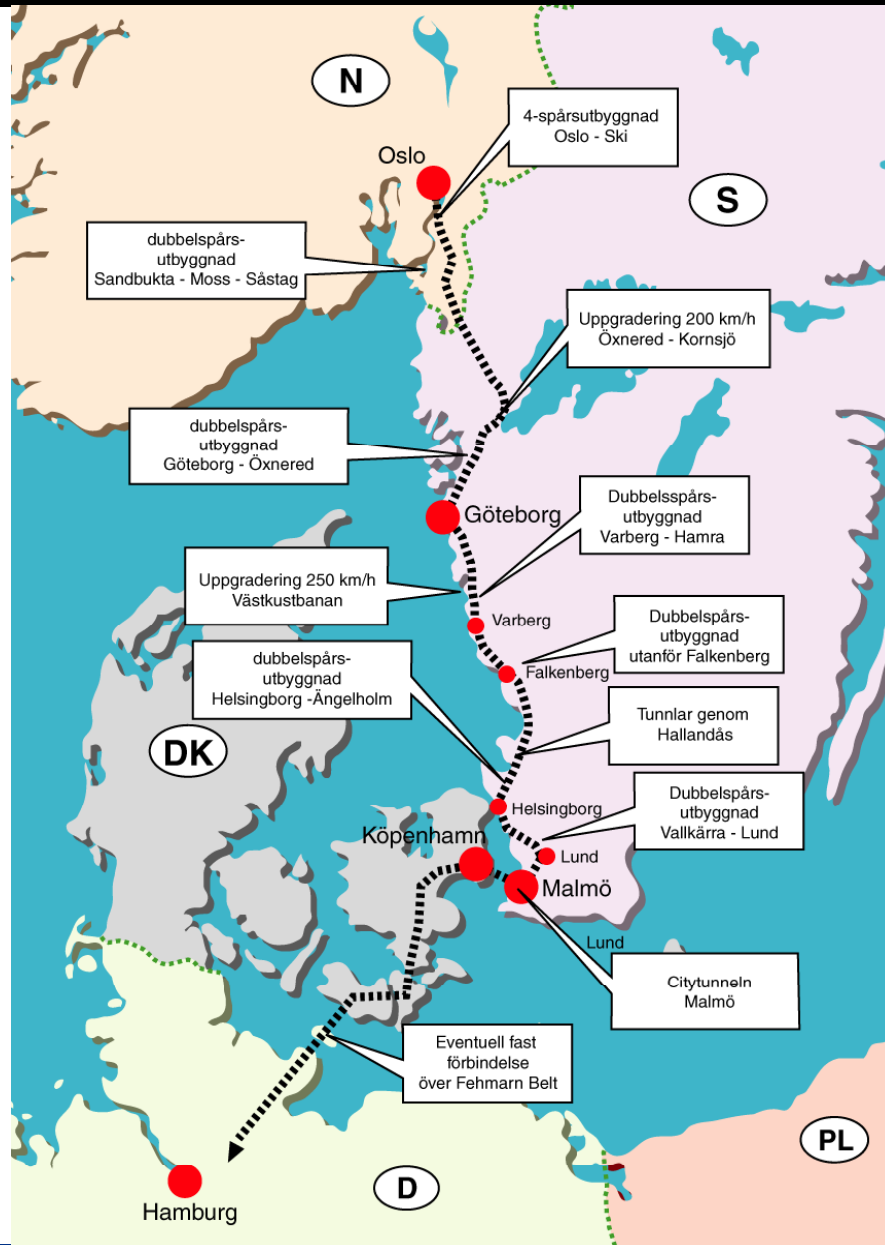


A good start involves putting questions to all (including yourself)

Needs are behind everything!

Conservation of energy and the environments combined with economic growth:

- Requires that we move transportation from roads to railway:
 - Requires that we have an effective railway system:
 - Requires that we build better railways
 - Requires that we can pay for them (economy)
 - Requires that we overcome natural obstacles
 - Requires that we build tunnels (etc)
 - Requires tha we have reasonably good rock
 - Requires that we know how to build them
 - Requires that we know the cost
 - Requires that we can get local acceptance
- 



Railway projects in western Sweden

Two Capitals: Oslo

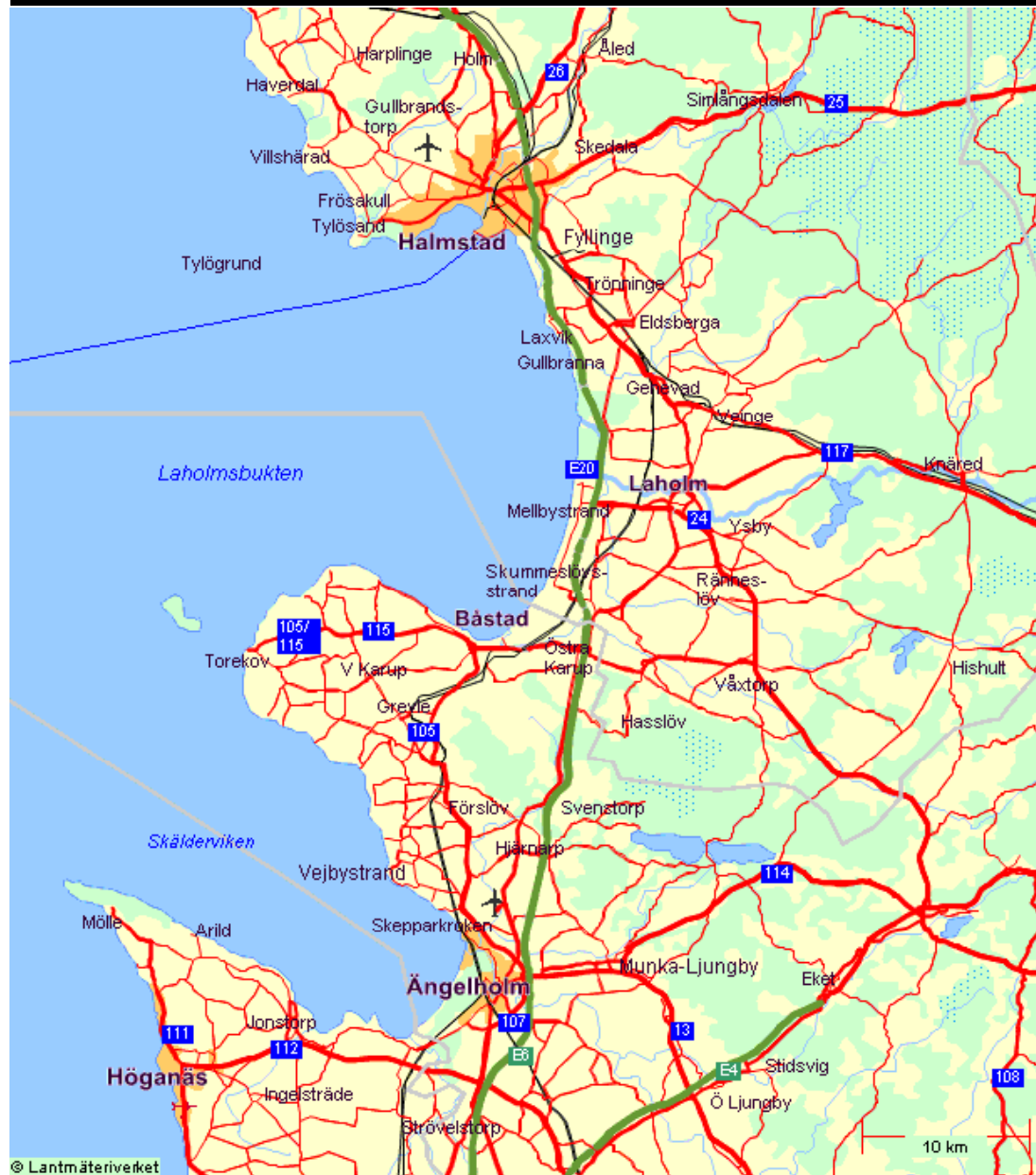
and Copenhagen

Sweden's 2nd and 3rd cities:

Göteborg and Malmö

Scandinavia's largest seaport:

Göteborg

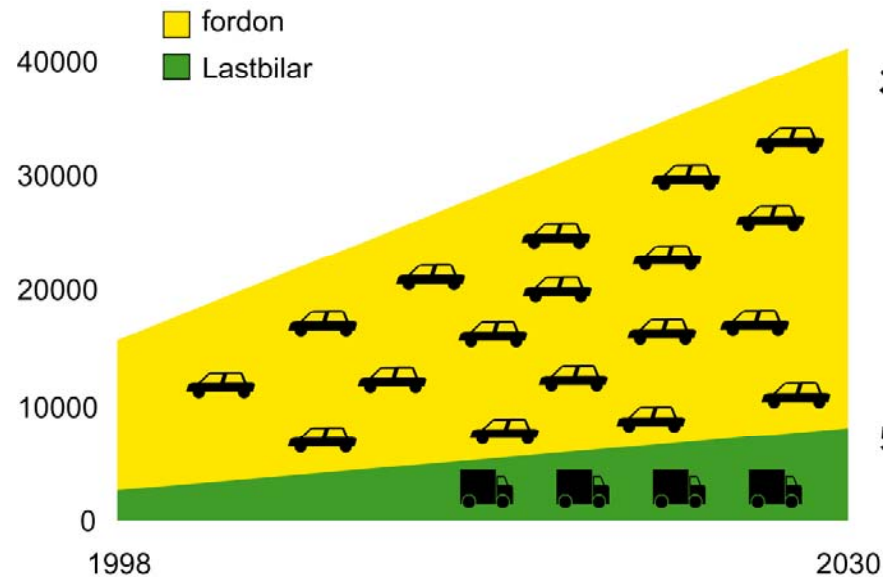


Where are
the
obstacles?

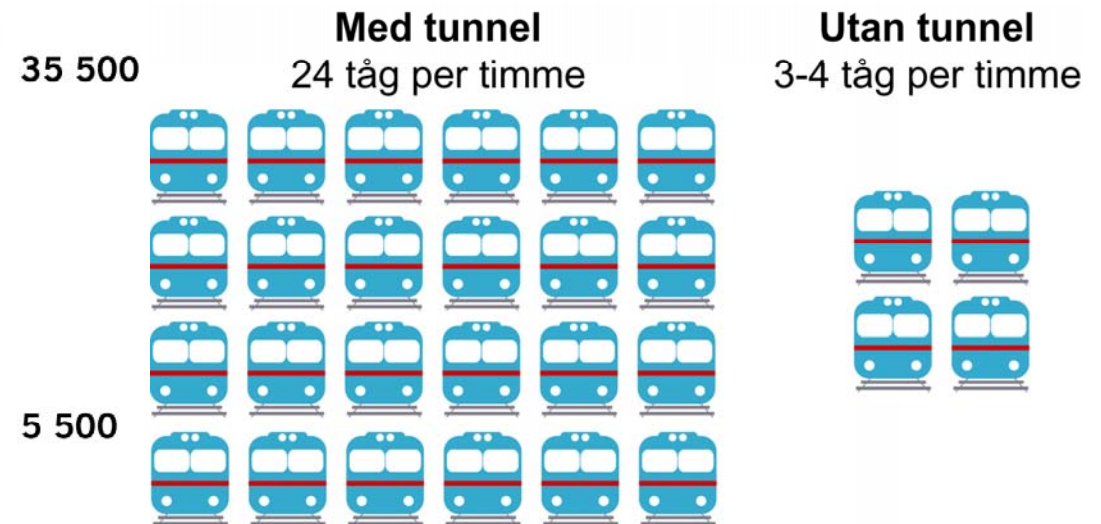
Who is
stakeholder?

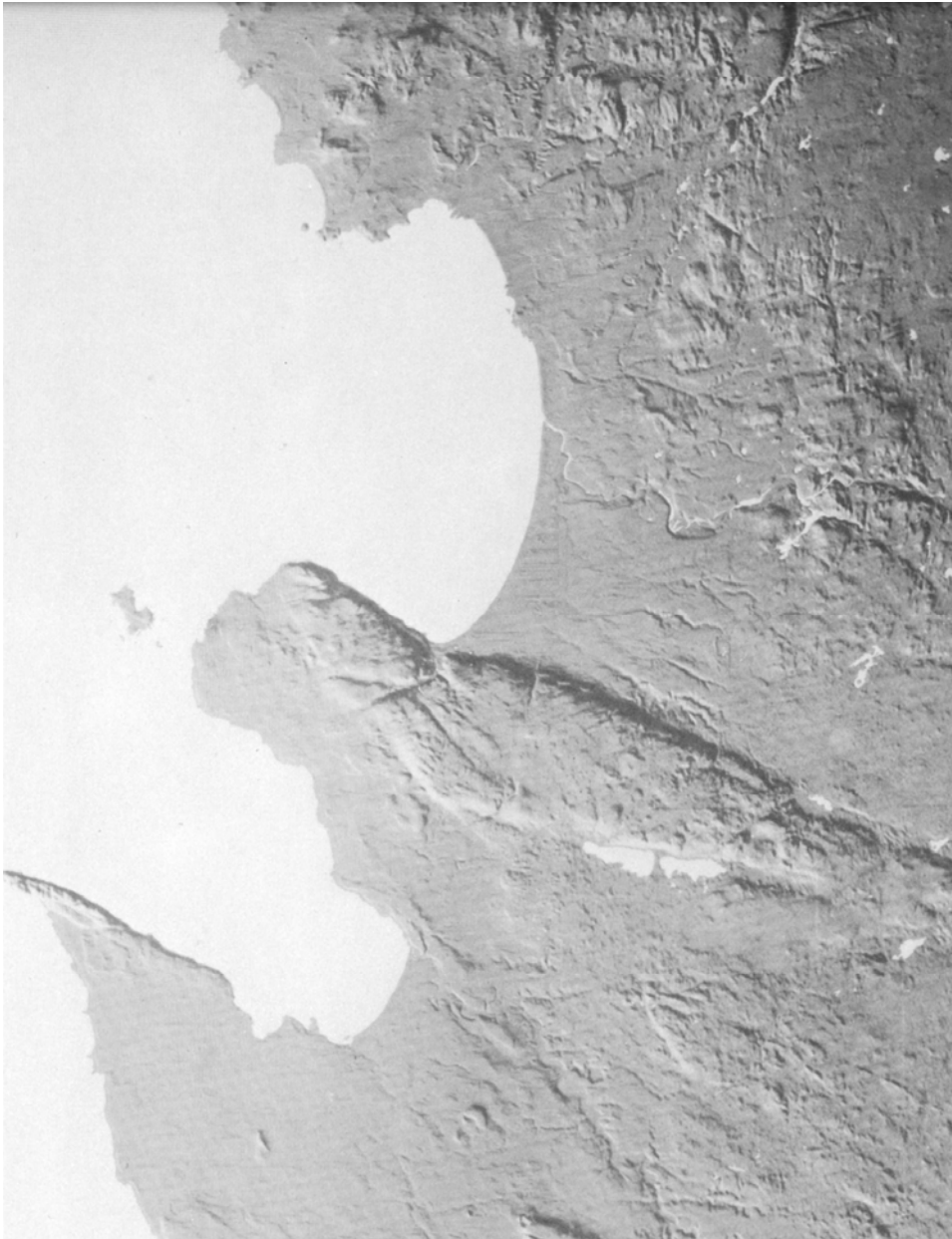
Transport development

Road transports over Hallandsås



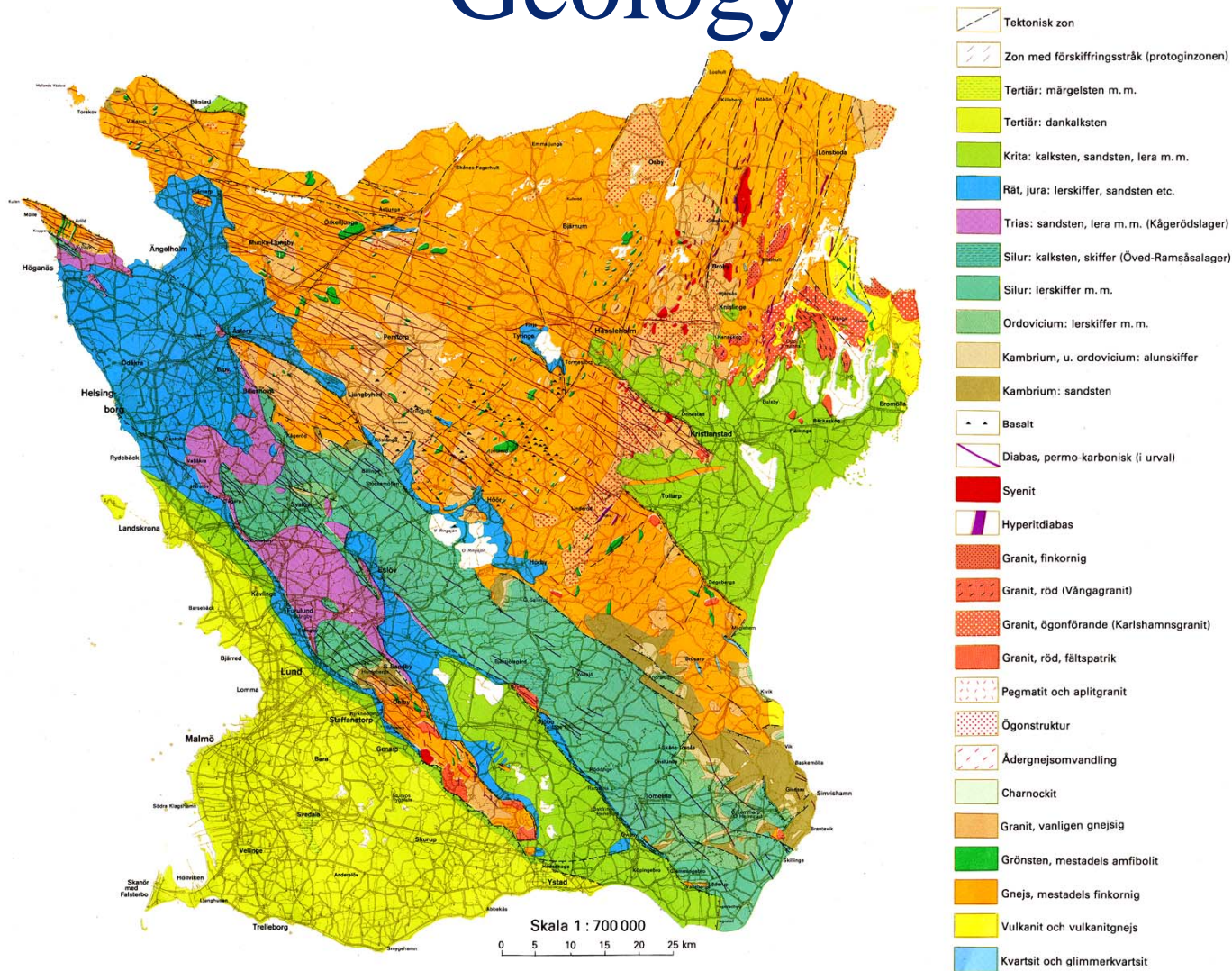
The capacity of the railway





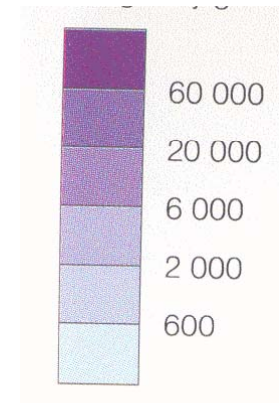
Topography

Geology

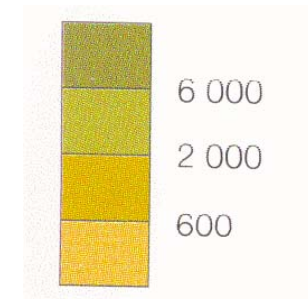


Hydrogeology

Well yields
Sedimentary rock



Well yields
Crystalline rocks



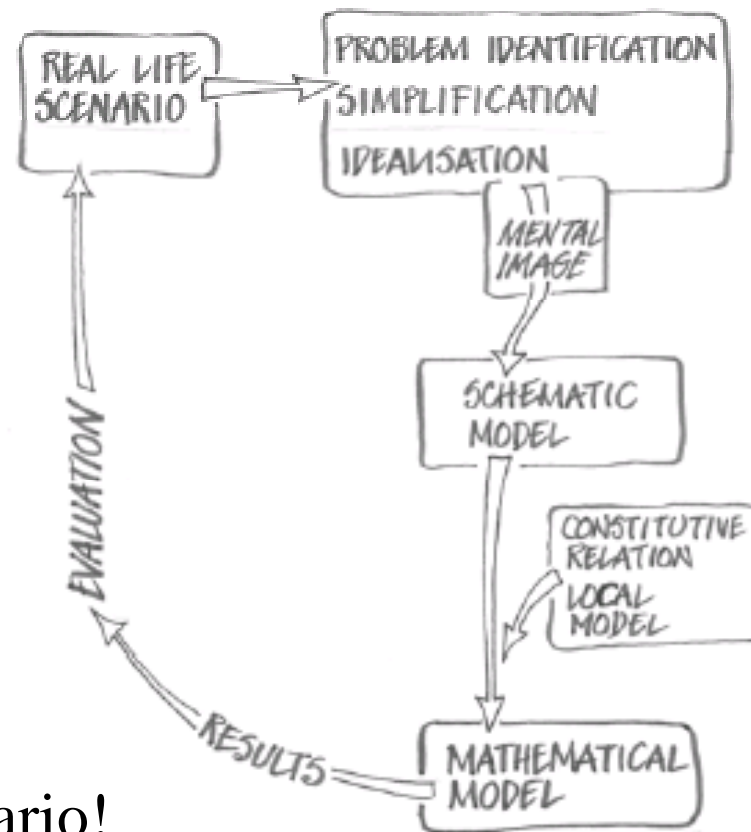
Questions to answer



The conceptual model



Modeling process in problem analysis

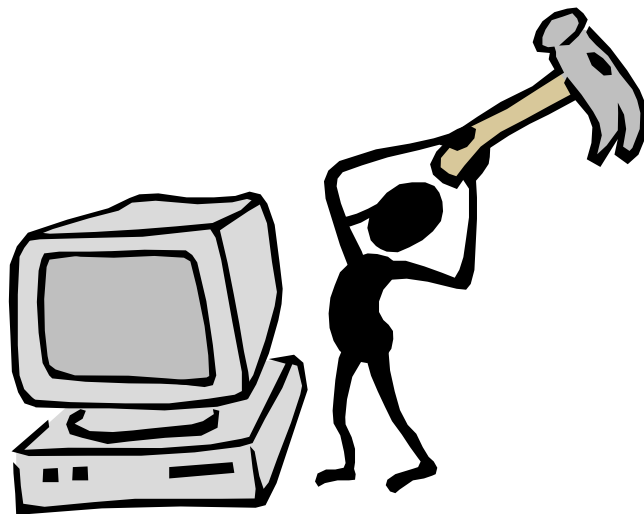


Not just one scenario!

Elements in a model

- Purpose and scope
- Objectives – What questions to answer
- Conceptual model
- Calculation
- Presentation of results
- Analysis and conclusions
- Judgement – Is the answer good enough?

Think before you compute!



There comes a day in every young engineer's life when she realises that the solution to her problem is not at the same time the solution to a differential equation

(Mart Mägi)