

Light-Rail Extension in Solna

Traffic modelling with Dynameq
and LinSig

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Light-Rail: Solnagrenen



- The light-rail extension from Alvik to Solna Station
- Stage 3- Solna Business Park to Solna Station



Frösundaleden – Traffic Flows



Solnagrenen- Ankdamsrondellen

Passes the junction in a tunnel underneath



Solnagrenen- Frösundaleden



Tvärbanan-Light Rail



- Tracks segregated from the carriageway
- Absolute priority at signalised junctions

Tvärbanan Frösundaleden

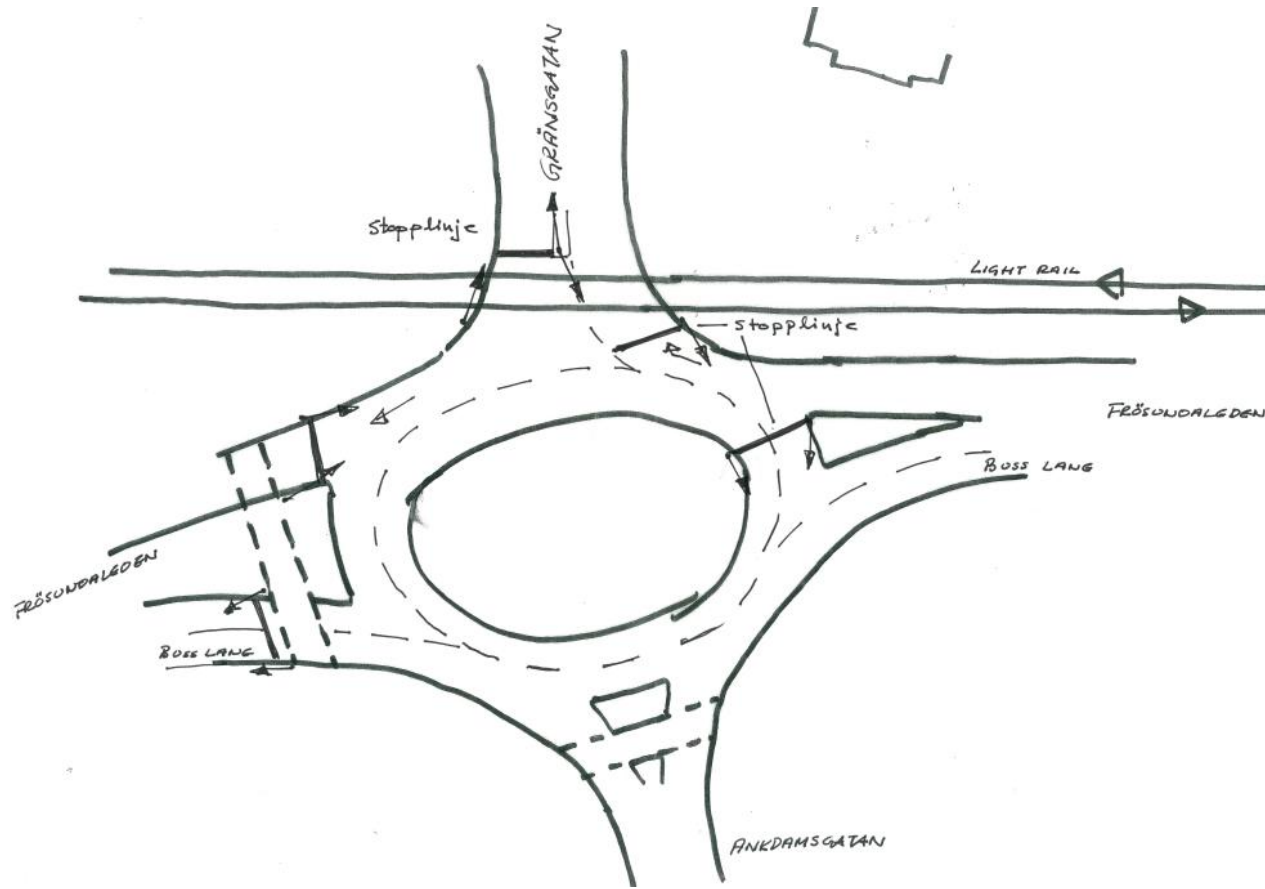
Cost reduction



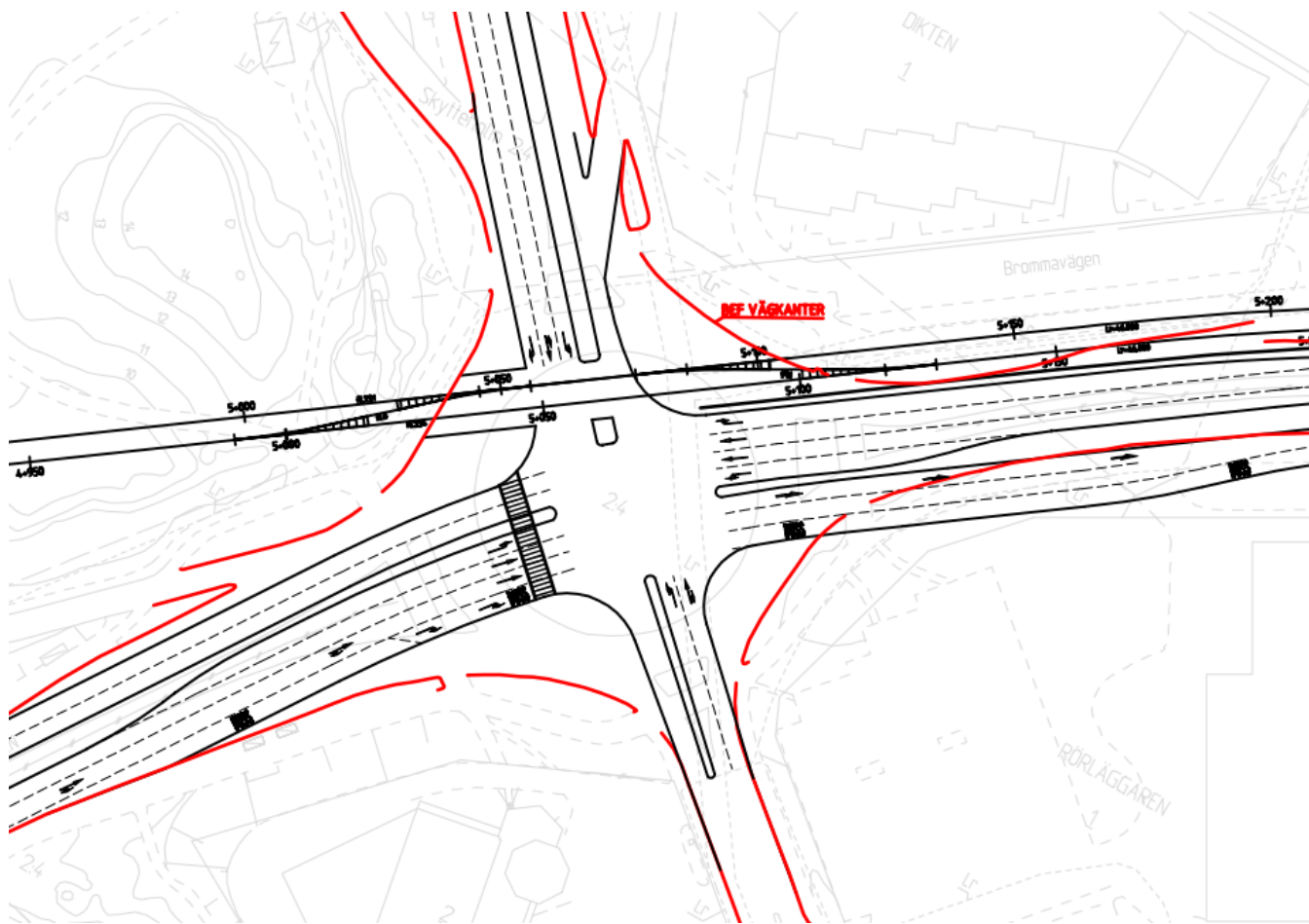
- Cost reduction- Constructions are taken away
- The train crosses Ankdamsrondellen at grade
- Suggested to cross also Solnavägen at grade instead of grade separated in tunnel

Ankdamsrondellen

Early attempt at design – all arms signalised



- Later design



Absolute priority for the light rail train



- The train needs a green light at least 150 meters before the junction
- The driver shall be able to decelerate to 15 Km/h at a point at least 40 m before the junction
- This will result in long red times for signal phases that are in conflict with the train!
- Even longer if two trains meet

Questions?



- How will this affect traffic on Frösundaleden?
- Can the train be given absolute priority through Ankdams roundabout?
- What are the junction design alternatives
- What will be the delay for conflicting traffic flows and will those delays affect traffic flows in the whole area?
- Will the altered traffic flows change the basis for the designs of adjacent junctions?

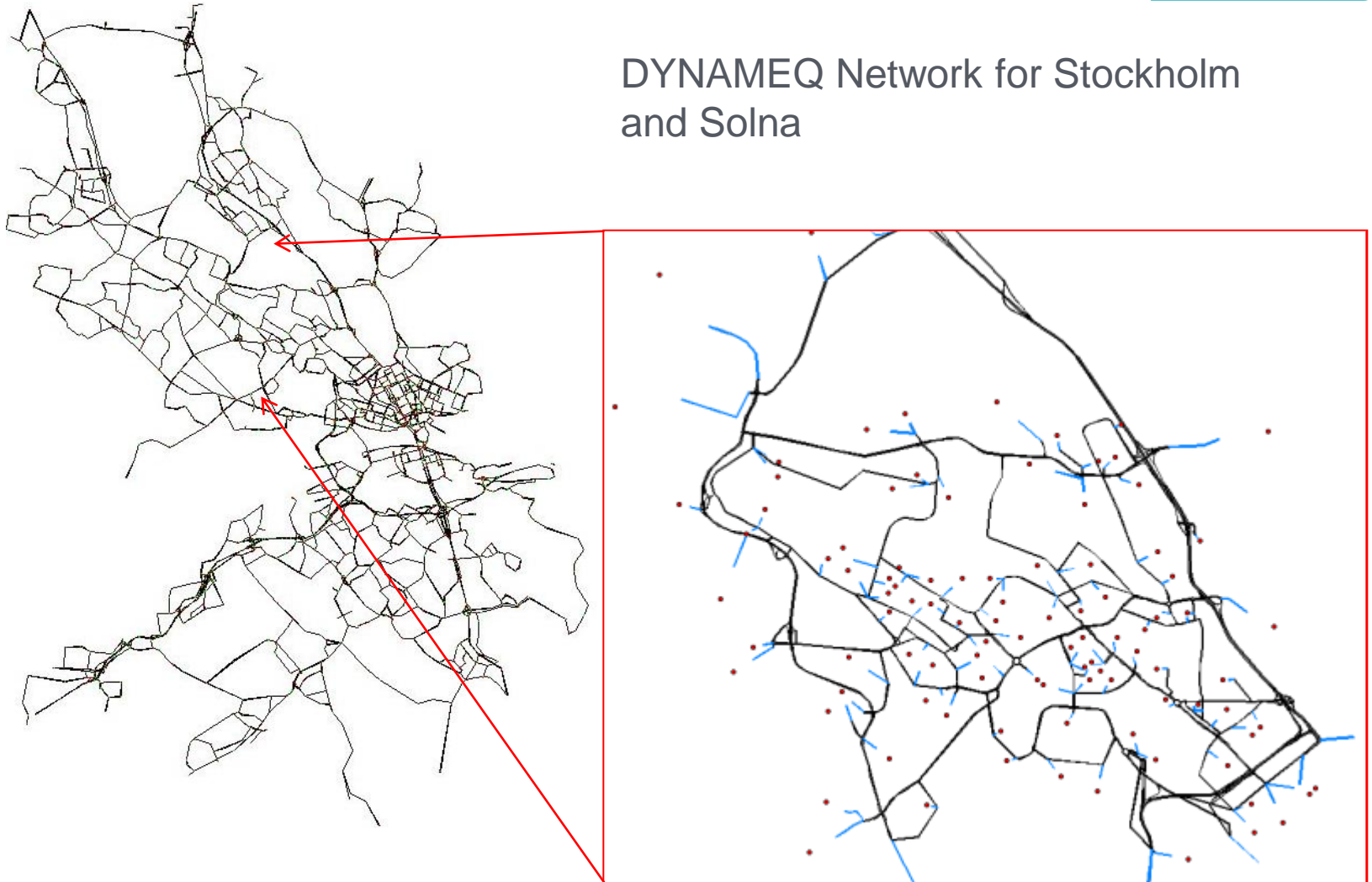
- To answer the questions we decided:
- To model the network for two future years; 2007 and 2015, using the software Sampers and EMME/2.
- To use a Mesoscopic model (Dynameq) to evaluate the effect on the Solna network.
- To use LINSIG to find a working layout for the junction and traffic signal designs and to get signal timings for Dynameq and Vissim.
- To use a microsimulation model (vissim) to evaluate the final design.

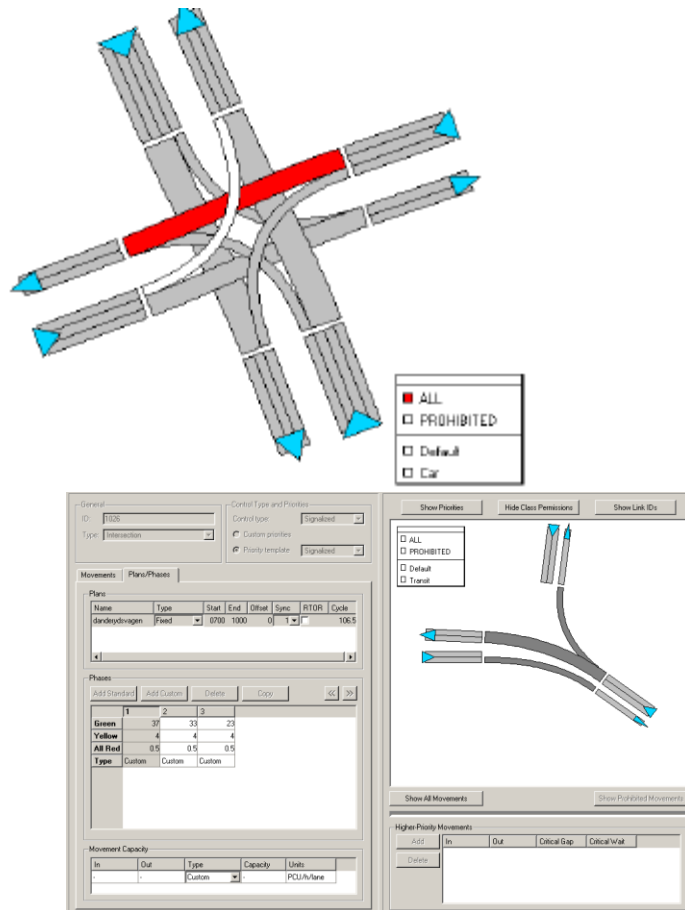
DYNAMEQ

Mesososcopic model



DYNAMEQ Network for Stockholm and Solna

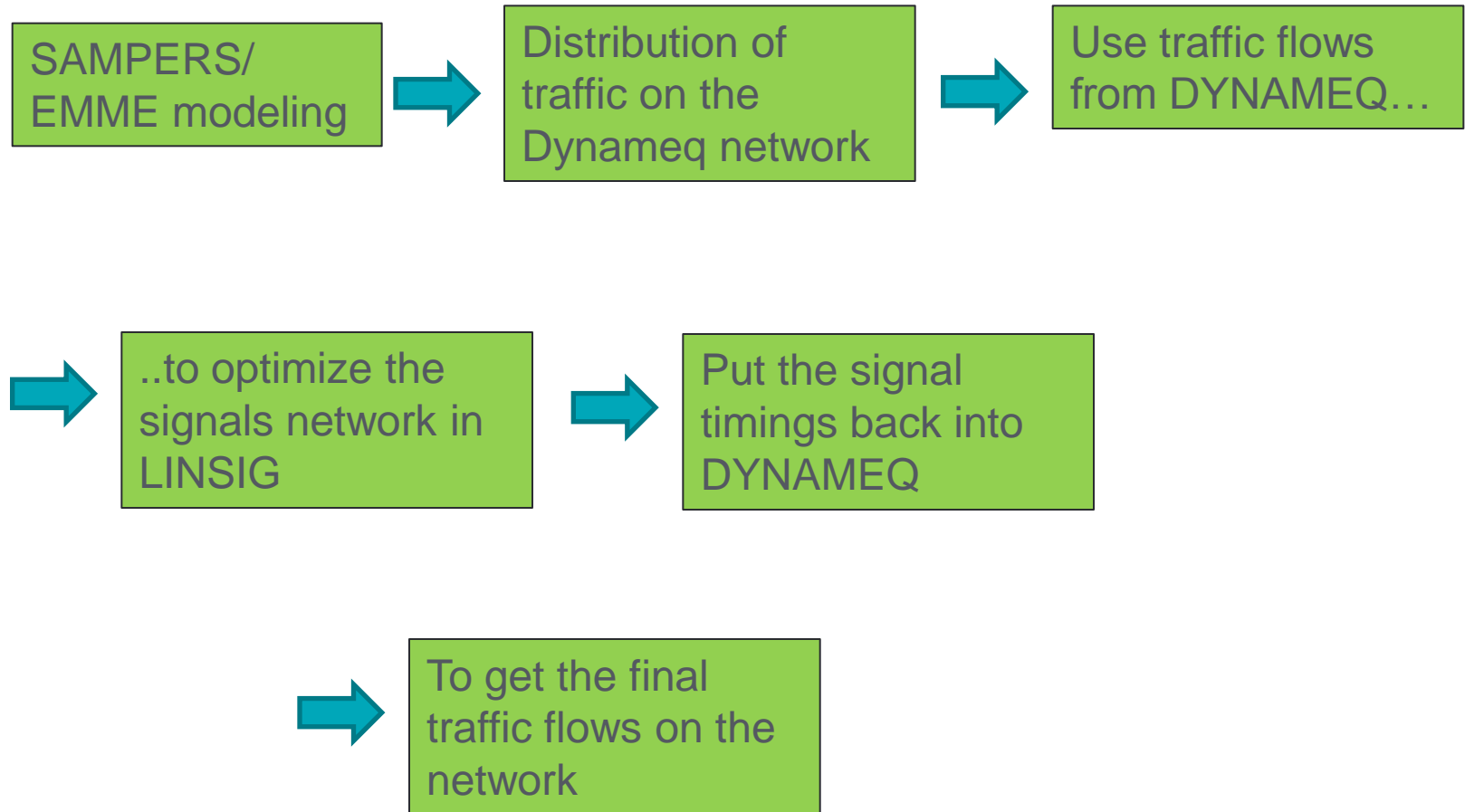




The graphical user interface for traffic Signals in DYNAMEQ

- Staging
- Intergreen
- Green times

Work flow

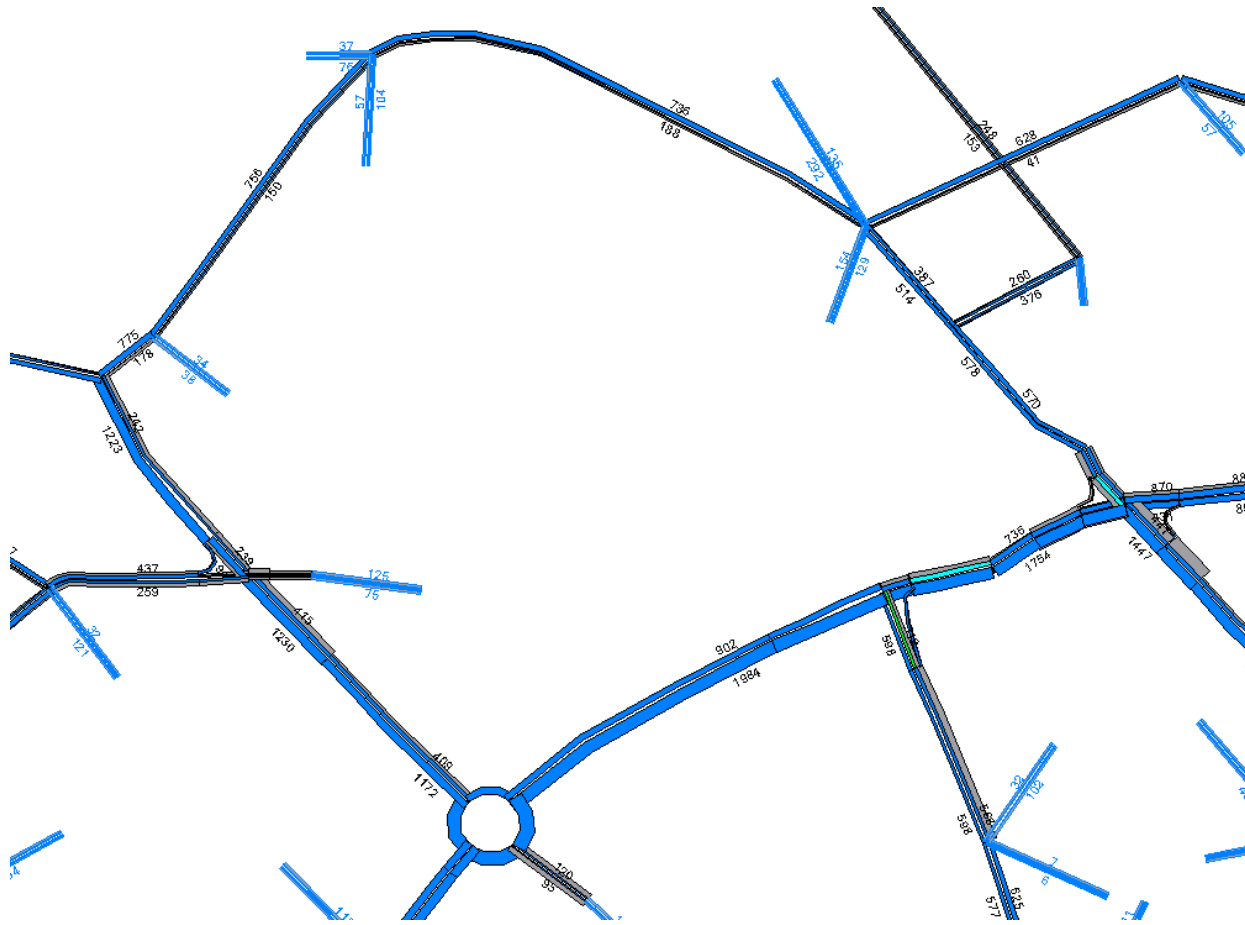


EMME/SAMPERS scenario 2015

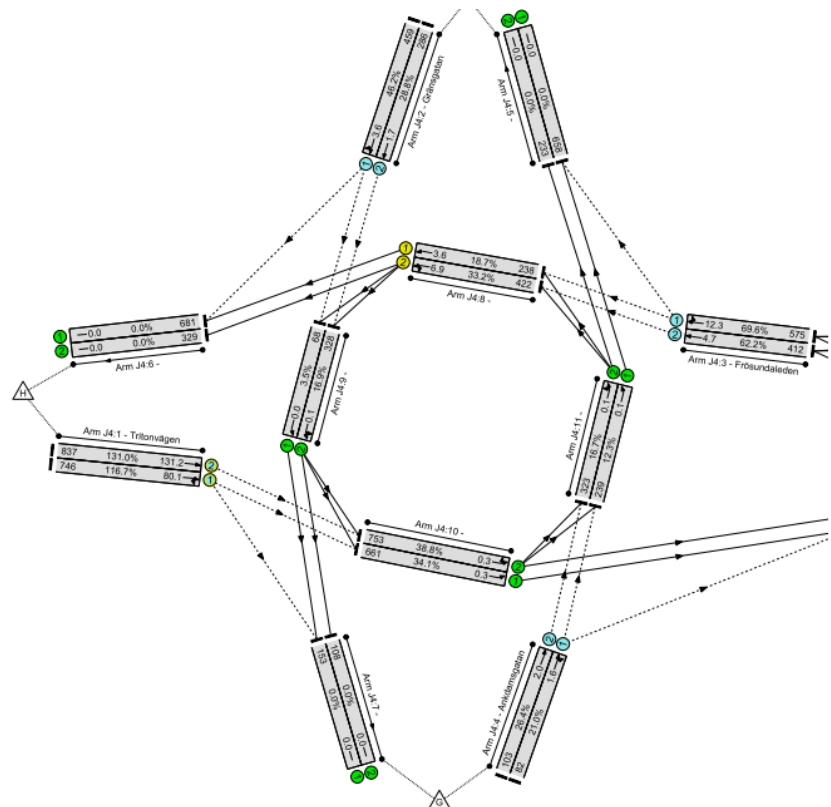


DYNAMEQ Network 2015

No train



- Saturation levels today calculated to just below 100%
- Ankdamsrondellen Roundabout oversaturated 2015, even without the light-rail extension.
- Saturation levels >130%
- With the light-rail the saturation levels are at most just over 100%, but all arms have high saturation levels.



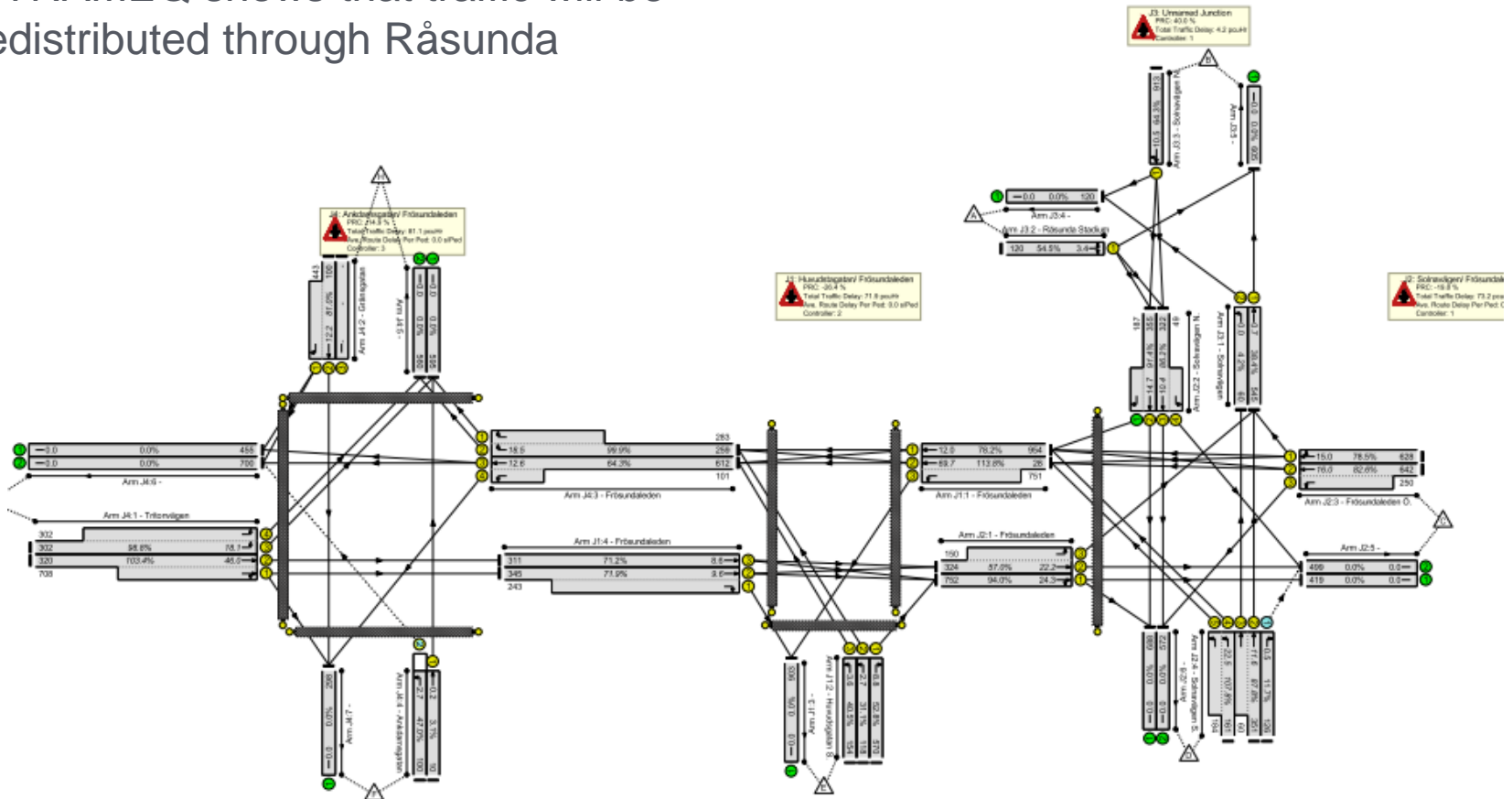
DYNAMEQ Network 2015

With train



- Traffic flow on Grängsgatan halved during peak hour
- +200 through Råsunda

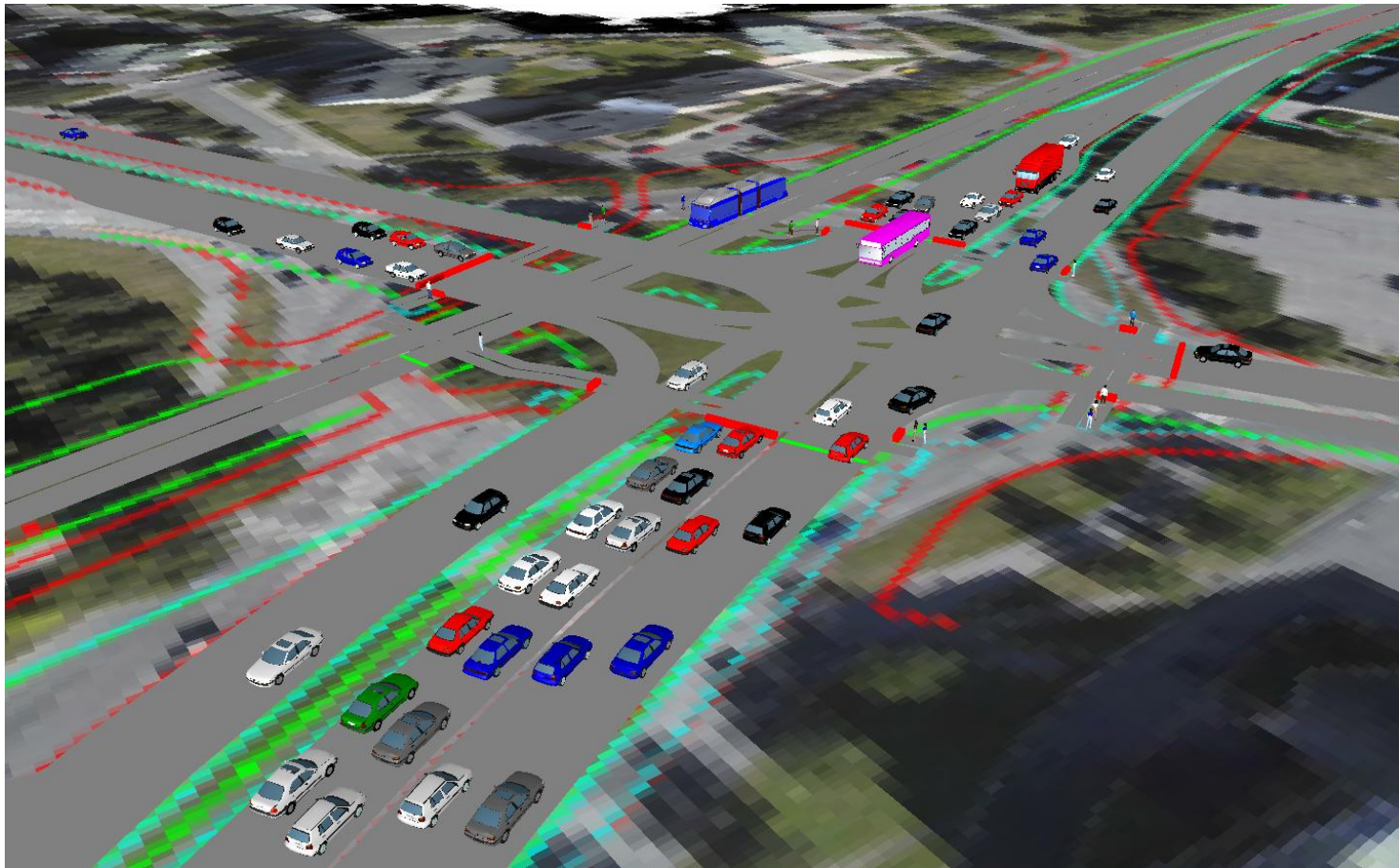
- Saturation rate at 103% on Frösundaleden
- DYNAMIQ shows that traffic will be redistributed through Råsunda



Vissim



Vissim was used to evaluate the designs



Conclusions



- The different models complement each other and answer different questions
- The use of different models also in the design stage gives a good understanding of how the traffic system works
- The effects of our design decisions quickly become apparent easing the decision making process
- Any change in the design makes you have to update at least two different models
- We haven't found any one model that can handle all levels of modeling as well as traffic signals optimisation