Integrated Network Management between Urban and Freeway networks

The Proof of Concept Trilogy
"The 3rd and Final Book"

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The Proof of Concept Trilogy
“The 3rd and final Book”

Recap

- Local and Regional Traffic Management policy
- Book 1 and Book 2

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Recap: Traffic Management Policy

“Healthy Urban Living ”

- Quality of life, environment, safety;
- Sustainable Mobility;
- Downgrading the urban motorways;
- Supporting Public transport, cyclists, pedestrians;
- Operational TM with regional partners;
- Syncronised regional TM policies;
- Regional TM systems.

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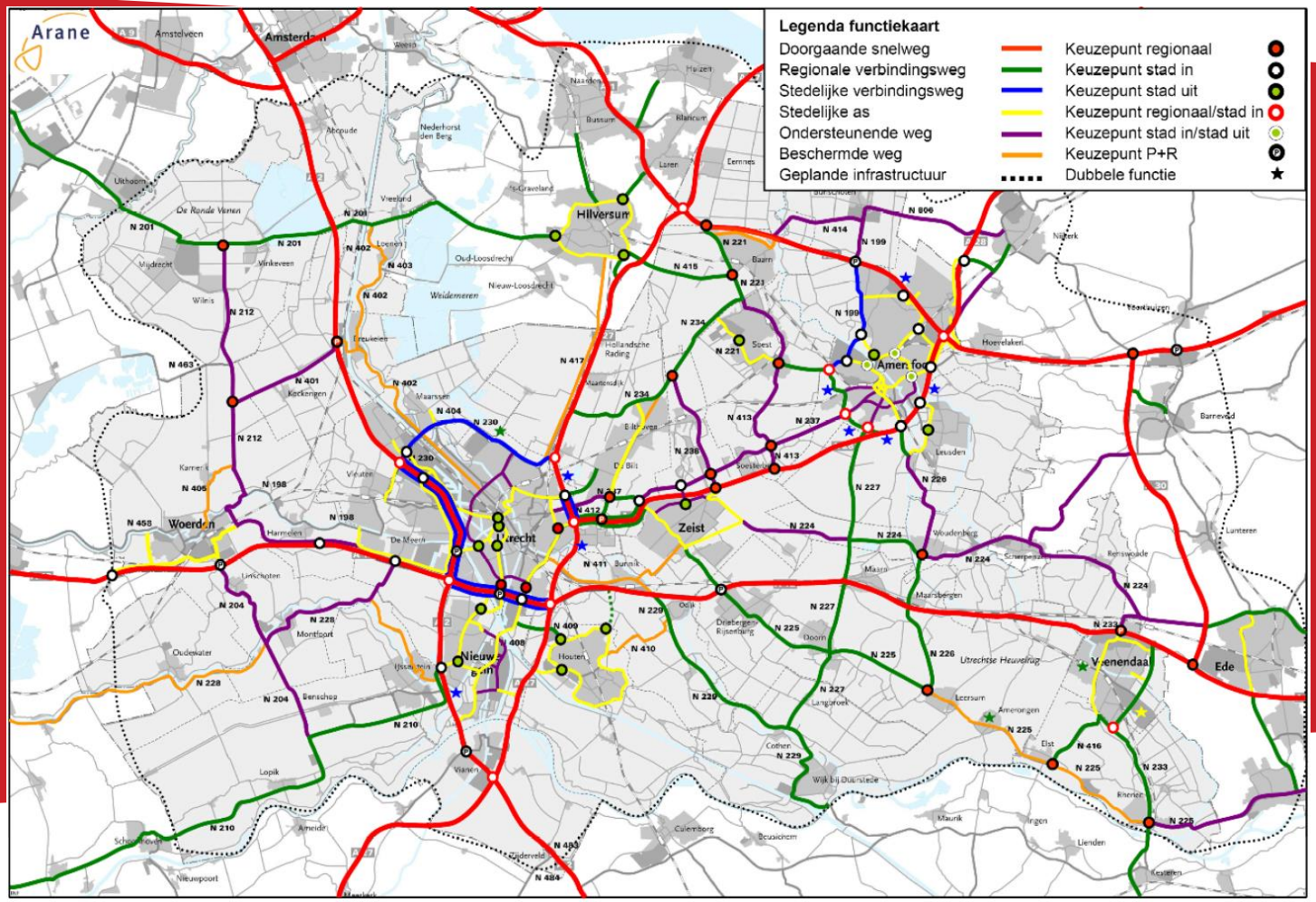
Recap: Regional Road Network for Traffic management



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Recap: Book 1
What did we want, have and need

"We wanted"

- Multi Modal regional Traffic Management
- Integrated and Network based (INM)

"We had"

- Agreed regional Traffic Management policies
- Some Regional TM systems (surely not state of the art…..)

"We needed"

- Automated and elegant TM measures
- Tools and instruments to do that job

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Recap: Book 1
Developement of TM Tools

- The radar Queue Estimator;
- The Bottleneck Germ Tracer, both for highways and urban roads;
- Concept of automated TM with alternating Master, Gard and Slave TLC's;
- Automated control directly from the regional Network Management System;
- Separate NMS for innovation: NMS-I.

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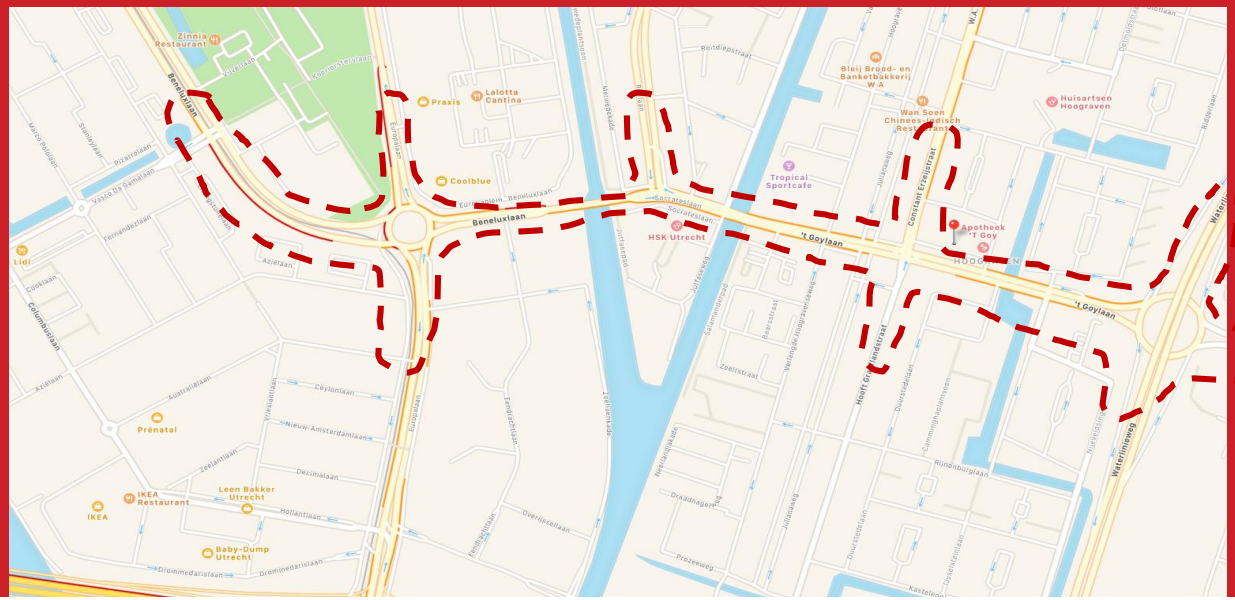
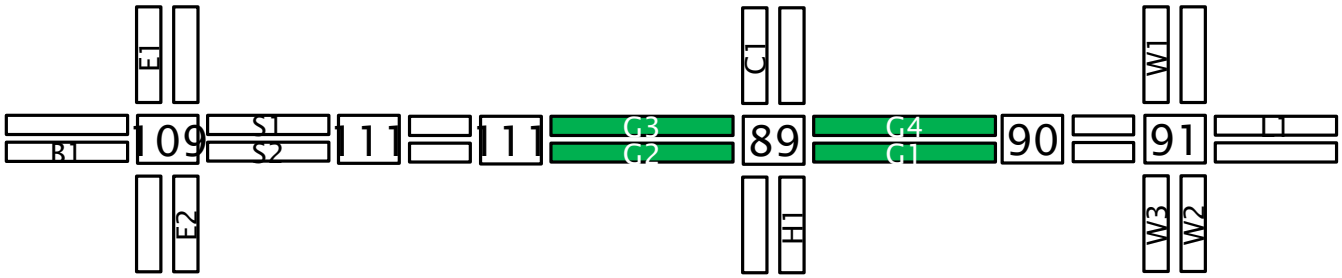
Recap: Book 1
“Simple” TM test area

- The ‘t Goylaan: 1 road , 3 intersections





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Recap: Book 2
Upscaling the TM Network

Goylaan – A12

Recap: Book 2

Data fusion of several sources

- FCD, Loop data, camera's etc.;
- Precise network analysis;
- Accurate monitoring, estimation and evaluation.

Functional and Operational Improvements

- User interfaces, automation, error logging, TM products

Robust and reproducible

- Most of the developed products became production proof
- For possible deployment in other parts of the region /country

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6 Sub Projects:

- A: Transition Inn. Env.-> Op. Env.
- B: Transfer of Knowledge
- C: Coordinated Rampmetering A12
- D: Radar instead of loops in LTC’s
- E: Thermicams for cyclists detection
- F: Forecasting traveltime in a network

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The 3rd Book, part A

Transition Inn. Env.-> Op. Env.

2 NMS's :

- NMS-I innovative ; Inn. Env.;
- NMS-P Production & Op. Env.

Transition from NMS-I to operational environment;

Ownership, Organization, Maintanance, Security, Costs, etc.etc.;

New innovative public-private partnerships.

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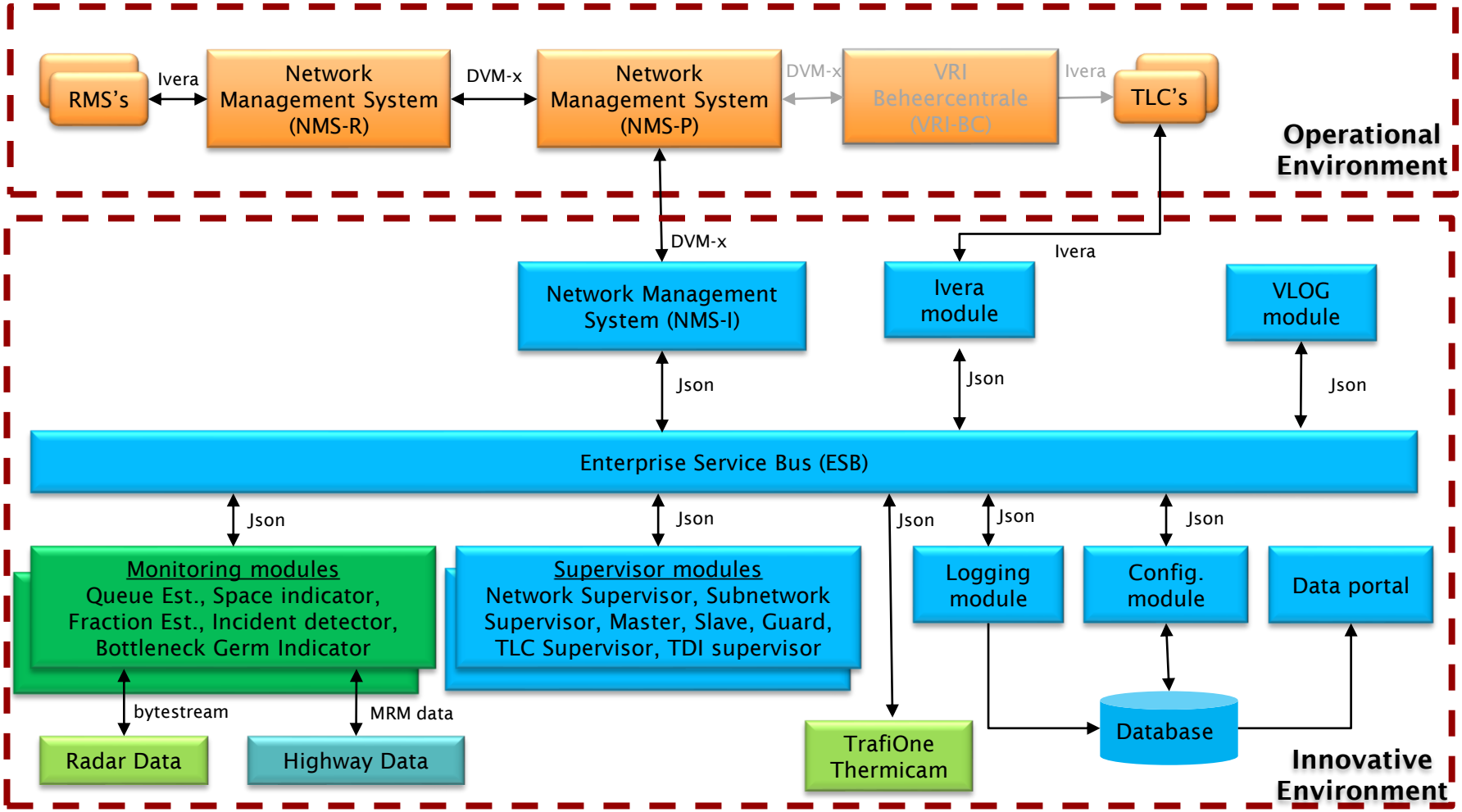
PoC System architecture



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The 3rd Book, part A
Conclusion

- Keep/build an Innovative Environment for future developments
- Need for unambiguos postioning of Traffic Management in the region;
- Start with short term contracts; 1-2 years
- Innovative Partnerships between involved parties both government and market

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The 3rd Book, part B

Transfer of Knowledge

- On the job training by the project experts and soft- hardware developers;
- Articles in outstanding trade journals;
- Congress Presentations (like this one ;-)).

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The 3rd Book, part B
Conclusion

- Immidate Learning by Doing !!
- Strucural periodic maintenance, incl. improvements and functional expansion
- Developement of daily procedures incl. documenting
- Last but not least: Impeccable archiving !!

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The 3rd Book, part C

Coordinated Rampmetering A12

- Reprogramming the Rampmeter software;
- Repositioning radars and connecting them to fibre optics and mains power supply.

- Adapting several parameters based on previous evaluations;
- Automated error handling.

- Works very well. RWS is going to implement this in more locations in the near future

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The 3rd Book, part D

Radar instead of loops in local TLC's

- Applicable for traditional local TM;
- Still minor problems with "occlution";
- Recognition of Freight traffic.

- Recommendation is to use this outcome for new development of sophisticated local traffic management.

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The 3rd Book, part E

Thermicams for cyclists detection

- Successfully tested of thermal cameras
- On cyclists and cars
- 2 brands: Thermicam (expensive) &
  TraffiOne (cheaper)
- Both can detect:
  quantities, occupancy rates, direction fractions, red light running
- In addition Thermicam can also detect:
  Speeds, length, congestion

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The 3rd Book, part F

Forecasting travel time in a network

Two components:

- Technical & Network: FCD based travel time forecasting in an urban network.
- Behavioral: persuasion of motorist to follow the rerouting advice.

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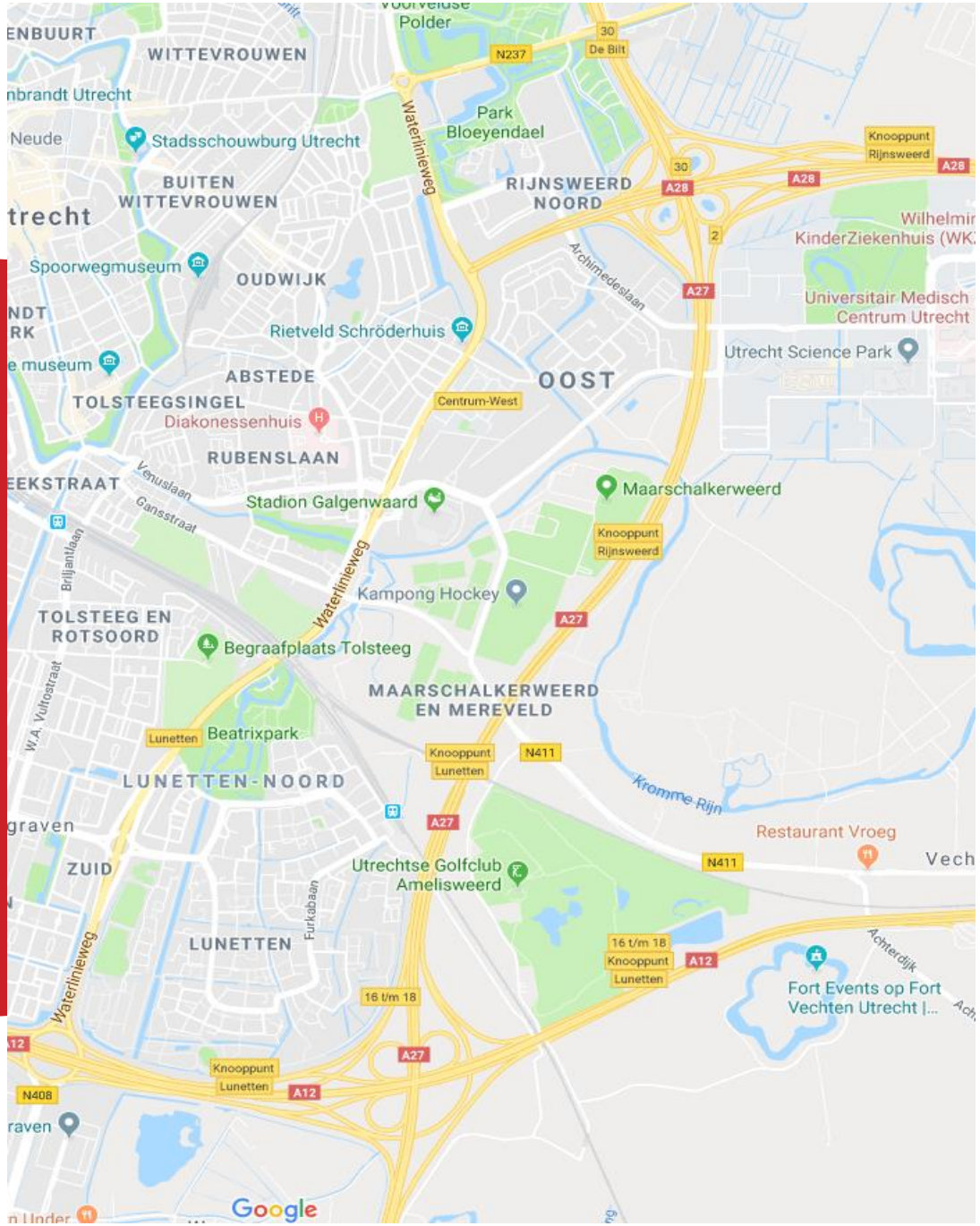
The 3rd Book, part F

Tecnical & Network component

Waterlinieweg highway A28 highway A27



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The 3rd Book, part F:

Technical & Network

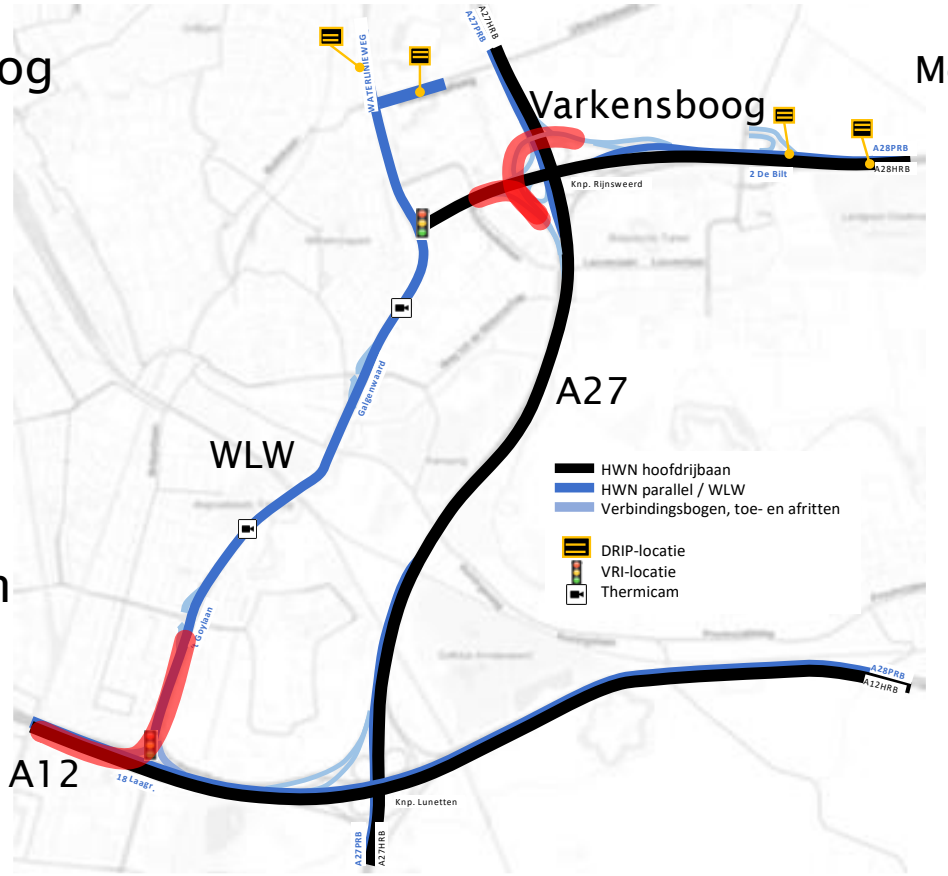
Problem
Congestion
- Germ Varkensboog
- Germ A12

Solution
Reduce Germ congestion by re-routing

Measures 1 & 2
Rerouting advice on VMS based on traveltime forecast WLW

Measure 2: Waterlinieweg

Measure 1: A28



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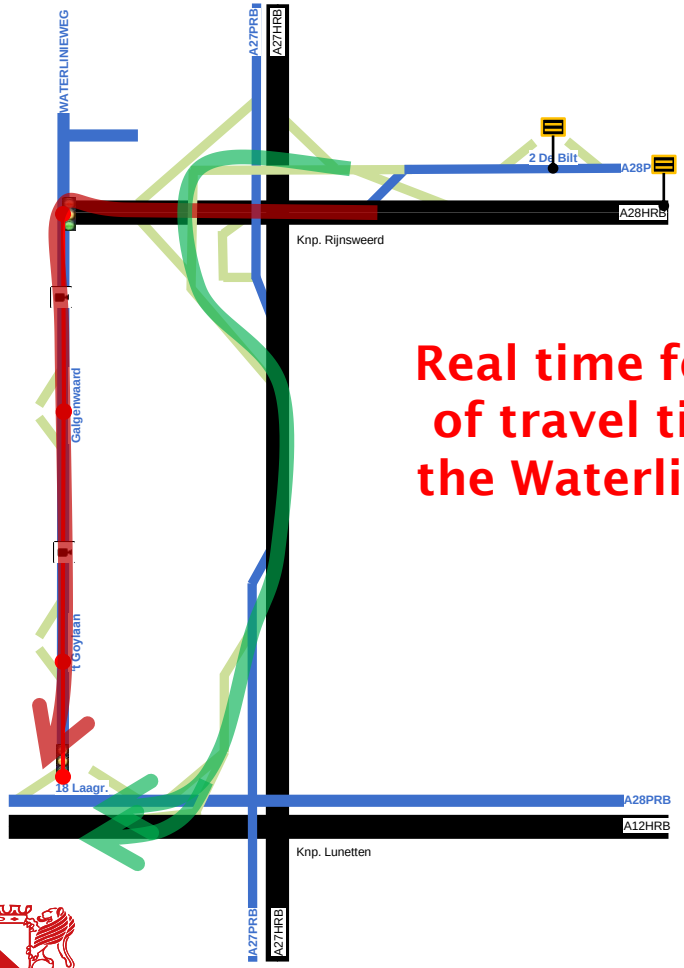
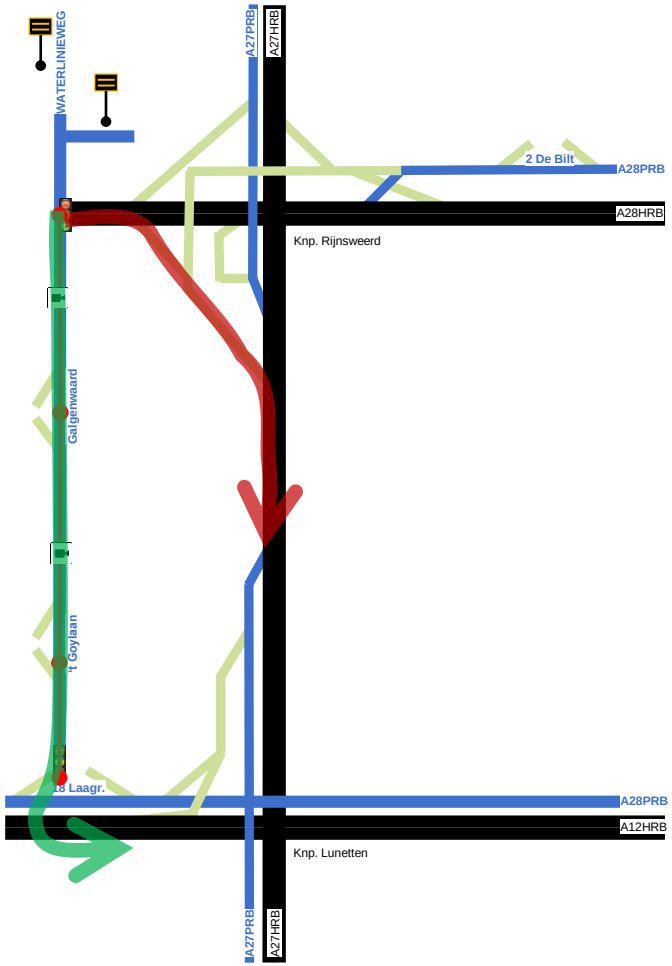
Scematic view of the network



Real time forecast of travel time on the Waterlinieweg



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The 3rd Book, part F
Conclusions Forecasting component

- Measuring actual travel time solely based on FCD is can be very acurate but
- Forecasting more then 10min is difficult and of limited use;

- Pattern recognition algorithms work beter then expected;

- Good enough for this experiment.

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The 3rd Book, part F

Behavioral Component

Persuading motorists to follow a rerouting advice that often is contradictory to their navigation app or what they actual see
???

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The 3rd Book, part F
Behavioral Component

- Re-routing advice in contradiction of navigation and/or actual actual axperience of motorists;
- Control group (n=100); fully informed and involved;
- Only VMS signing in spite of preference for the In-Car method (costs / time).

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The 3rd Book, part F
Conclusions Behavioral component

- Control group members were more then willing to follow the rerouting advice;
- Follow up of the others is limited, highly dependent on actual visual road sitiation;
- The measures really worked well for the control group members;
- Communication and target group preparation is crucial.
- In-Car re-routing advice instead of VMS signaling !

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Lessons learnt

- It all takes a lot more time;
- “Innovative Partnerships” between government the market/suppliers/knowledge centers is key;
- Crusial are clear agreements/contracts about responsibilities and ownership after delivery and closing of the project;
- Always develop in such a way that the deliverables can be applied immediatly to “the real world”;
- Project financing is completely different from the structural concern financing……;
- Do not wait with the transfer of knowledge until the end of the project.

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Thank You !
Any Questions ?

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