



INCORPORATING A CYCLING MODEL IN AN EXISTING MULTIMODAL MODEL



JAN DE COSTER

— JAN.DECOSTER@MINTNV.BE

ANN VANCLOOSTER

— ANN.VANCLOOSTER@MINTNV.BE

CINDY PUTTEMANS

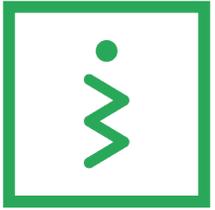
— CINDY.PUTTEMANS@MINTNV.BE





CYCLING POTENTIAL





CYCLING MODELS?

- Mostly an afterthought in multi-modal models
- Modelled as an alternative for the other modes but no detailed assignments
- Difficult to evaluate different schemes since the existing models are not sensitive enough to different parameters



CYCLING MODEL - GHENT

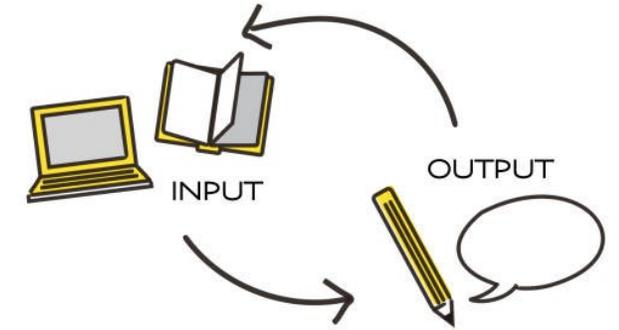
- Developed for a local city (+- 250k inhabitants)
- “Old” 4-stage model already had a cycling module
- Recently upgraded to agent-based model

=> Reimplement/improve a detailed cycling module within this existing multimodal model without reestimation of the existing model

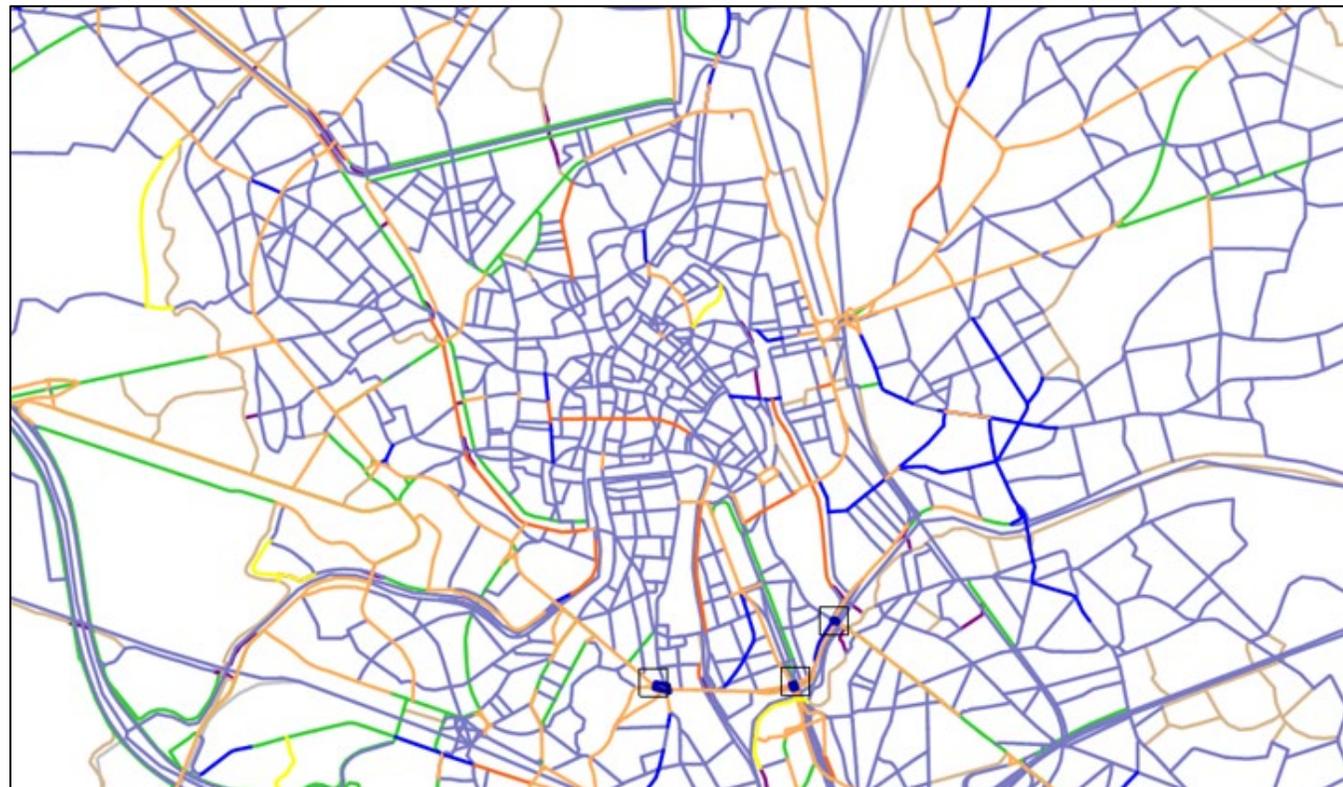




CYCLING MODEL - INPUT



- Cycling behaviour is not “just” influenced by speed but also by a myriad of other, more qualitative factors





CYCLING MODEL - INPUT

- Higher requirements of inputs
 - What type of infrastructure:
 - Adjacent or dedicated ?
 - Cycle street?
 - Cycling path?
 - Width of cycling infrastructure
 - ...





CYCLING MODEL - INPUT

- Surface type? Asphalt? Cobblestones?





CYCLING MODEL - INPUT

- Steepness? Varied gradients influences route choice

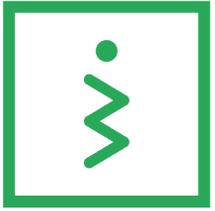




CYCLING MODEL - INPUT

- Tramtracks?





CYCLING MODEL - INPUT

- How much car/freight traffic in mixed traffic?
- During skims proxy-attributes are used such as road width, car speed, number of lanes,...
- During final assignments use the results of the car assignment (#vehicles)





CYCLING MODEL - INPUT

- Large data collection exercise
- A lot of data available but very fragmented
- Importing in existing traffic model networks

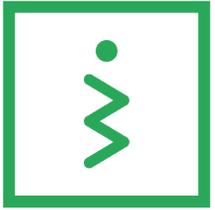
⇒ Quality check very much necessary

⇒ Local knowledge was a big advantage!



CYCLING MODEL - MODEL

- Little/no data available to estimate different parameters
 - cycle street ↔ gradient ↔ #car traffic...???
 - Expert judgment + usage of local knowledge (colleagues who live/cycle in Ghent daily)
 - Implementing parameters in such a way that :
 - Correct routes are chosen
 - Traffic volumes are closer to counted values
- New “cycling-impedance” instead of more general travel time, sensitive to more parameters



CYCLING MODEL - MODEL

- BUT: cycling model did not operate in a vacuüm!
- Existing multi-modal model “expects” cycling travel times for mode choice
- Not possible to reestimate the model since it was required that it operated within the existing model
- Model results not related to the city of Ghent should remain the same (for consistency)
- Necessary to scale new cycling impedance such that existing modal split remains stable



CYCLING MODEL - CALIBRATION

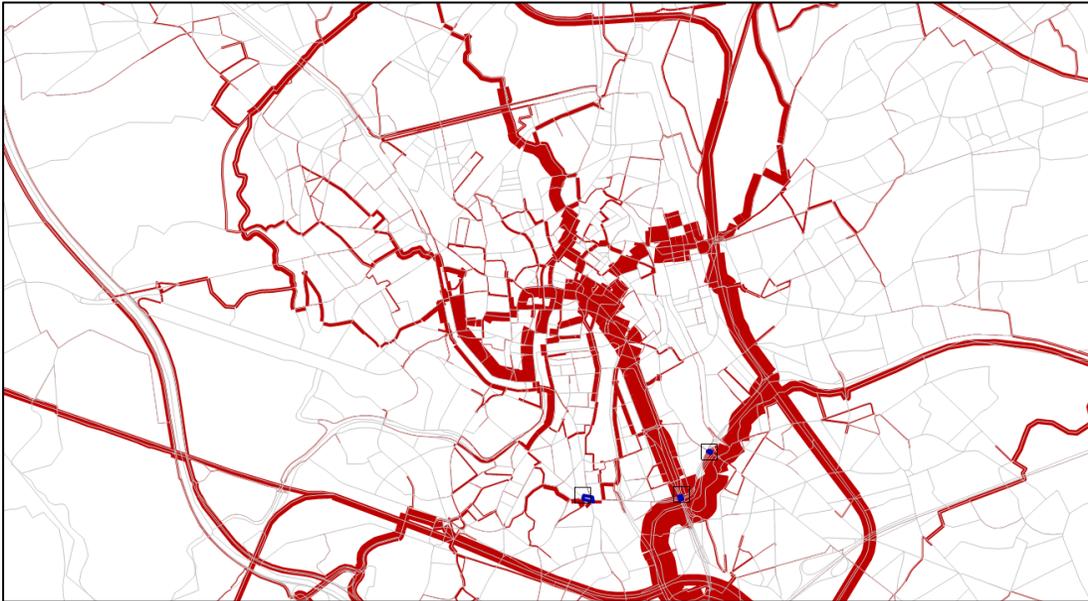
- Possible to implement a cycle calibration
- Large dataset available of cycle counts within Ghent
- Necessary to do a thorough filtering
 - Non representative moments (eg. middle of winter/summer)
- Same method as developed for car calibration to “feed” the results of the cycling calibration back to mode choice model



CYCLING MODEL - OUTPUT

- Quite a lot of detailed input necessary....but results are also detailed!

Cycling assignment without detailed input



Cycling assignment with detailed input





CYCLING MODEL - OUTPUT

- Model evaluation options:
 - **Mode choice** = How many extra cyclers can we expect from a new scheme? From which mode do they come? What kind of people does this scheme attract? Young, old (AgBM!)? ...

	bestuurder	passagier	trein	bus/tram	fiets	te voet	totaal
referentie	111 692.00	35 424.00	6 553.00	17 851.00	89 489.00	61 976.00	322 985.00
scenario fietsbrug	111 631.00	35 391.00	6 553.00	17 841.00	89 533.00	62 036.00	322 985.00
verschil	- 61.00	- 33.00	-	- 10.00	44.00	60.00	-

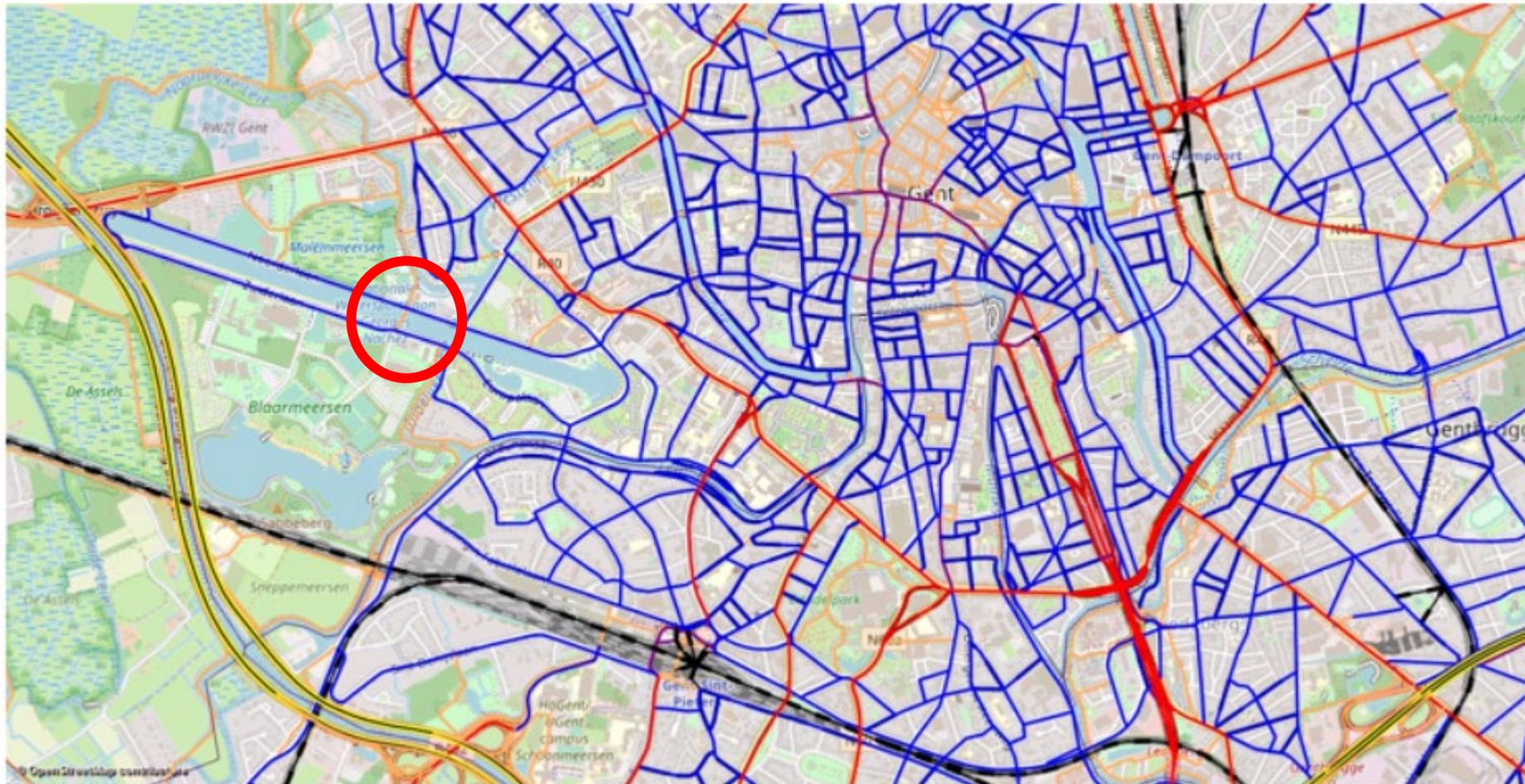


CYCLING MODEL - OUTPUT

- Model evaluation option:
 - **Route choice?** – the cycling model incorporates a detailed cycling assignment calibrated and validated on a large set of cycling counts
 - **How wil existing routes change?** New schemes will not only attract new cyclist but the existing cyclists will change their routes
- Assignment results, difference plots, select link analysis,... All the usual suspects from car assignments become available



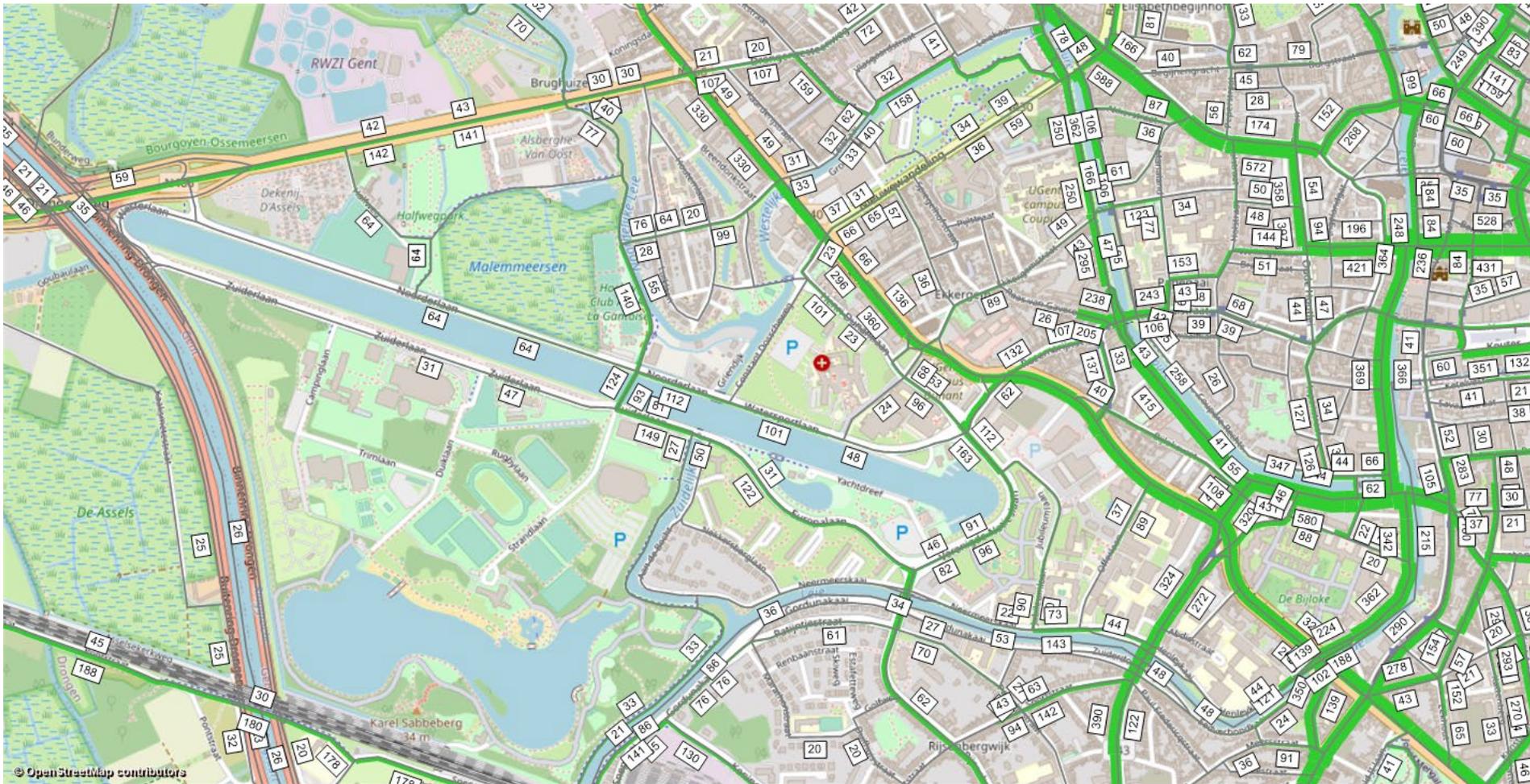
CYCLING MODEL: SCENARIO ADDING A NEW CYCLE BRIDGE





CYCLING MODEL: SCENARIO ADDING A NEW CYCLE BRIDGE

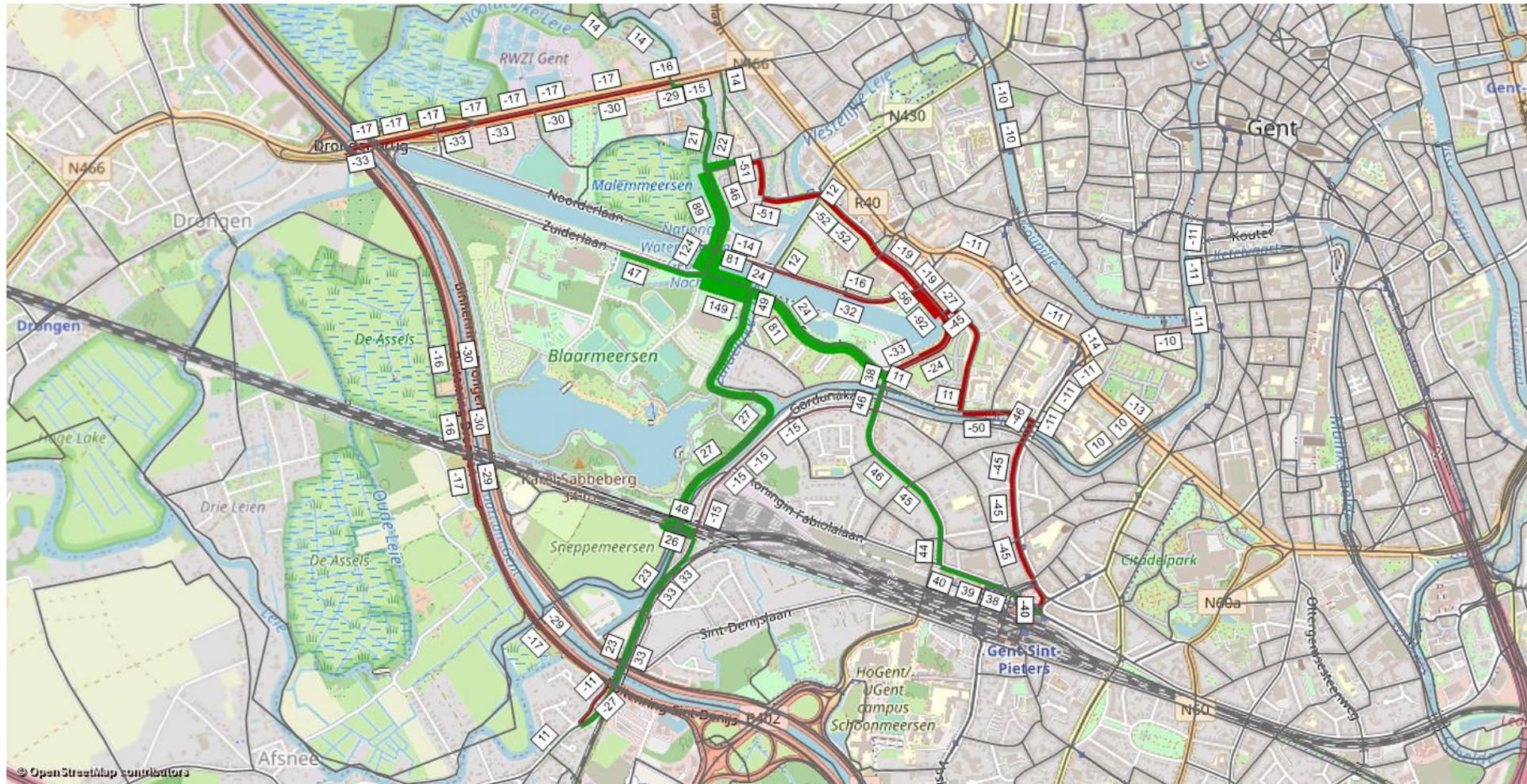
- Assignment morning peak 8-9h





CYCLING MODEL: SCENARIO ADDING A NEW CYCLE BRIDGE

- Difference plot morning peak 8-9h





SECONDARY RESULTS CYCLING MODEL: ISOCHRONE MAP REFERENCE SITUATION/SCENARIO'S



Bron : MINT (verkeersmodel stad Brugge)



CYCLING MODEL - ADVANTAGES

- Detailed instrument to quantitatively support policy decisions
- Provides more insight in the impact, both in scope and size that a certain scheme can have in an urban environment
- Large range of different schemes can be evaluated
- Extensive set of results available
- Fits within the “standard” Flemish traffic models without changing existing results => “extra menu option”, just local data needed



CYCLING MODEL - DISADVANTAGES

- Cycling choices are based on a lot of local factors => necessary to also implement the input data on this local level
- Parameters are based on a lot of local knowledge
- A lot of work that can't easily be automated



ANY QUESTIONS?

www.mintnv.be

Jan De Coster – jan.decoster@mintnv.be

Kantoor Mechelen: Hendrik Consciencestraat 1 b | 2800 MECHELEN | T 015 56 04 20 | E mint@mintnv.be

Kantoor Gent: Koningin Maria Hendrikaplein 8 bus 1 | 9000 GENT