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Developing a decision support tool for traffic safety using open data

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Context

- Leveraging data to advance safety, but
 - Crashes are rare events subject to randomness
 - Safety = number of crashes?
- Exposure effect





Framework

 Telraam



OpenStreetMap



OpenStreetMap

 Traffic Scout



Network



OpenStreetMap



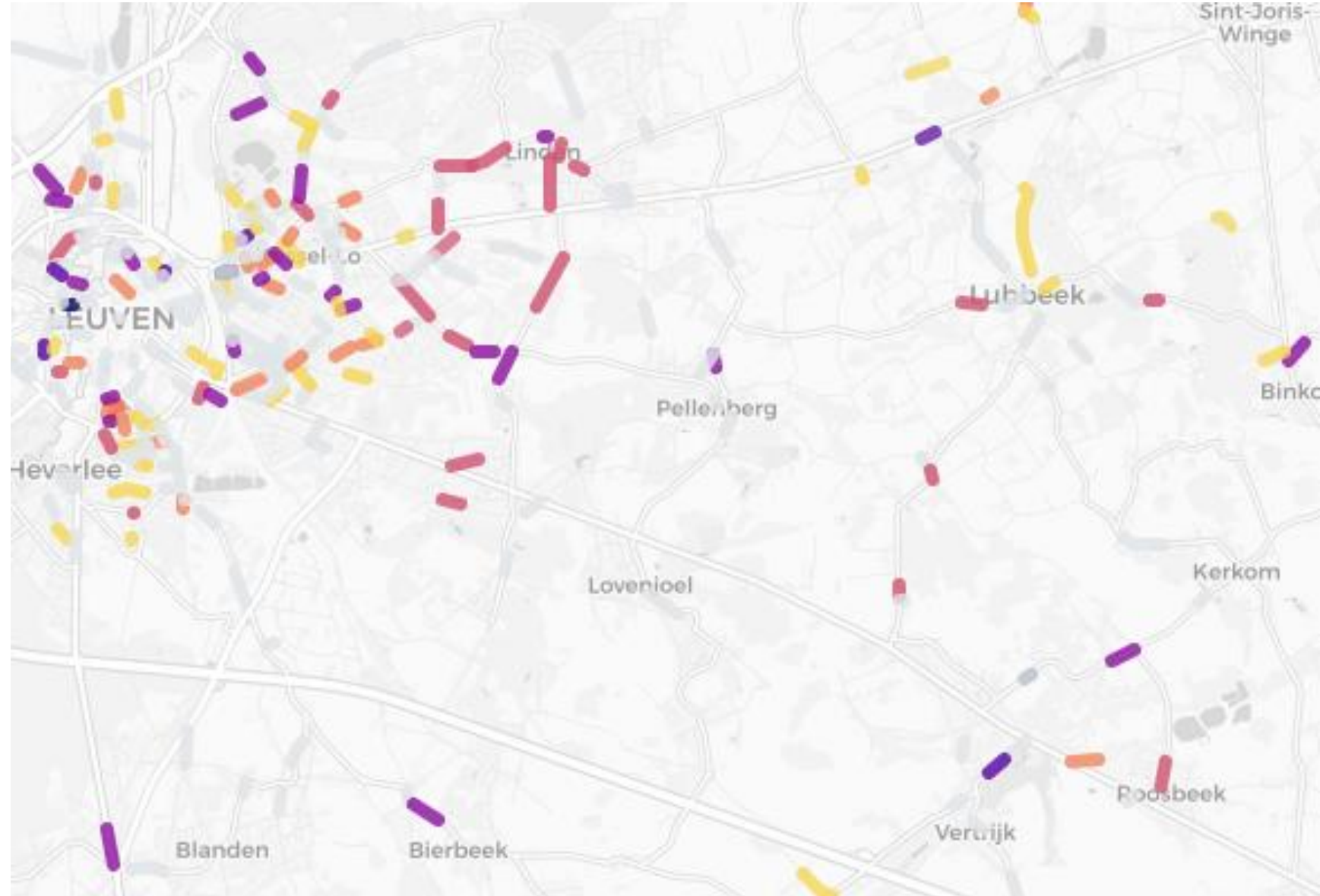
Directed graph

- nodes
- links



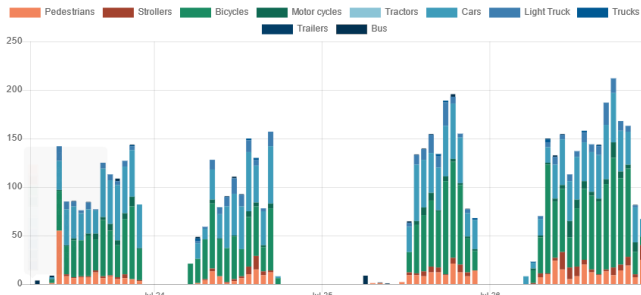
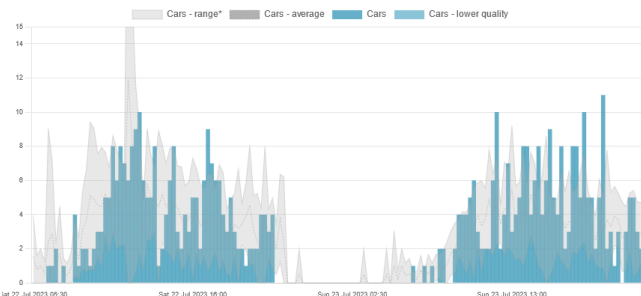
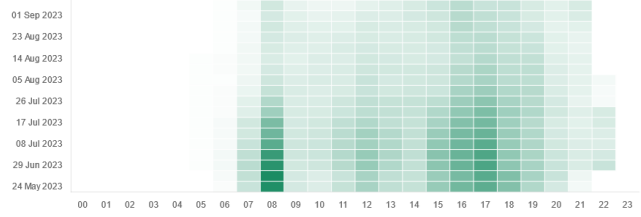


Traffic counts - Telraam





Traffic counts - Telraam



Telraam

- Halle
- Dashboard
- Users
- Candidates
- Mails

Network Dashboard

Your devices in the field

26

Users counting at the moment

76 Candidates

72 Users registered

54 Users counted before or still counting

Average uptime in past 30 days: 24 up 4 up & down 26 down

18 Users that never counted/started

11 No segment 7 No data

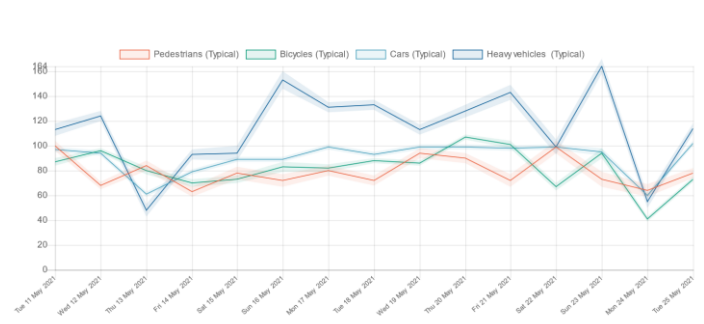
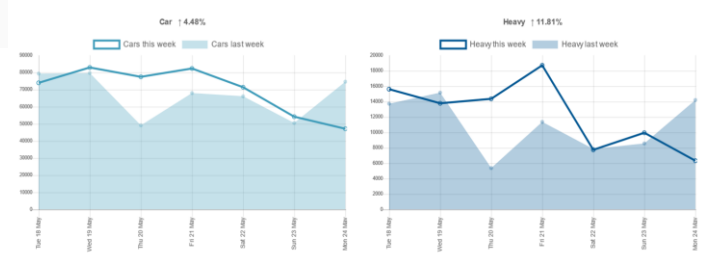
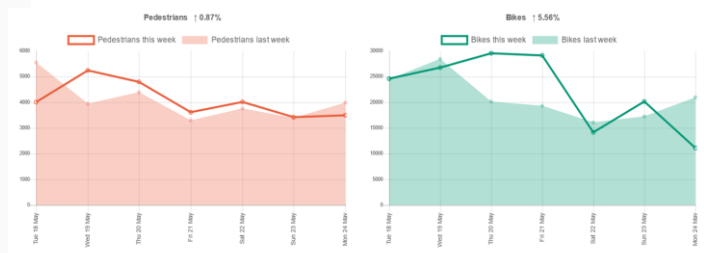
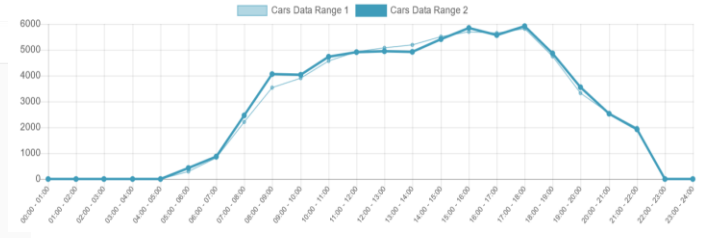
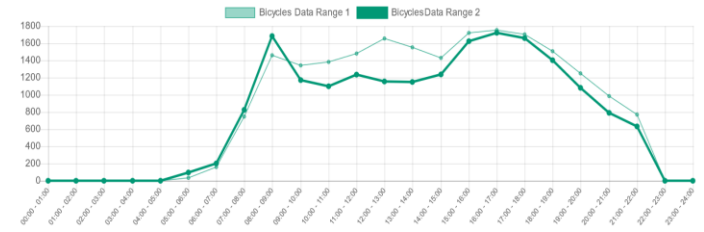
Users

Overview Mails Reports

Users that are counting or did count

This report shows up time for all users in the network that counted before in the last 30 days. Every afternoon there is a query where we check the status of all the users. The overview gives an idea of the general up time of the network.

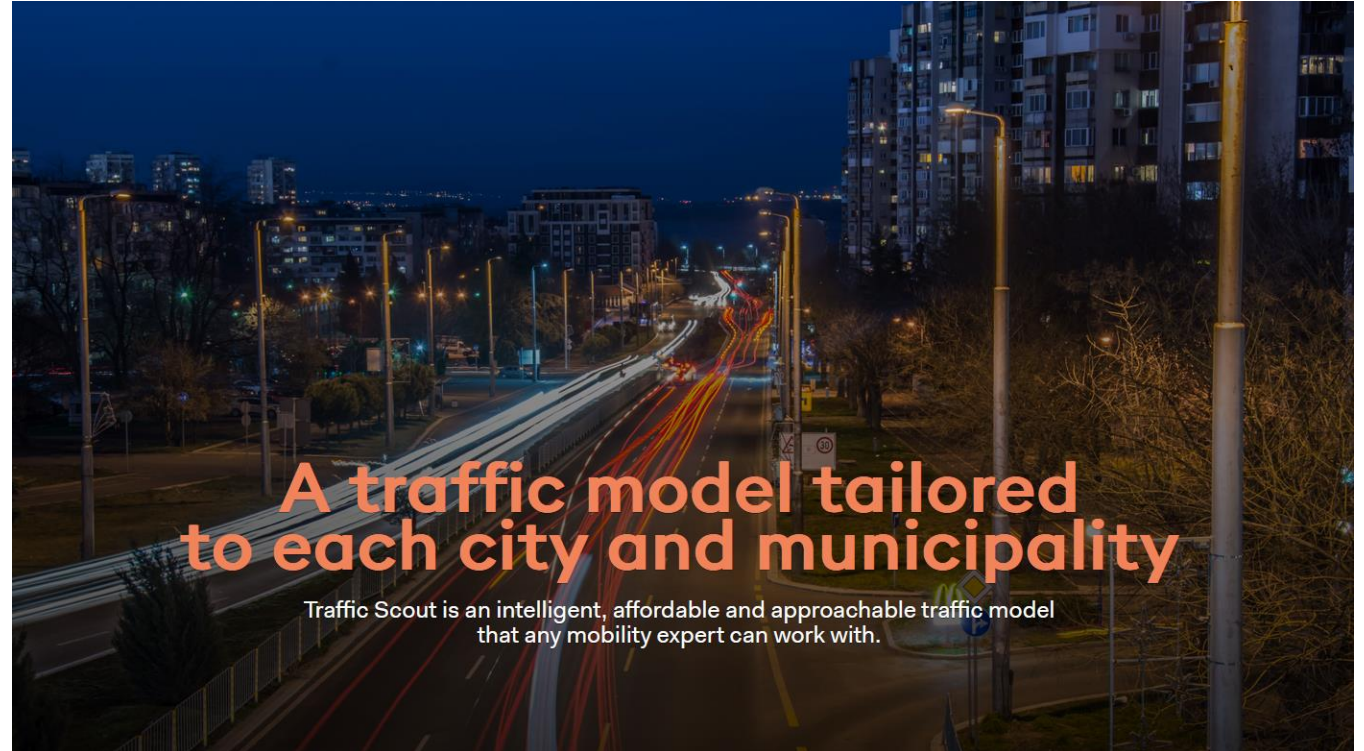
User Id	Email	Street	Counting Days	Status
3336		Crosted Road	99 % UP 38 / 38	● up
7644		Dalmore Road	99 % UP 38 / 38	● up
7647		Chancellor Grove	99 % UP 38 / 38	● up
7654		Robson Road	99 % UP 38 / 38	● up
7655		Elmcourt Road	99 % UP 38 / 38	● up
7656		Chatsworth Way	99 % UP 38 / 38	● up
7664		Guernsey Grove	99 % UP 38 / 38	● up





Traffic Scout – what?

- Traffic modeling framework for small & bigger cities
- Multimodal : cars, trucks & cyclists
- Intuitive web-based interface for urban policy assessment



 **Traffic Scout**



Traffic Scout – approach

- Use open data (OSM, Telraam, MIV data)



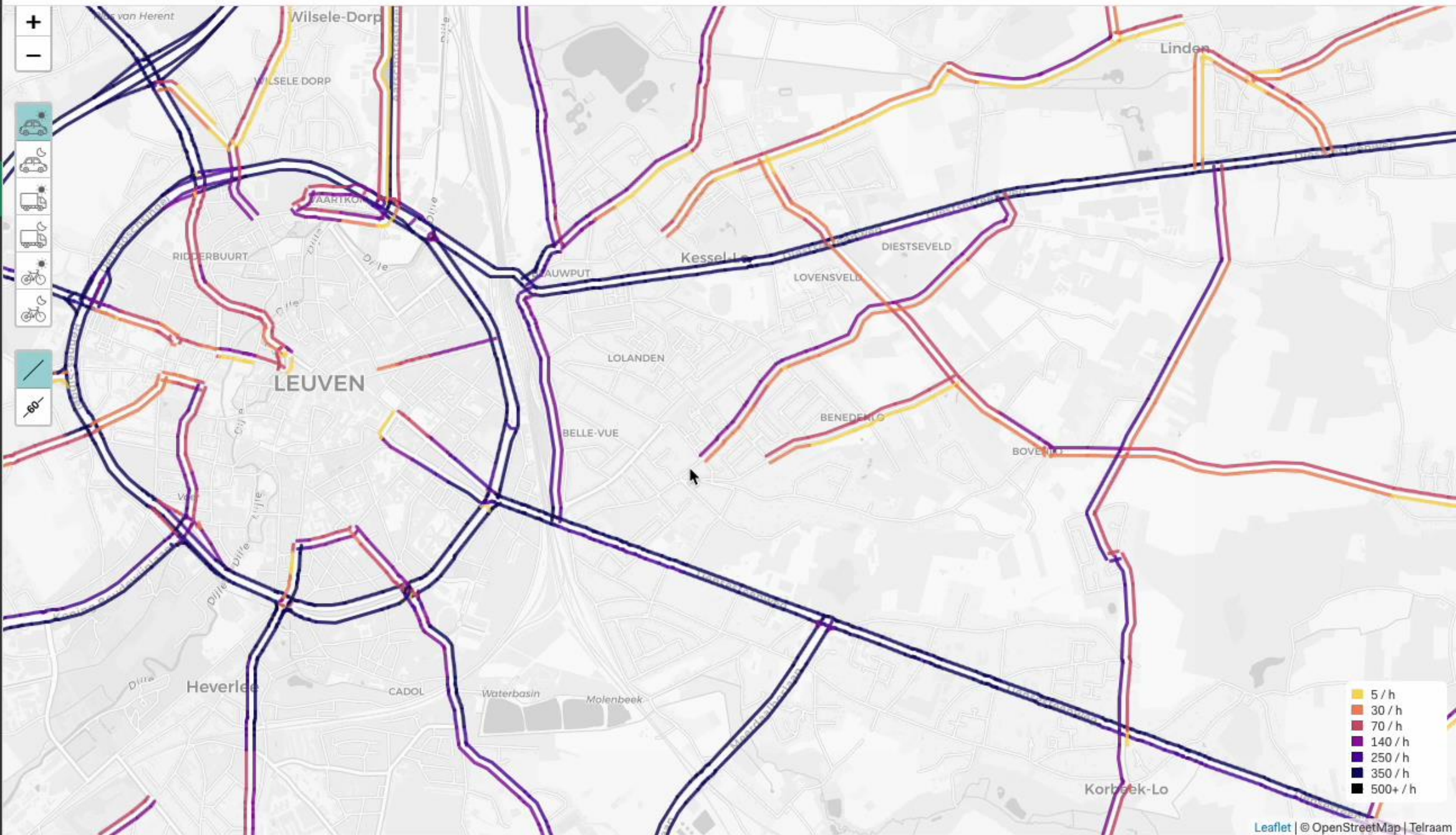
Telraam



OpenStreetMap

- Estimate traffic volumes on each street & intersection

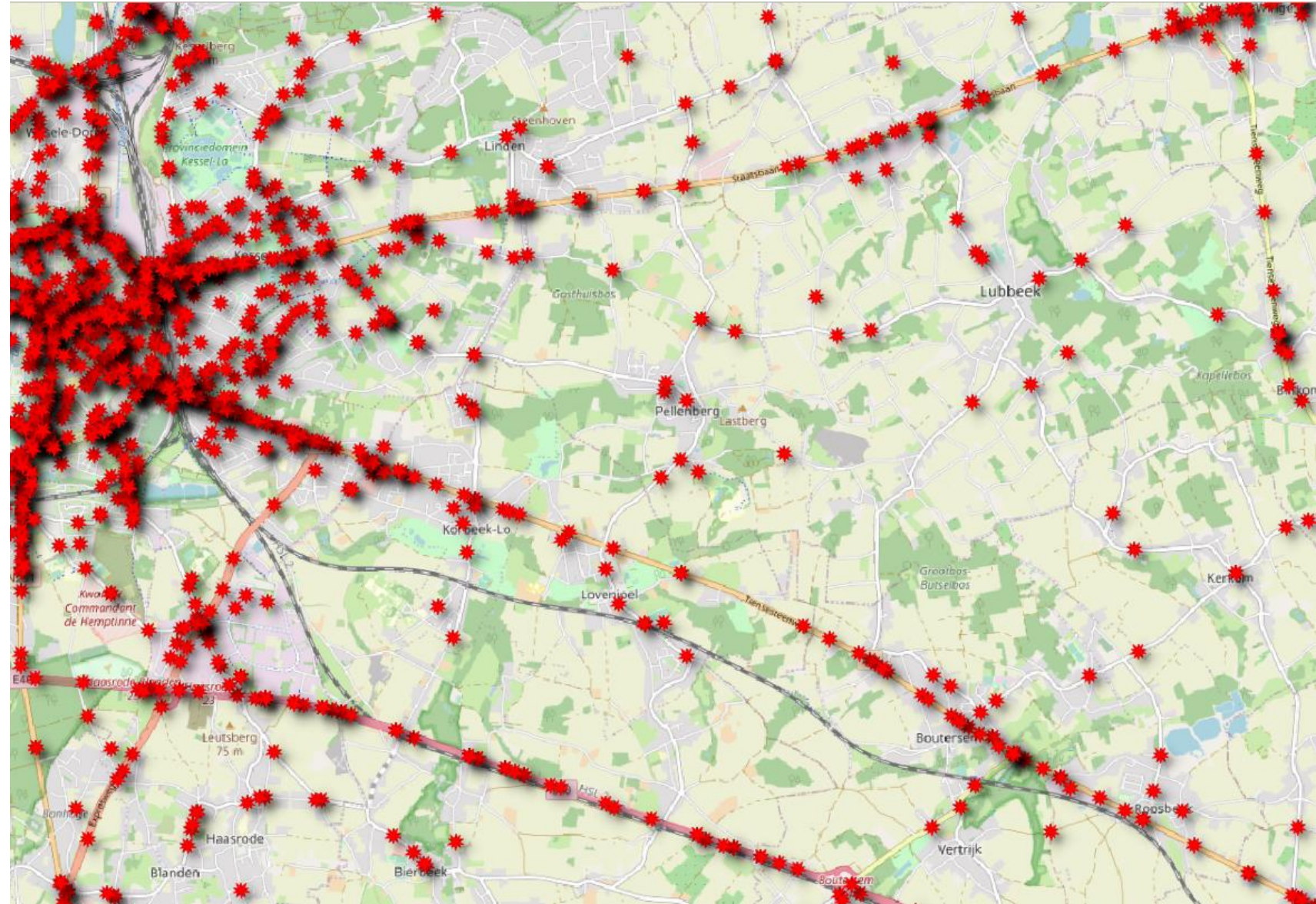
 **Traffic Scout**





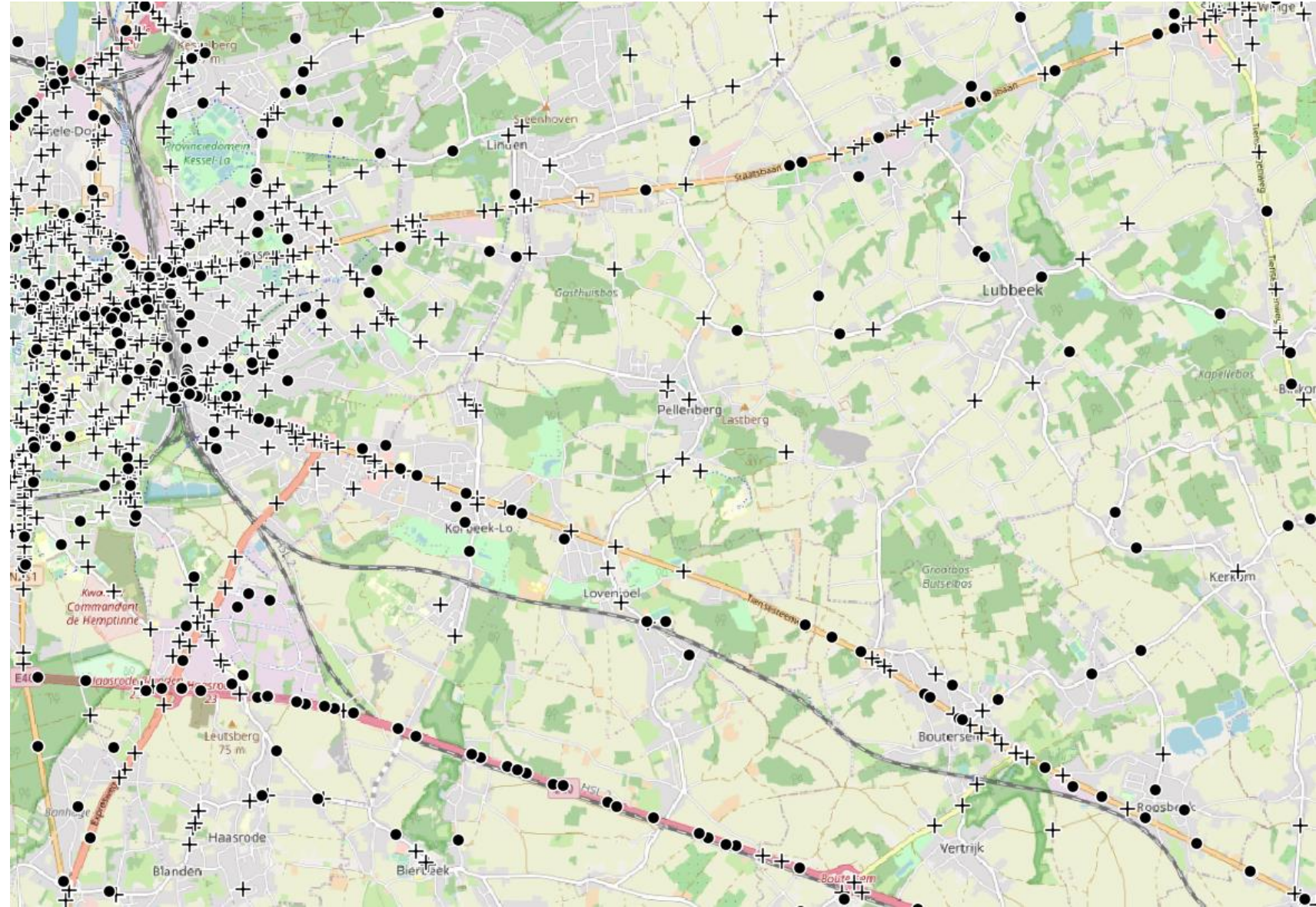
Crash data

- 5 years of data
- ~2200 crashes
- Source: Statbel



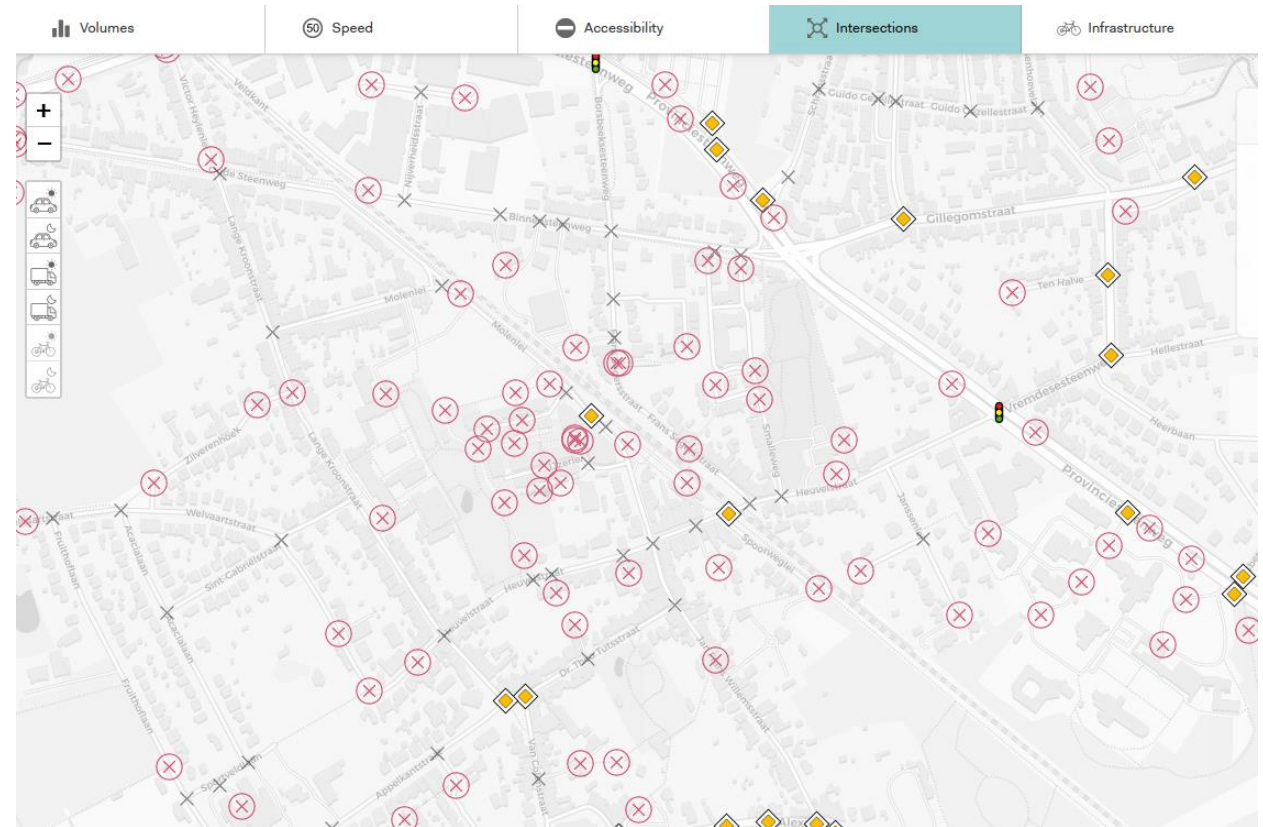
Crashes on intersections & streets

- Crash risk model for intersections
- Crash risk model for streets



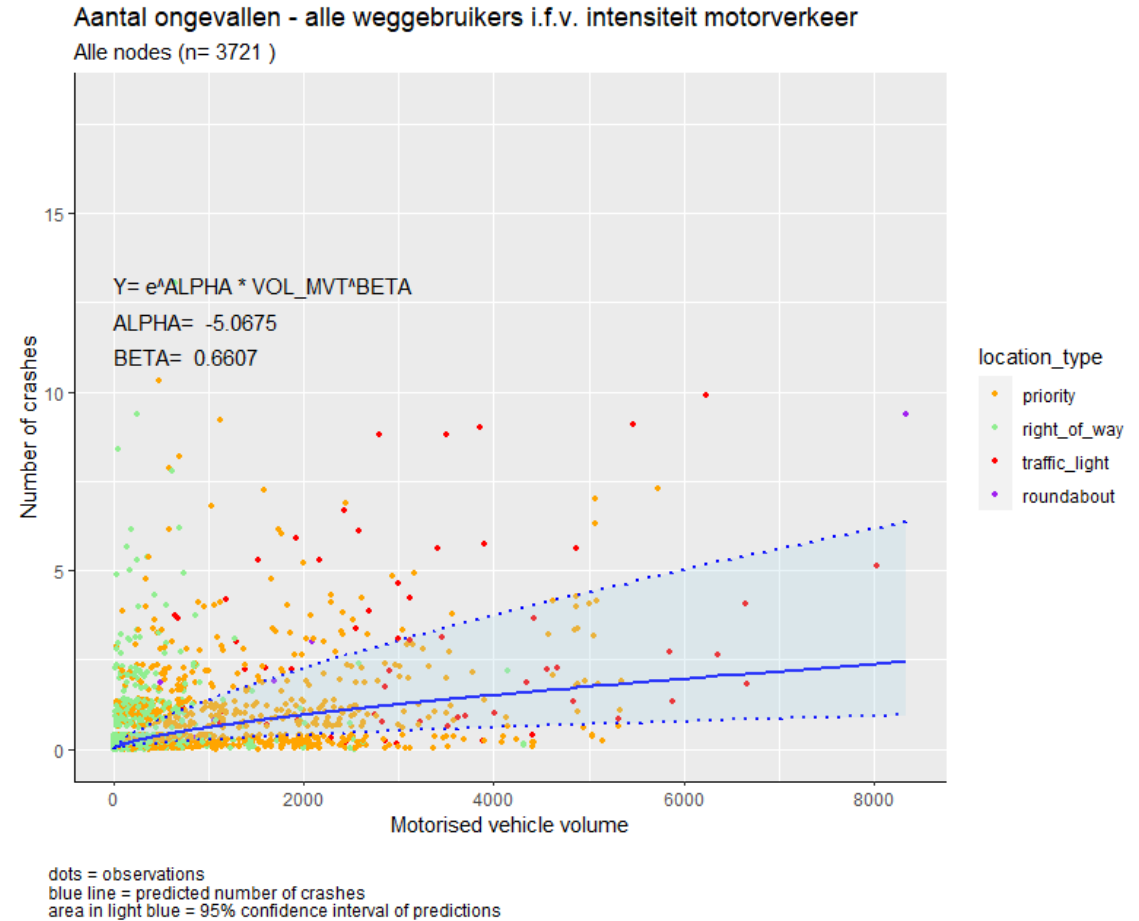
Model variables

- Traffic Scout
 - Cycle traffic
 - Car traffic
- OSM
 - Speed limit
 - Type of intersection
 - Bicycle infrastructure



Model outcome

- Intersection
 - Traffic volume = main predictor
 - Cycle volume, type of intersection: statistically significant, but small
 - Large variation in observations
- Street
 - Traffic volume = only predictor
 - Large variation in observations

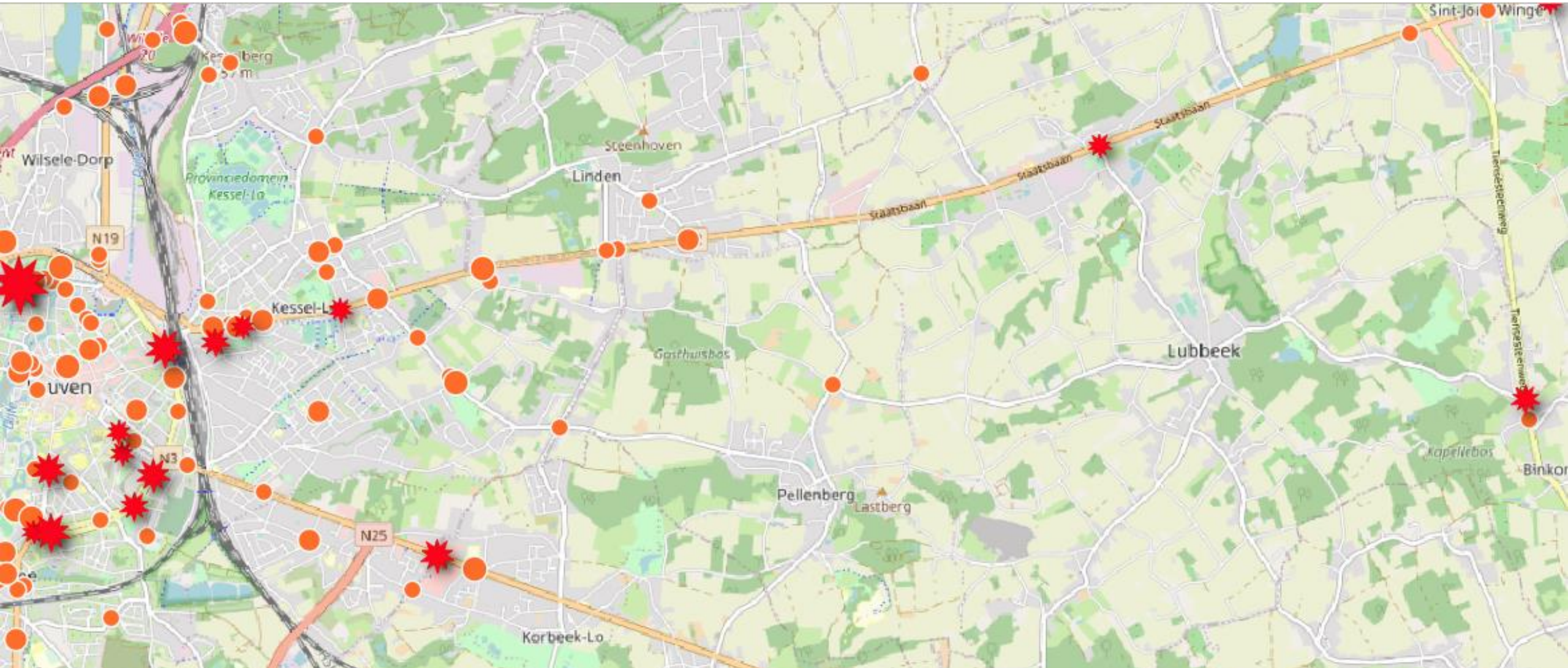




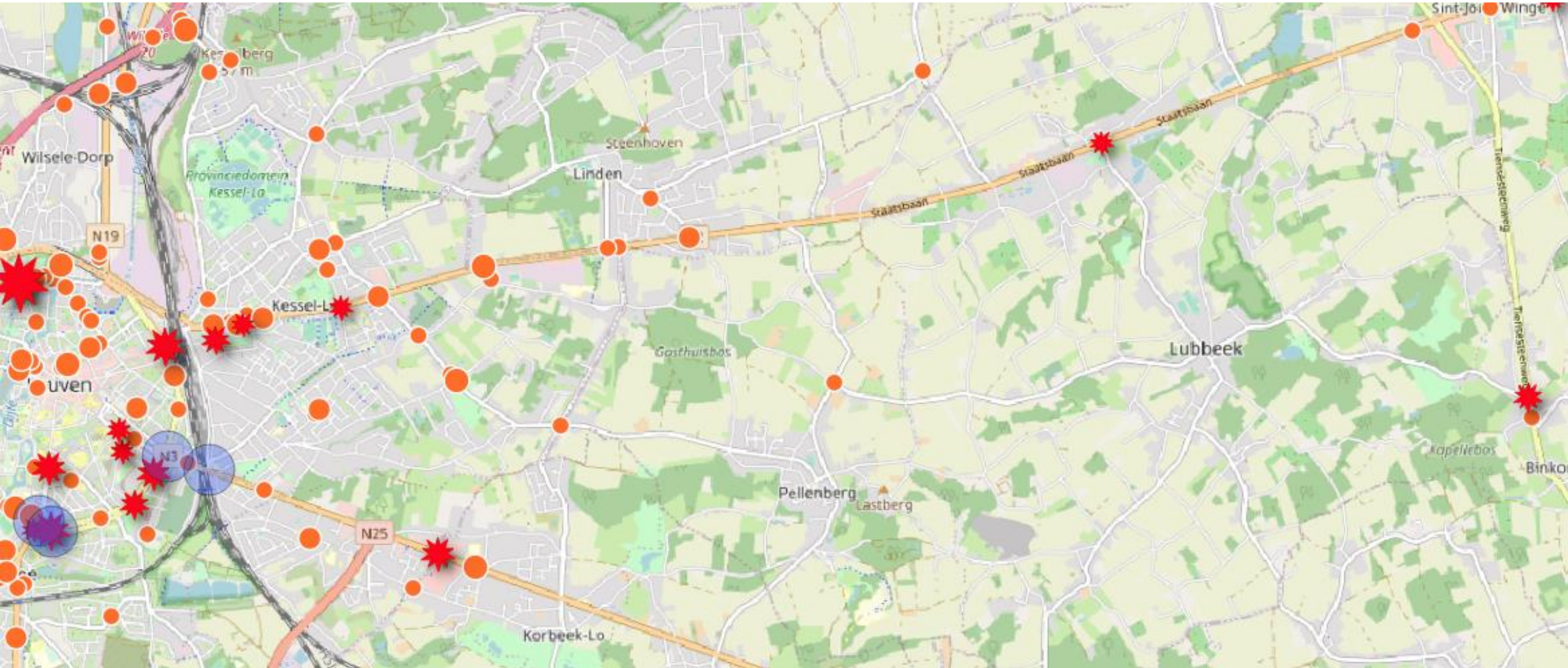
Applications – crash risk map



Applications – crash anomalies



Applications – crash anomalies





Future work

- Many assumption & limitations
- Future research:
 - Extra variables
 - Improve accuracy of data
 - Test more advanced models
- Extend to Flanders/Belgium
- Use framework as assessment tool for policy measures





**Thank you for
your attention!**



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