Bus Depot Sandmoen

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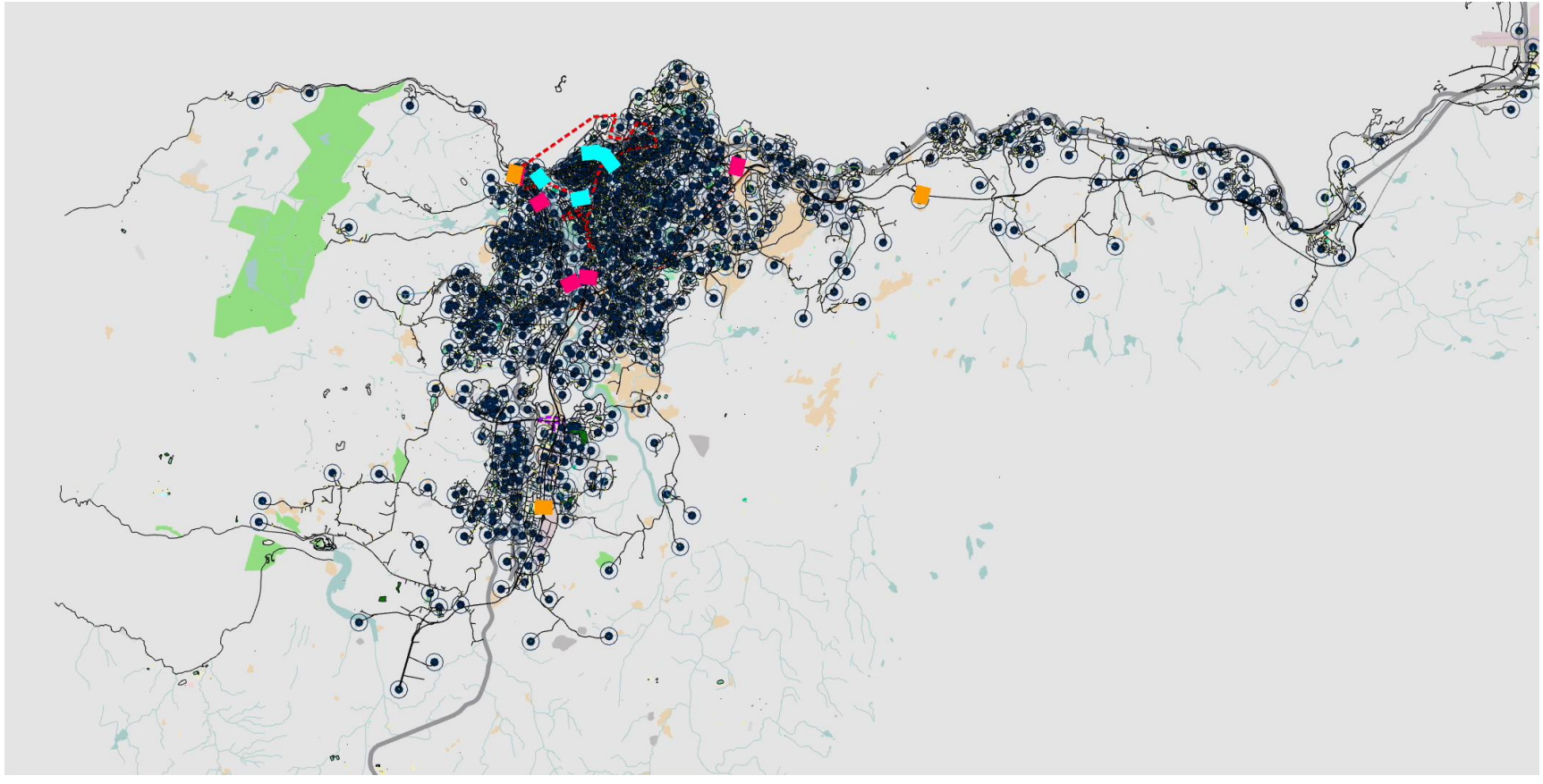
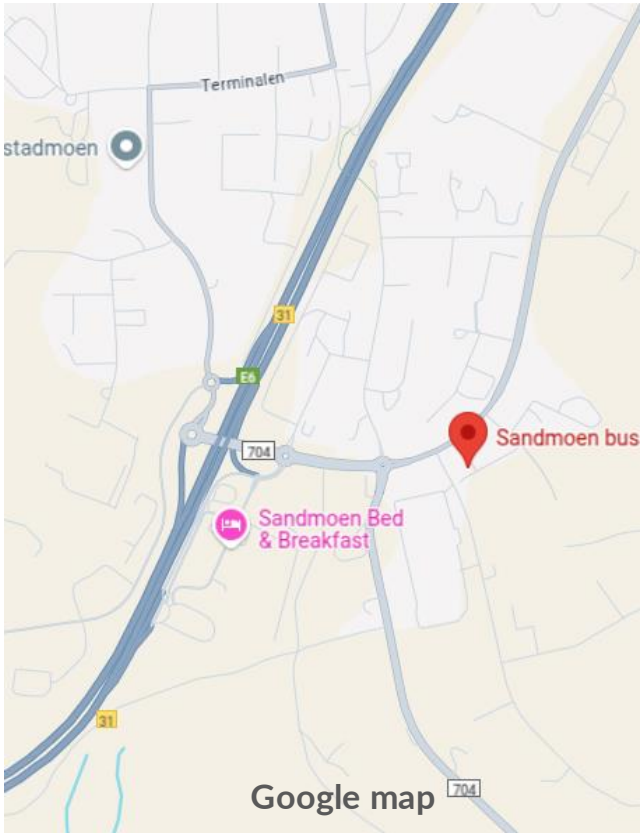
23rd April 2025

Trondheim Model

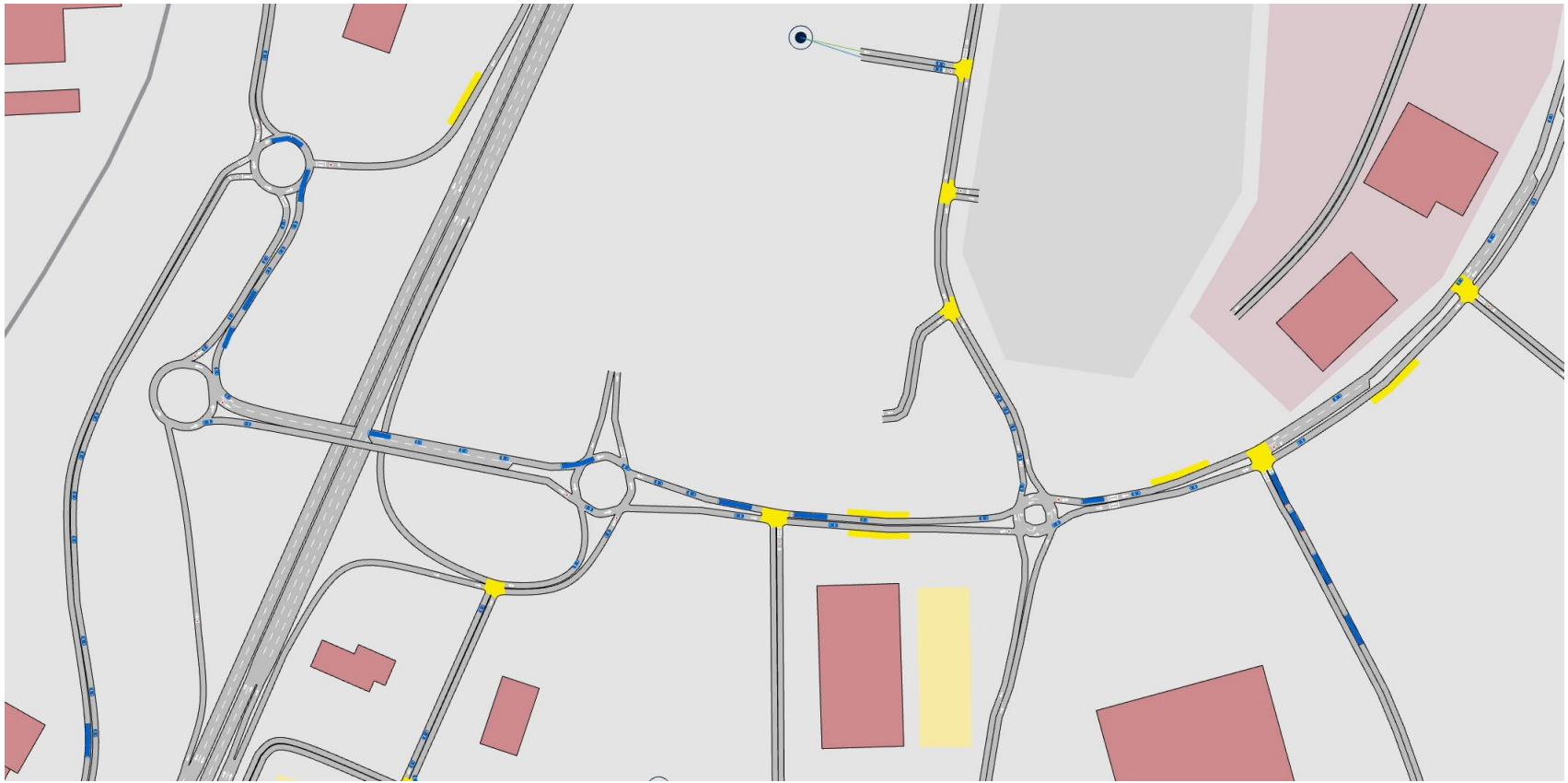


Defining Sandmoen Area

- Area near the Sandmoen bussdepot



Running a Simulation with Dummy Traffic Data



List of Busses

- **Departure** and **returning** times of 322 busses from the Sandmoen Bussdepot

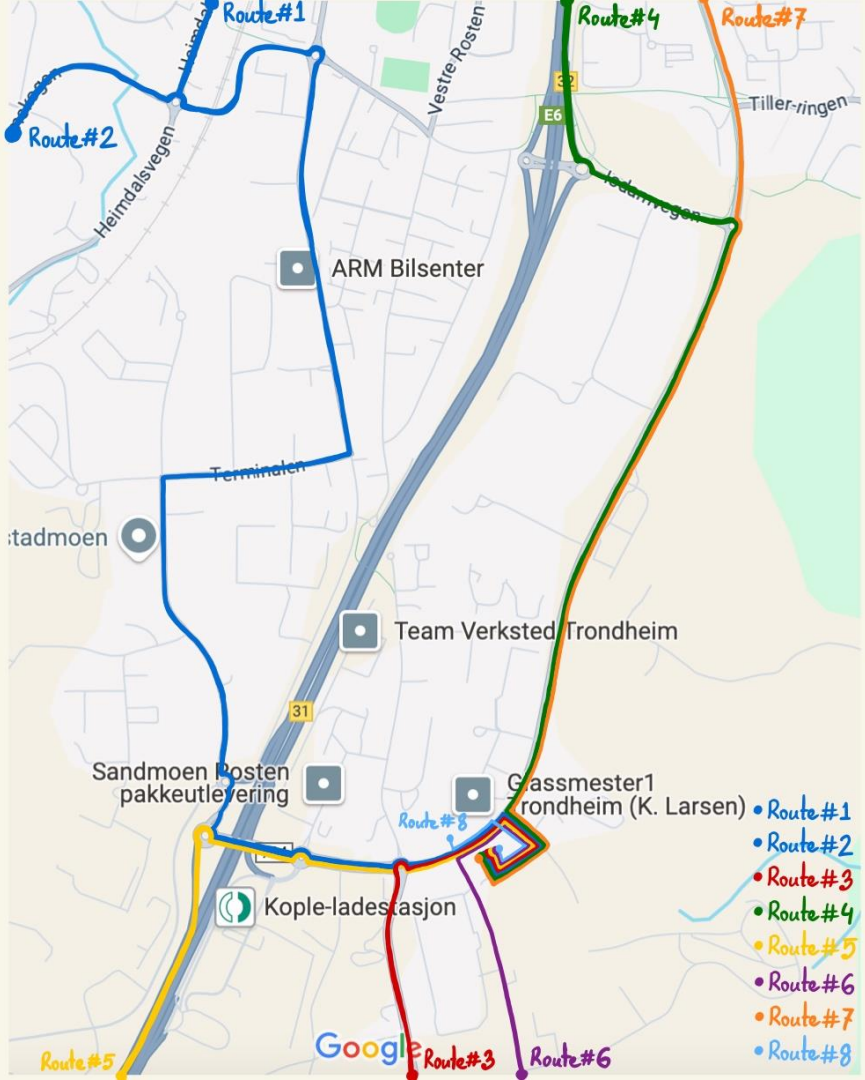
Vognløp	Start fra garasje	Destinasjon	Slutt garasje	Buss type
1	4:41	Østre Lund-Ranheim	25:06	Metrobuss 22m
2	4:51	Østre Lund-Strindheim	24:26	Metrobuss 22m
3	4:52	Østre Lund-Ranheim	24:57	Metrobuss 22m
4	4:54	Østre Lund-Ranheim	24:46	Metrobuss 22m
5	5:01	Østre Lund-Ranheim	20:31	Metrobuss 22m
6	5:11	Østre Lund-Strindheim	21:03	Metrobuss 22m
7	5:12	Østre Lund-Ranheim	24:15	Metrobuss 22m
8	5:14	Østre Lund-Ranheim	24:39	Metrobuss 22m
9	5:21	Østre Lund-Ranheim	24:35	Metrobuss 22m
10	5:32	Østre Lund-Ranheim	25:15	Metrobuss 22m

- Number of unique starting points: 46 (these 322 busses are traveling to 46 different locations)

Grouping Destinations into Common Routes

- Identified **common routes** shared by multiple busses from origin to starting point

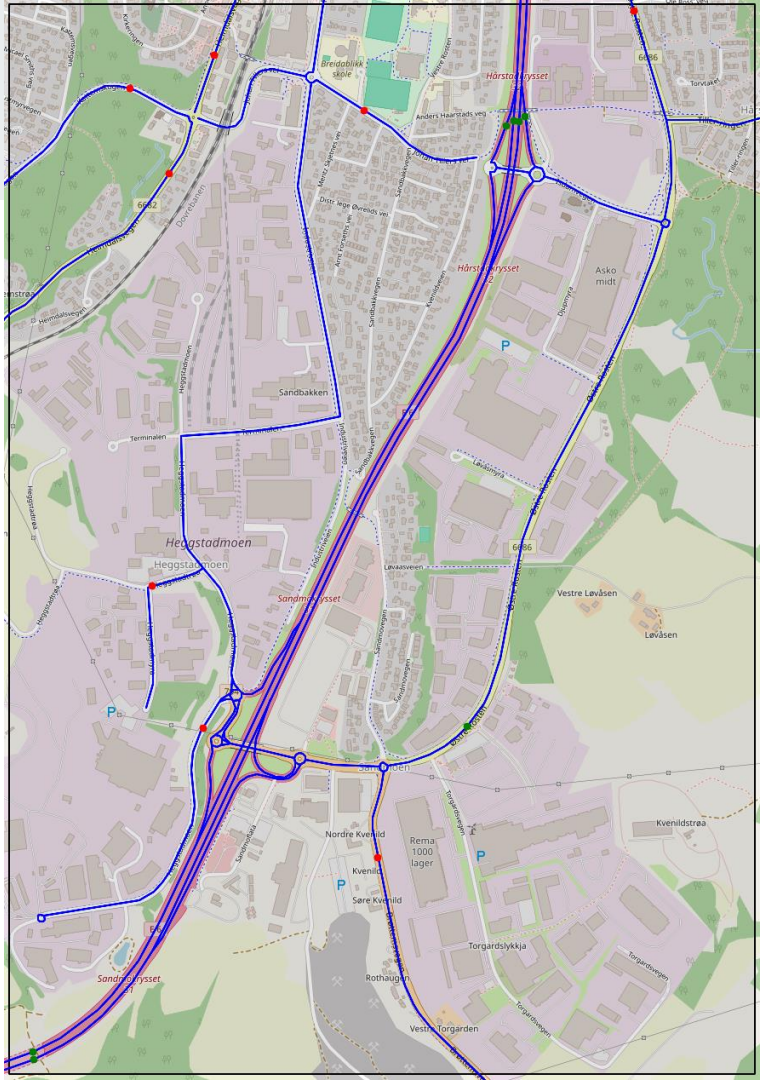
- Grouped destinations sharing the same primary roads into **eight common routes**



Real Data for Background Traffic

- Traffic data from **Statens Vegvesen (SVV)**
  - Hourly data since October 2019 (some of them since 2017)
  - Vehicle count (based on length)
    - < 5,6m
    - 7,6m - 12,5m
    - 12,5m - 16,0m
    - >= 24,0m

- Telia Crowd Insights
  - Blue lines highlighting where traffic data is available
  - Crowd data doesn't provide vehicle modalities



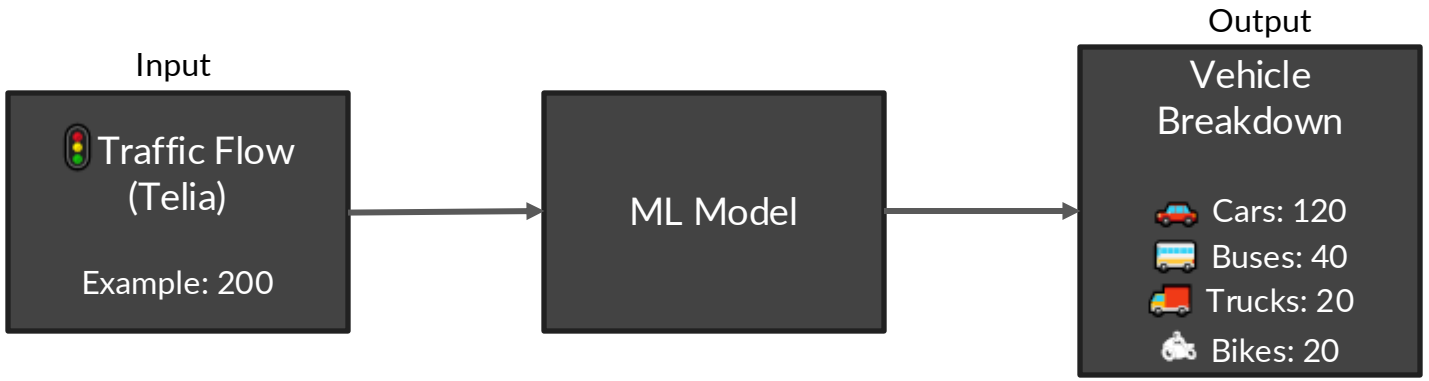
Interpretation for Background Traffic

Trained a Machine Learning model to learn from Statens Vegvesen and predict the breakdown for Telia.

📈 **Input:** Traffic flow of a certain location (Telia)

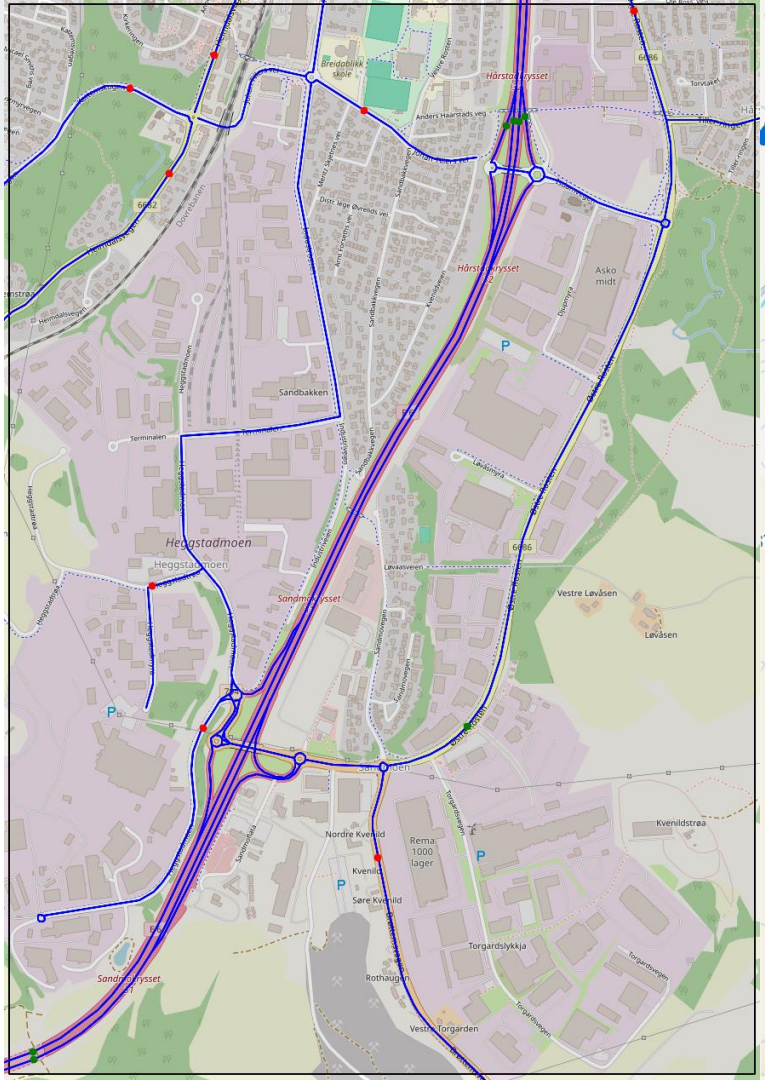
🔍 **Model:** Learns patterns from vehicle breakdown (Statens Vegvesen)

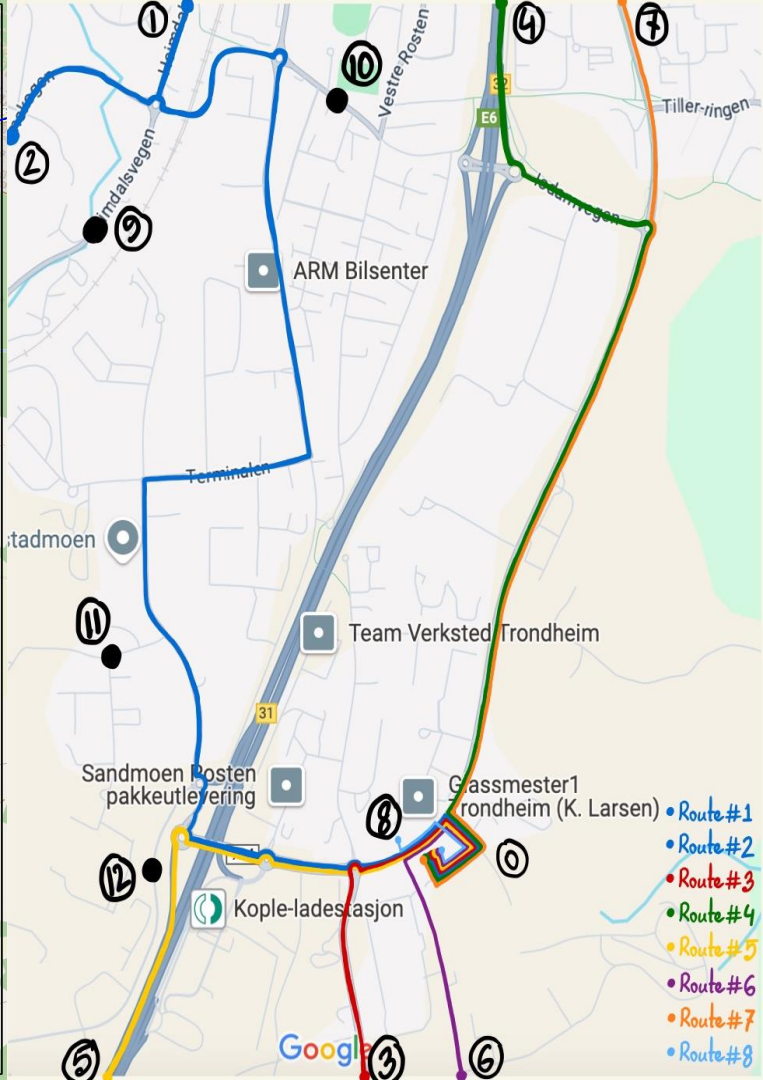
📊 **Output:** Estimated breakdown by vehicle type



Sandmoen Buses Route

** Kvenildstrøa
1. Heimdalsvegen (Nord)
2. Kattemskogen
3. Brøttemsvegen
4. E6
5. Storlersbakken
6. Torgardsvegen
7. Østre Rosten (Nord)
8. Sandmoen-ØstreRosten
9. Heimdalsvegen (Sør)
10. JohanTillers
11. Heggstadtrøa
12. Heggstadmoen





Vehicle Categorization in Aimsun

Background Traffic

<5.6m	Passenger Vehicles (Cars)	500432: (N) Personbiltrafikk
5.6m-7.6m	Vans/Pickups	3949: (N) Miljøkjøretøy
7.6m-12.5m	Buses and Medium Trucks	
12.5m-16.0m	Heavy Rigid Trucks	806836: (N) Lastebil
16.0m-24.0m	Heavy Goods Vehicles	
>=24.0m	Trams	500430: (N) Trikk

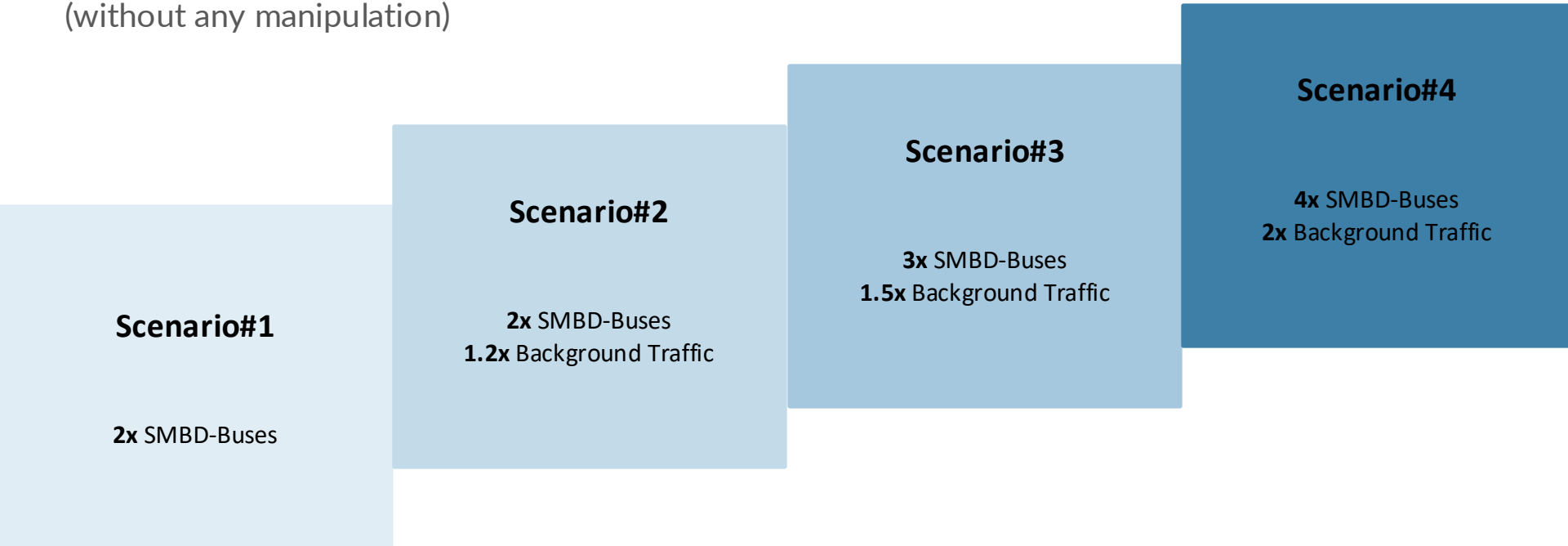
Sandmoen Buses

12	500424: (N) Buss 11,9 m
13	500427: (N) Buss 13,5 m
15	
18	500428: (N) Buss 23,5
22	

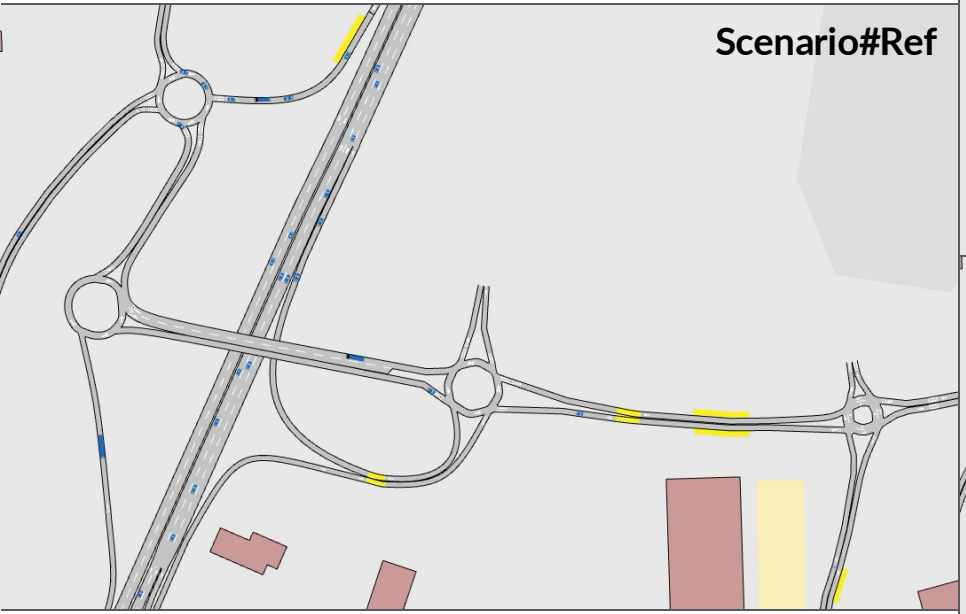
Experimental Scenarios

Scenario#Ref

24-hour simulation of real-data
(without any manipulation)

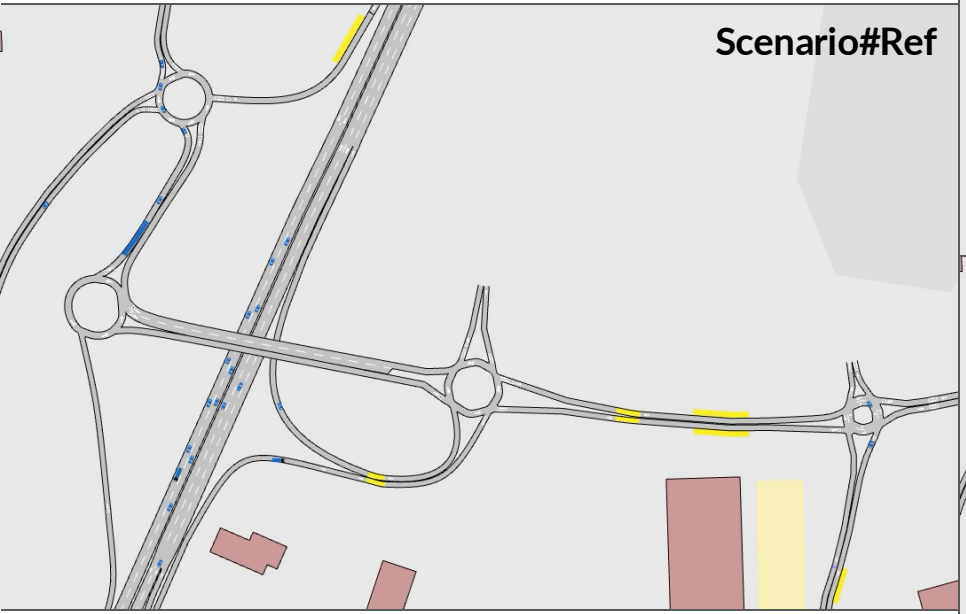


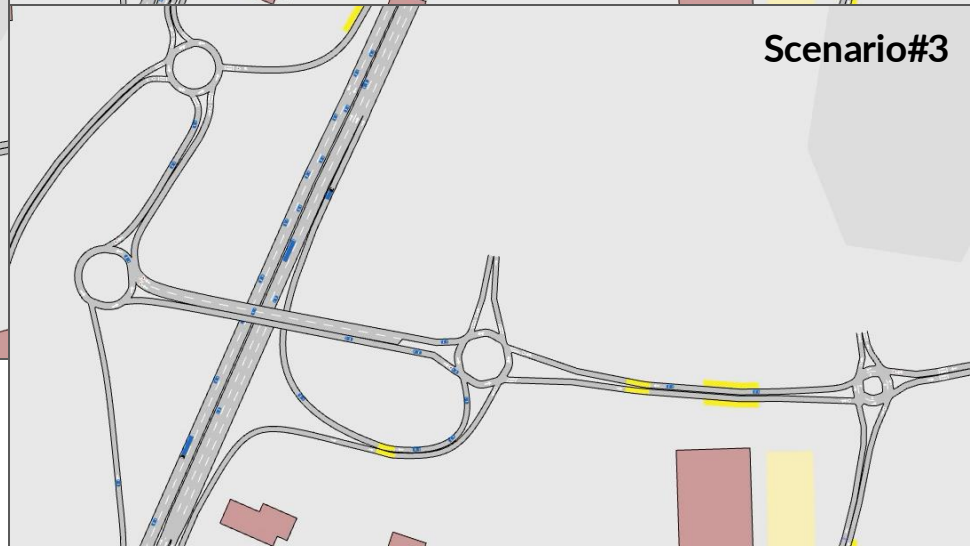
Experimental Scenarios



07:00 AM – 08:00 AM

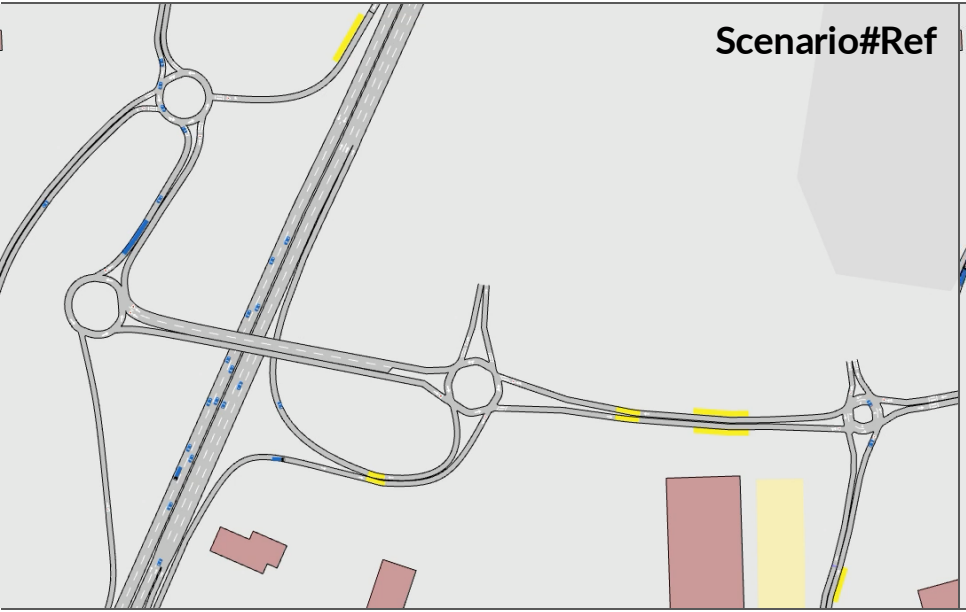
Experimental Scenarios

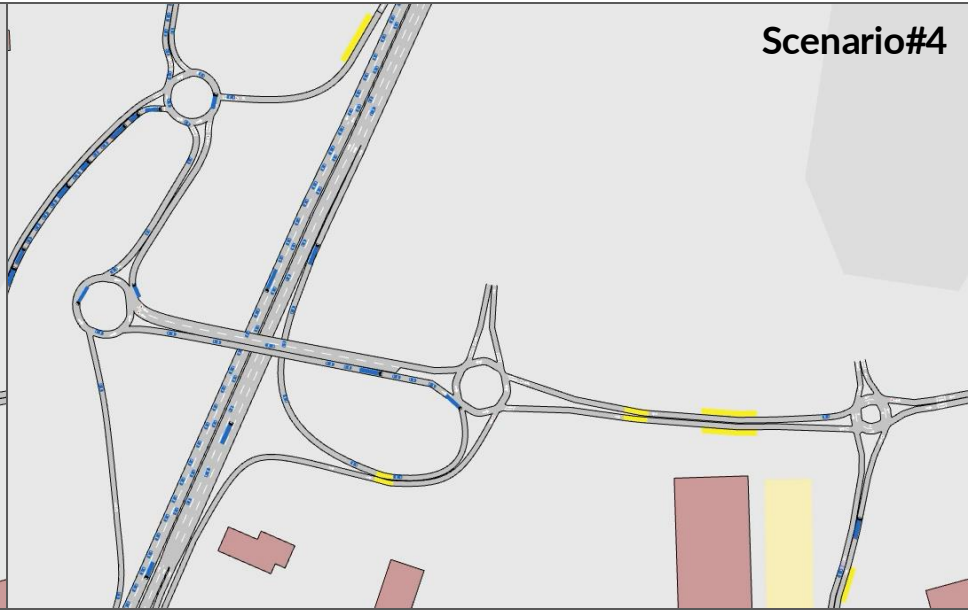




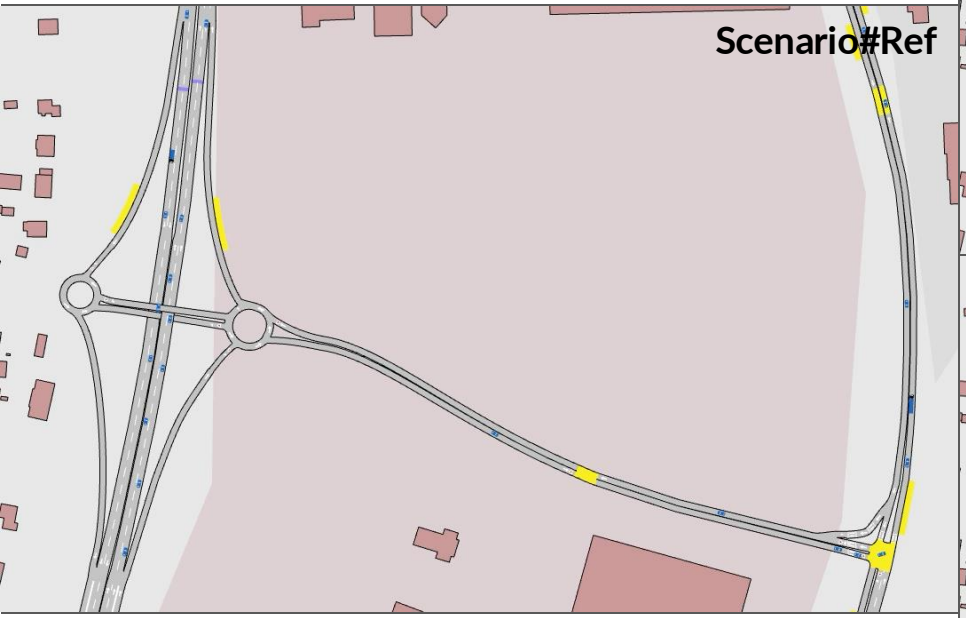
04:00 PM – 05:00 PM

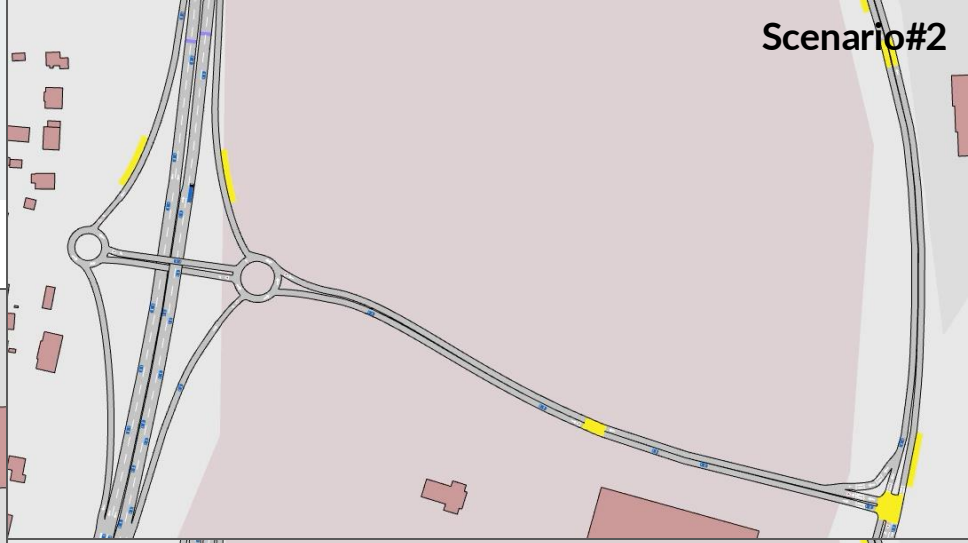
Experimental Scenarios

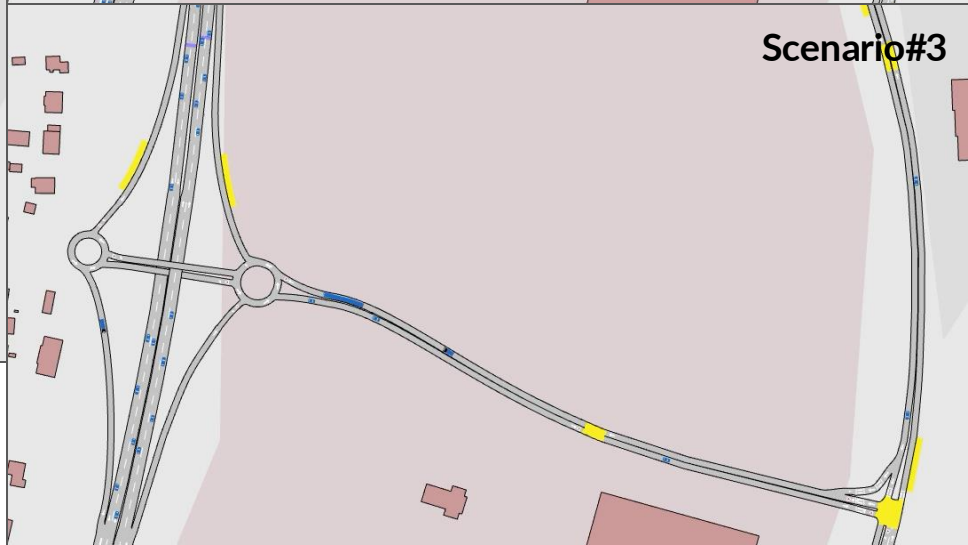




Experimental Scenarios

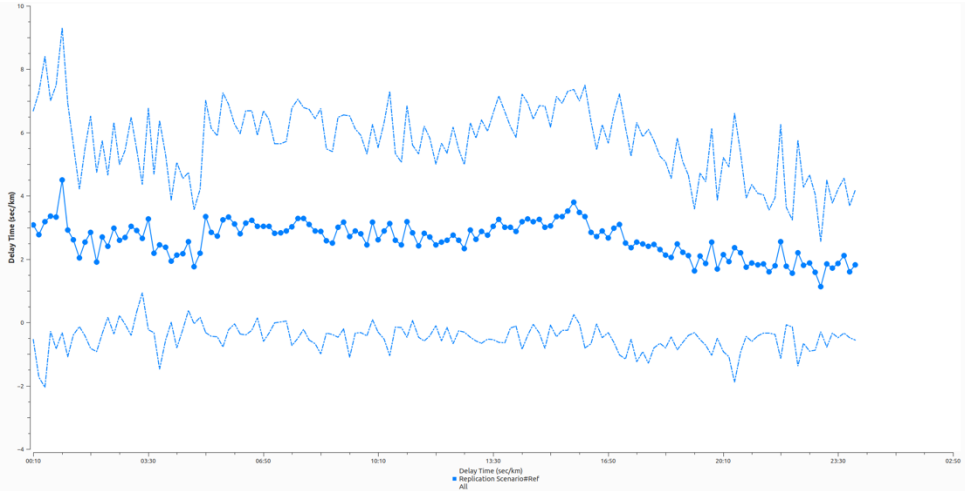






07:00 AM – 08:00 AM

Results – Delay Time



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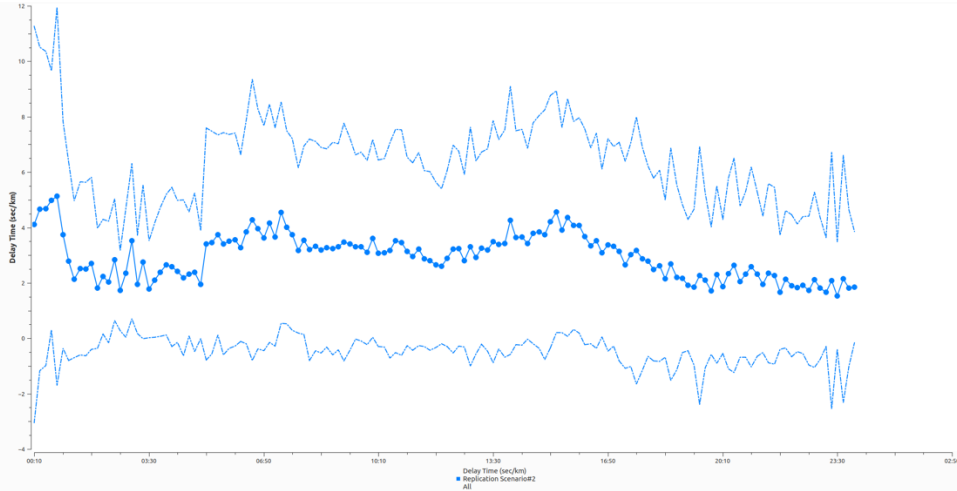
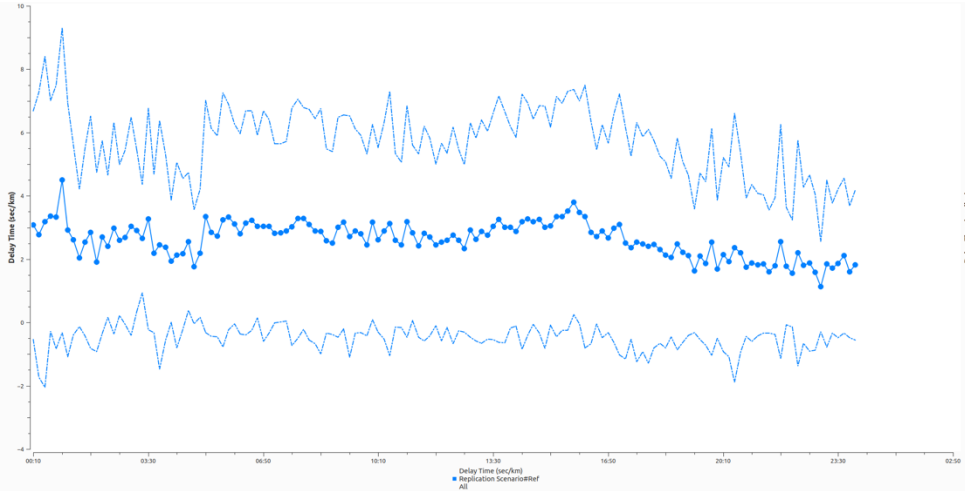


Scenario#2

Results – Delay Time



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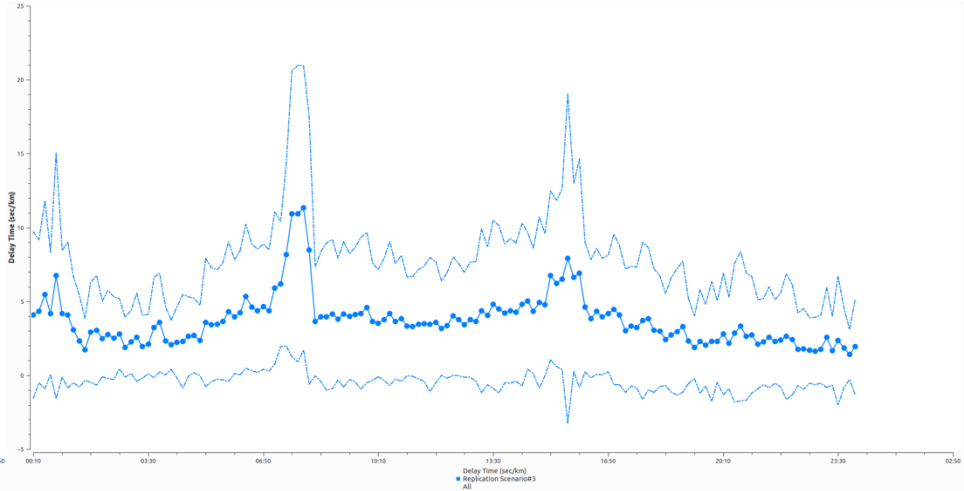
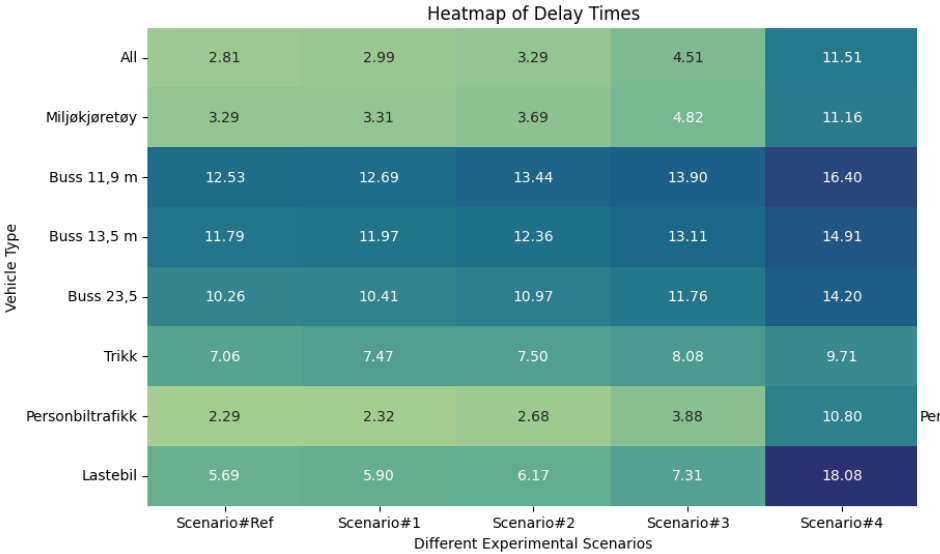
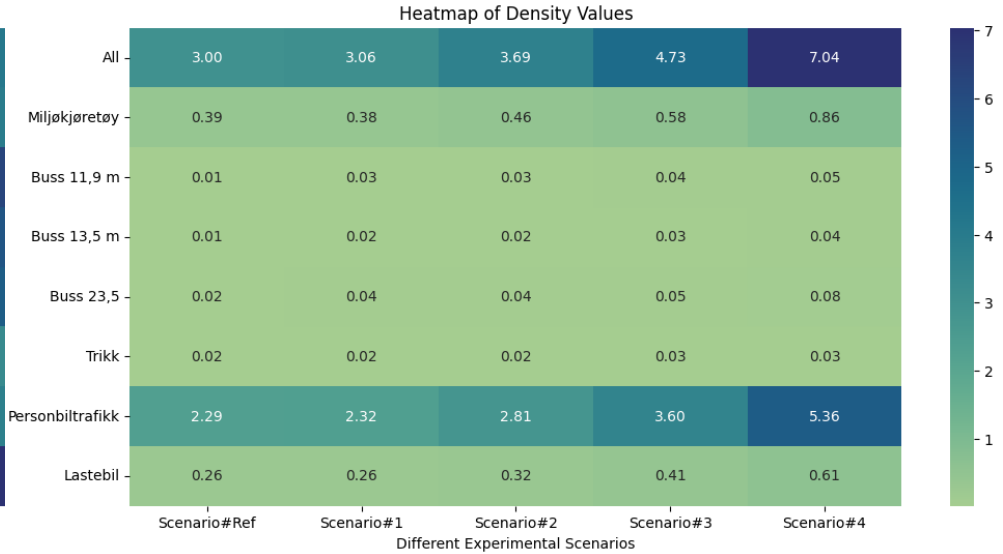


Scenario#3

Results – Traffic Density & Delay Time



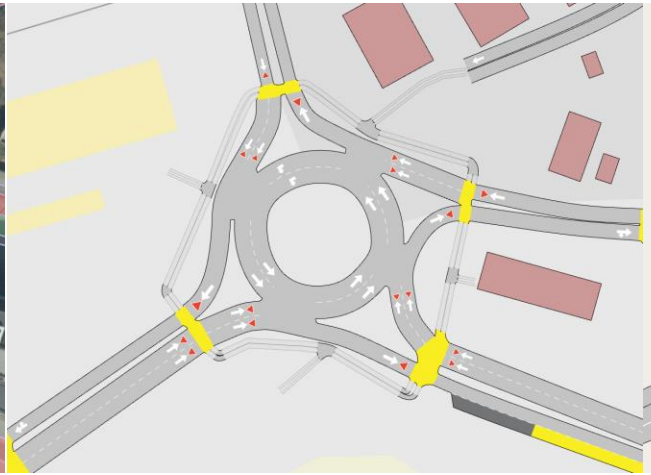
Traffic Density



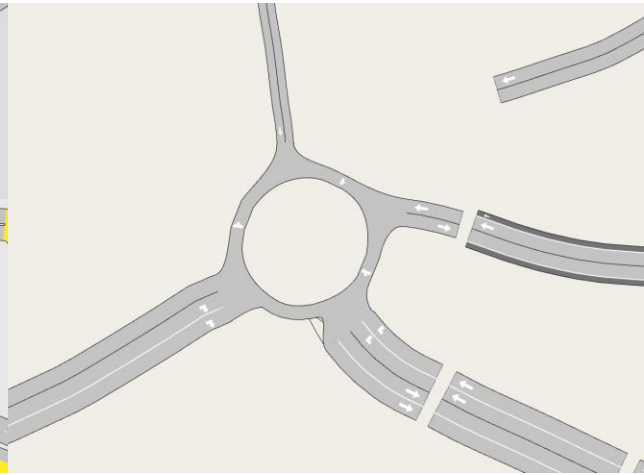
Delay Time

Bringing Geometric Accuracy

Google Map



Pre-existing models with less accurate geometry



Enhanced geometric information (ongoing)

Thank you!