Simulation Project

Team B

Improve Throughput of the Main Road

Hannoversche Str. / Diesdorfer / Ummendorfer Str.

Milestone 5

Presented by

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Overview

1. Program concept and structure
2. Modularization
3. Simulation program
4. Verification
5. Experiments
6. Project Cost and Project progress
7. Challenges faced
8. Lessons Learned

System


Kummelsberg
1. Reitsport- und Fahrverein Alt...
Schrote
Podologie Ramona Möring &...
Hannoversche Str.
Institut f.Präventive Medizin &Klinische...
Stadion der Bauarbeiter
ule Diesdorf
Ummendorfer Str.
Große Diesdorfer Str.
Diesdorfer Graseweg Str.
3D
Google
100%
Imagery date: 6/21/22
GeoBasis-DE/BKG (©2009)
100 m
Camera: 695 m 52°07'51"N 11°34'22"E
58 m

Program concept and structure

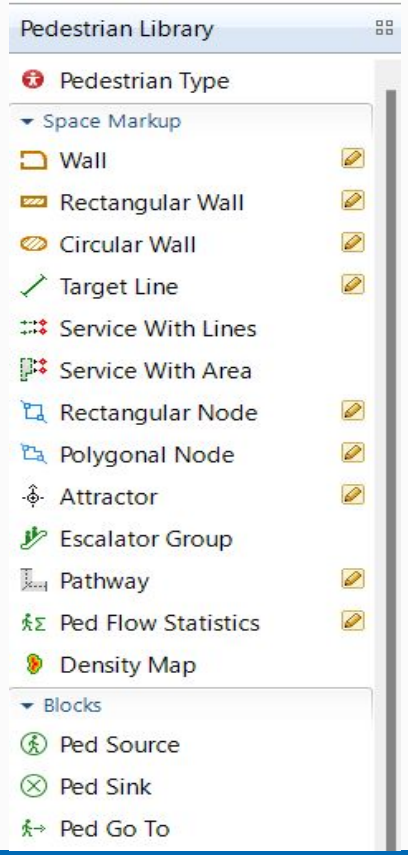
Modelled using AnyLogic 8 Personal Learning Edition 8.8.2

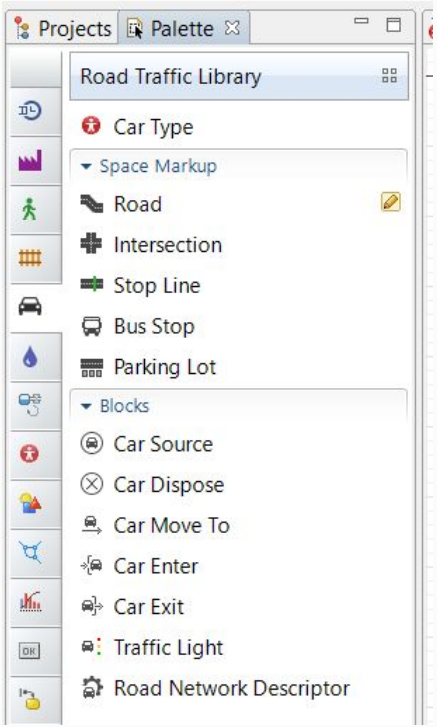
The following libraries were used,

- Pedestrian Library
- Road Traffic Library
- Process Modeling Library
- Agent Library
- Analysis Library

We divided the design into different parts,

- Modelling Vehicles
- Modelling Trams
- Modelling Traffic lights





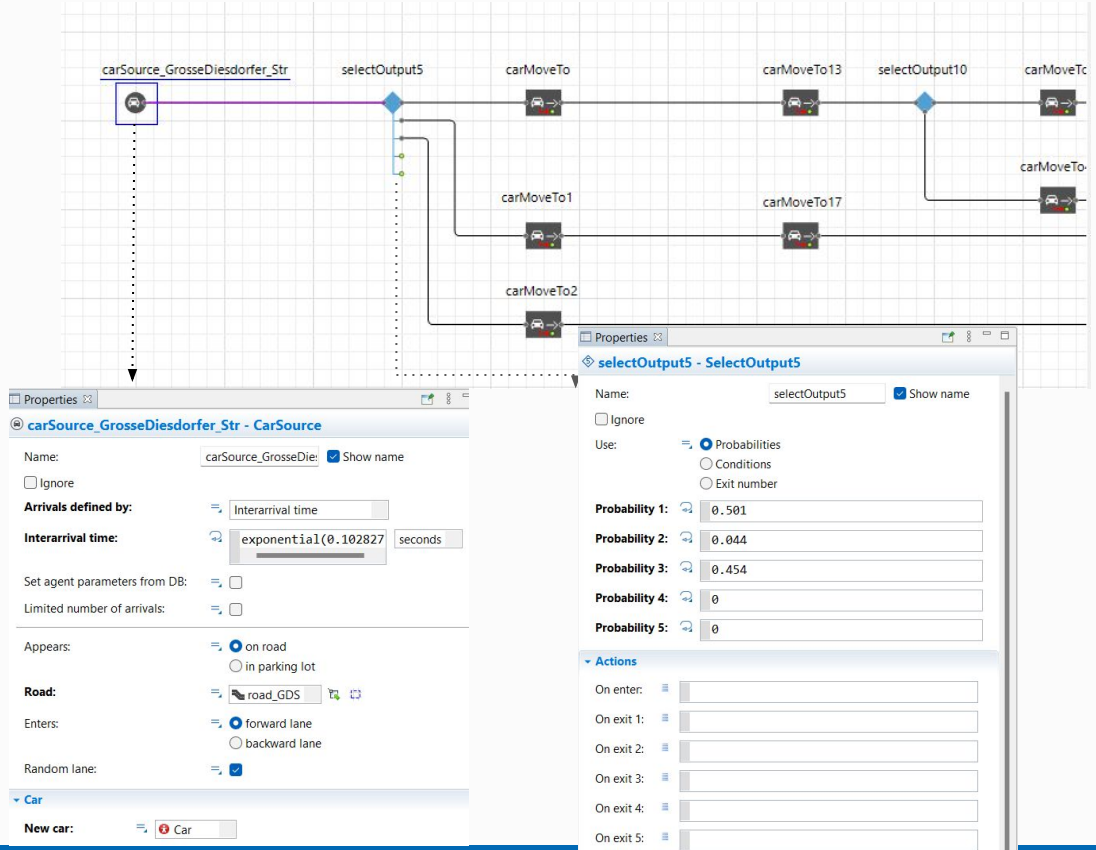
Modelling vehicles

The space markup shapes used were,

- Road
- Intersection
- Stopline

The following nodes were used to create and control cars/vehicles,

- Car Source
- Select Output
- Car Move To
- Car Dispose

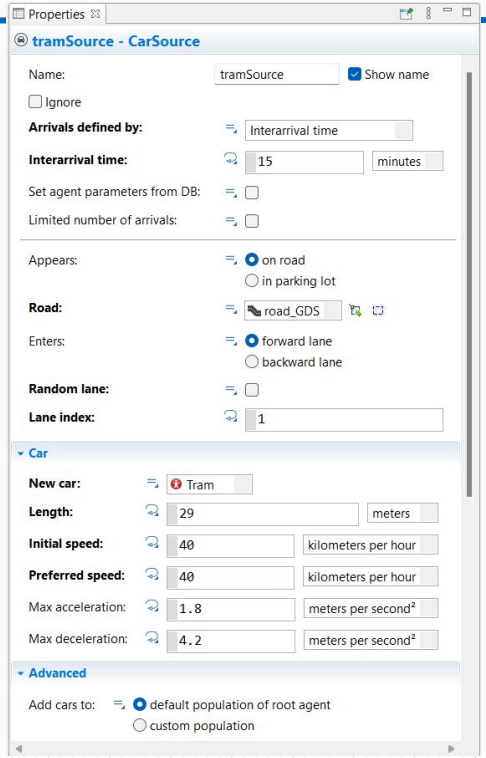


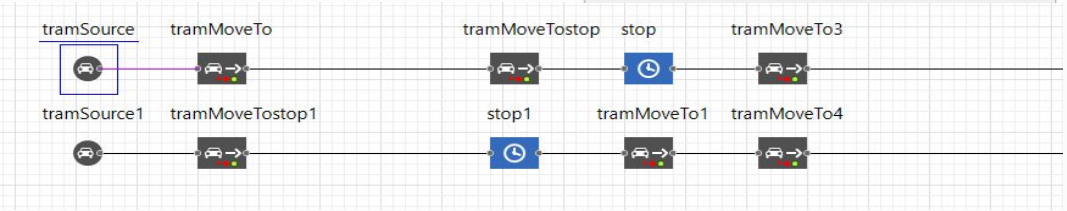
Modelling trams

Created a custom agent ‘Tram’ for the trams.
The following nodes were used to create and control the tram,

- Car Source
- Car Move To
- Car Dispose

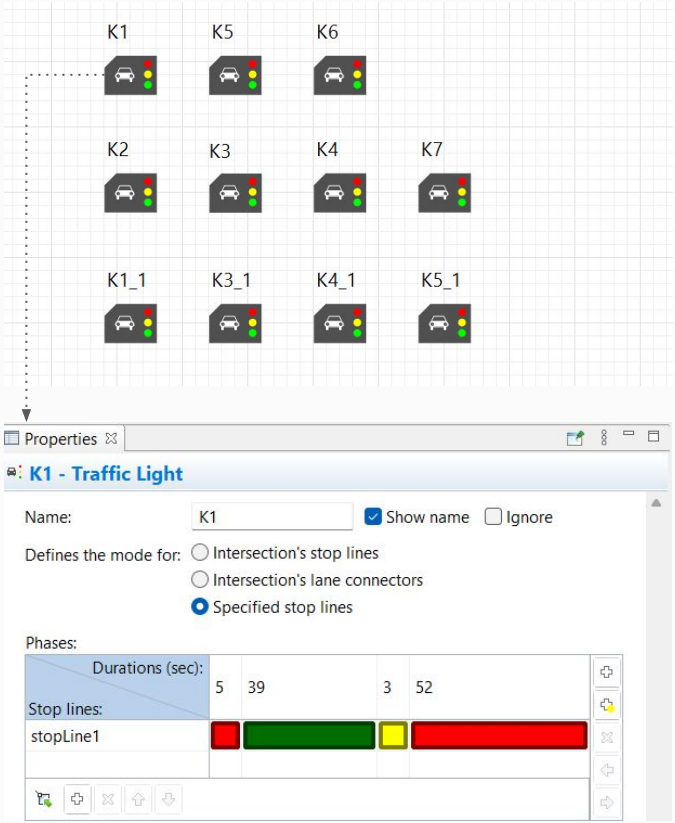
‘Delay’ was also used from Process Modelling Library to create a waiting time for the trams at the stop



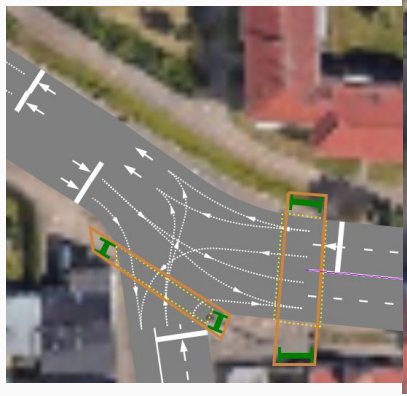


Modelling traffic lights

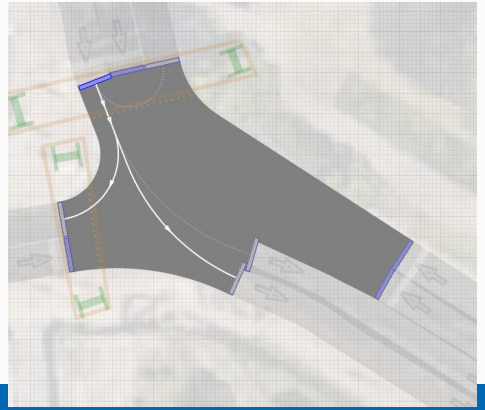
- Traffic light patterns were designed based on SP 4 VA-Nachmitagspitze “signal program and SP 5 signal program provided from the city office
- Separate traffic light nodes for each road at the intersections
- Vehicle flow controlled using a combination of Stop Lines and Traffic Light nodes



Modularization



- Creation of two intersections in Hannoversche Str.
- Trams do not exactly follow the path as in the real system due to some constraints
- Exclusion of Tram Signals
- Exclusion of buses in our model.
- Compared the Simulation model with the conceptual model and found the following discrepancies
  1. The conceptual model didn't account for the ability of vehicles to move forward from the intersection at Ummendorfer Str.
  2. Exclusion of pedestrian crossings in the simulation model



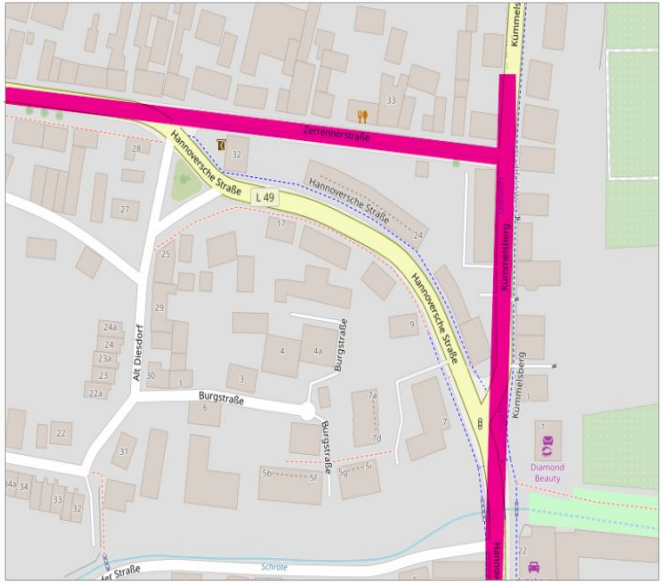
Simulation Program

Verification

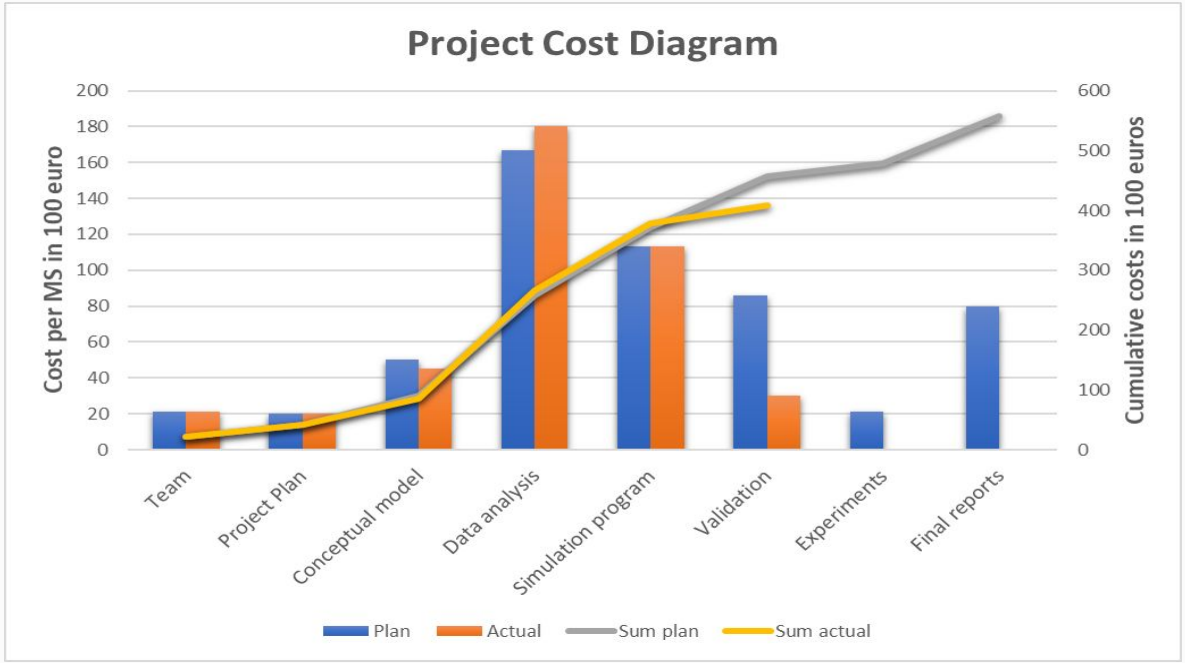
- Code review: Thoroughly examined the simulation program's code to ensure accuracy, efficiency, and adherence to best practices as possible.
- Checked the face validity of the model
- Made sure the program has no compilation errors
- Collected validation data.

Experiments planned

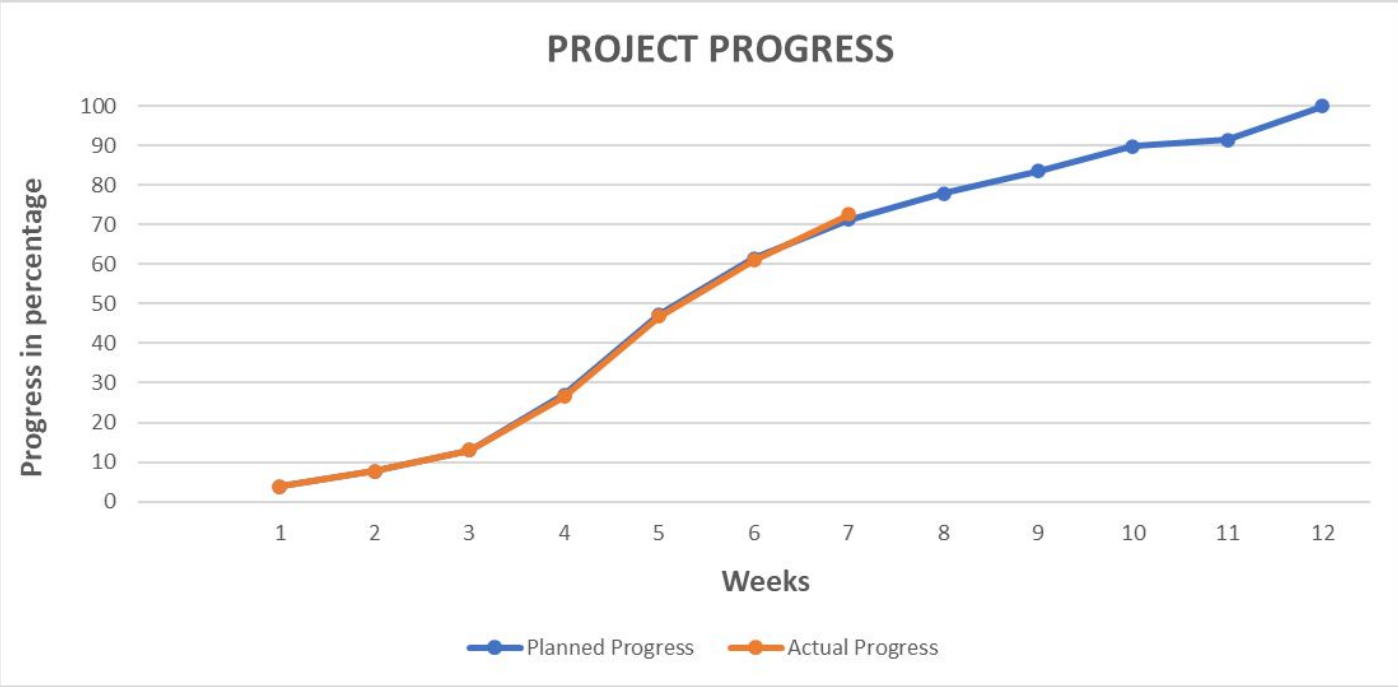
- Pedestrian subway - Remove the phases of traffic lights that were previously dedicated to pedestrian crossings.
- Removal of the Second Signal from Große Diesdorfer Str. allowing a free right access to Hannoversche Str.
- Elimination of Kümmelsberg Intersection: Remove the entire intersection at Kümmelsberg, including associated traffic lights. Instead, redirect the right lane to continue straight towards Kümmelsberg.
- This involves a redesigned course for Hannoversche Straße: The proposed change involves modifying the course of Hannoversche Straße, indicated by the red lines, to accommodate the new traffic pattern.
- Optimization of traffic lights.



Project Cost



Project Progress



Challenges Faced

- Familiarizing with Road Traffic and Pedestrian Libraries: Understanding the functionalities of the libraries in the AnyLogic software.
- Integration of Libraries: Combining the Road Traffic and Pedestrian Libraries to simulate vehicular and pedestrian traffic interaction.
- Accurate Traffic Light Modeling: Creating realistic traffic light behavior and timings for the simulated intersection.

Lessons Learned

- Model a real life system in a simulation software
- The simulation model should be flexible
- Gained some insights into the complexity of traffic signal patterns
- Teamwork improves quality

Thank You

Any Questions?