



Team C-rious

Milestone 8

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- Results of the Project
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- Cost Analysis
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Milestone Recap

1: Team

Respect your
teammates!

Name	Role
Madeleine Breitzkreutz	Team Leader
Teja Sri Lakshmi Ganesh Balaji Bokka	Conceptual Model
Rajesh Bhandari	Input Data Analyst
Jannis Römermann	Chief Software Architect
Manu Benny	Experiment Designer
Atif Harshad	Validation and Quality Control

Pull your
weight!

Milestone Recap



Milestone Recap



Milestone Recap



Milestone Recap

1: Team

Special Challenges:

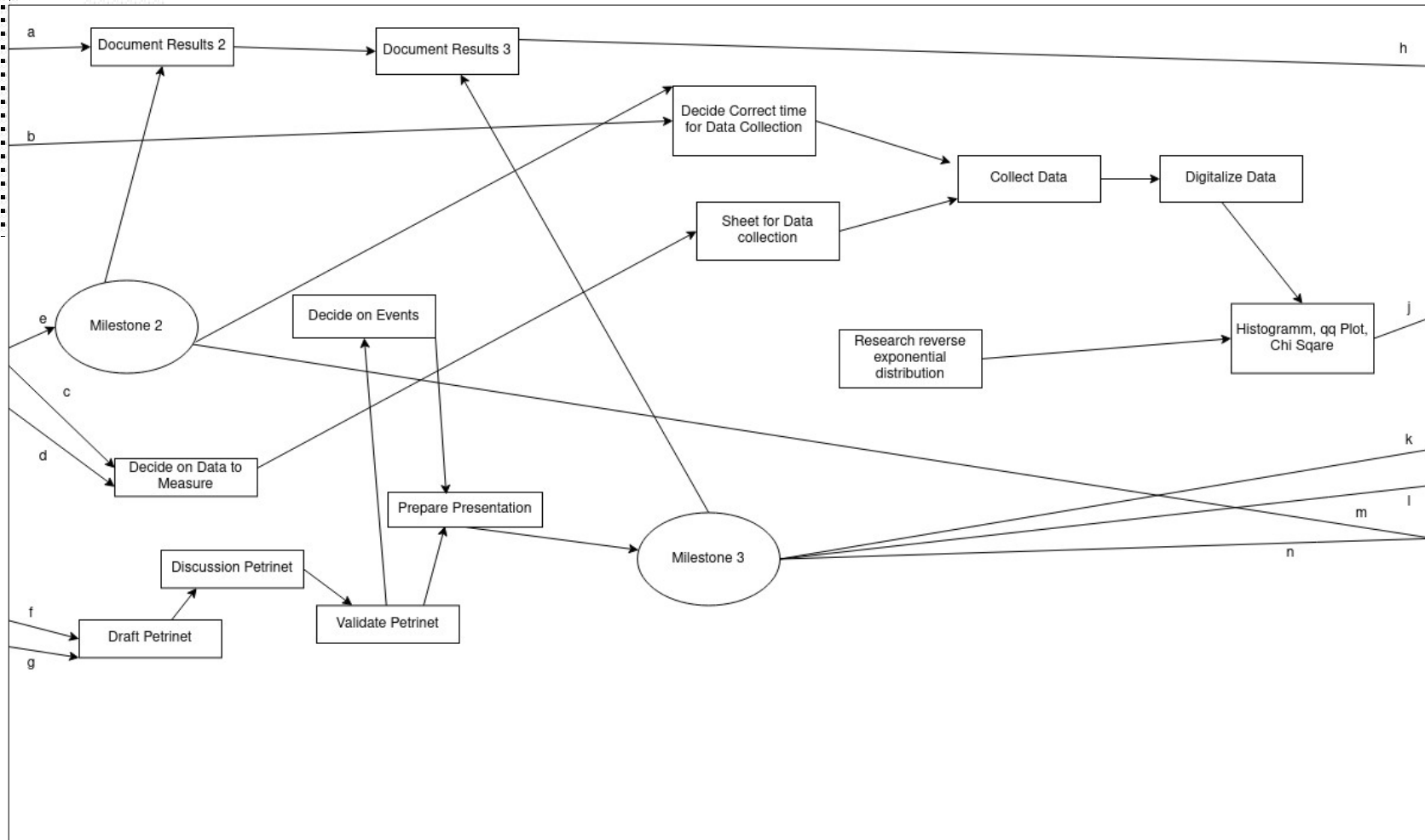
- Finding a timeslot for the meeting
- Coordinating the first milestone without meeting
- Lack of Feedback

Milestone Recap

2: Project Plan

Task	Responsible	Deadline	Duration (hours)
<i>Conceptual Model</i>		04.05.23	32,5
Research Petrinets on Intersections	Teja, Atif, Manu	23.04.23	3
Logic Road Signs	Madeleine	22.04.23	1,5
Draft Petrinet	Teja, Atif, Manu, Madeleine, Jannis	27.04.23	15

Milestone Recap



Milestone Recap

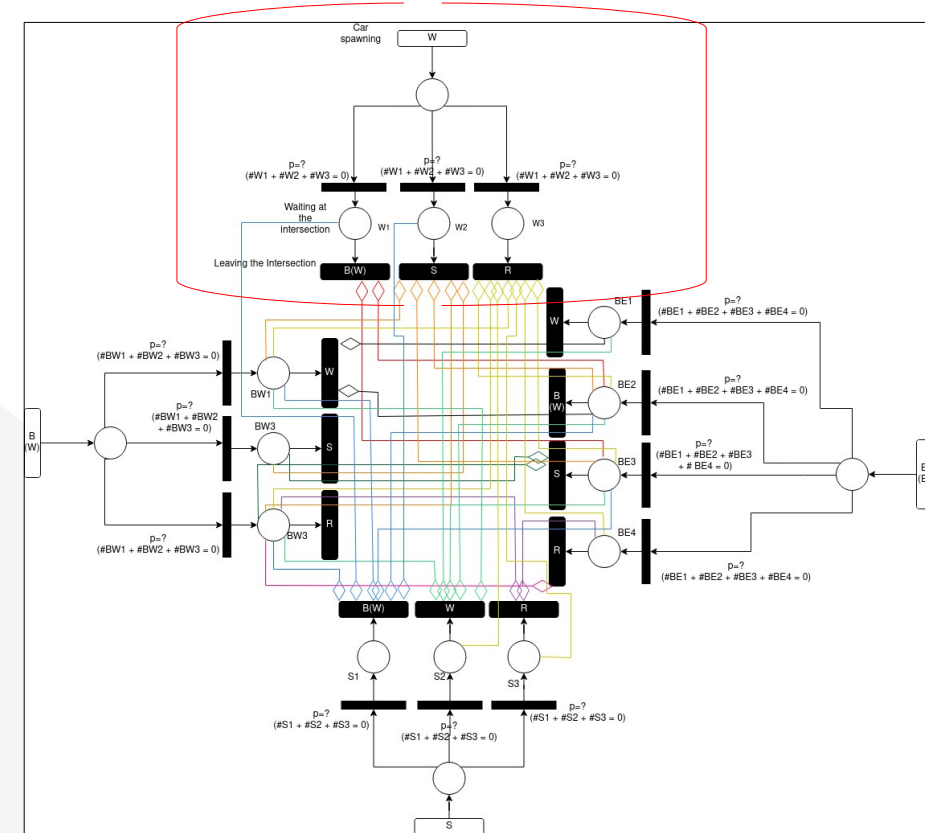
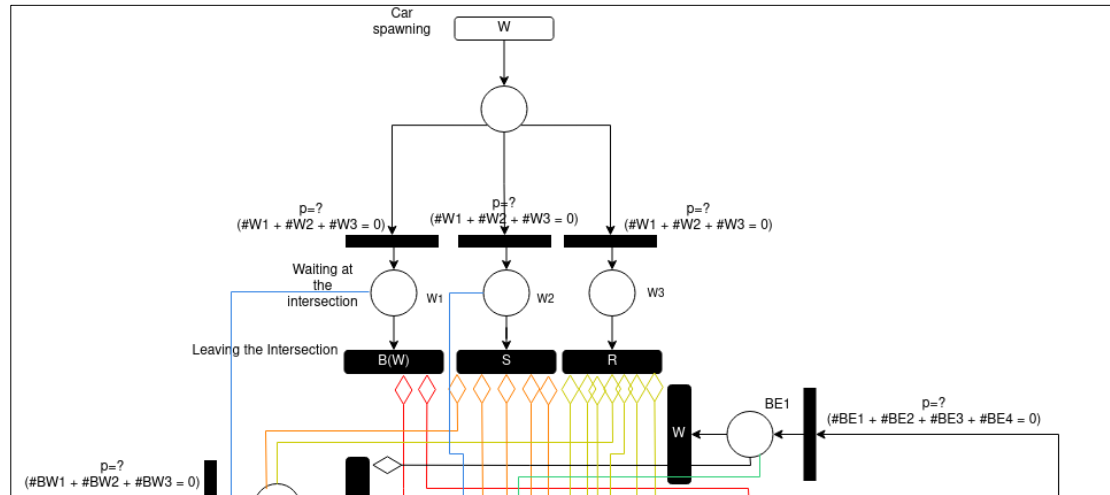
2: Project Plan

Special Challenges:

- Time consumed for the plan
- Reliability of the plan
- Estimating durations and therefore costs

Milestone Recap

3: Conceptual Model



S → Schöninger Straße
W → Wolfenbüttler Straße

B(E) → Braunschweiger Straße East
B(W) → Braunschweiger Straße West

R → Rottersdorfer Straße

Milestone Recap

3: Conceptual Model

Special Challenges:

- Communication of the task at hand
- Visually representing the net
- Minimalism or accuracy

Milestone Recap

4: Data Collection

Traffic Data Collection at Junctions: Tallying Car Directions

Starting time:

Braunschweiger Straße (W) to

Street Name	Tally	Total Count
Wolfenbütteler Str.		
Rottersdorfer Straße		
Schöninger Straße		

Milestone Recap

4: Data Collection

Throughput in cars per minute:

Mean	5.36
Confidence Interval	[2.65, 8.06]

Waiting Time in seconds:

	B(W)	B(E)	S	W
Mean	0.01	0.02	0.09	0.67
Confidence Interval	[-0.01, 0.02]	[0.01, 0.03]	[-0.04, 0.22]	[0.55, 0.79]

S → Schöninger Straße

W → Wolfenbüttler Straße

B(E) → Braunschweiger Straße East

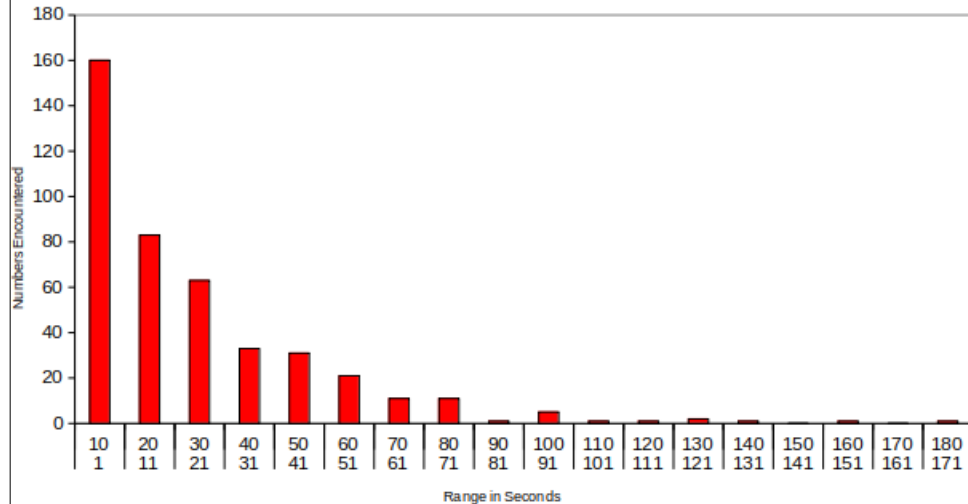
B(W) → Braunschweiger Straße West

R → Rottersddorfer Straße

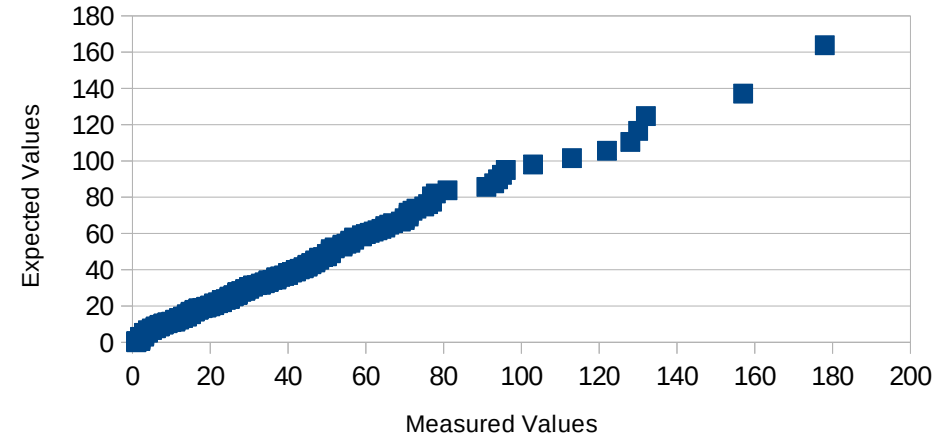
Milestone Recap

4: Data Collection

Histogram for Braunschweiger Straße East



QQ-Plot Braunschweiger Straße East



Accepted by a χ^2 Test with exponential distribution $\lambda = 0,04$, $f = 3$, $\alpha = 0,01$

Milestone Recap

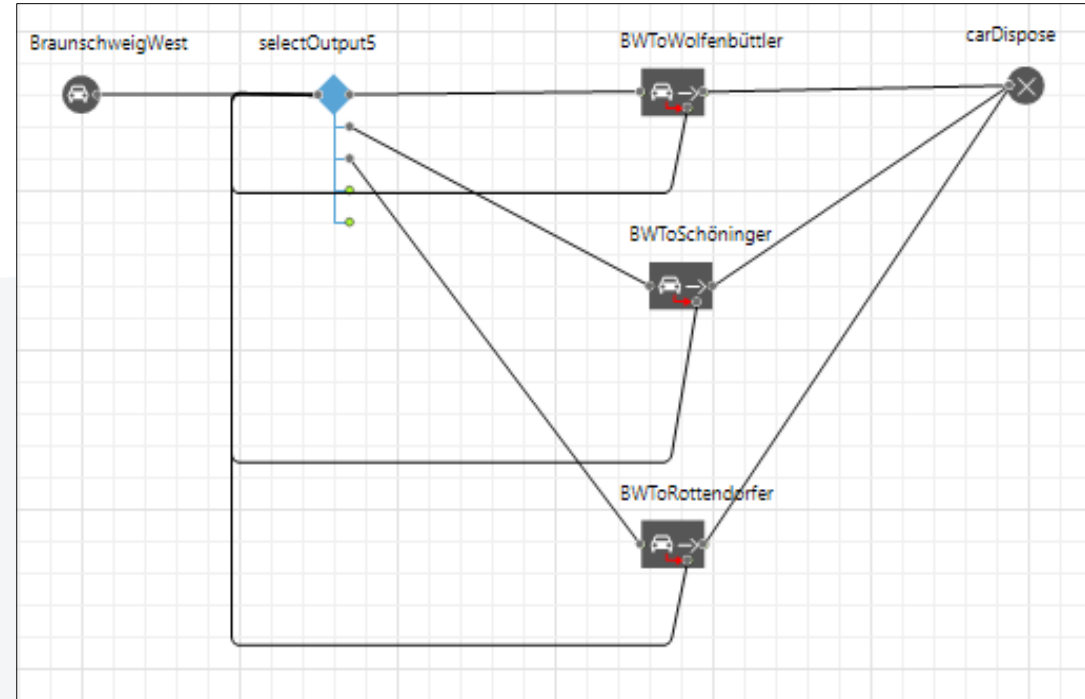
4: Data Collection

Special Challenges:

- Redoing things for the documentation
- Fitting distributions to the data
- High inaccuracy for small time values resulting in awkward buckets for the Chi^2 Test

Milestone Recap

5: Anylogic Model



Milestone Recap

5: Anylogic Model

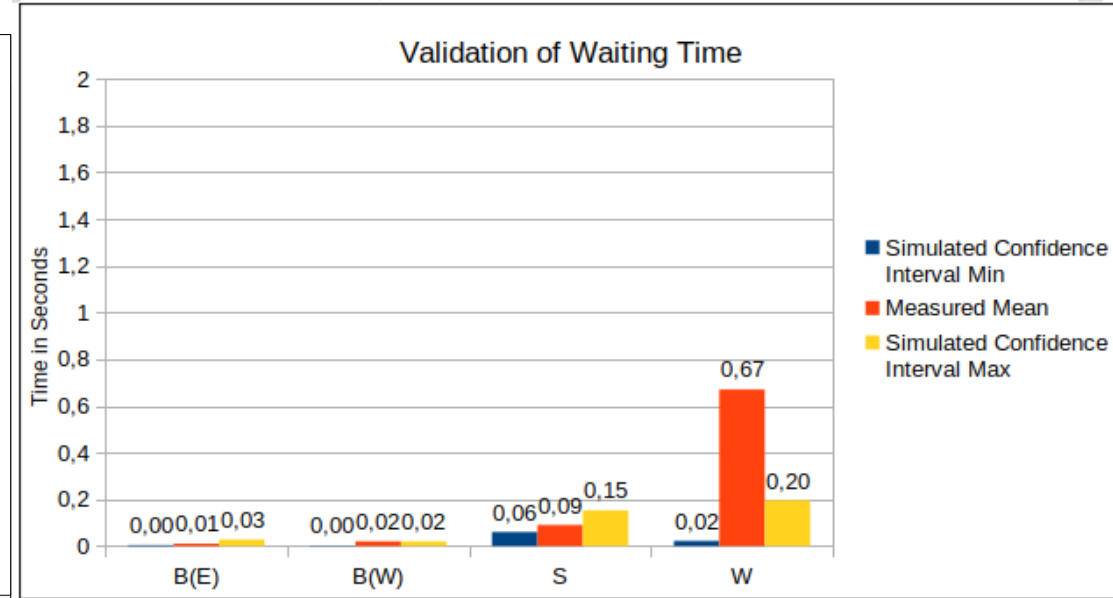
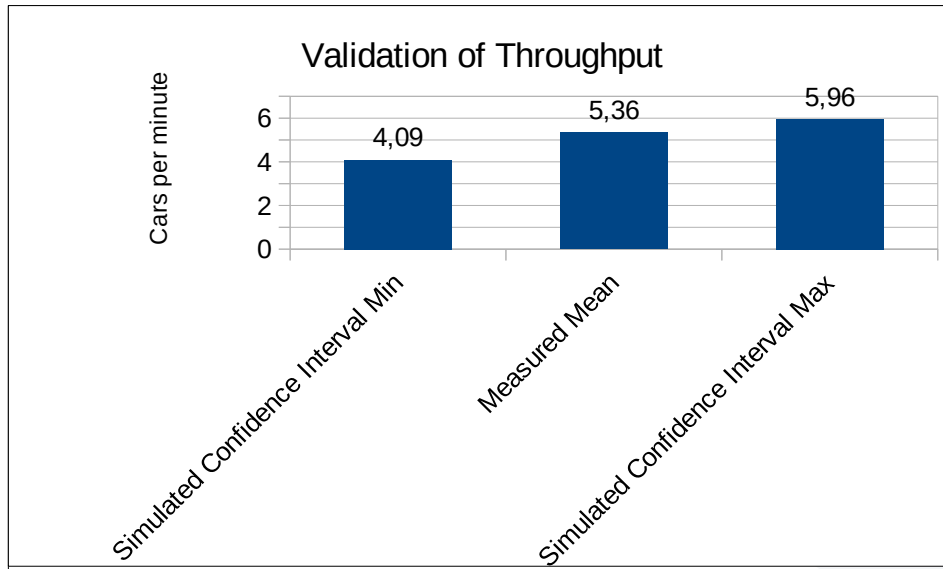
Special Challenges:

- Debugging

Milestone Recap

6: Validation

Some cars treat the stop sign at W like a yield sign, others do not



S → Schöninger Straße

W → Wolfenbüttler Straße

B(E) → Braunschweiger Straße East

B(W) → Braunschweiger Straße West

R → Rottersdorfer Straße

Milestone Recap

6: Validation

Limitations:

- Traffic Peaks only
- Wolfenbüttler Straße measured higher waiting time
- No pedestrians
- No difference in kind of vehicle
- Input of an estimated distribution

Milestone Recap

6: Validation

Special Challenges:

- Finding out what exactly to do
- Communication errors in the choice of validation
- Bad choice of visualisation

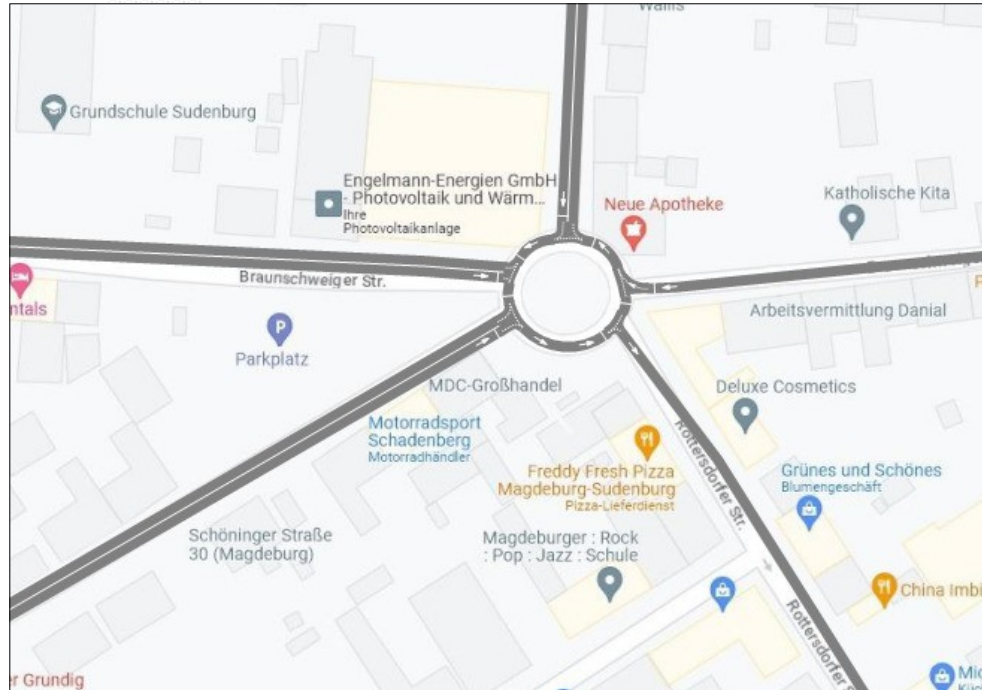
Milestone Recap

7: Experiments

- 5-way roundabout
- 4-way roundabout
- 2-way traffic for Braunschweiger Straße East
- 2-way traffic for Rottersdorfer Straße

Milestone Recap

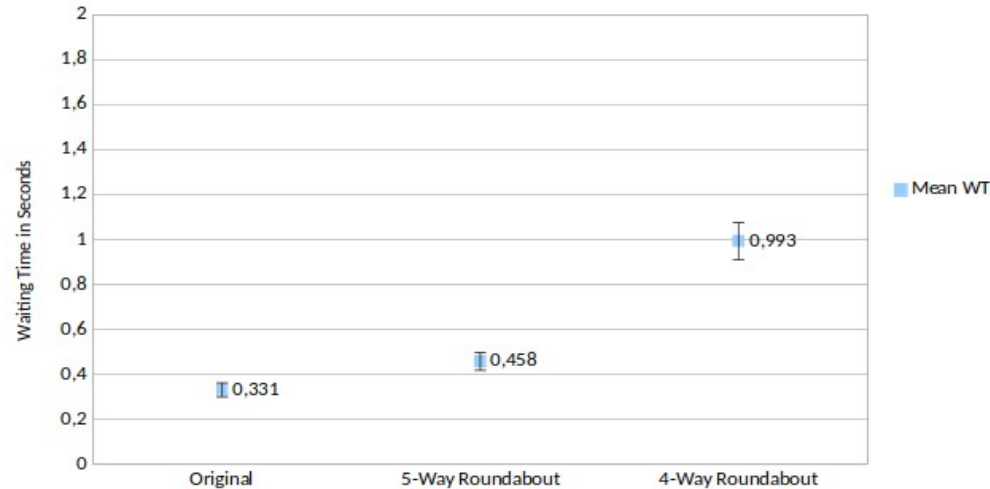
7: Experiments



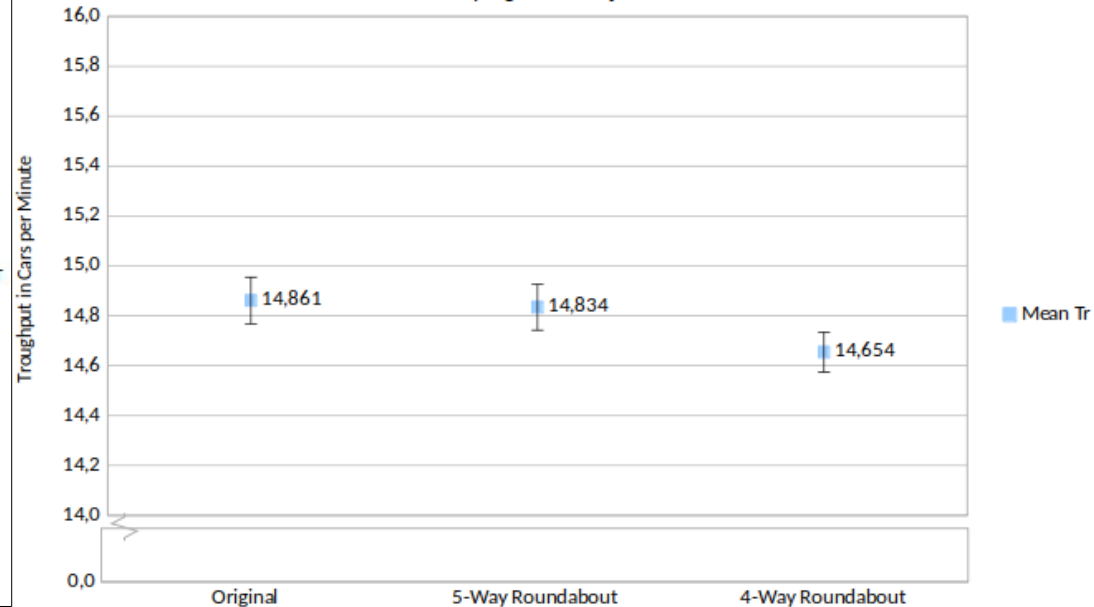
Milestone Recap

7: Experiments

Waiting Time Experiments
Keeping One-Way Streets



Throughput Experiments
Keeping One-Way Streets



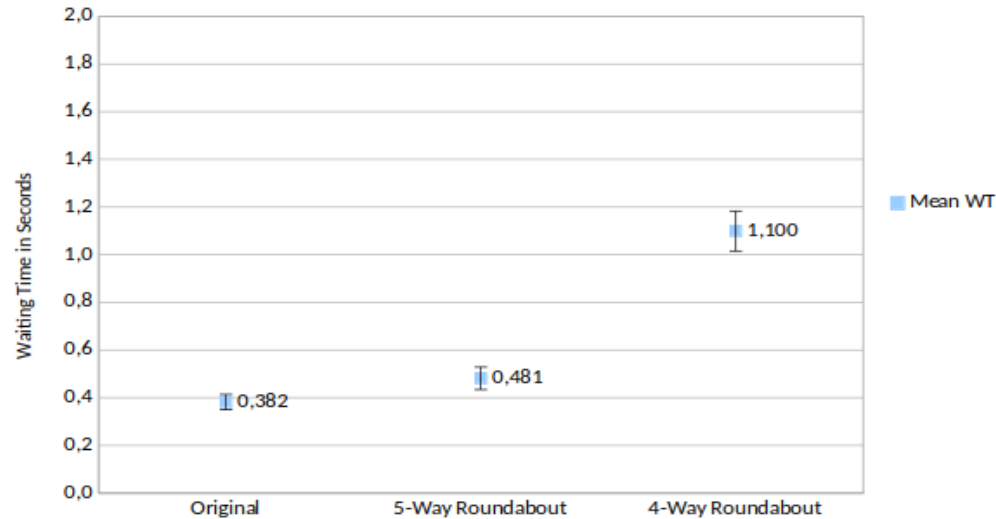
Conducted with 3* the amount of current traffic

Milestone Recap

7: Experiments

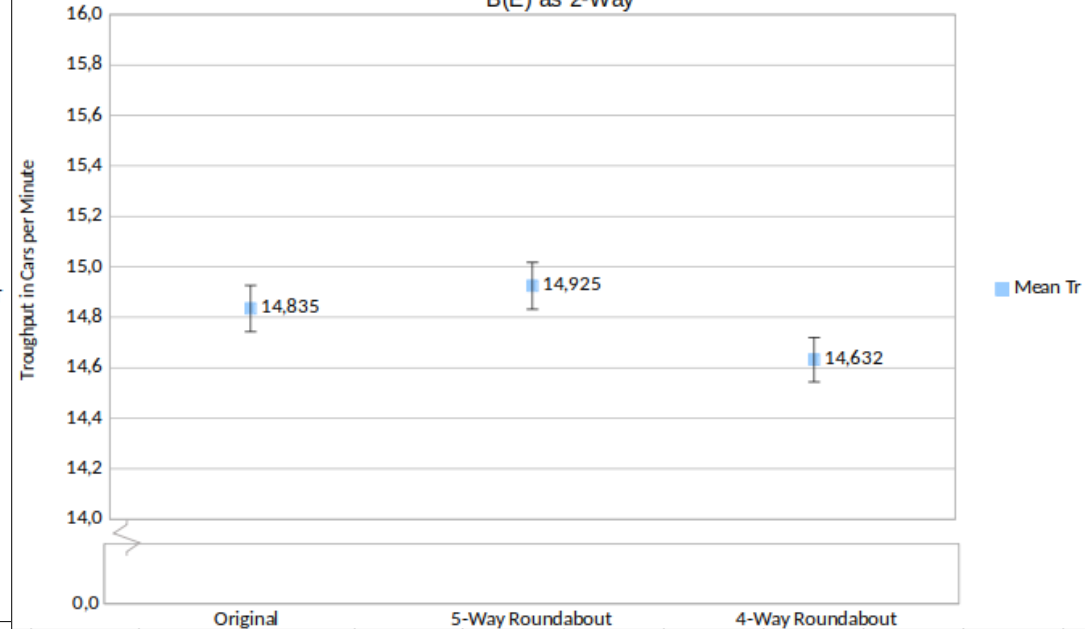
Waiting Time Experiments

B(E) as 2-Way



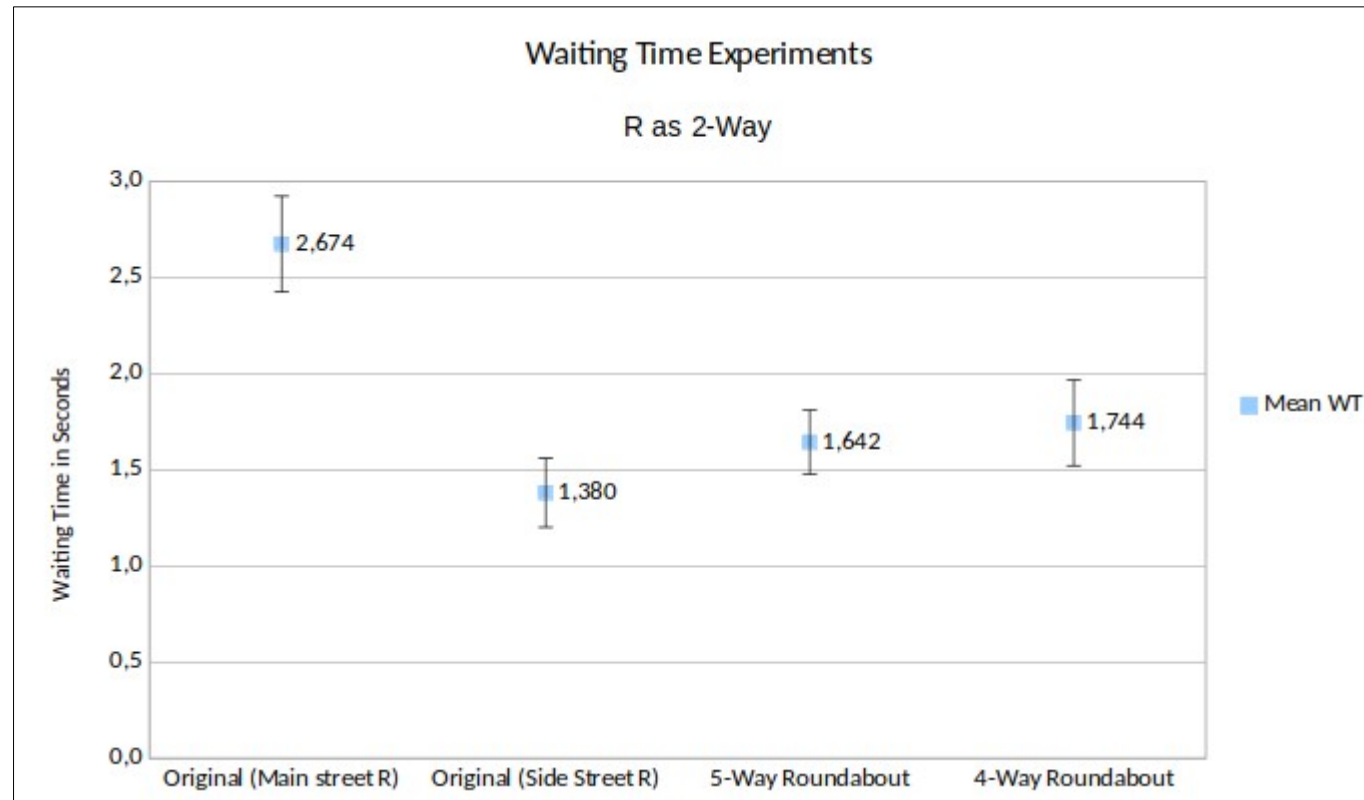
Throughput Experiments

B(E) as 2-Way



Conducted with 3* the amount of current traffic
B(E) → Braunschweiger Straße East

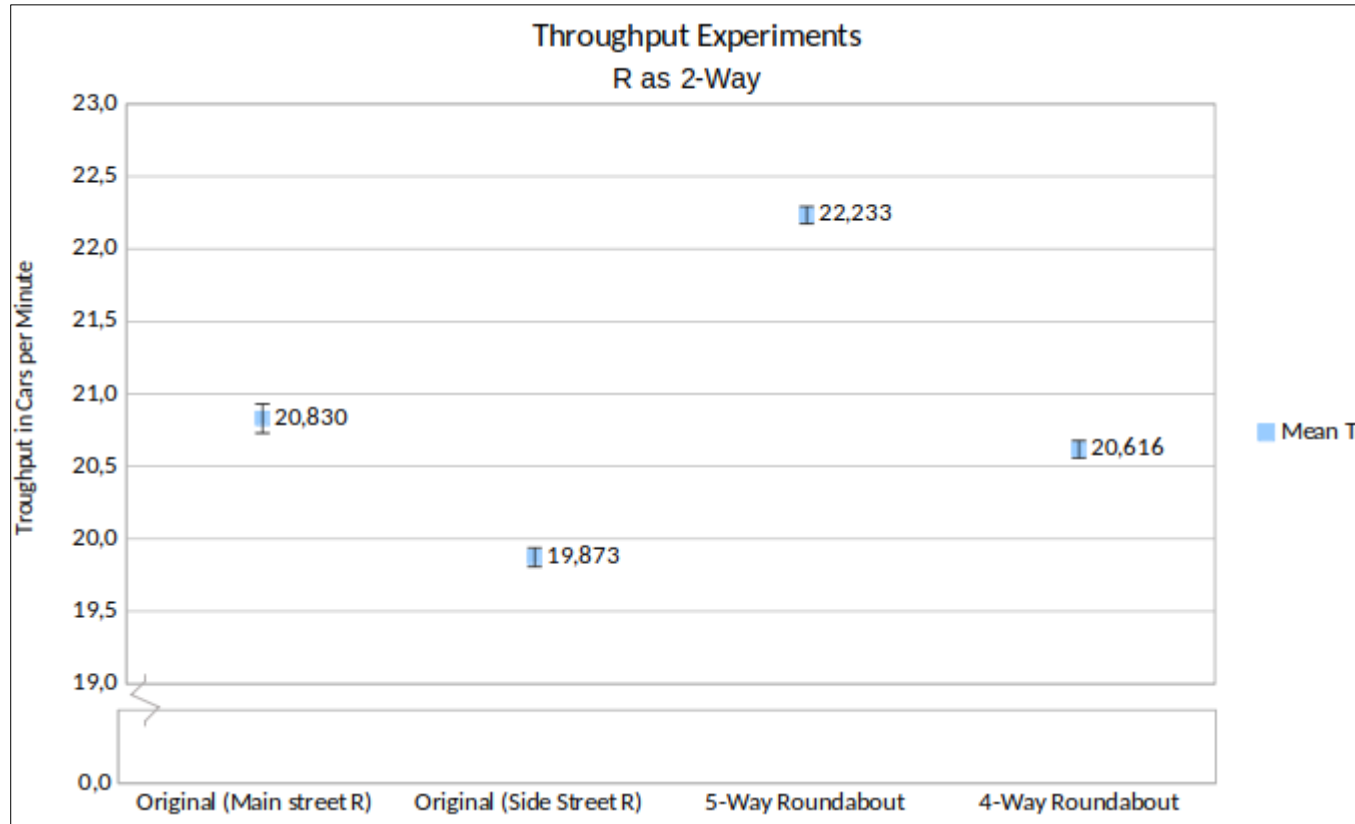
Milestone Recap



Conducted with 3* the amount of current traffic

R → Rottersdorfer Straße

Milestone Recap



Conducted with 3* the amount of current traffic
Rottersdorfer Straße

Milestone Recap

7: Experiments

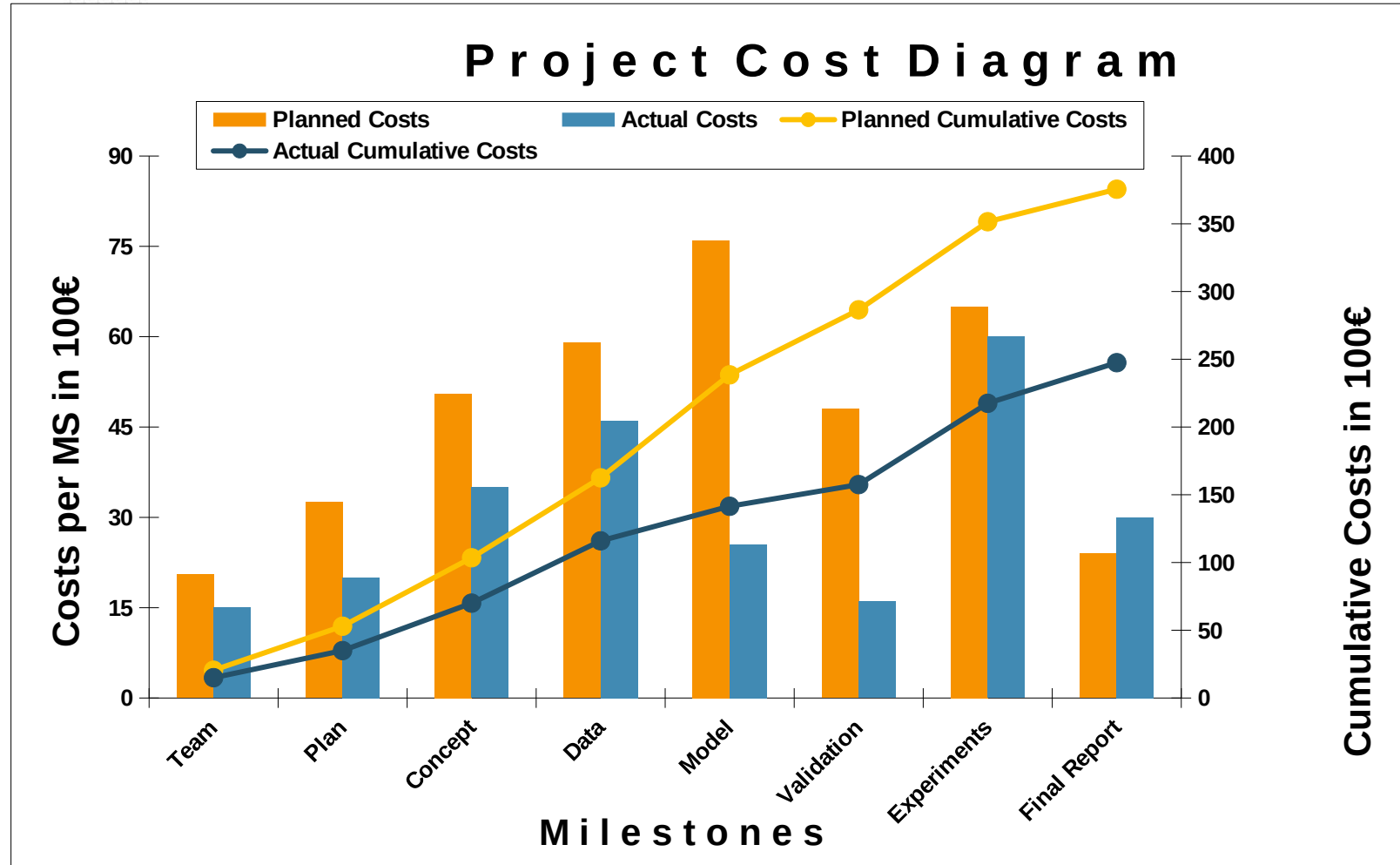
Special Challenges:

- Finding experiments at all
- Finding new ones as we used a different definition of the word

Recommendations

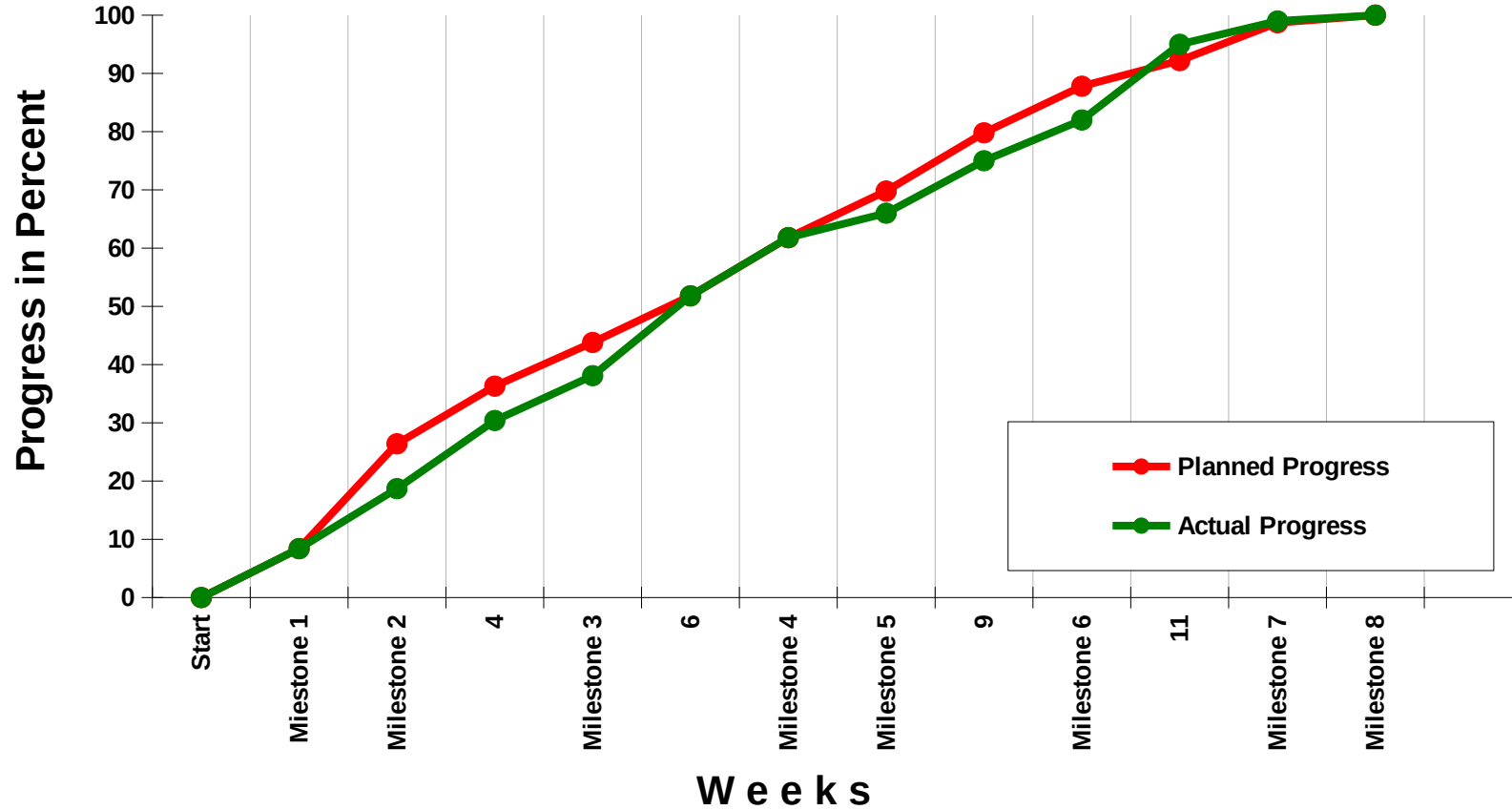
- Current situation suggests no changes
 - Roundabouts possibly easier to understand
 - Roundabouts do not perform worse
- Possible changes for increased traffic
 - 4-way roundabout underperforms
 - 5-way roundabout performs as well as current node
 - 5-way roundabout is versatile
 - In current node Rottersdorfer Straße should not become main street

Cost Analysis



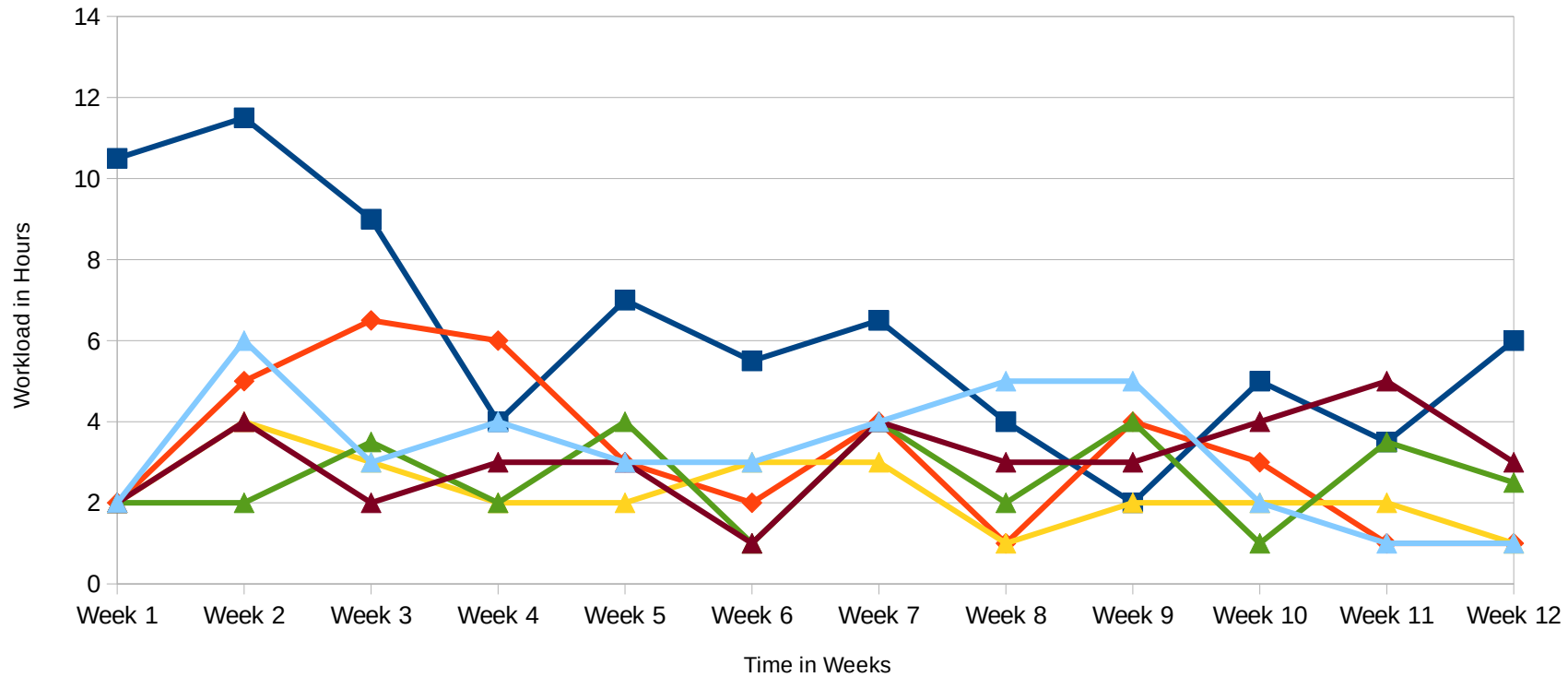
Cost Analysis

Project Progress



Cost Analysis

Workload Over Time



Lessons Learned

- Overestimated working time for tasks
- Planning is everything
- If it is easy it doesn't mean it's fast
- Communication as non-native speaker to non-native speaker
- Constraints are friends
- Placing the marshmallow on top