



Team C-rious

Milestone 2

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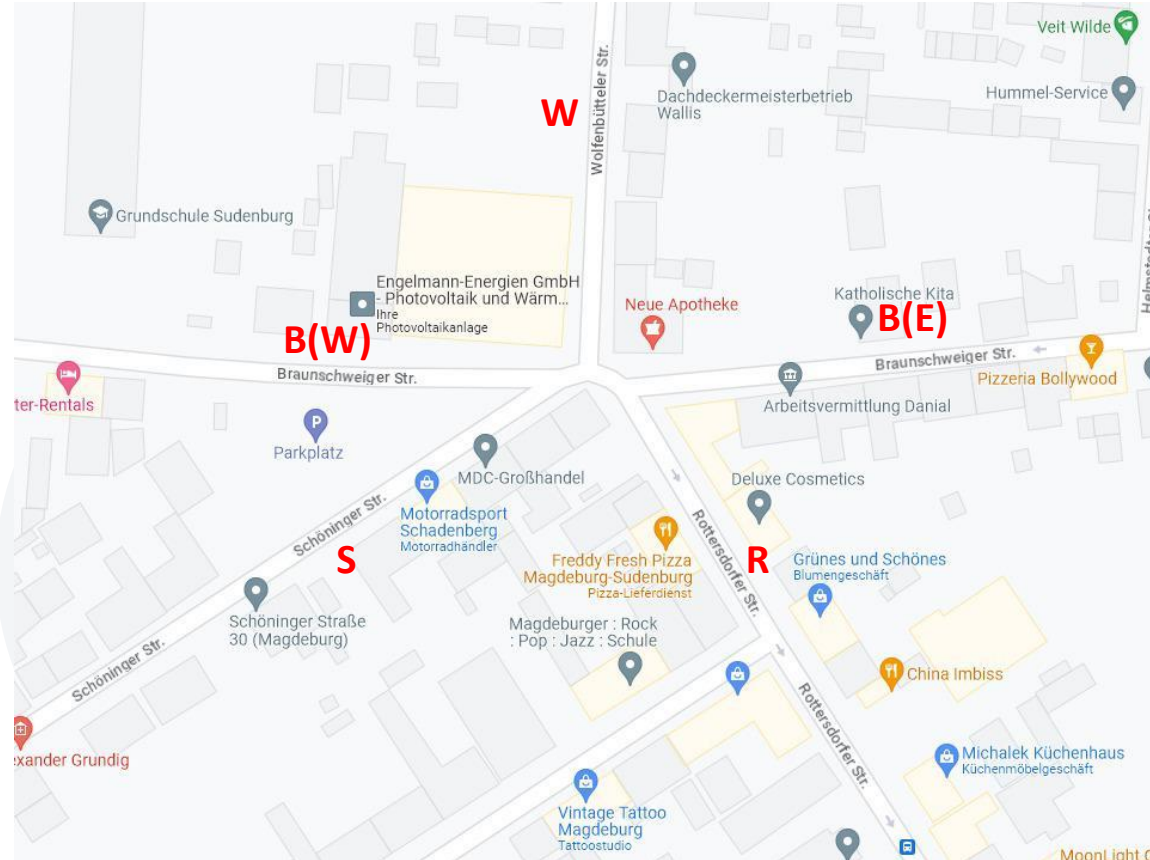
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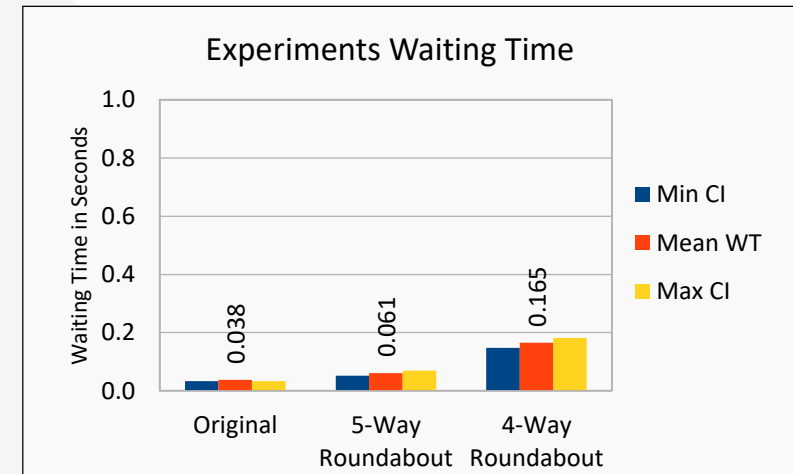
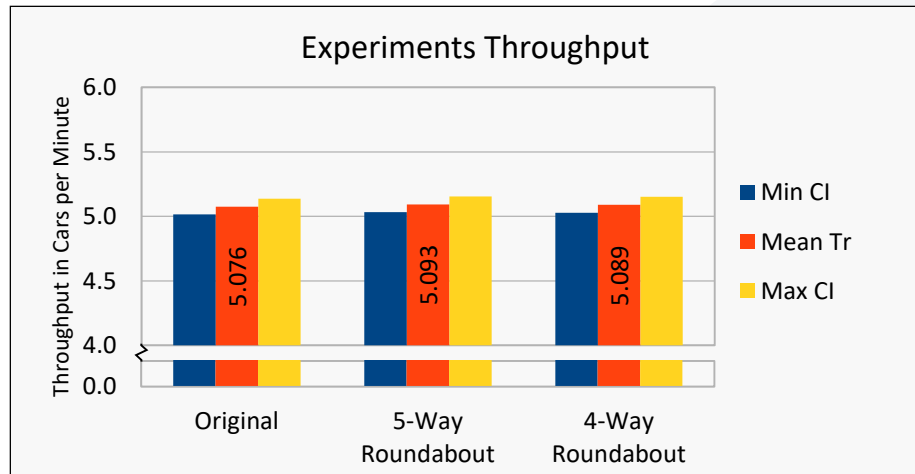
Node Overview

B(W): Braunschweiger Straße (W)
W: Wolfenbüttler Straße
B(E): Braunschweiger Straße (E)
R: Rottersdorfer Straße
S: Schöninger Straße



Experiment Design

- Investigate the effect of a Roundabout on throughput and waiting times.
- Experiments on roundabout with current volume of traffic hardly indicate any difference
- Further experiments were all conducted with 3 times the current traffic volume



Calculated with 95% confidence interval(CI) for the three main variations

Experiment 1 – 5 way Roundabout

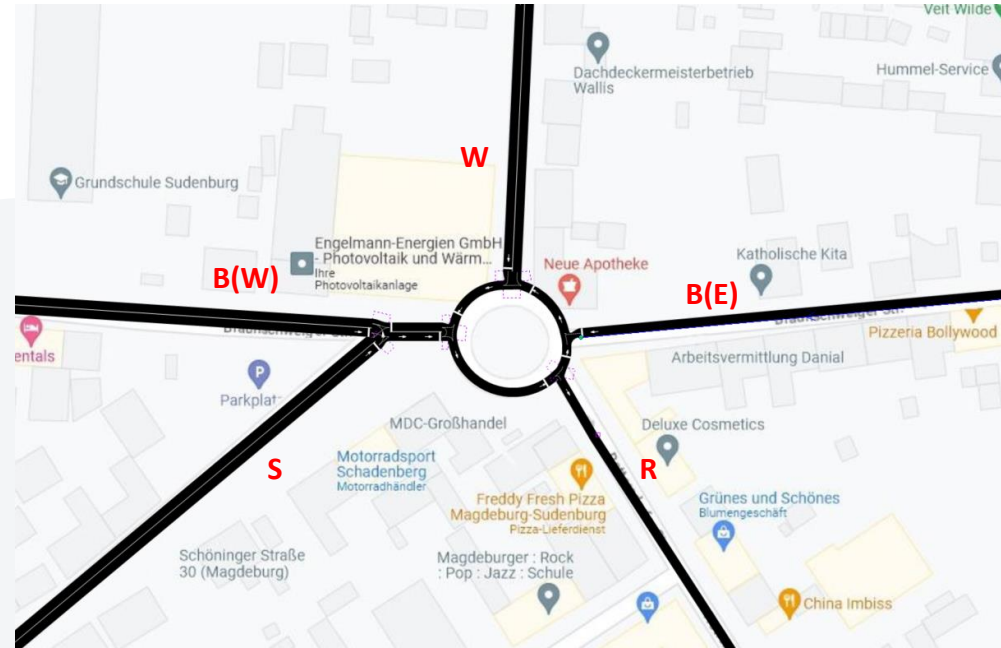
- **Objective:** To analyse the effects on the Throughput and Waiting times.
- Connects Braunschweiger Str. (E), Braunschweiger Str. (W), Rottersdorfer Str., Wolfenbuttler Str. and Schoninger Str. directly to the single lane roundabout



B(W): Braunschweiger Straße (W) **W:** Wolfenbuttler Straße **B(E):** Braunschweiger Straße (E) **R:** Rottersdorfer Straße **S:** Schoninger Straße

Experiment 2 – 4 way Roundabout

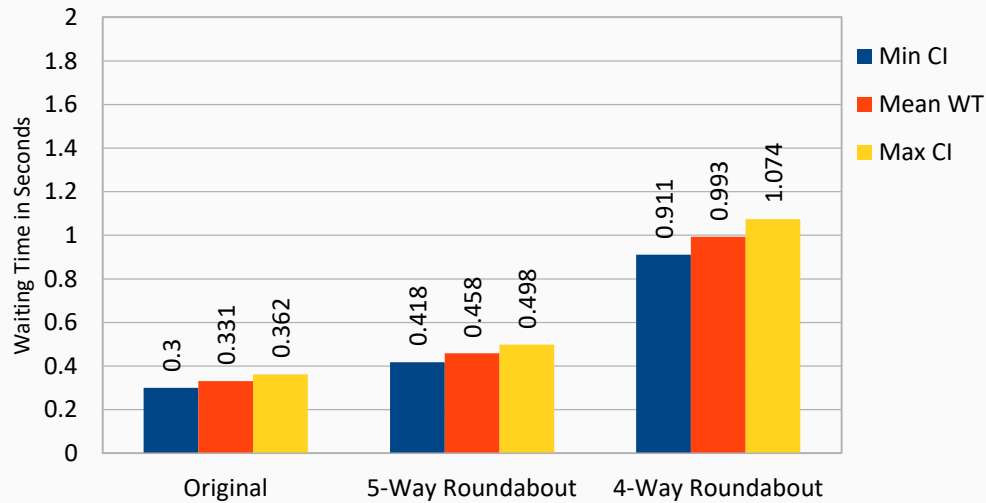
- **Objective:** To analyse the effects on the Throughput and Waiting times.
- The road unifies Braunschweiger Str. (W) and Schoninger Str. into a single path, merging into the 4-arm single lane roundabout.



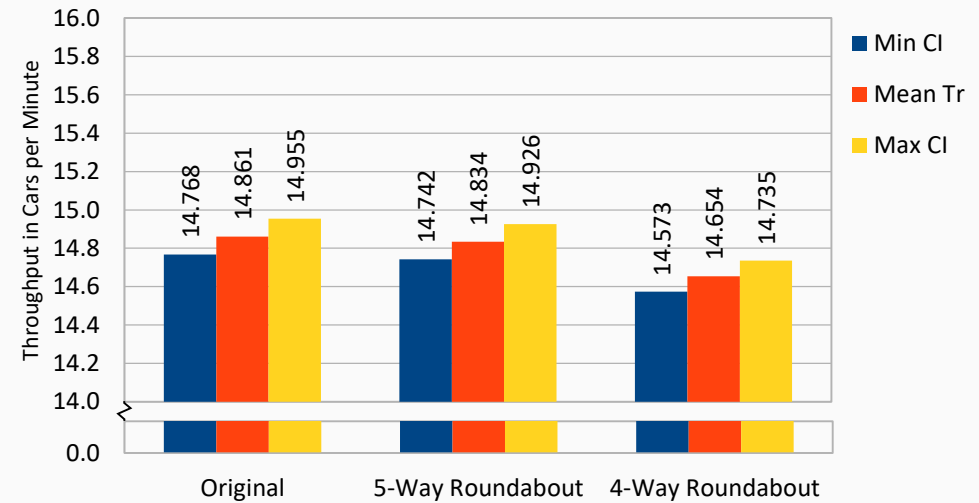
B(W): Braunschweiger Straße (W) **W:** Wolfenbuttler Straße **B(E):** Braunschweiger Straße (E) **R:** Rottersdorfer Straße **S:** Schoninger Straße

Results from Experiments 1 and 2

Waiting Time Experiments



Throughput Experiments



Calculated with 95% confidence interval(CI) for the three main variations showing negligible difference of a fraction of a second in WT and barely showing differences in Tr

Transitioning to Two-Way Street with Assumed Traffic Data

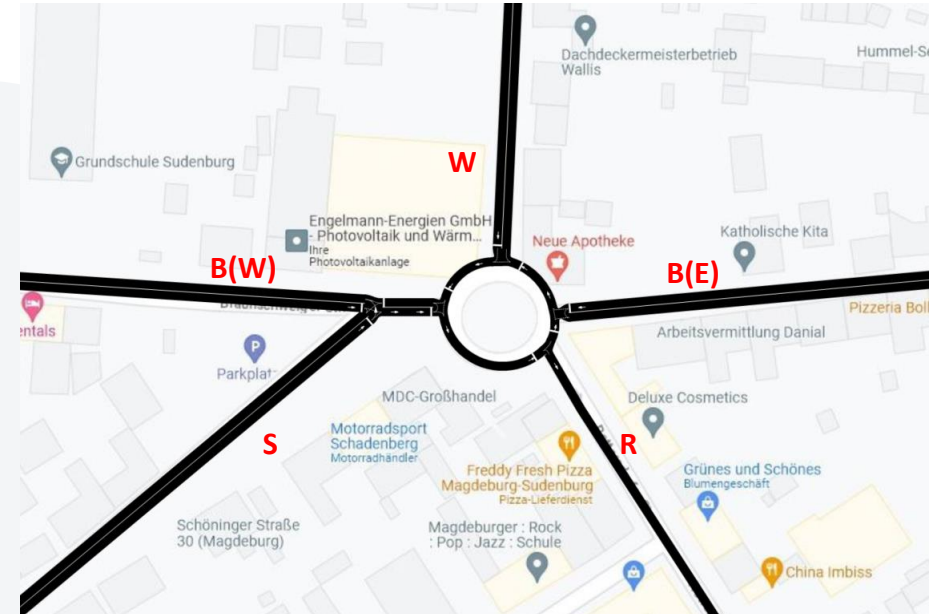
- To turn Braunschweiger Straße East or Rottersdorfer Straße into 2-way streets, reasonable assumptions were made on turning probabilities in both cases and inter-arrival time in the latter.
- Rottersdorfer Straße was deemed an average inter-arrival rate of 10 seconds
- Assumed Probability: R -> S: 0.2, R -> B(W): 0.4, R -> W: 0.4
- For Braunschweiger Straße East all the other turning probabilities would be influenced by the new option.

	From B(E)	From S	From W	From B(W)
To B(E)	-	0.3	0.2	0.43
To S	0.02	-	0.05	0.02
To W	0.18	0.15	-	0.12
To B(W)	0.4	0.15	0.1	-
To R	0.4	0.4	0.65	0.43

Turning probabilities for the 2-way street variation of Braunschweiger Straße East

Experiment 3 – Opening Braunschweiger Str. (E)

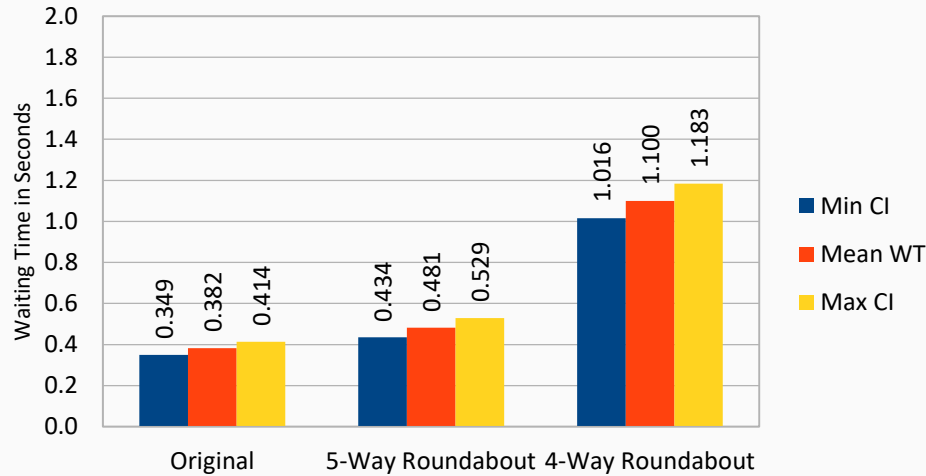
- **Objective:** To analyse the effects on the Throughput and Waiting times.
- Opening Braunschweiger Str. (E) for traffic in both directions.



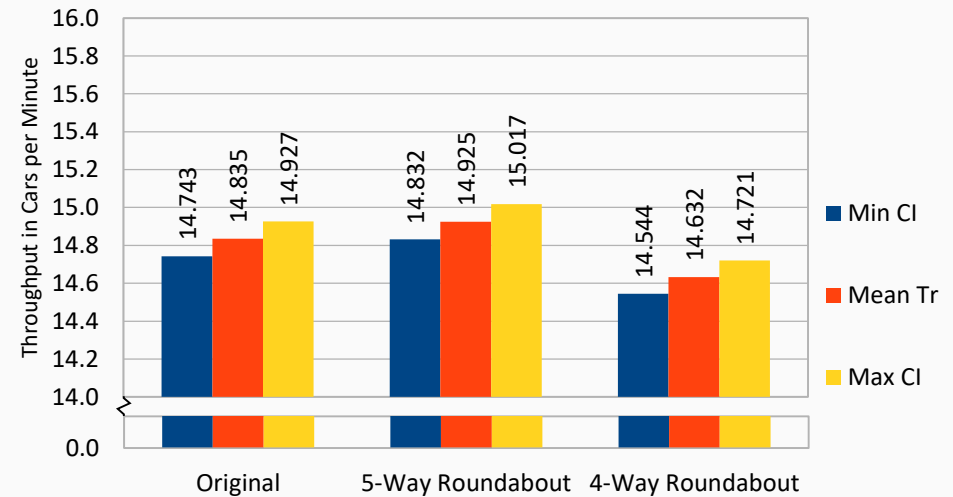
B(W): Braunschweiger Straße (W) **W:** Wolfenbuttler Straße **B(E):** Braunschweiger Straße (E) **R:** Rottersdorfer Straße **S:** Schoninger Straße

Results from Experiment 3

Waiting Time Experiments



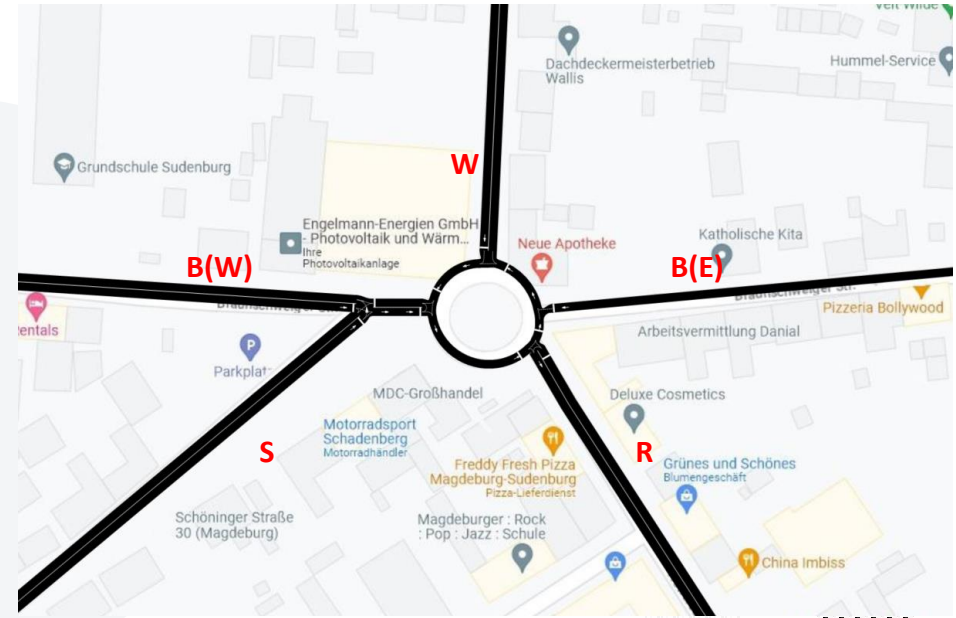
Throughput Experiments



Calculated with 95% confidence interval(CI) for the three main variations while opening Braunschweiger Straße East for both directions

Experiment 4 – Opening Rottersdorfer Str.

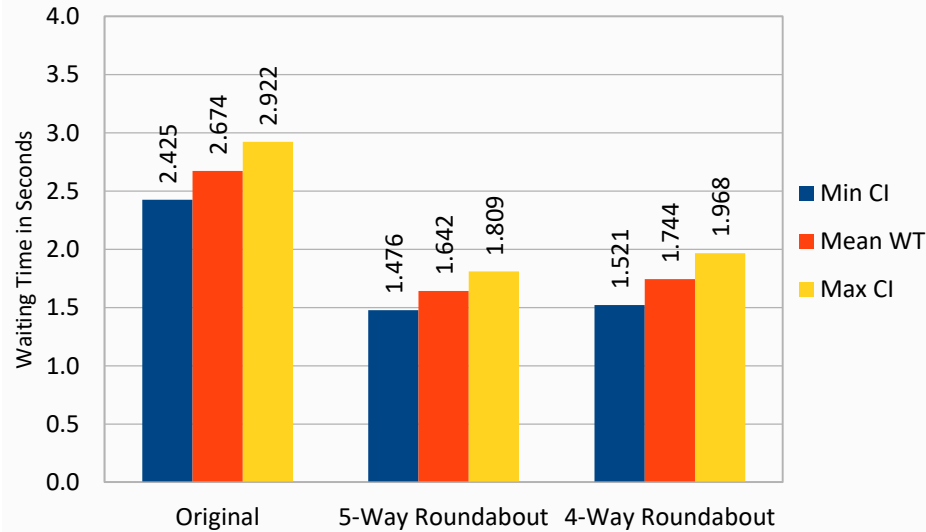
- **Objective:** To analyse the effects on the Throughput and Waiting times.
- Opening Rottersdorfer Str. for traffic in both directions.



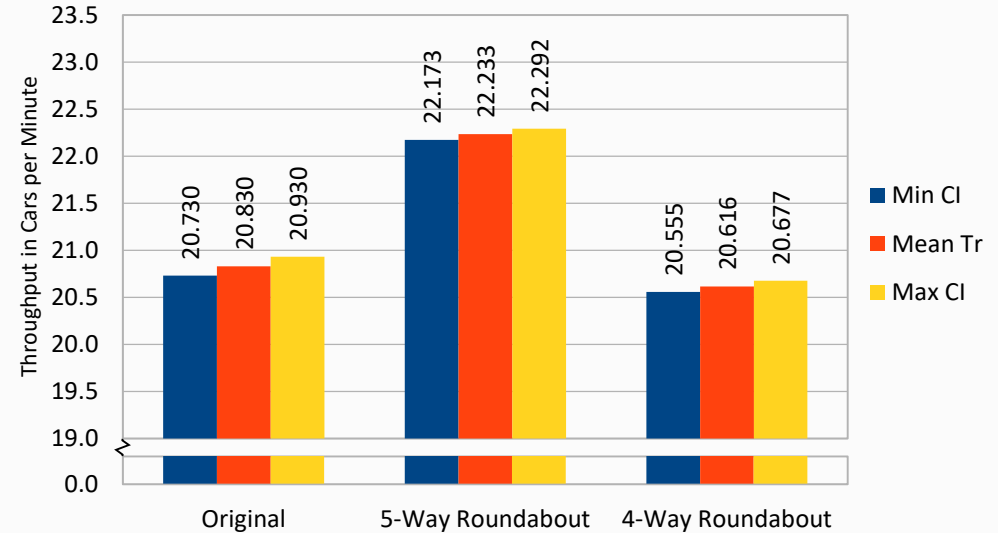
B(W): Braunschweiger Straße (W) **W:** Wolfenbuttler Straße **B(E):** Braunschweiger Straße (E) **R:** Rottersdorfer Straße **S:** Schoninger Straße

Results from Experiment 4

Waiting Time Experiments



Throughput Experiments



Calculated with 95% confidence interval(CI) for the three main variations while opening Rottersdorfer Straße for both directions

Conclusion

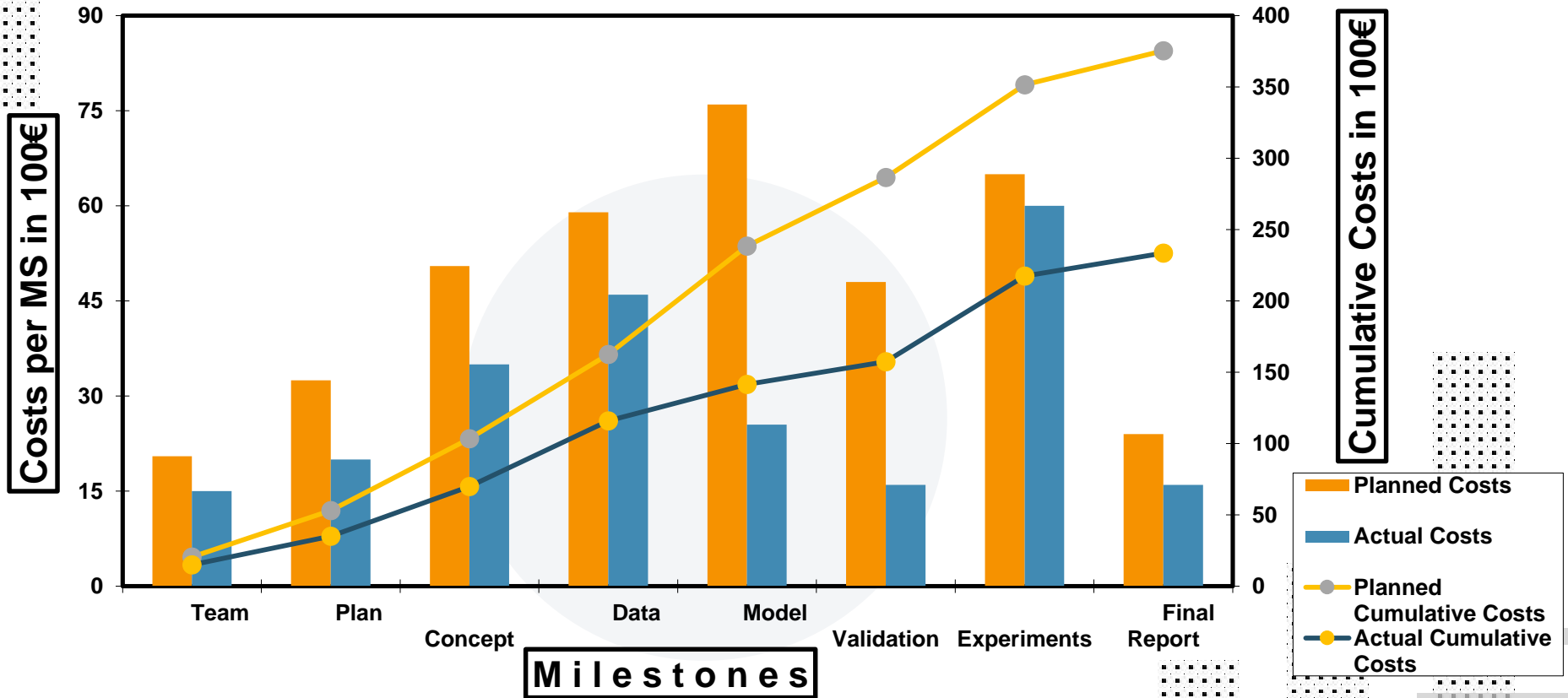
- For the current traffic situation, the waiting time and throughput are pretty much same for original traffic node and both roundabouts.
- When the volume is increased, the 4-way roundabout worsens waiting time in current configuration and also when B(E) is open.
- 5-way roundabout is still viable when B(E) is open.
- However when R is opened, even though the waiting times go up as expected due to increased traffic volume, both roundabouts become more viable.

Recommendation

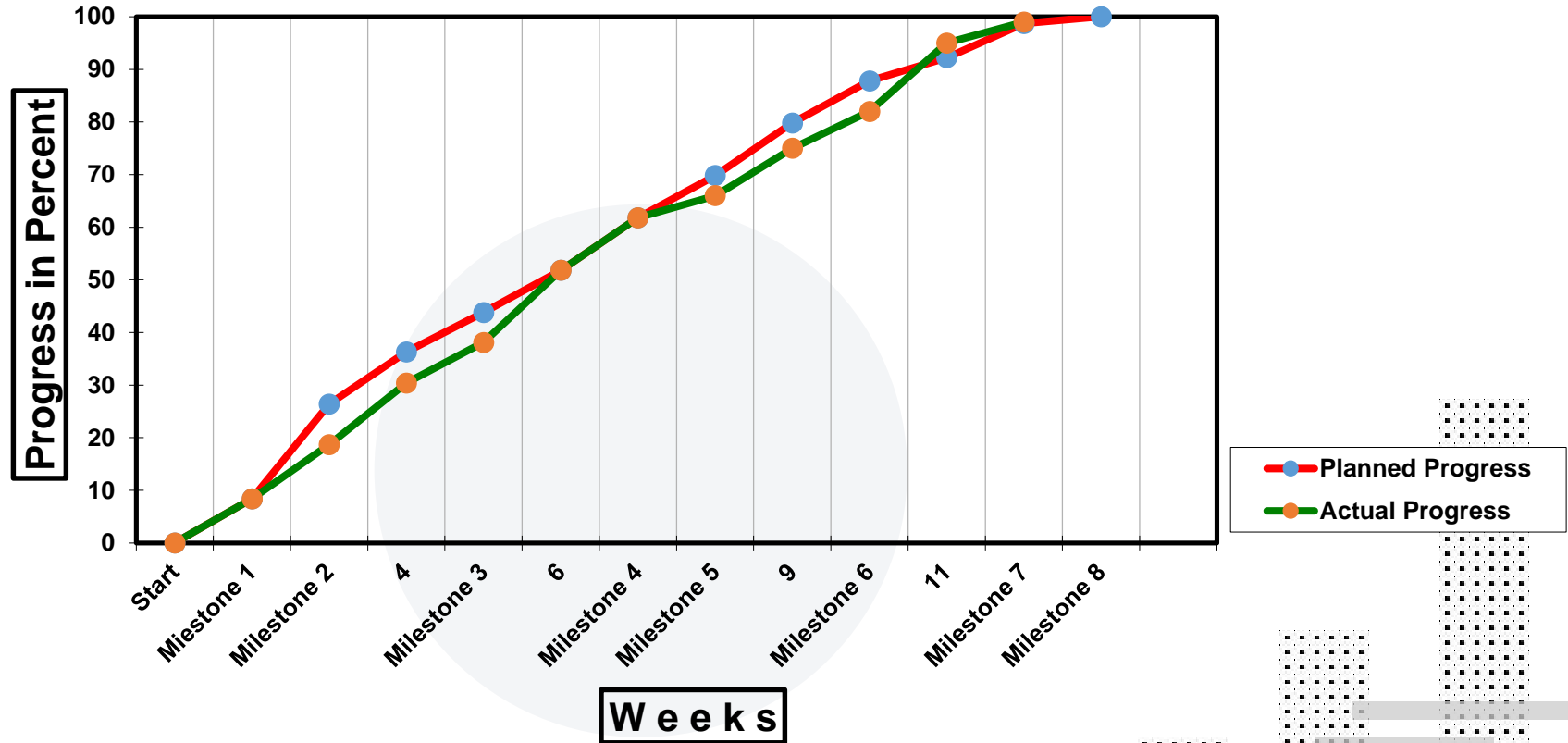
- 5-way Roundabout seems to be the most versatile model for any conditions.
- It performs at least as good as the current node for some variations and even better for others.
- Could possibly improve safety.



Project Cost



Project Progress



Lessons Learned

- Importance of Experimental Design
- Perceived assumptions could be wrong
- Team collaboration
- Time management



**ANY
QUESTIONS**

