

The Mobil-o-mat: A Simplified Assessment Approach for Early Stages of Transportation Planning

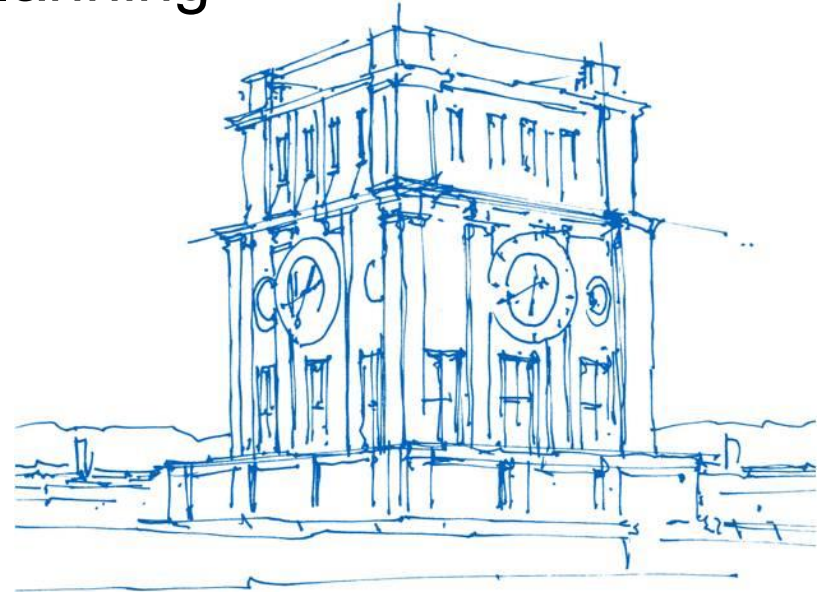
Yamam Alayasreih

Technische Universität München

School of Engineering and Design

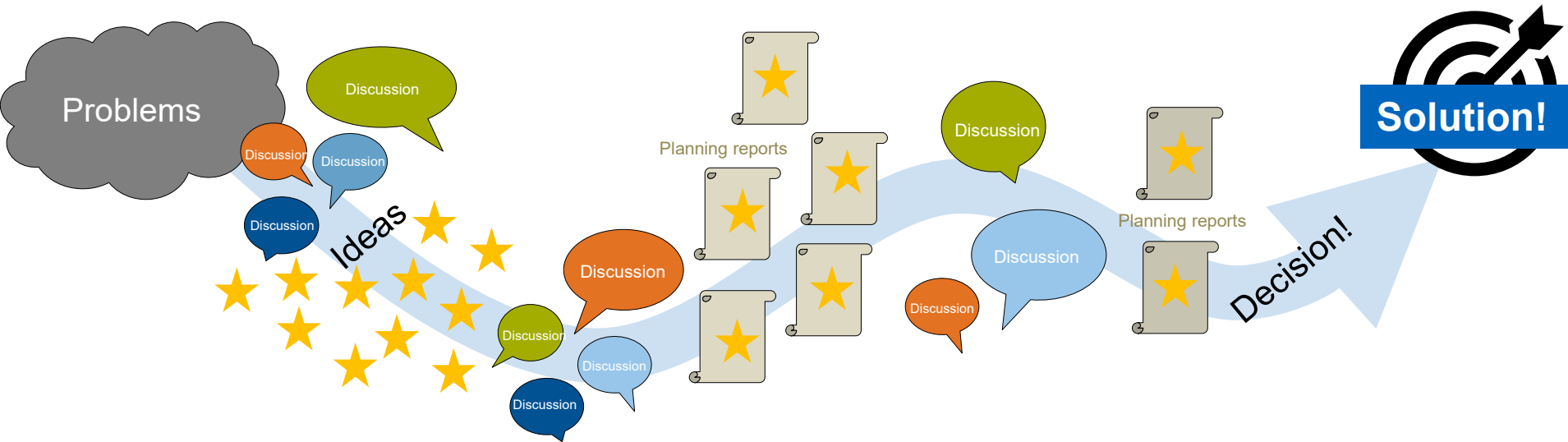
Chair of Traffic Engineering and Control

Munich, April 11th 2024



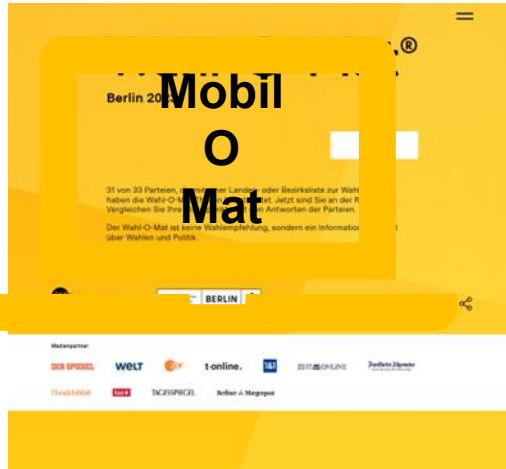
Uhrenturm der TUM

Motivation – An Average Planning Process



Methodology – General Outline of the Tool

Inspired by the „Wahl-o-Mat“



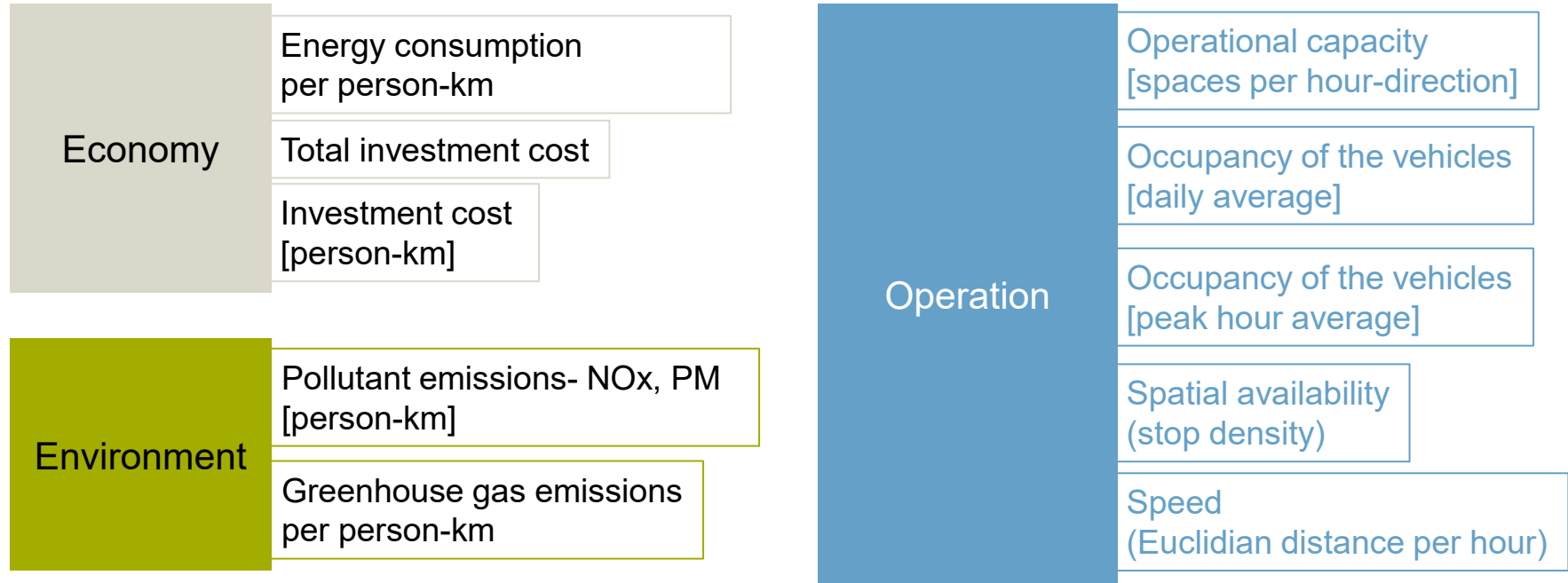
10 performance indicators

How do the scenarios perform

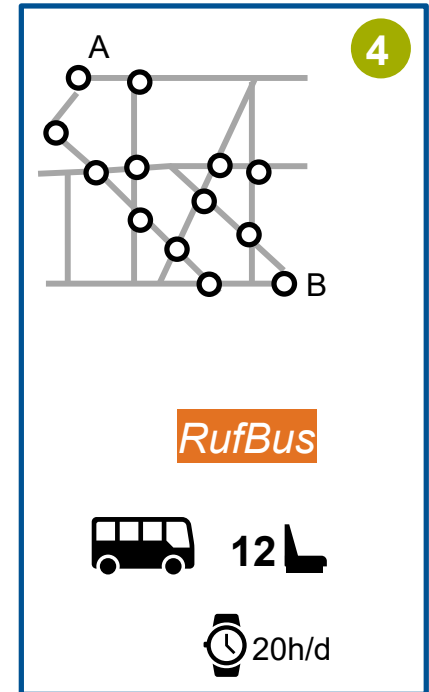
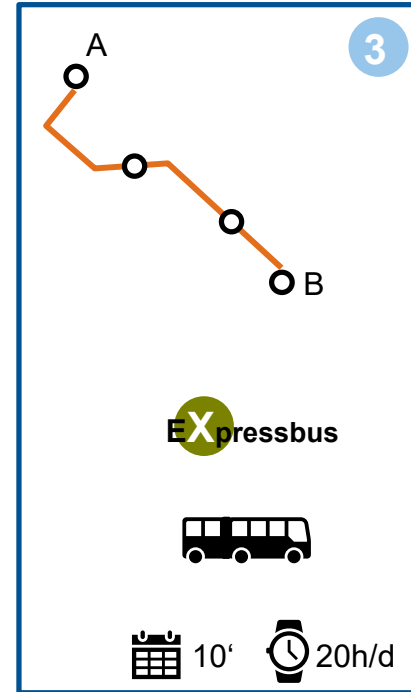
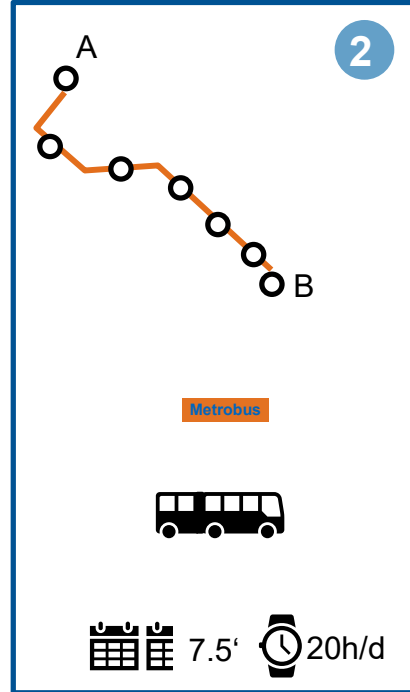
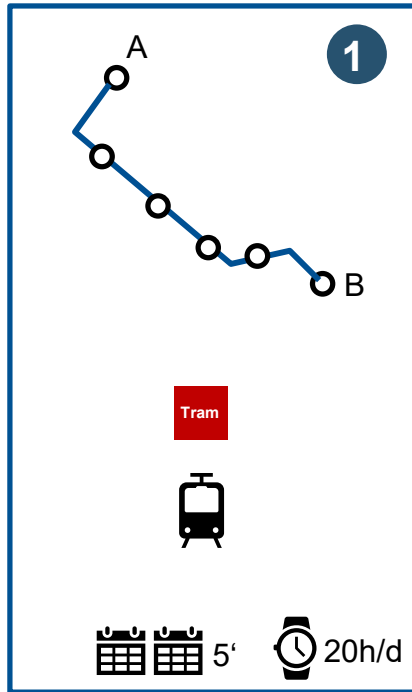
Weighting of the indicators

Ranking of the scenarios

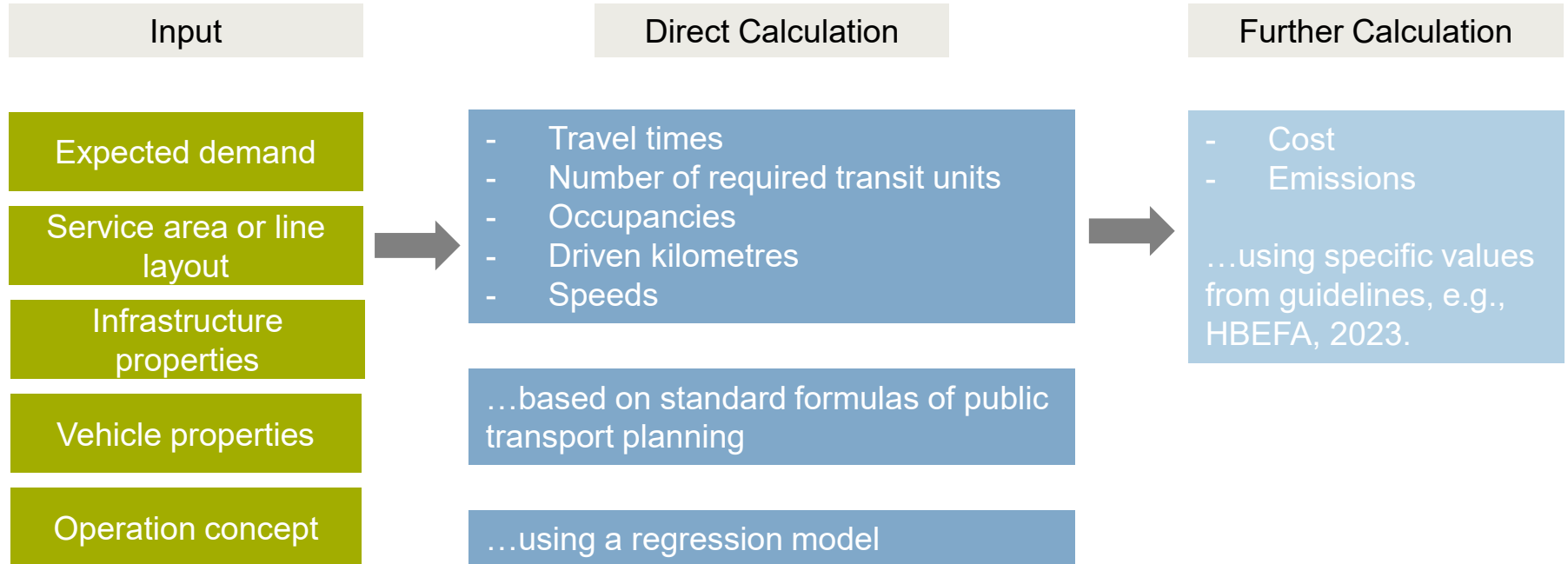
Methodology – Indicators of a Comparable Evaluation



Methodology – How to Design a Scenario



Methodology – Calculations



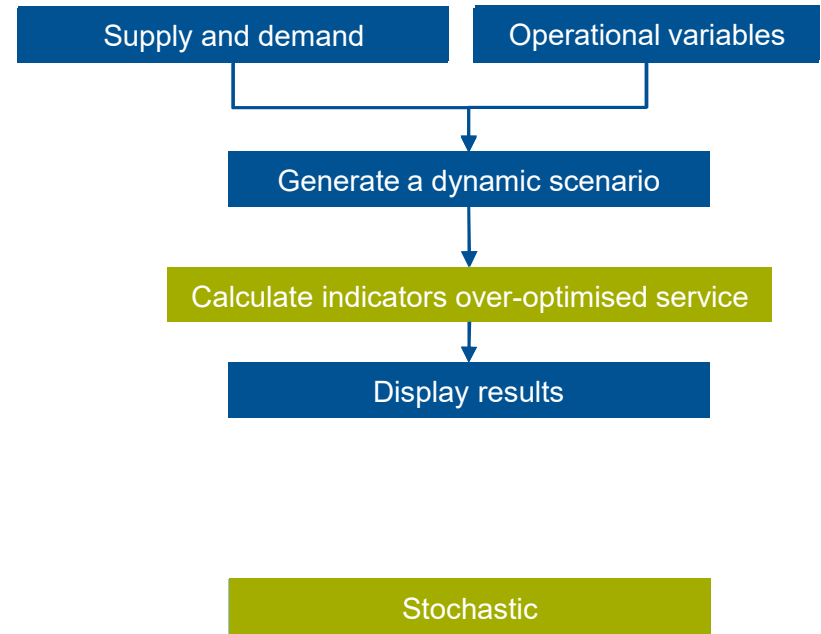
A Challenge: How to Plan ODM in Excel

For public transport line operation...

The relationship between input and output is expressed in formulas derived from transport planning.

For ODM services...

The relationship between input and output is subject to optimisation algorithms.

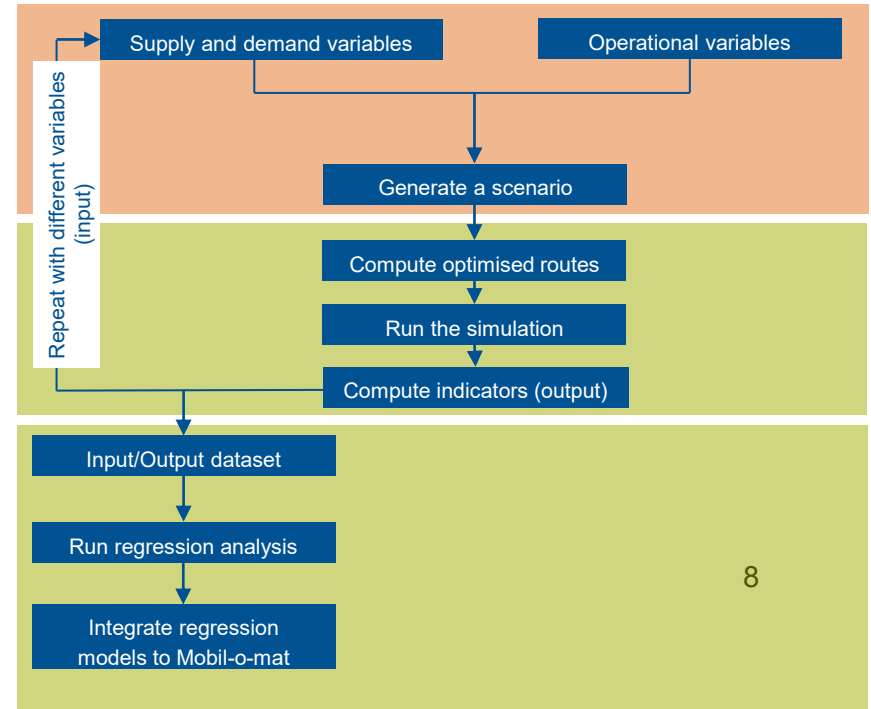


A Challenge: How to Plan ODM in Excel

Construction of a regression model designed for ODM.

To inform the model's development, 470 synthetic ODM scenarios with varying parameters such as;

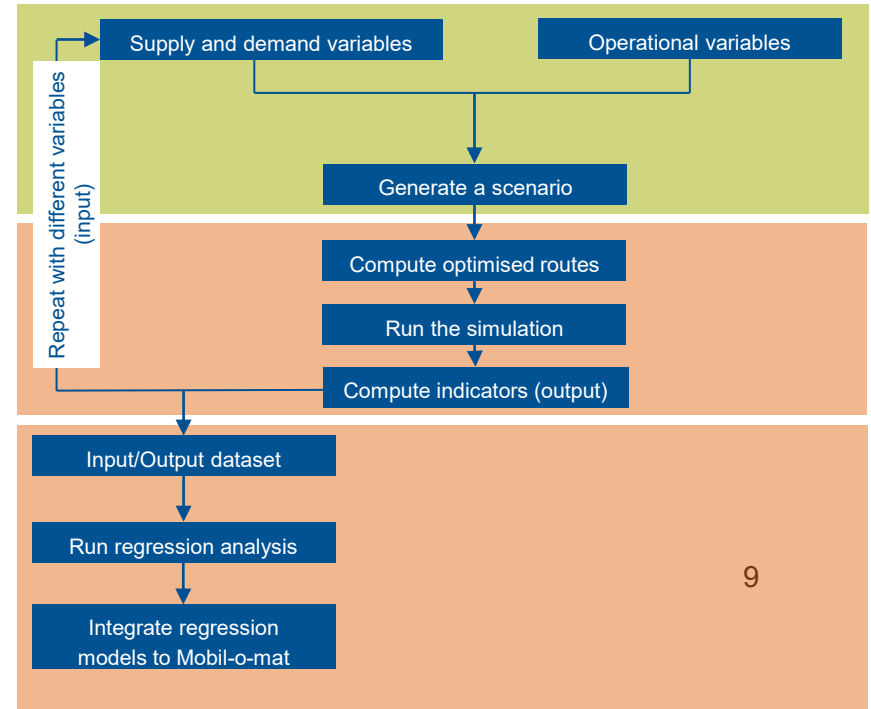
- i. Grid network size
- ii. Block size
- iii. Number of stops
- iv. Number of users
- v. Fleet sizes.



A Challenge: How to Plan ODM in Excel

These scenarios were simulated using the simulation framework; "FleetPy".

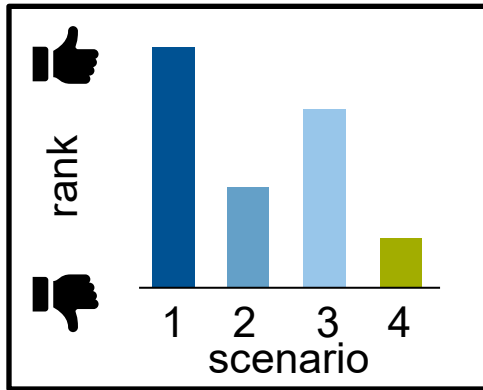
The results were used as input for a linear regression model to calculate key metrics, including speed, mileage, and occupancy.



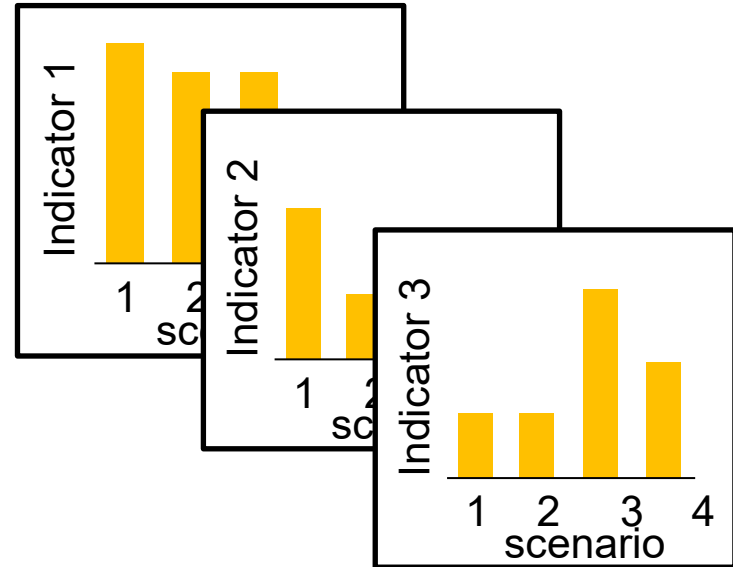
Methodology – A Comprehensible Output

Management level: ranking of the scenarios

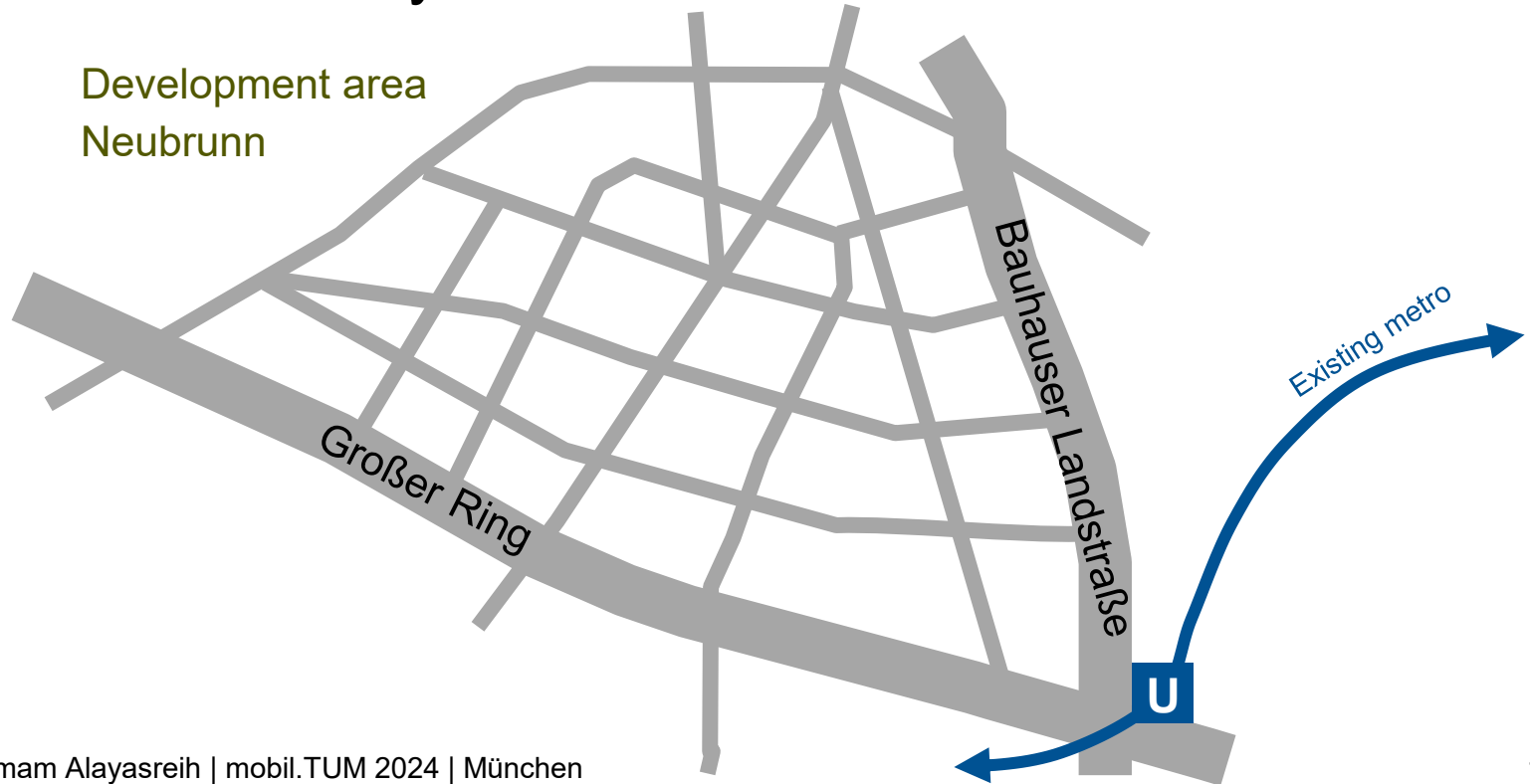
Indicators are normalised and averaged based on a priority-based weighted average.



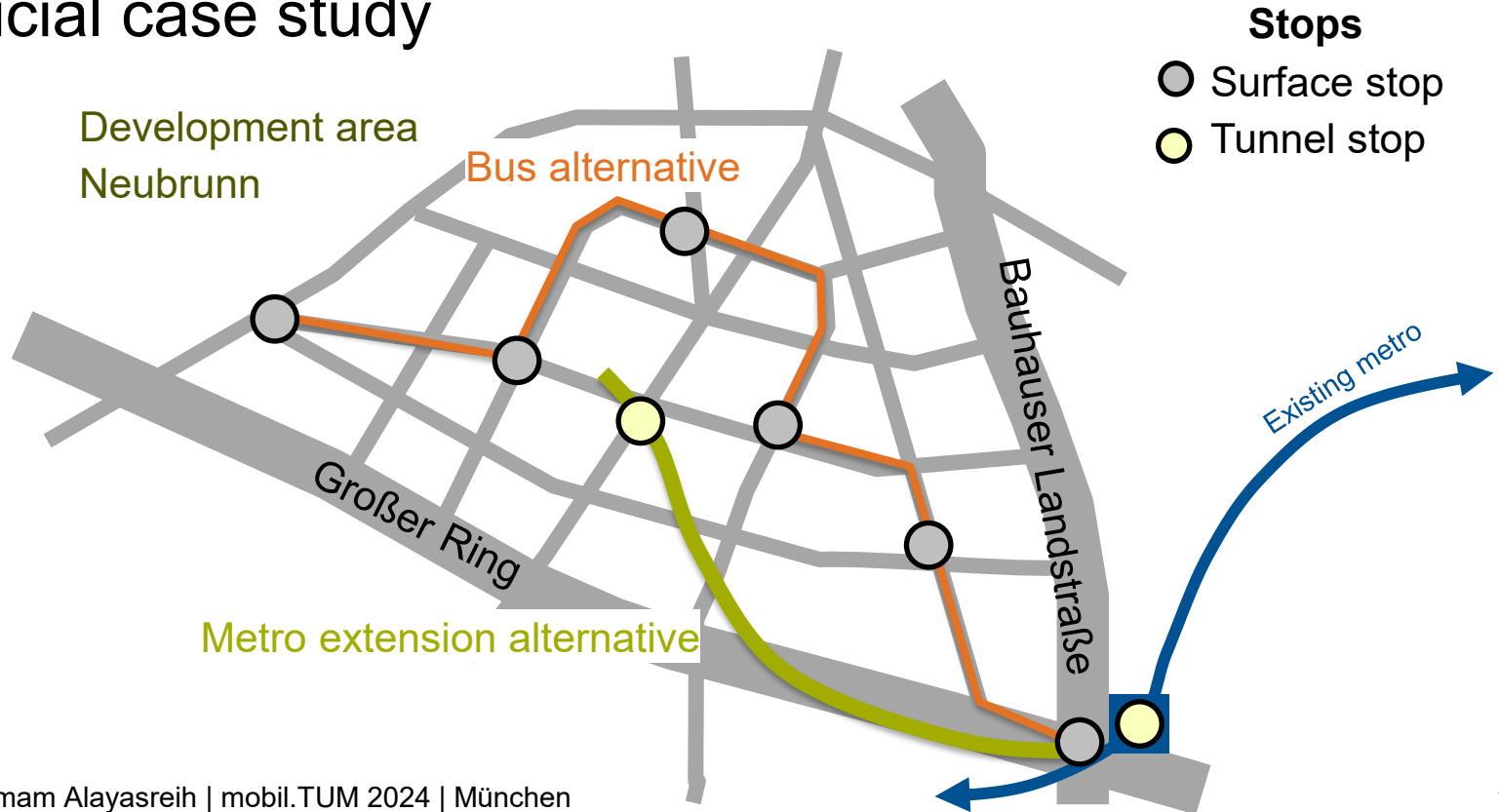
Expert level: indicator values



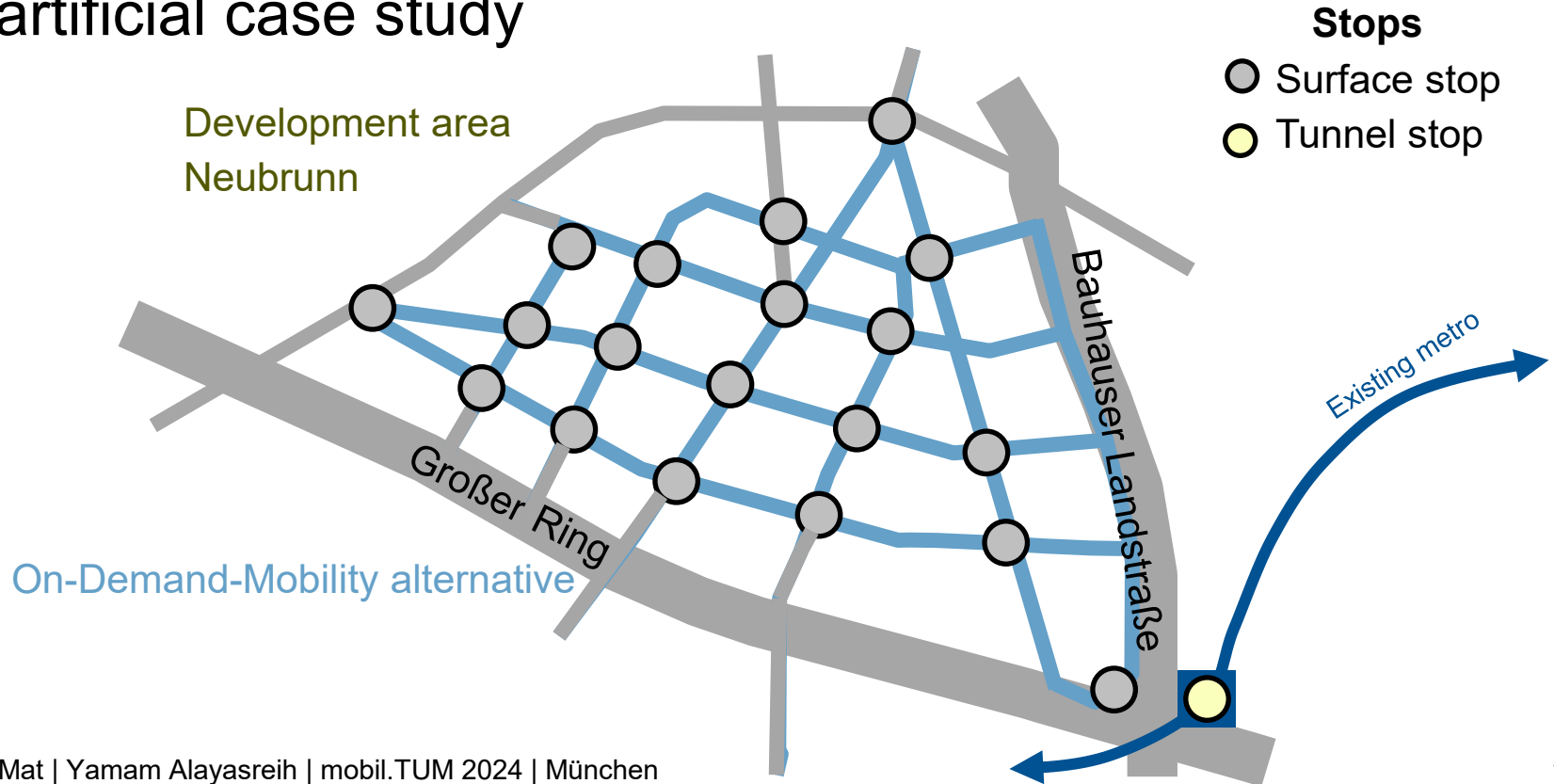
An artificial case study



An artificial case study

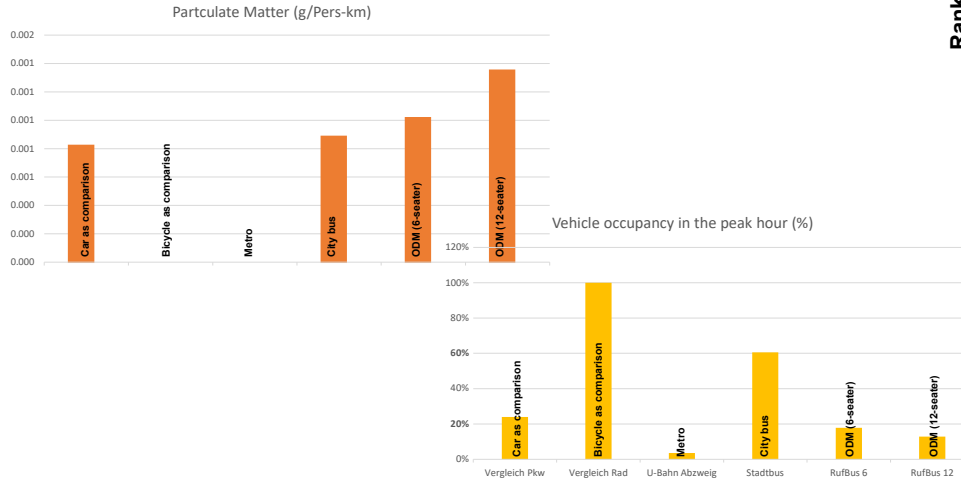


An artificial case study

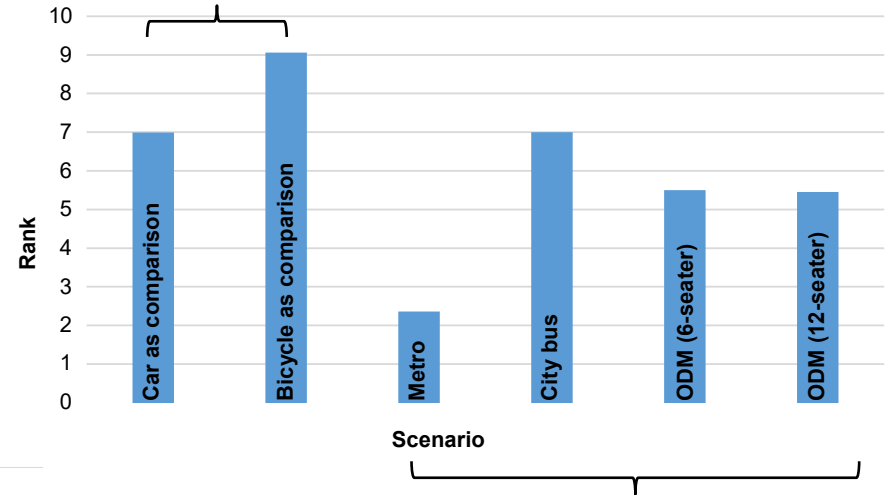


Results

The case studies showed that the calculated indicators can be used for a realistic comparison between different mobility solutions.



„What is the effect if we were to transport the same number of people with car or bicycle“



A look at the individual indicator values helps understand the ranking

Conclusion & Outlook

- The tool ranks the scenarios in a comprehensible way
- The indicator values are visible for all scenarios to understand the scenario performance in detail
- the weighting of the indicators plays a major role in the final result

- Testing on real planning cases is necessary to verify the correctness of the results

Thank you for your attention!

Questions?

