FACULTY OF SCIENCES

DEPARTMENT GEOGRAPHY
RESEARCH GROUP SOCIAL & ECONOMIC GEOGRAPHY

IMPLEMENTATION OF ATTITUDES AND WELL-BEING IN MATSIM

MATSim User Meeting 2022 - Leuven

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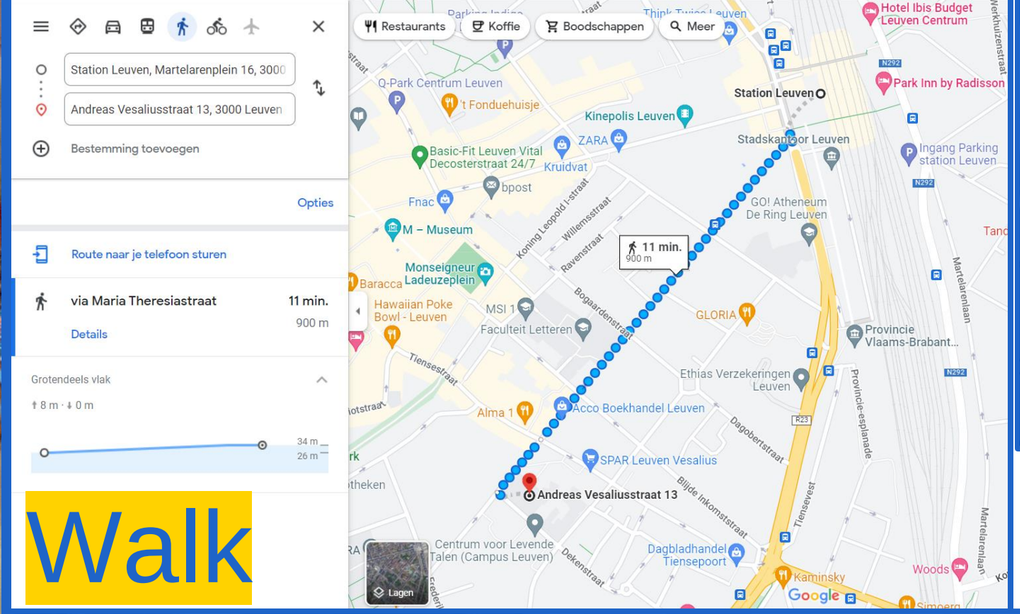
EXTRA experimenting with city streets to transform urban mobility


08067
1
2
2
2


LEUVEN

Shared bike



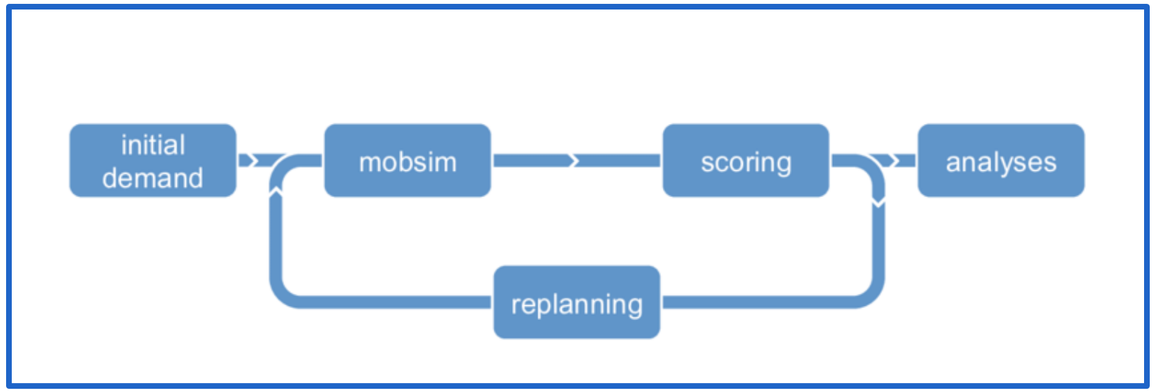
Walk

Car

Bus

??

HOW WOULD MATSIM SOLVE MY PROBLEM?



Main Replanning strategies

- Departure time choice
- Destination Choice

- Route choice
- Mode choice

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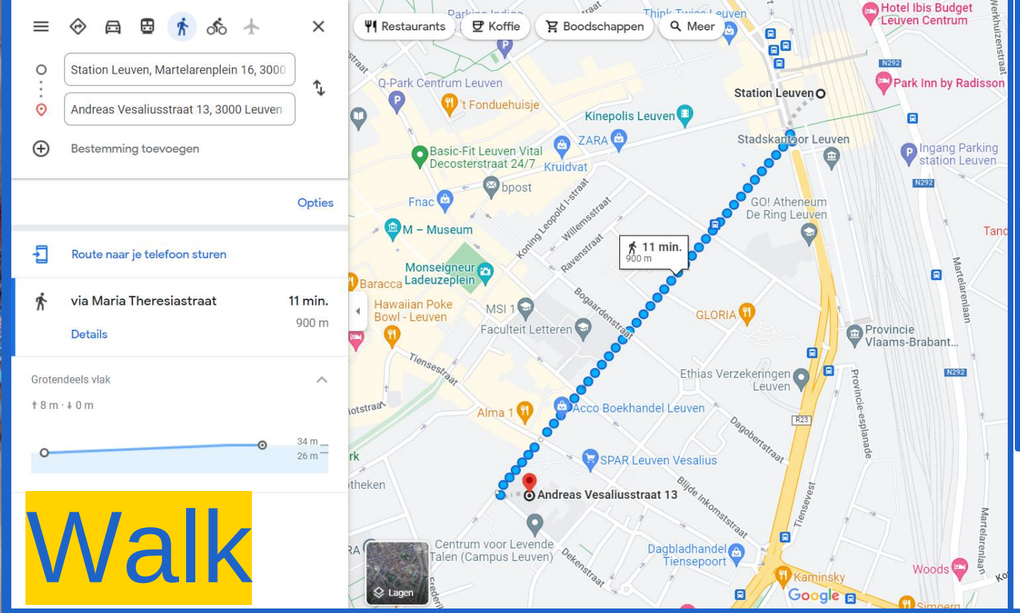


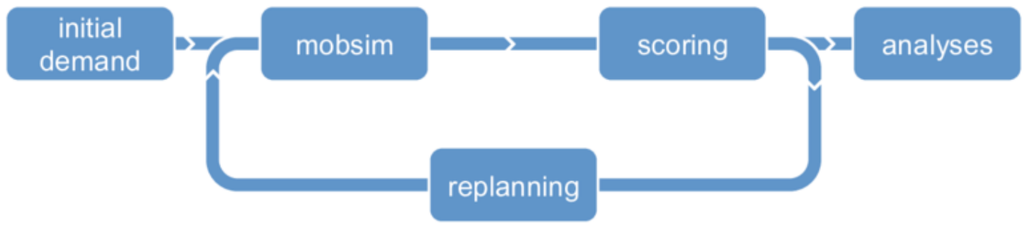
Walk

Car

Bus

MATSIM WORKFLOW

– Utility based



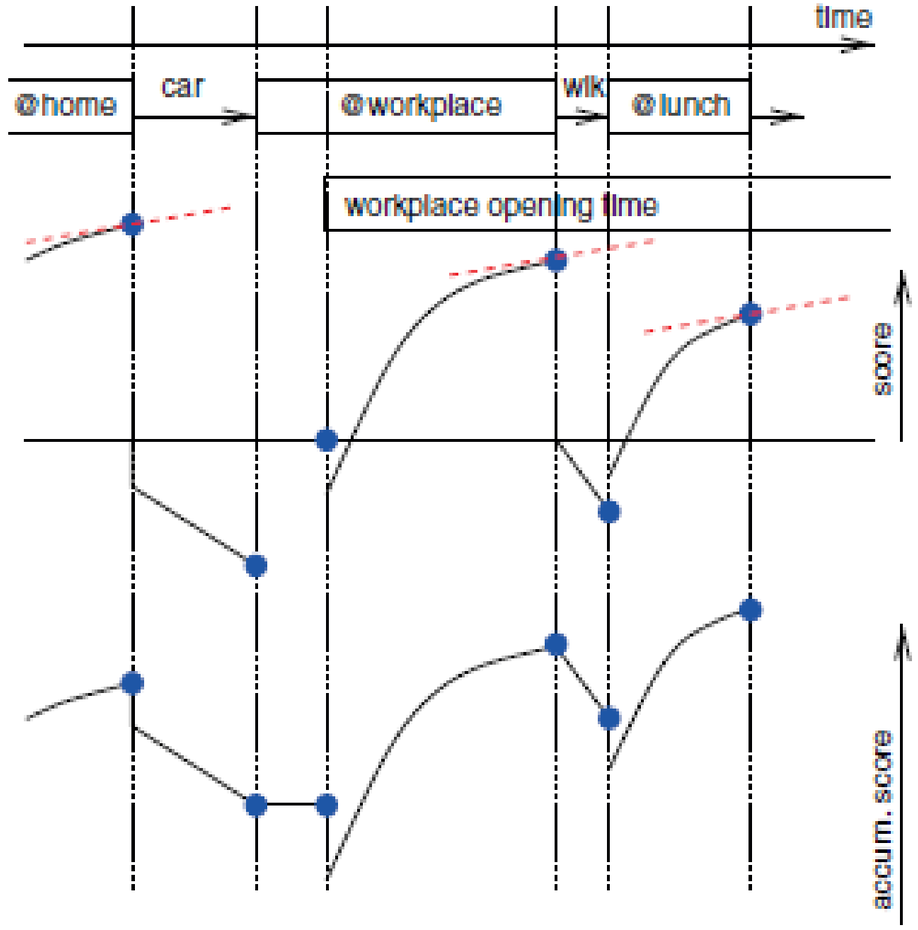


Figure 3.1: Illustration of the scoring function. TOP: Individual contributions of activities and legs. BOTTOM: Score accumulation over a day.

Nagel, K., Kickhöfer, B., Horni, A., & Charypar, D. (2016). A closer look at scoring. In W Axhausen, K., Horni, A., & Nagel, K. (Eds). *The multi-agent transport simulation MATSim* (p. 23-33). London: Ubiquity Press.

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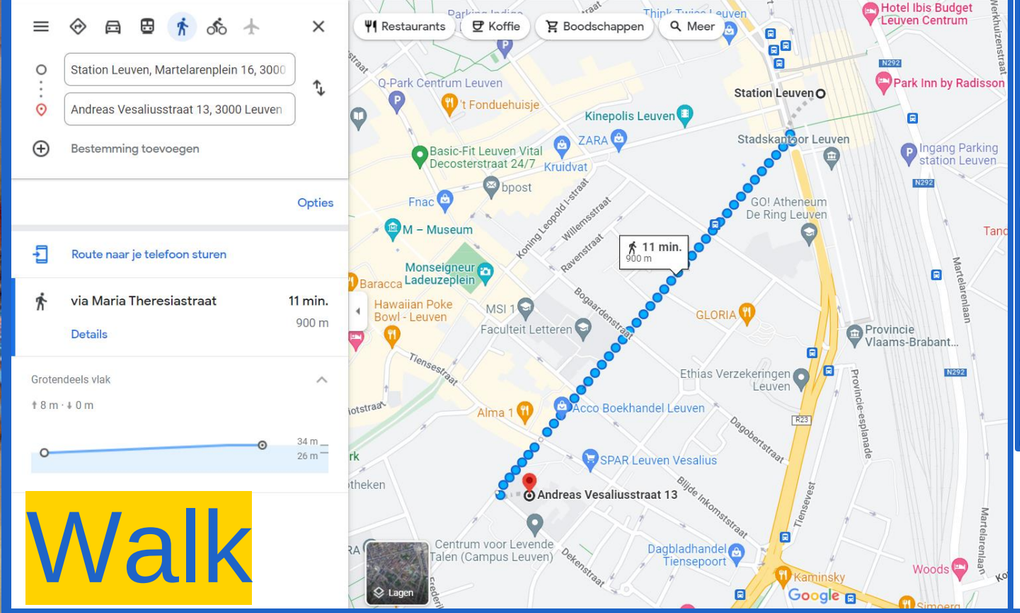
Shared bike



Walk

Car

Bus

HOMO ECONOMICUS

- Perfect rationality
- Seldom possible
- Self-interested
- Maximize utility

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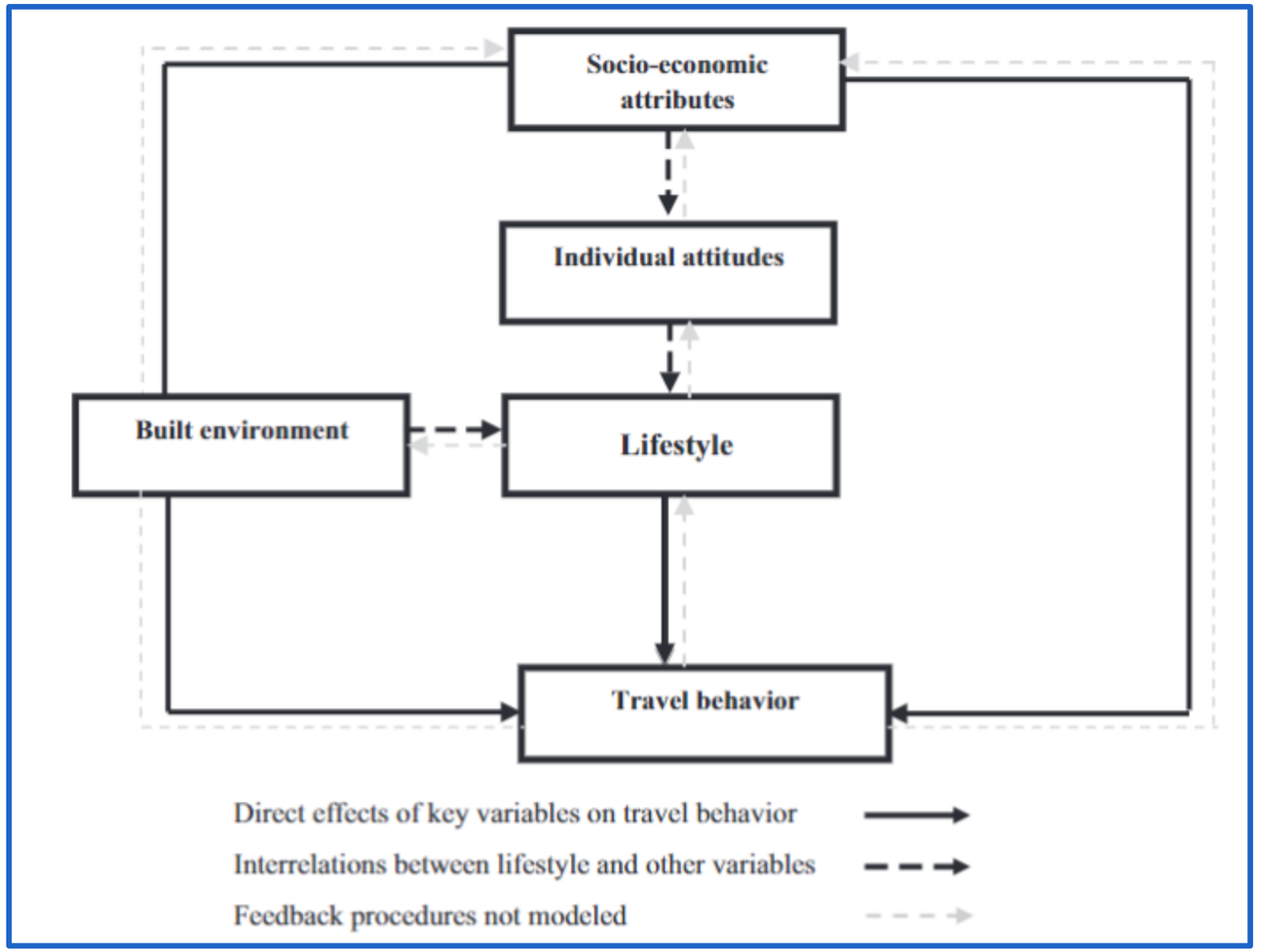
TRAVEL BEHAVIOUR RESEARCH

- Attitudes
- Emotions
- Well-being
- Travel satisfaction



Etminani-Ghasrodashti, R., & Ardeshiri, M. (2015). Modeling travel behavior by the structural relationships between lifestyle, built environment and non-working trips. *Transportation Research Part A: Policy and Practice*, *78*, 506-518.

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- Focus on Mode choice
- Focus on scoring mechanism
- Incorporating/Implementation of personal attitudes in MATSim

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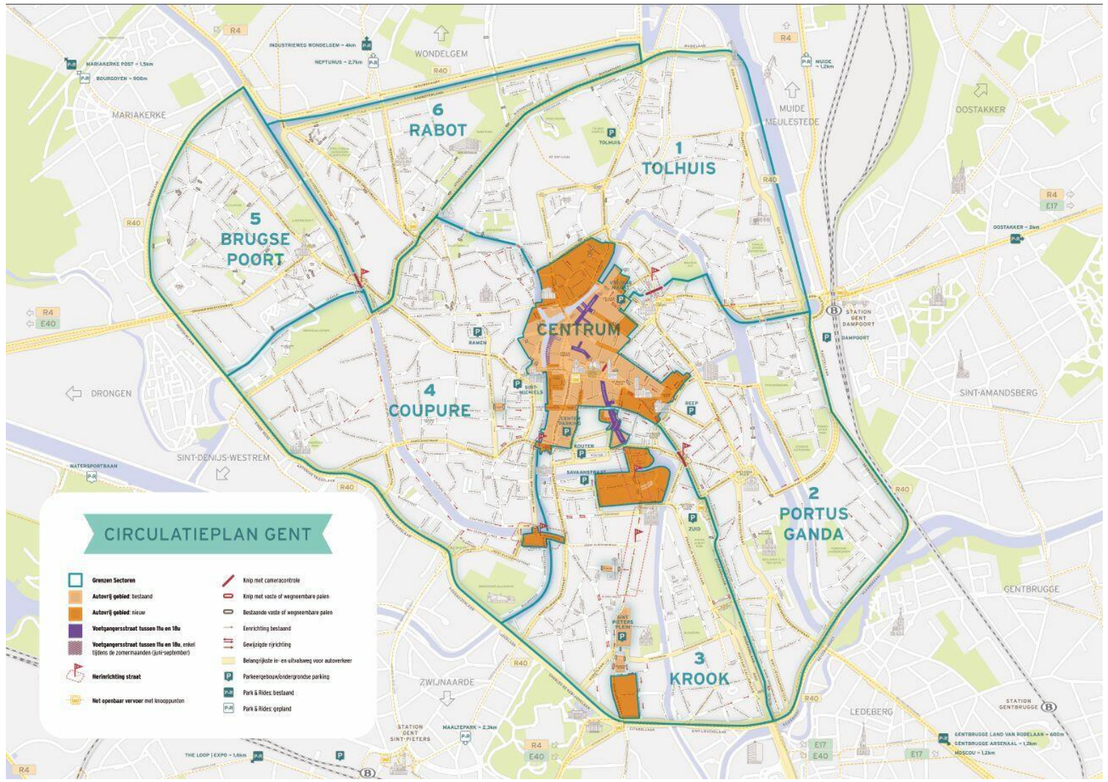
STUDY AREA

- City of Ghent
- Travel diary survey

- 2012 – 2015 – 2018 – 2021 – …
- Travel diaries
- Inhabitants of Ghent

- SE-variables + daily schedule of activities



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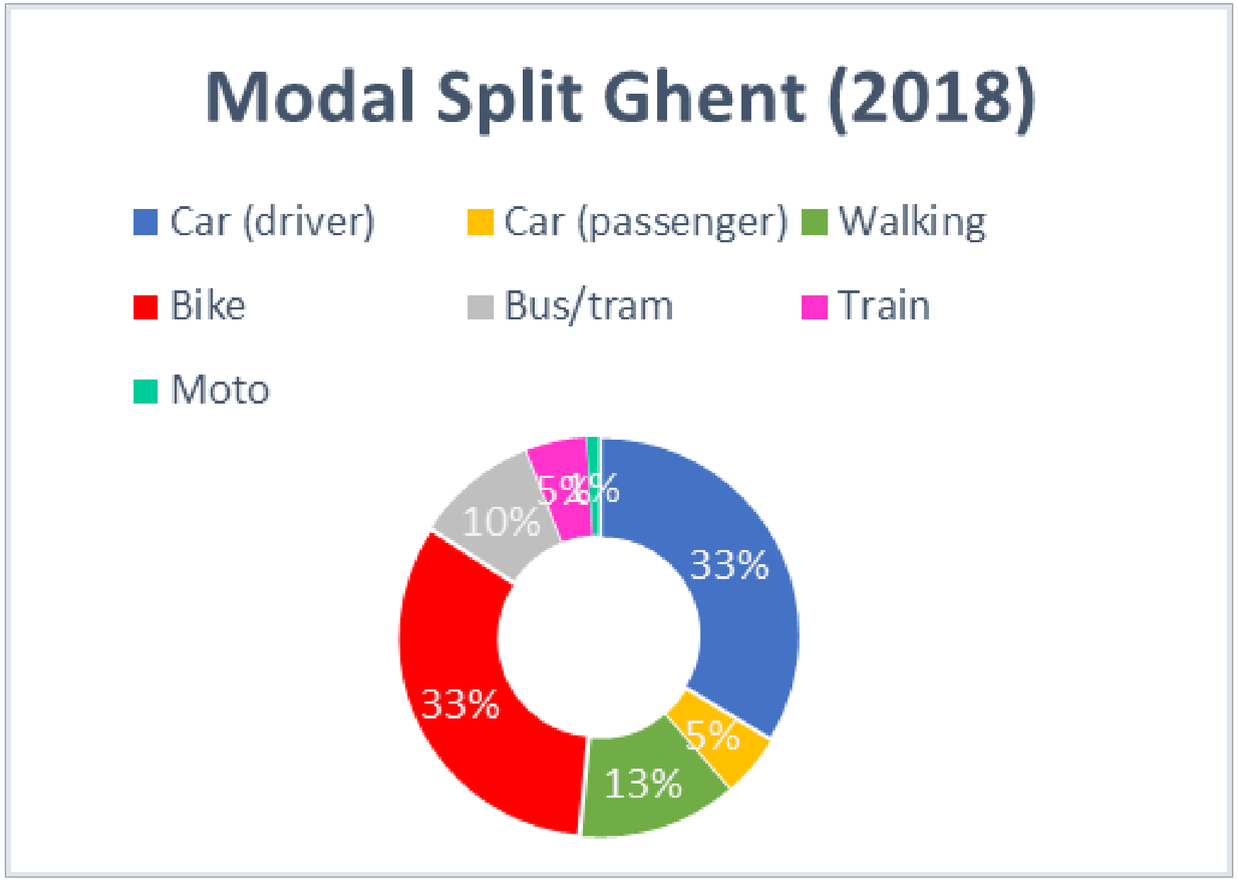

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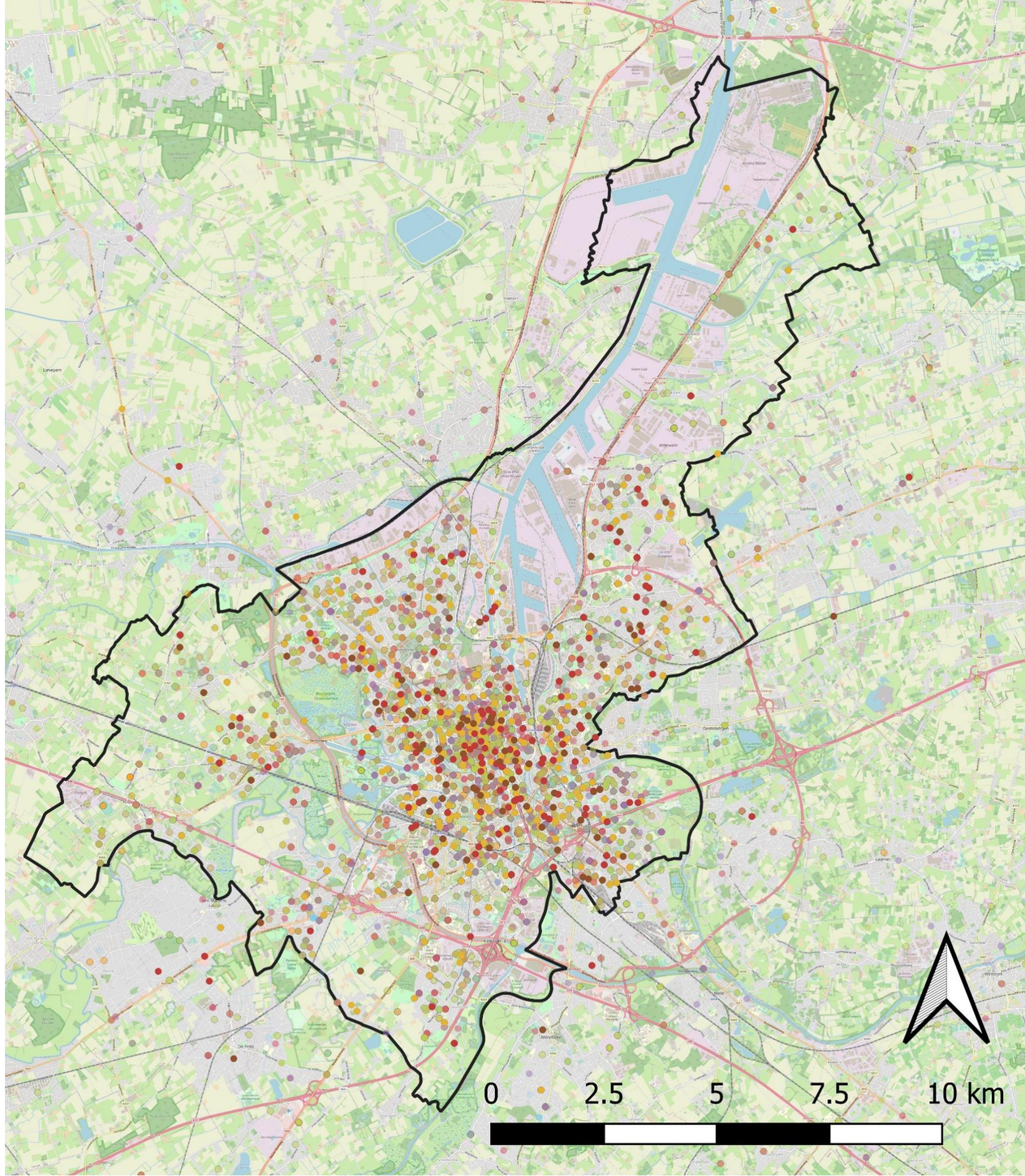

TRAVEL DIARY SURVEY

- City of Ghent
- 2013 – 2015 – 2018 – 2021 – …
- Inhabitants of Ghent
- SE-variables + daily schedule of activities

+ information on how they perceive mobility measures in Ghent – – – – – – → Attitudes

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GOAL

Dataset of Ghent → Attitudes of agents → impact on travel behaviour

Penalty for ‘non-preferred’ travel mode
Bonus for ‘preferred’ travel mode

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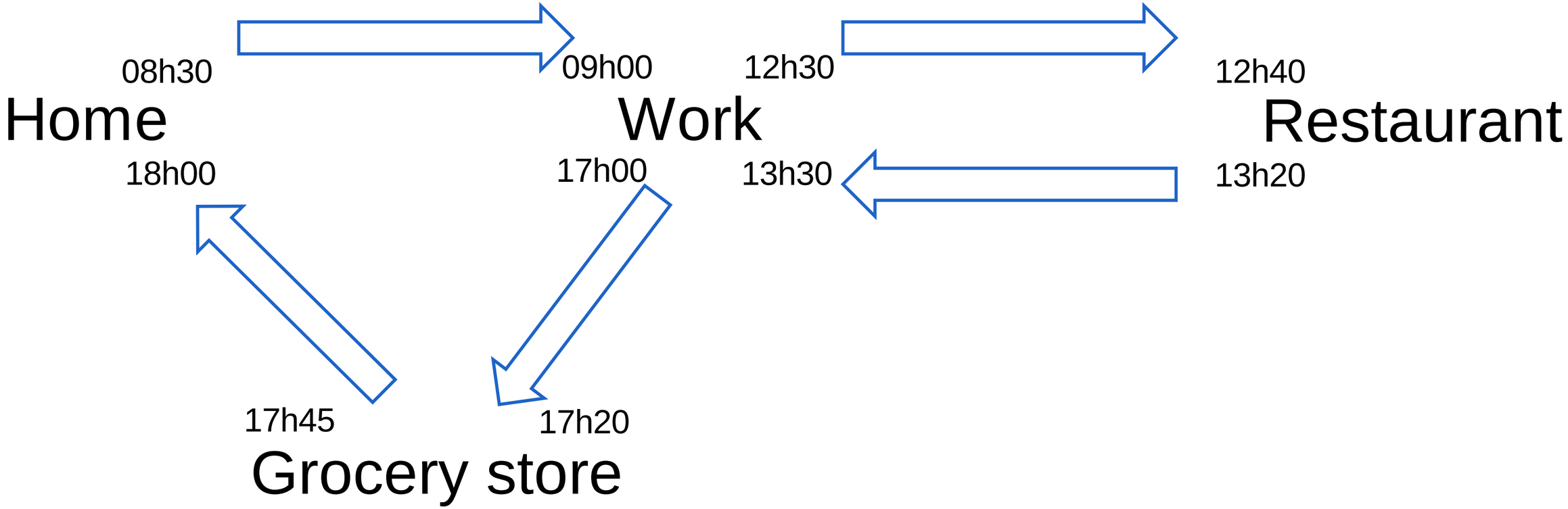
EXAMPLE



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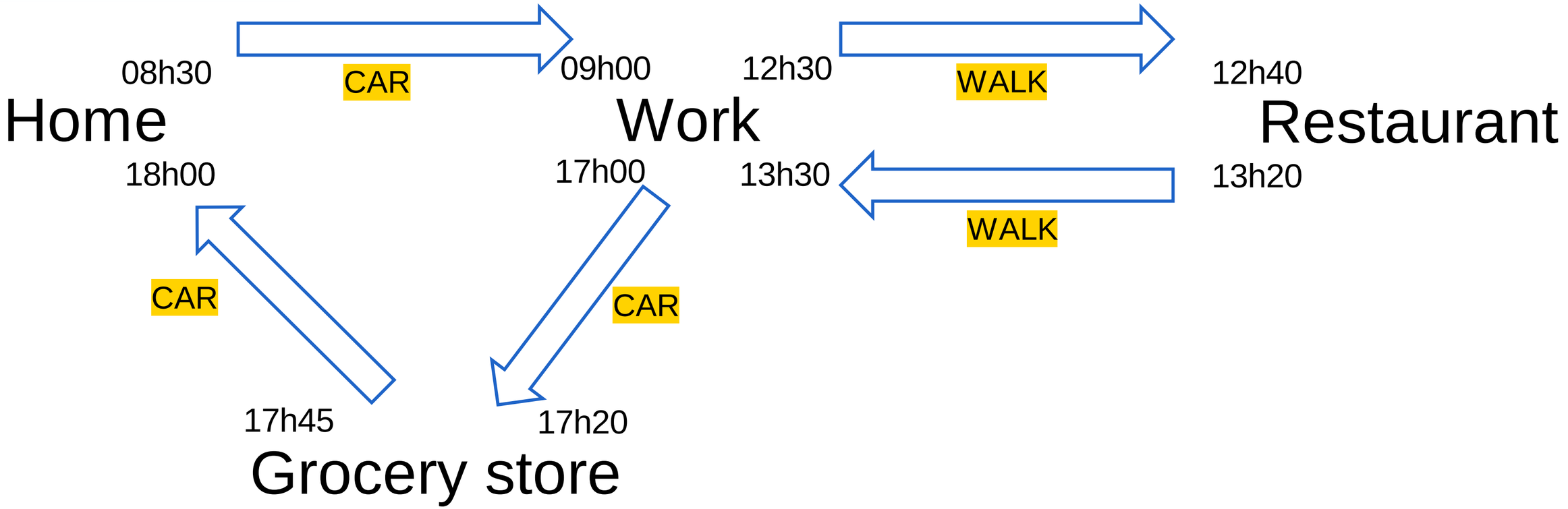
EXAMPLE



Plan 1 → Score = 40

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CURRENT REPLANNING STRATEGIES

Main strategies

- Departure time choice
- Route choice
- Mode choice
- Destination Choice

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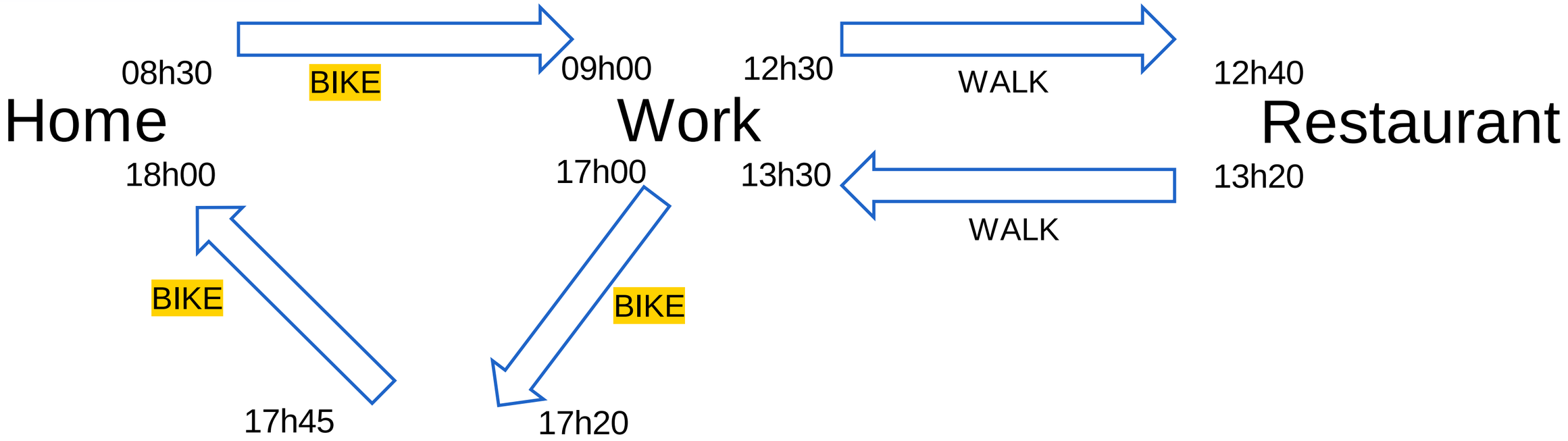
EXAMPLE



Plan 2 → Score = 60

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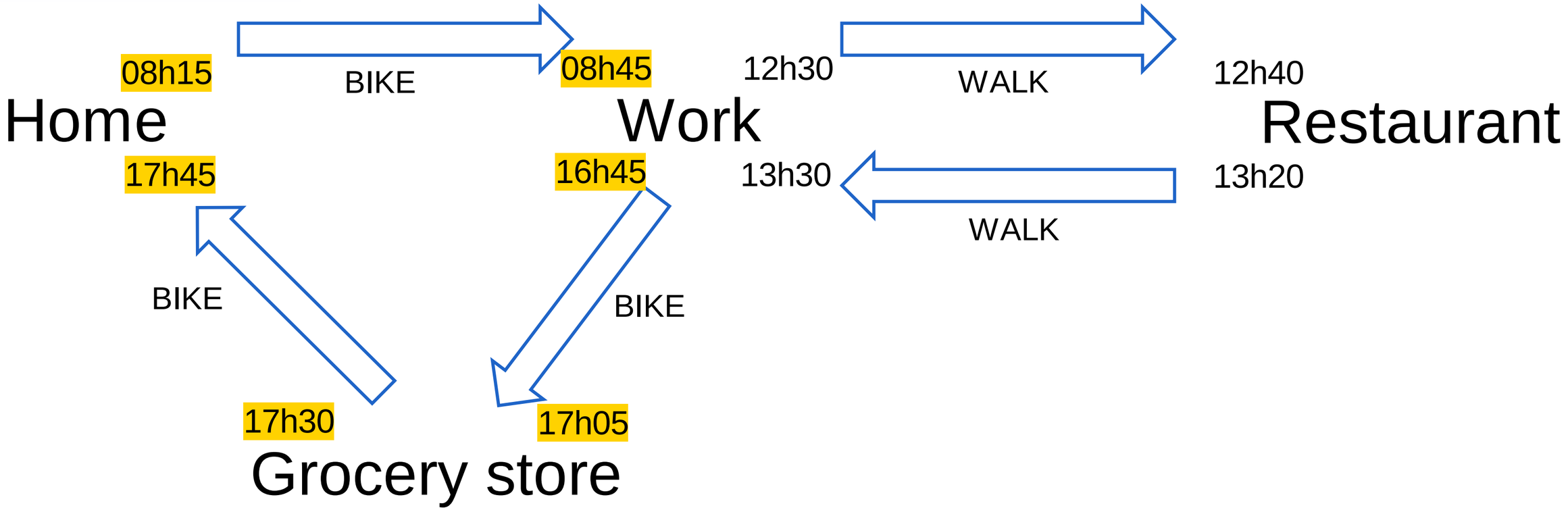
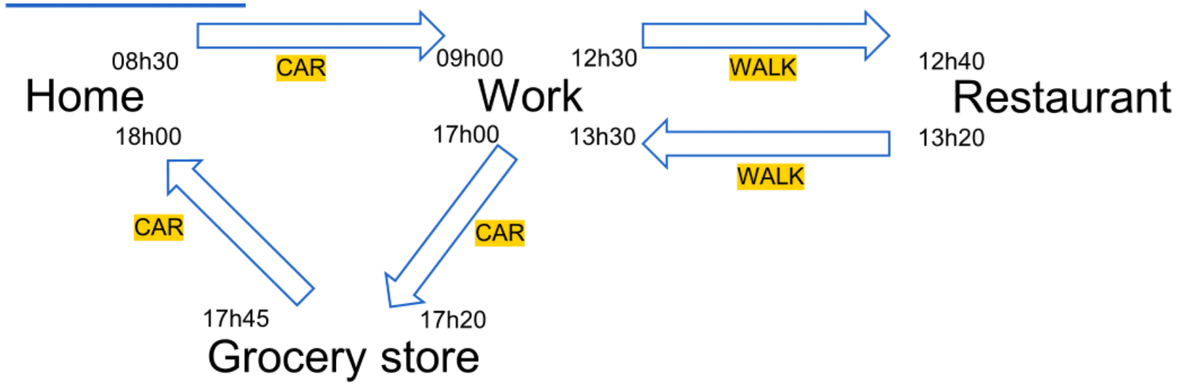
EXAMPLE



Plan 3 → Score = 70

EXAMPLE



Plan 1 → Score = 40

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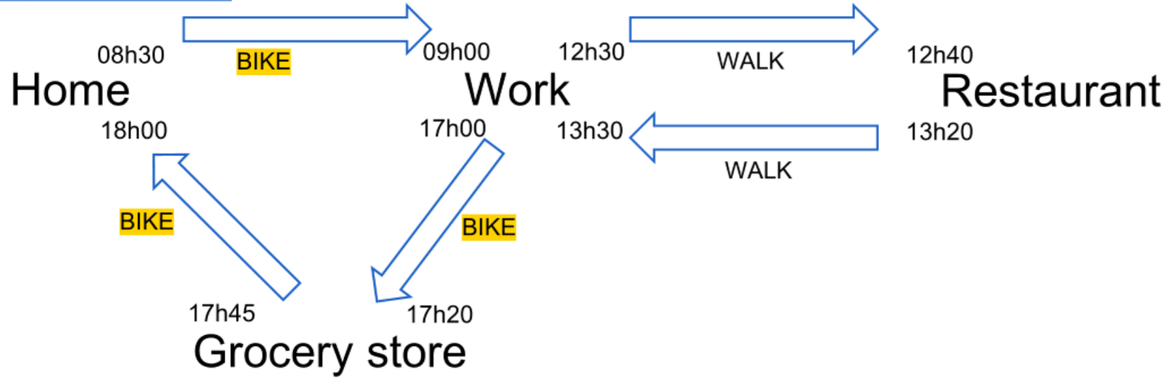
EXAMPLE



Plan 2 → Score = 60

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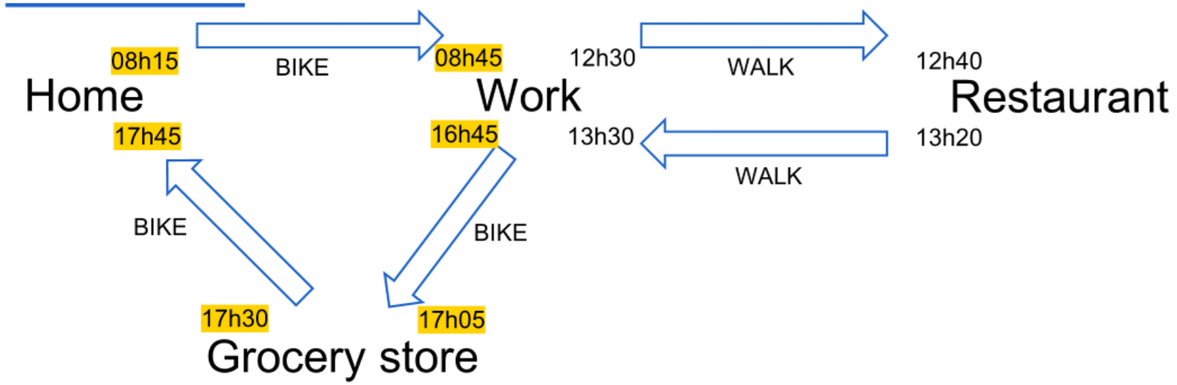
EXAMPLE



Plan 3 → Score = 70

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What if this person is a petrol-head?

Personal travel satisfaction?

Well-being?

Effect on scoring algorithm

Effect on score of a plan

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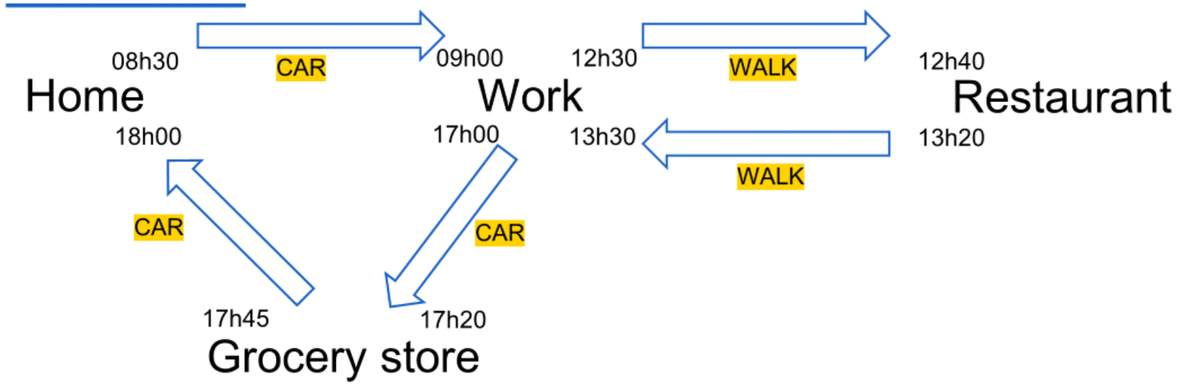
EXAMPLE



Plan 1 → Score = 40

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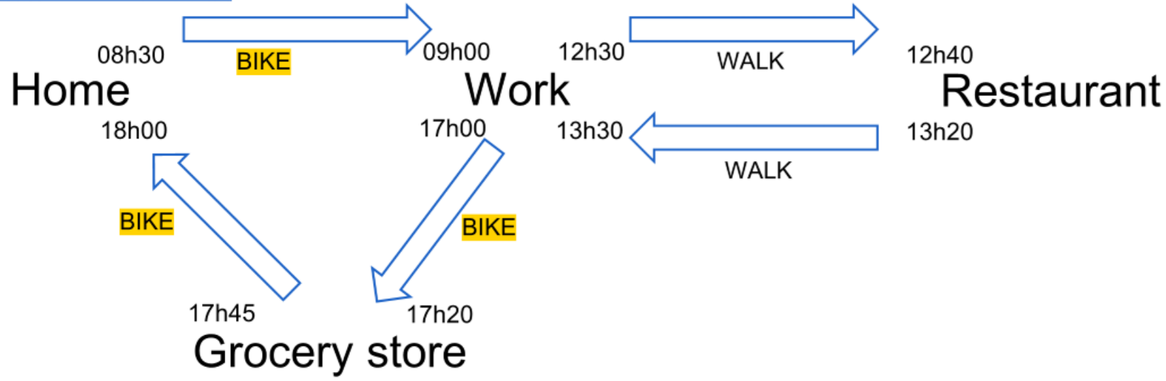
EXAMPLE



Plan 2 → Score = 60

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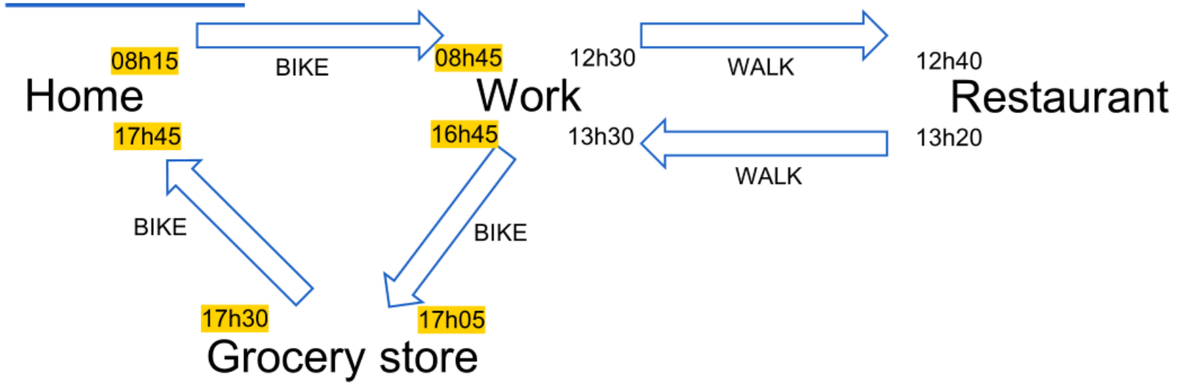
EXAMPLE



Plan 3 → Score = 70

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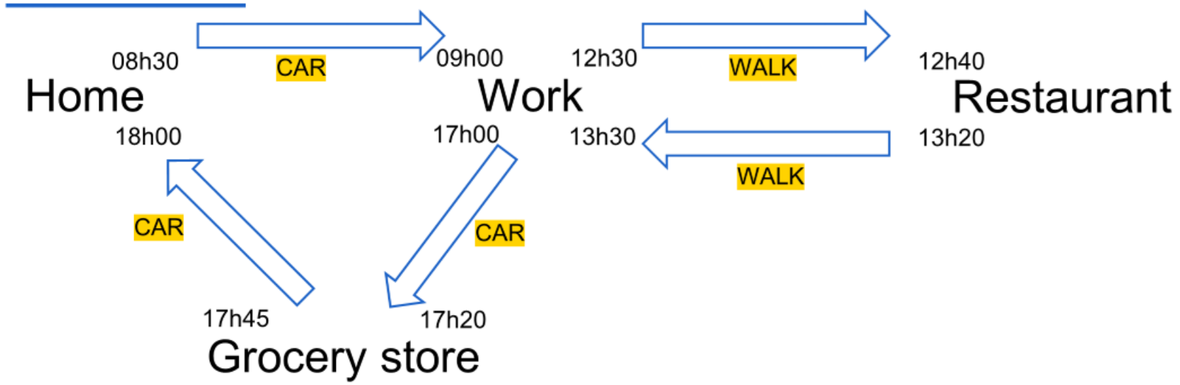
EXAMPLE



Plan 1 → Score = 40

Score Plan → Score = 40

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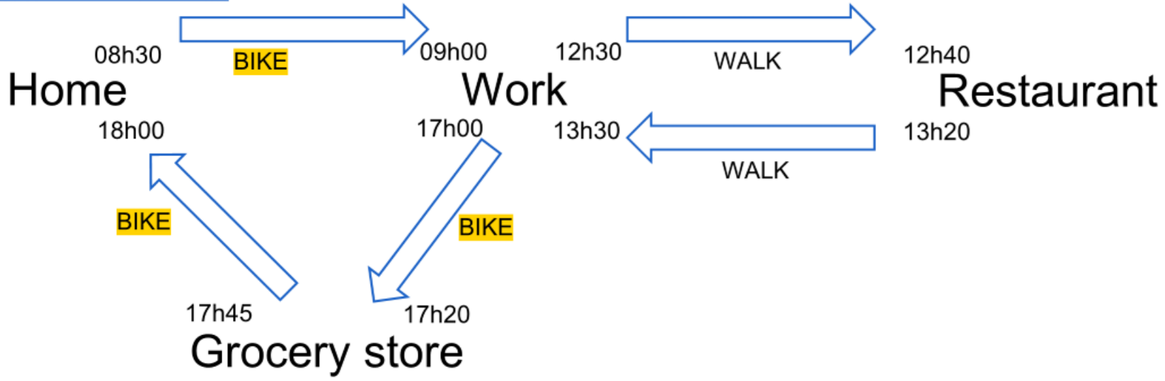
EXAMPLE



Plan 2 → Score = 60

Score Plan → Score = 20

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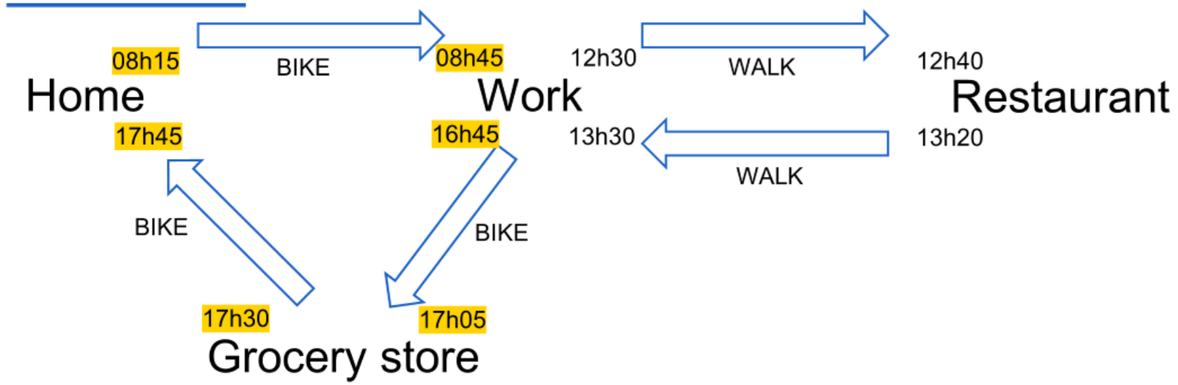
EXAMPLE



Plan 3 → Score = 70

Score Plan → Score = 25

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UPCOMING TASKS

Define attitudes

Define effect of attitudes on scores of different plans

Implementation in MATSim

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THANK YOU FOR YOUR ATTENTION

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