

MATSim Location Choice for Shopping and Leisure Activities: Ideas and Open Questions

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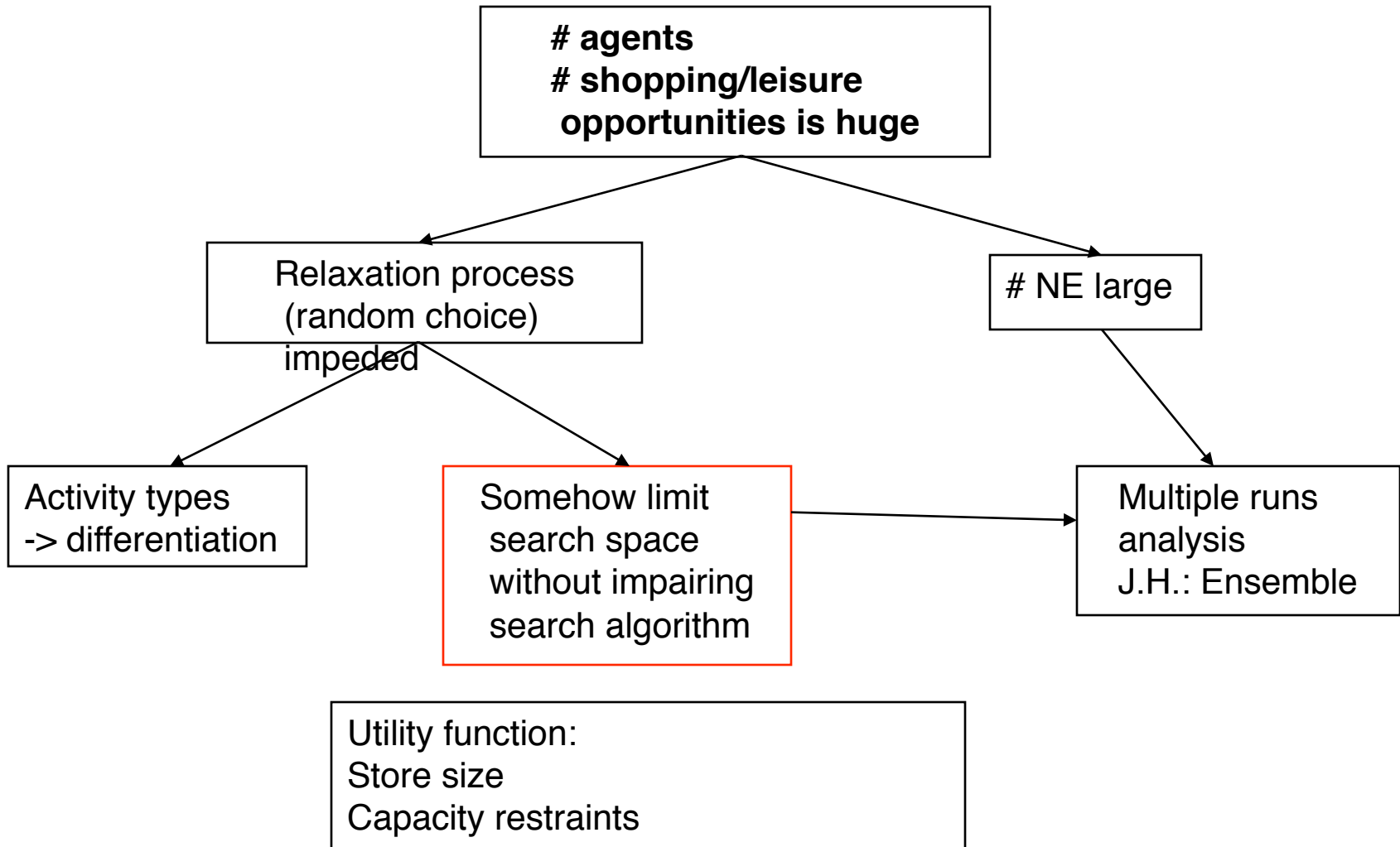
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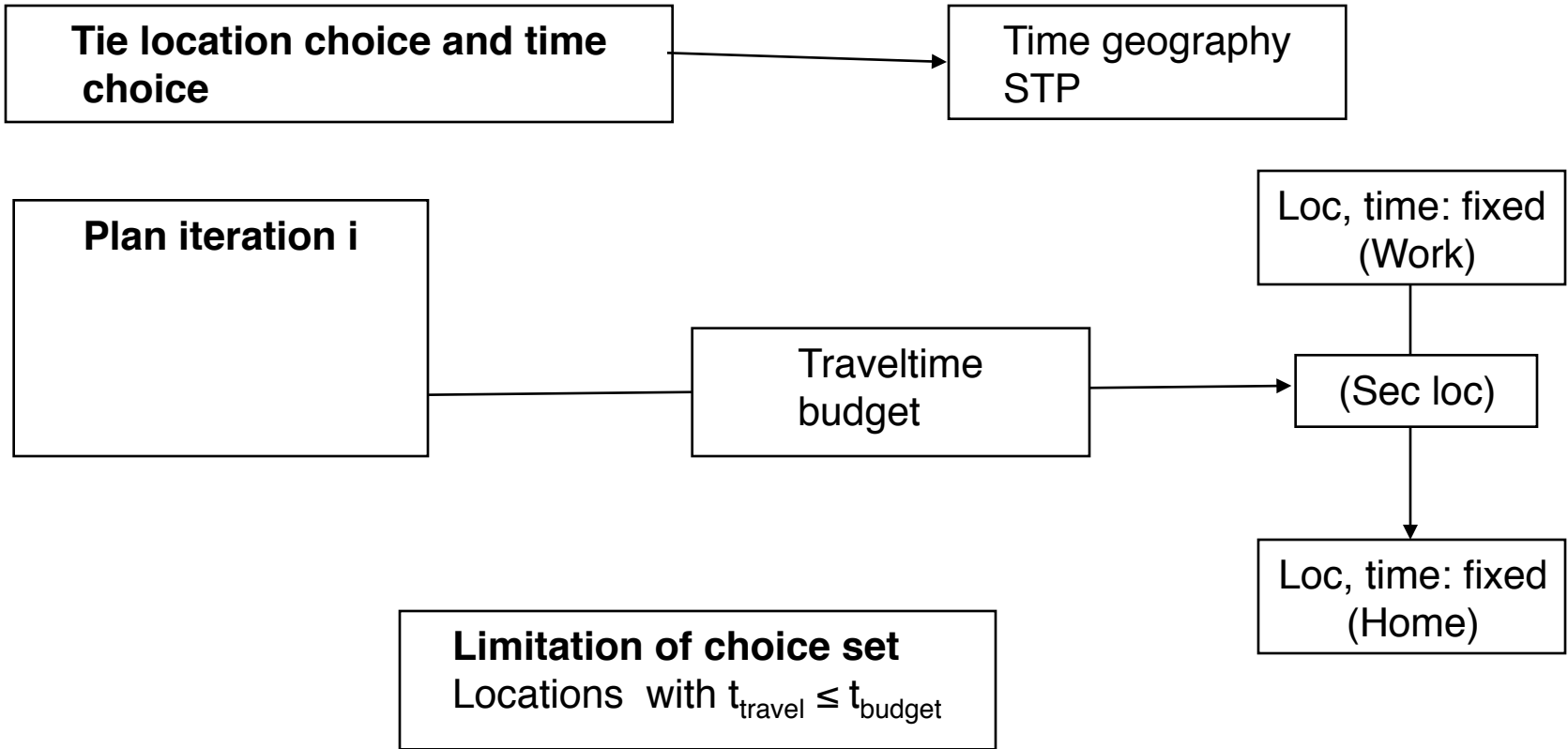
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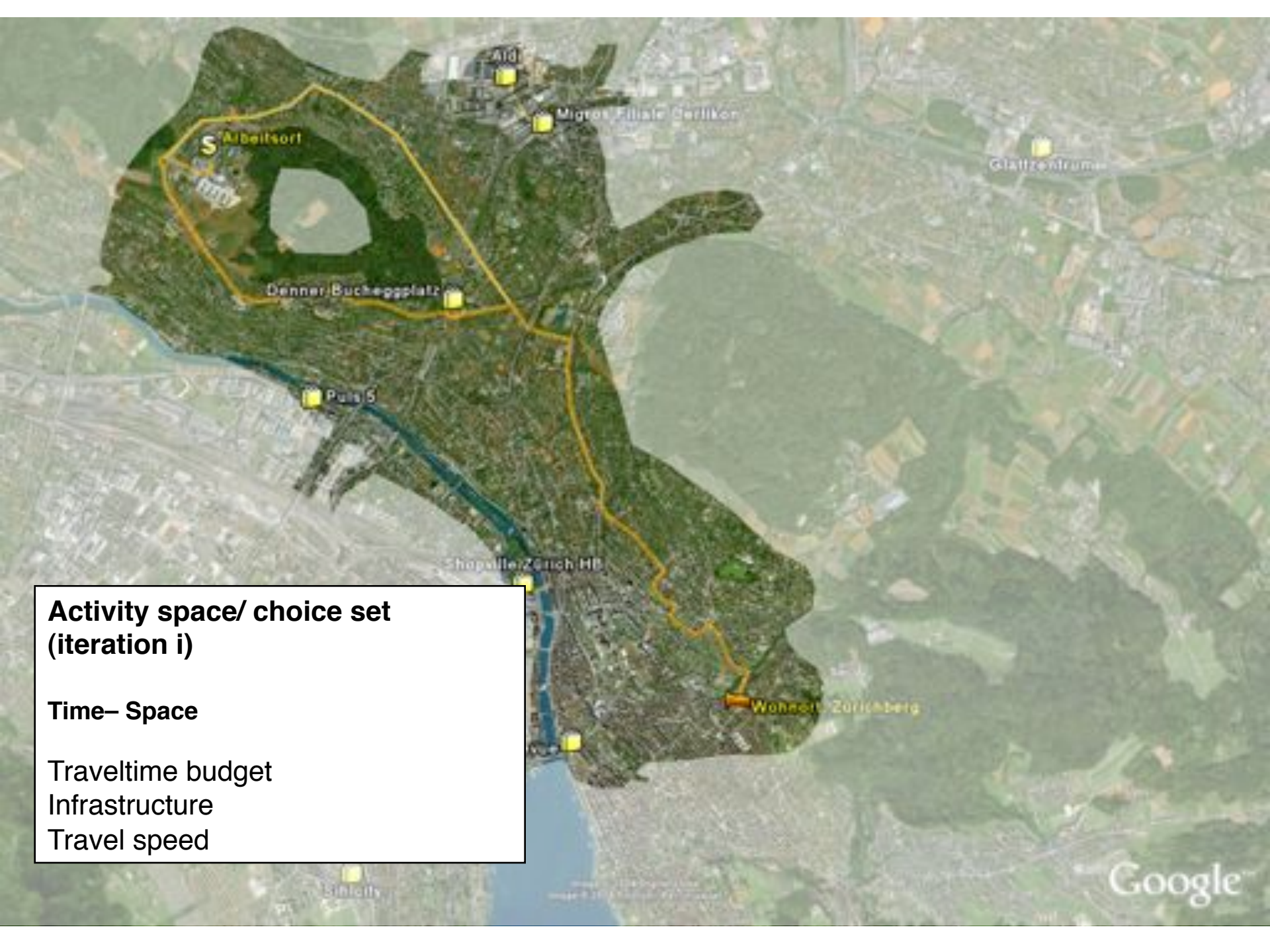
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Location Choice – Challenges and Open Questions



Location Choice – Limit Search Space





**Activity space/ choice set
(iteration i)**

Time- Space

Traveltime budget

Infrastructure

Travel speed

Choice Set Construction - Time Geography

Based on GIS-PPA
-Algorithm Scott, 2006




Choice drawn from implicit choice set
Chains of secondary activities



$$r = t_{\text{budget}}/2 * v$$



Check all locations
 $t_{\text{travel}} \leq t_{\text{budget}}$
→ choice set 

Random choice

Check $\sum t_{\text{travel}} \leq t_{\text{budget}}$

Facility Capacity Restraints

Time-dependend restraint function

Penalty term

Descriptive → explicative

Stability of algorithm

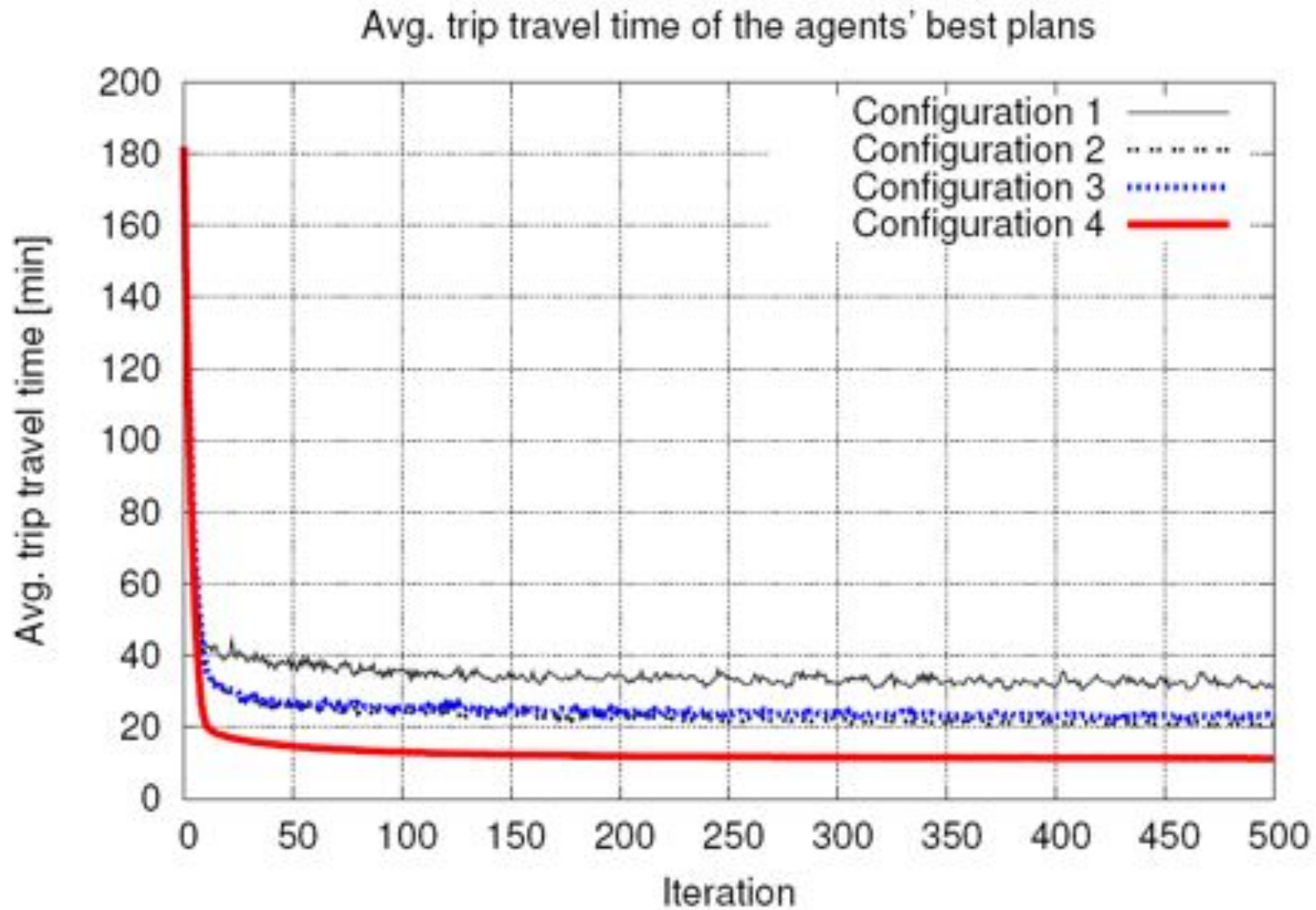
Scenario ZH

- Total number of agents simulated: 61,480
- Zürich circle: total number of facilities for ...
 - **shopping** activities: 1,162
 - **leisure** activities: 6,662
- Total number of activities performed for ...
 - **shopping**: 25,896
 - **leisure**: 40,971
- Total number of persons doing ...
 - **shopping** activities: 22,639
 - **leisure** activities: 32,229
 - **shopping** or **leisure** activities: 42,962
- Activities ...
 - **primary**: home, work, education
 - **secondary**: shop, leisure
- Average number of trips per agent: 3.35
- Network: number of ...
 - **directed links**: 60,492
 - **nodes**: 24,180

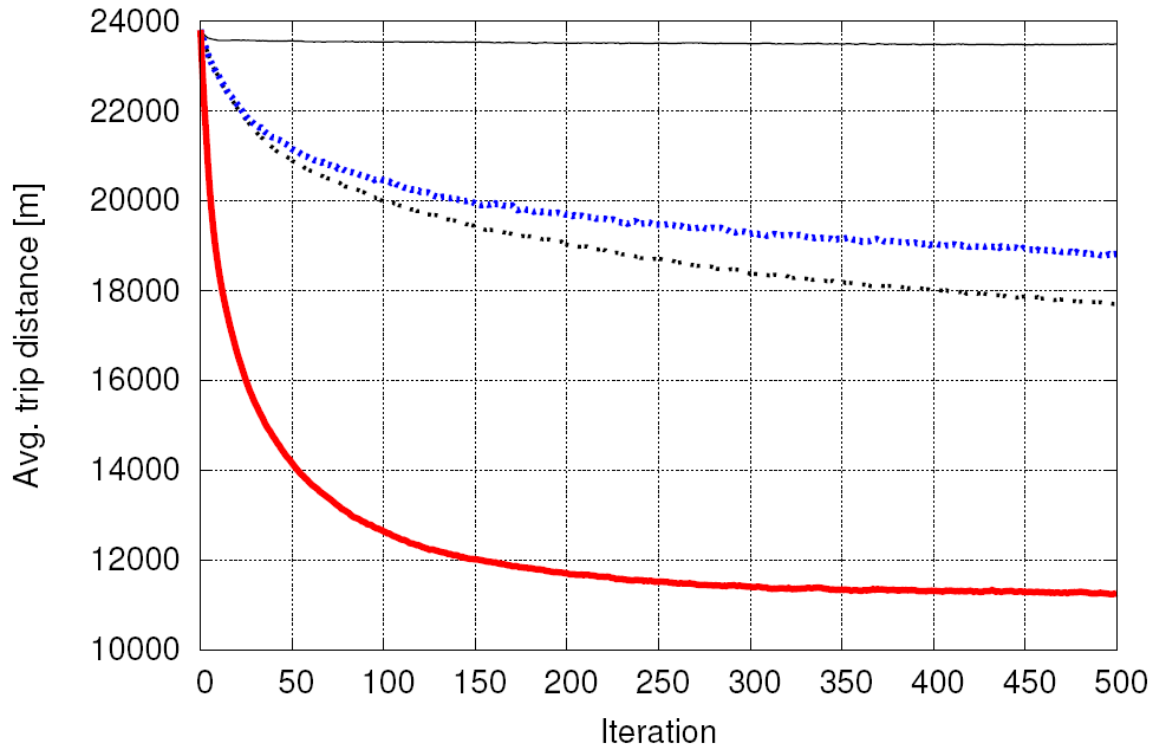
Configurations

- Configuration 1:
 - **Replanning:** Rerouting; Time choice
 - **Scoring:** No capacity restraints
- Configuration 2:
 - **Replanning:** Rerouting; Time choice; Location choice (universal choice set)
 - **Scoring:** No capacity restraints
- Configuration 3:
 - **Replanning:** Rerouting; Time choice; Location choice (universal choice set)
 - **Scoring:** Including capacity restraints
- Configuration 4:
 - **Replanning:** Rerouting; Time choice; Location choice (constrained choice set)
 - **Scoring:** Including capacity restraints

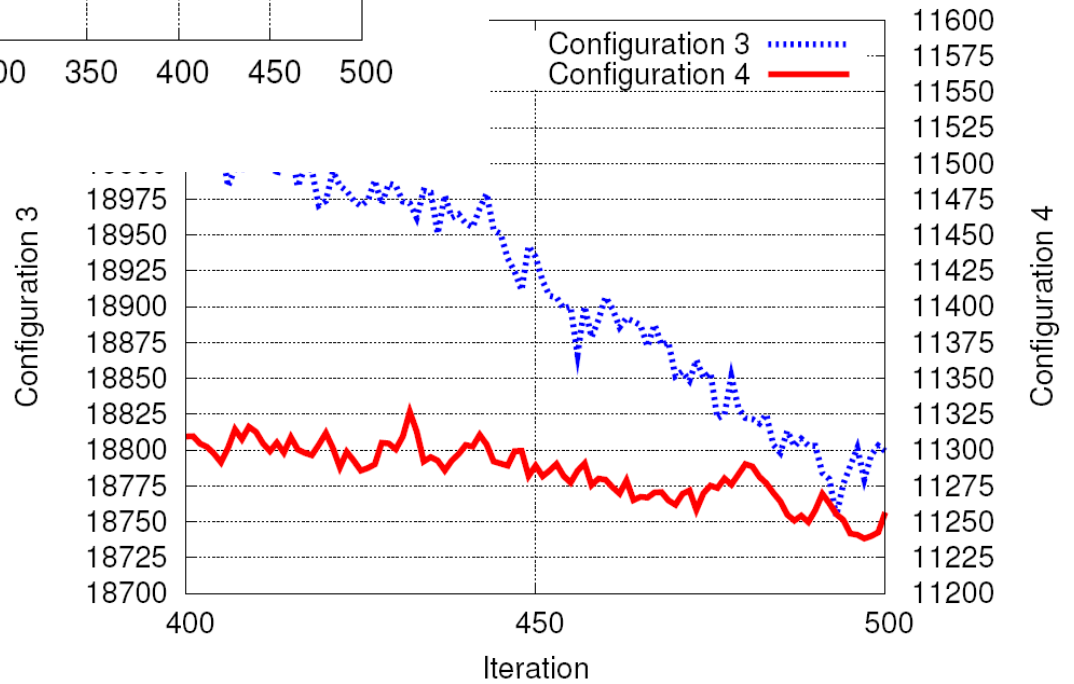
Simulation Results – Travel Times



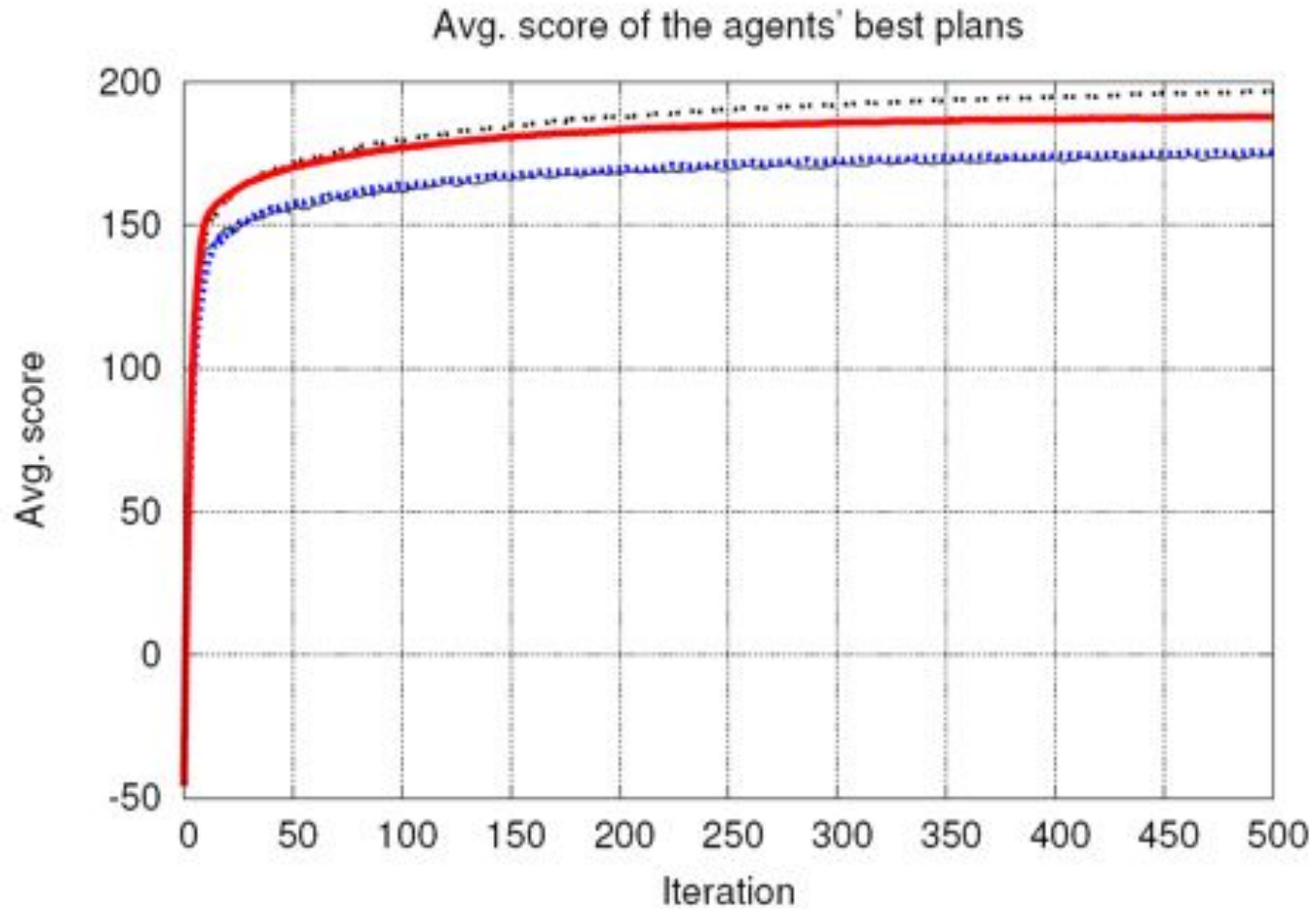
Avg. trip distance of the agents' best plans



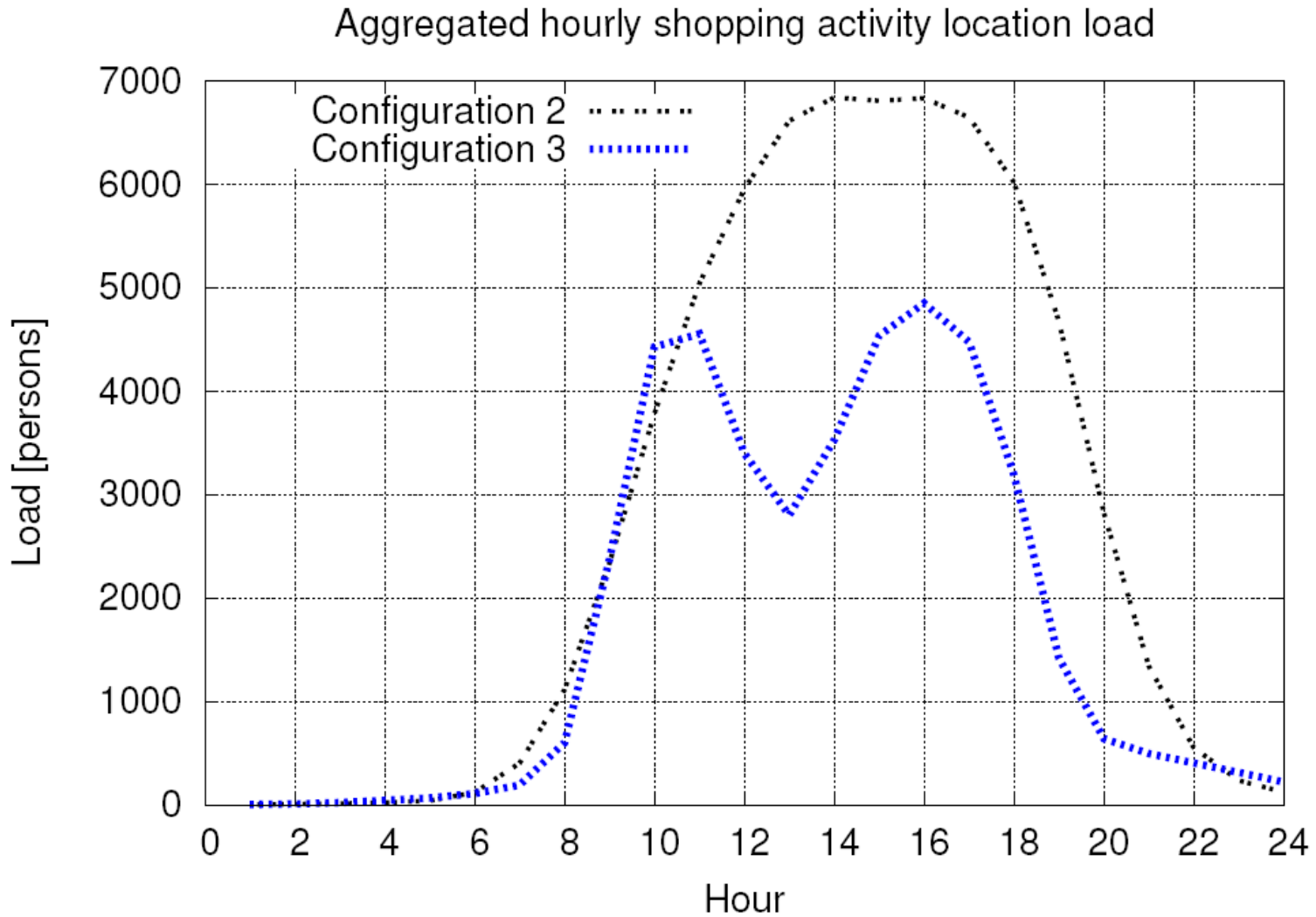
Avg. trip distance of the agents' best plans [m]



Simulation Results



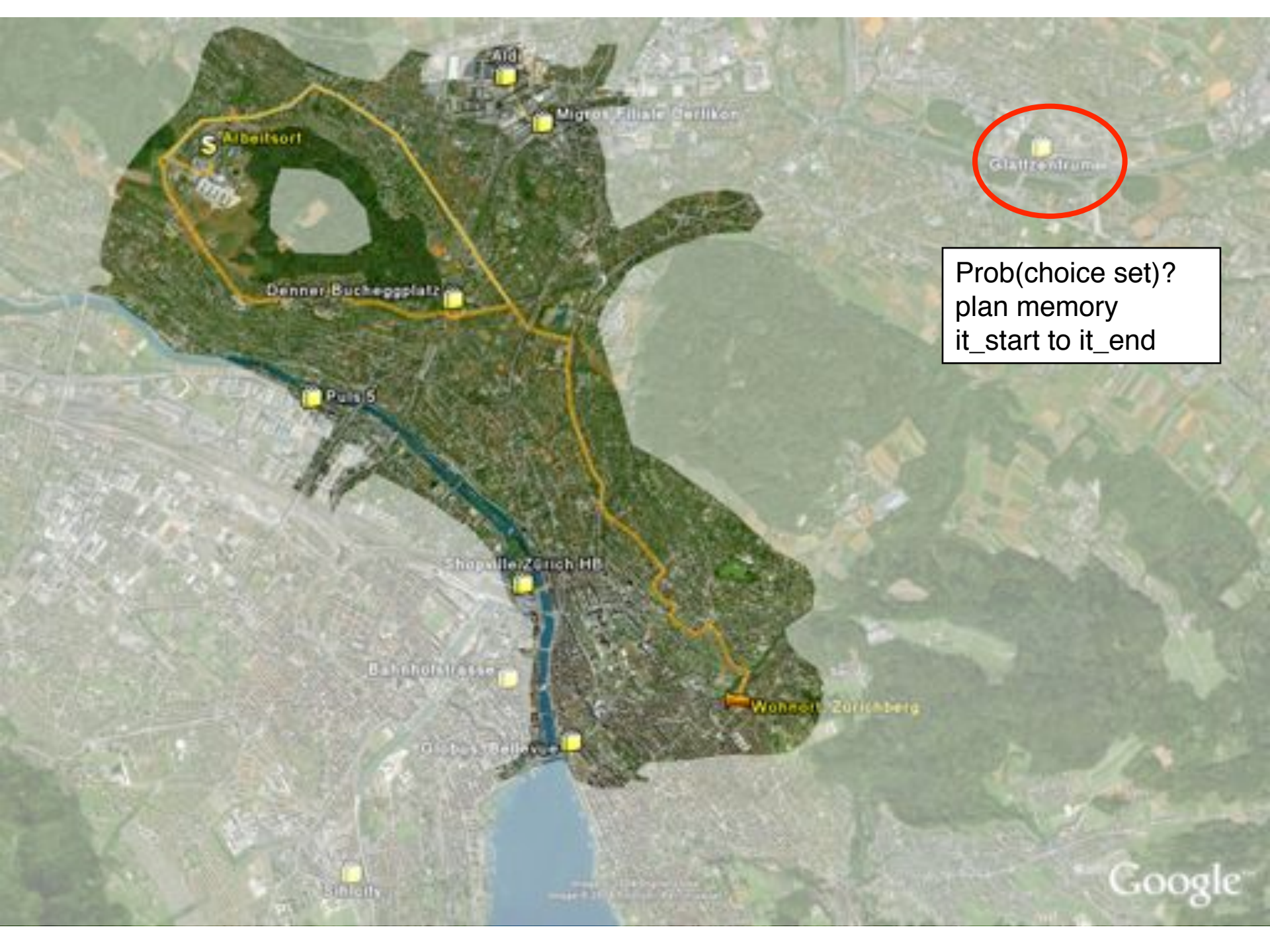
Simulation Results



Simulation Results – Computation Time

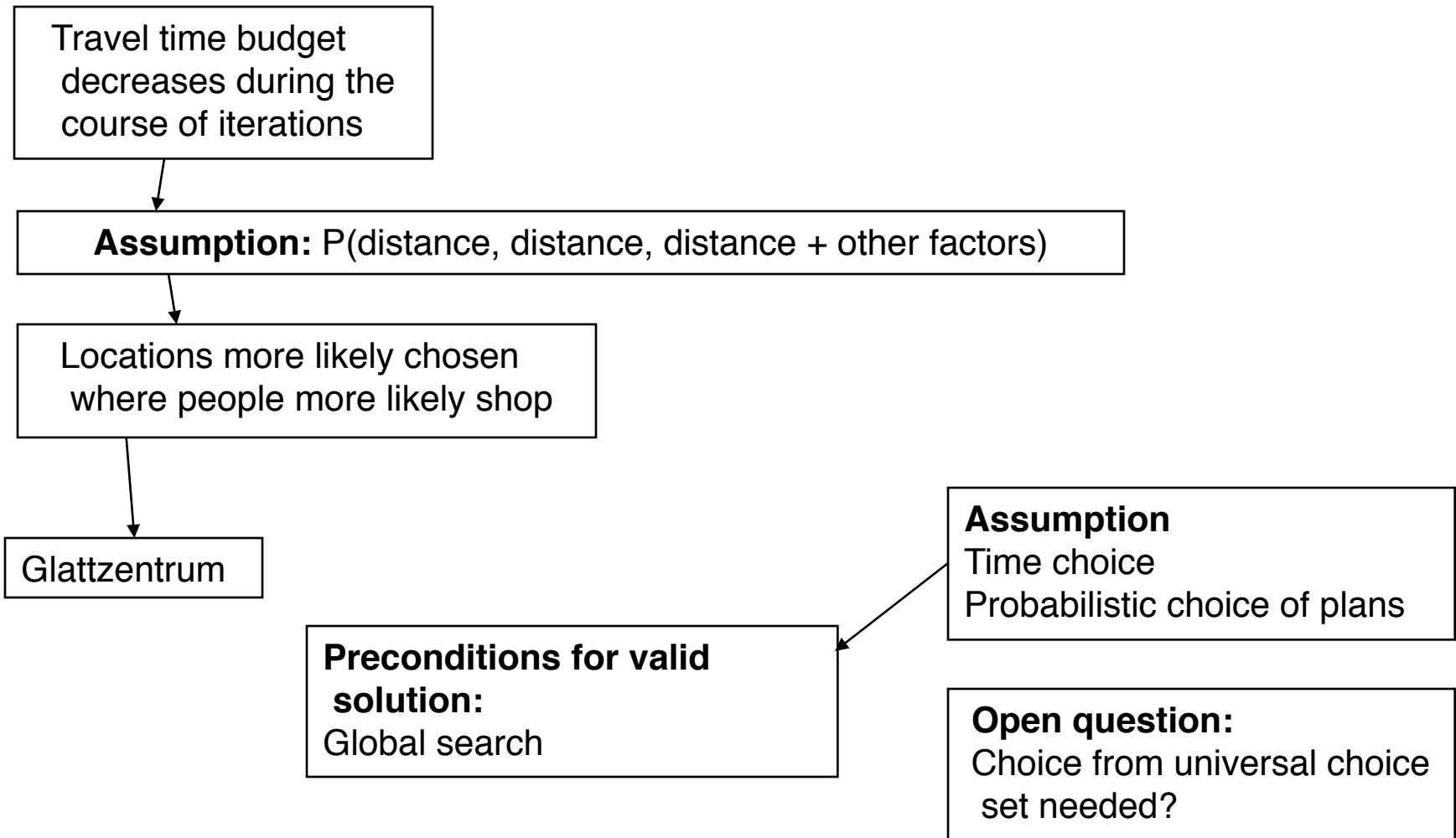
Configuration	Mobsim	Replanning	Sum
1	581	13	594
2	498	49	547
3	529	50	579
4	365	82	447

[s]/it (500 its)



Prob(choice set)?
plan memory
it_start to it_end

Location Choice – Open Questions



Nest steps

Validation basis (visitor freqs,...)

Utility function extension
Hypothesis testing

Hierarchy of activities in PPA
instead of chronological order