

A Simulation Study on the Interaction between the Land-Access Function for Motor Vehicles and the Pedestrian Walkability in Urban Streets

自動車の沿道出入機能と歩行者のウォークアビリティの相互作用に関するシミュレーション研究

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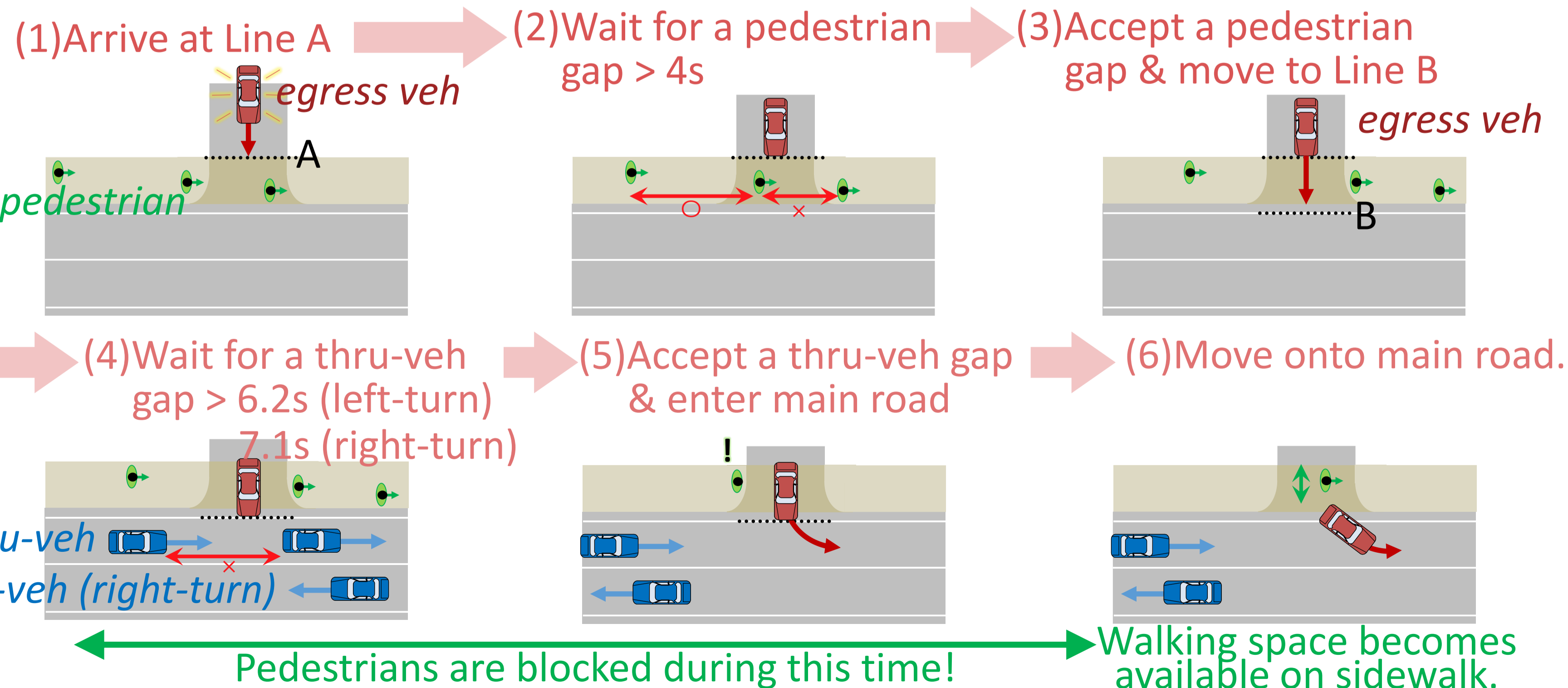
1. Introduction

- Driveway provides a direct connection between a street and an abutting property for motor vehicles – **Land-access function**.
- If it is not well accommodated in urban streets, it causes vehicle-pedestrian interactions, which affect pedestrians walking environment – **Walkability**.
- Quantitative assessment of such interactions is needed in street design & operation.
- This study aims to quantify the interactions btw. the land-access function and the walkability at the driveway exit on urban streets by simulations.

2. Simulation Algorithm – two-stage gap acceptance of egress vehicles

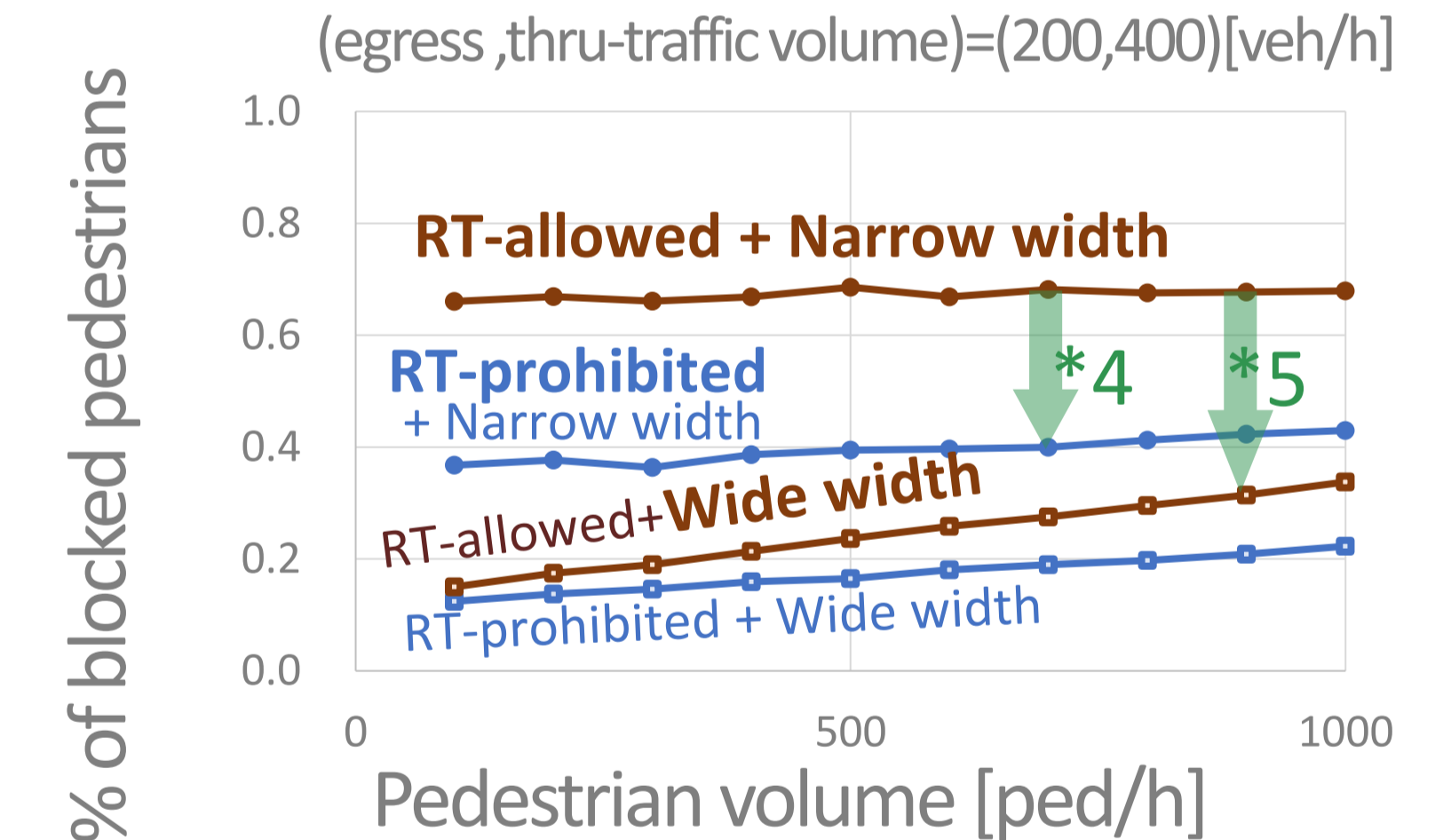
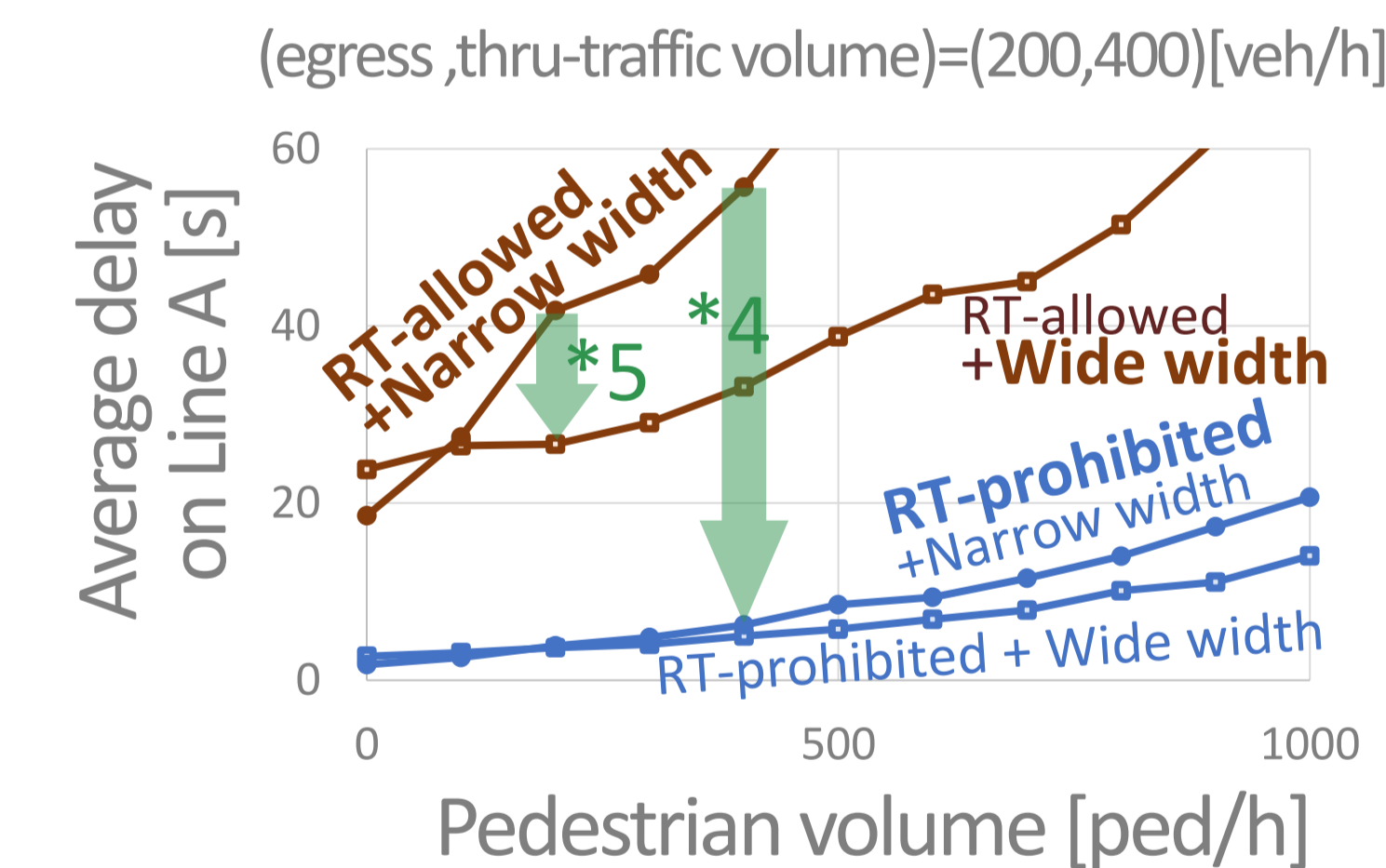
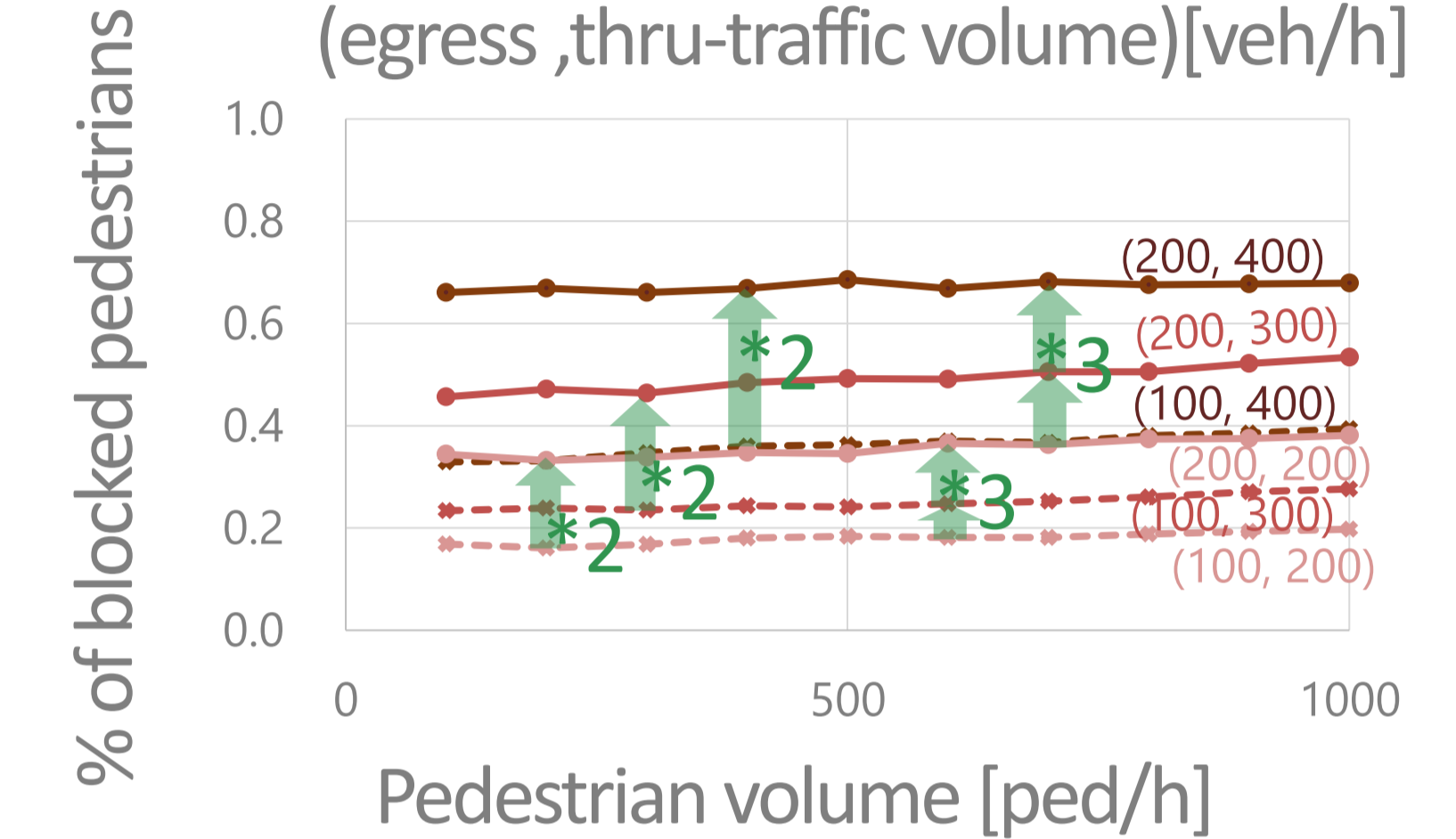
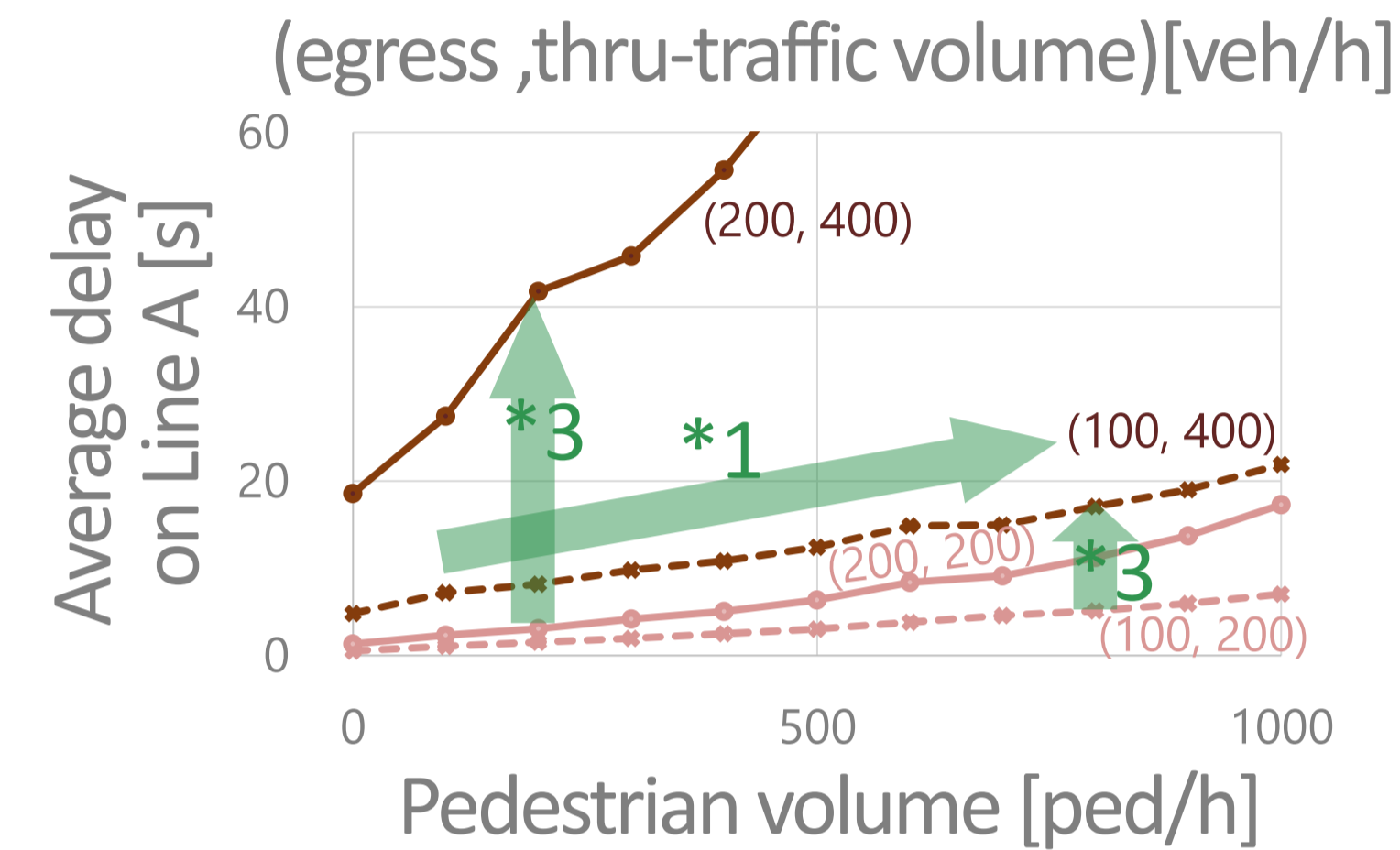
- Hypothesis: **Gap acceptance model**
 - Egress vehicles **accept** any gap of pedestrians in sidewalk or through vehicles in main street that is **greater than the respective critical gap** and **reject gaps smaller than this threshold**.

Outline of the Simulation



3. Simulation Results

- Impact on the Land-access function (of egress vehicles)
- Impact on the Walkability



4. Conclusion

- Land-access function for motor vehicles deteriorates with increasing pedestrian volume^{*1}. Walkability becomes worse with increasing in the egress volume^{*2}. Both of them are impacted negatively by the through traffic volume^{*3}.
- Prohibiting the right-turn egress^{*4} as well as widening the sidewalk and curbside^{*5} has the potential to improve both land-access function and walkability.