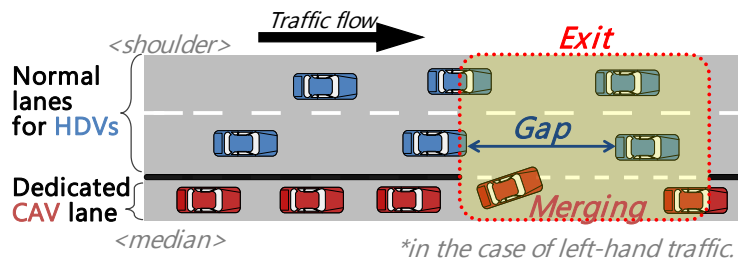


1. Introduction

- A possible way to early introduce CAV is to provide dedicated CAV lanes.
- At an exit of dedicated lane, CAVs must merge into human driven vehicles (HDVs).

→Where to locate an exit for better CAVs' merging?

Objective: Utilize gap distributions of HDVs to evaluate the merging opportunities of CAVs.



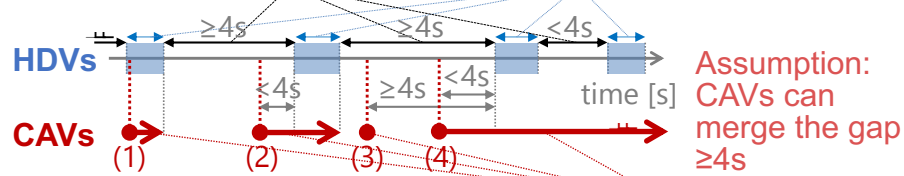
2. Methodology

Gap distribution

- Combined gamma model
 $f(t) = \varphi * g(t) + (1 - \varphi) * h(t)$

Occupancy Time distribution

- Gamma model



Available percentage

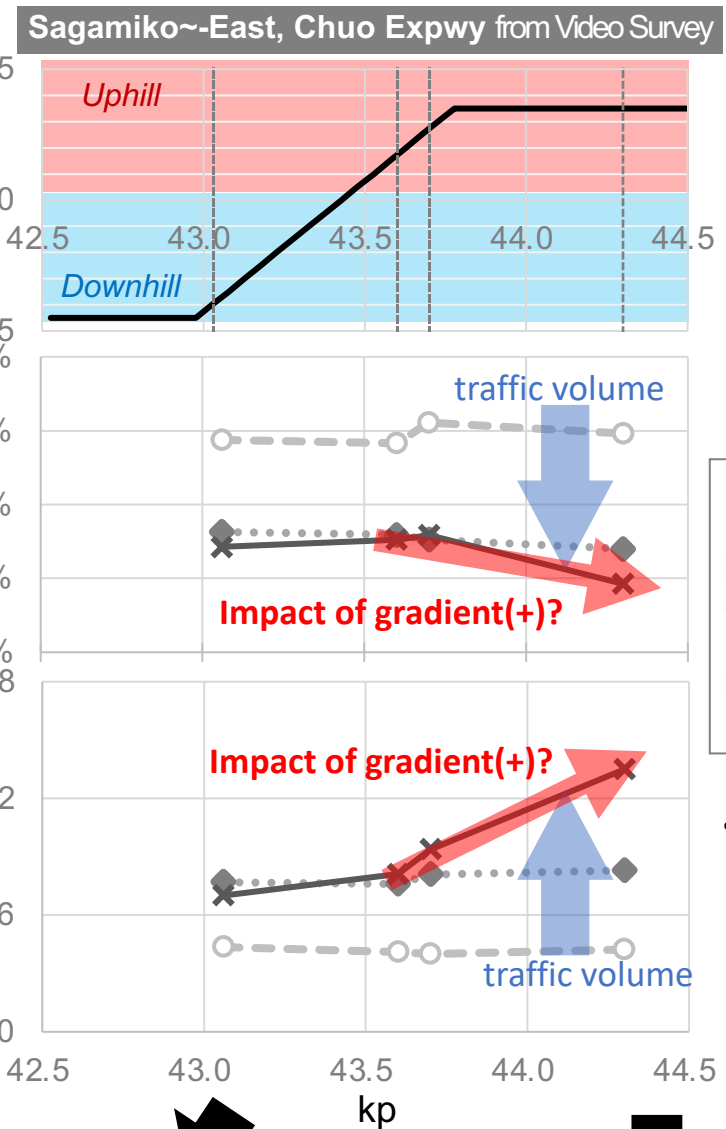
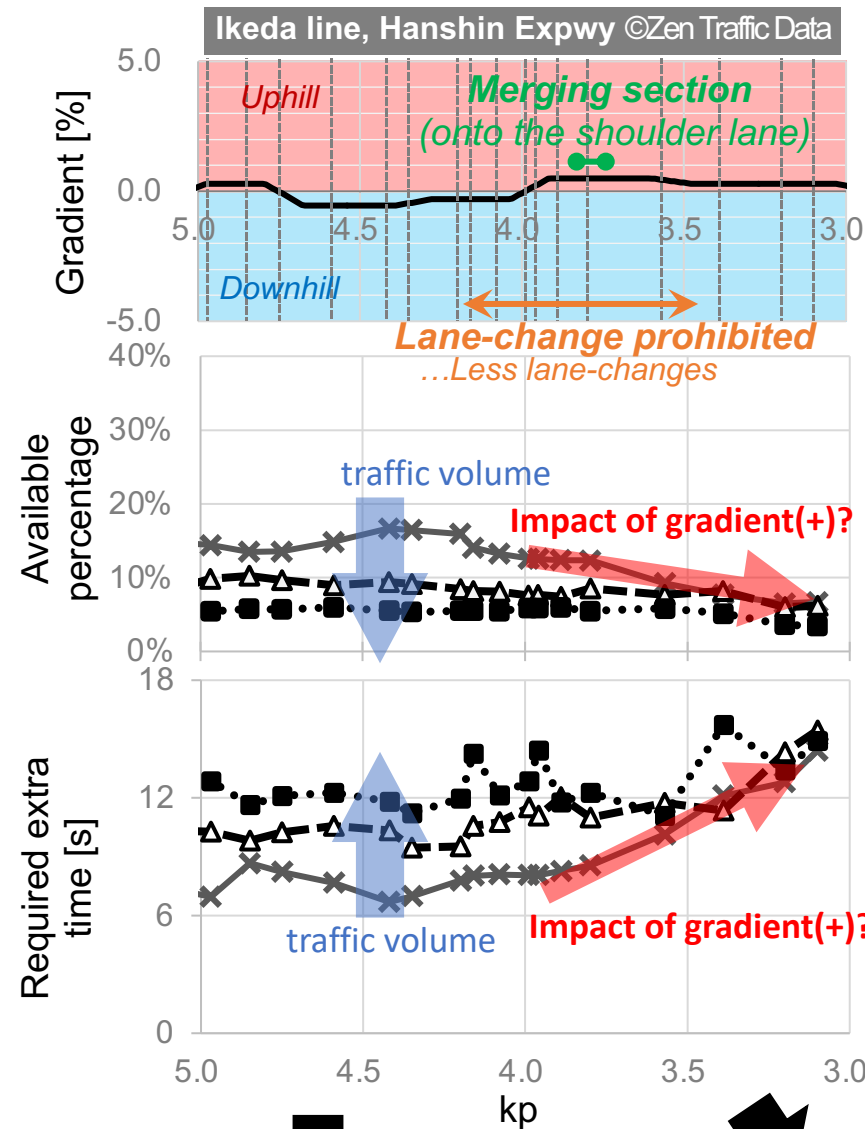
% of gaps longer than the critical gap (4 s)

Required Extra Time

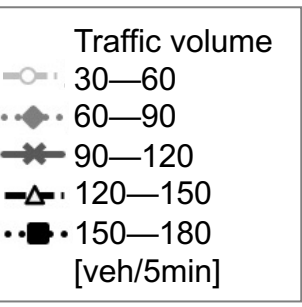
Extra duration a CAV needs, to merge from dedicated CAV lane into HDVs' normal lane

Merging opportunity Evaluation (at a location)

3. Results & Discussion



- Uncongested conditions only. ($\ge 60\text{km/h}$ in 5min on Hanshin Expwy; $\ge 80\text{km/h}$ in 5min on Chuo Expwy)
- Small vehicles only.



- Current conclusions are based on the limited samples, further validation must be done.

Higher traffic

- ✓ CAVs have difficulties to merge.
- ✓ Exit must be carefully designed & operated. (merging lane, V2I to monitor HDVs, etc.)

90—120veh/5min

- ✓ Exit should be avoided at long-stretch uphill due to less merging opportunities.

Lower traffic

- ✓ Merging opportunities are not much influenced by geometry.