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Disruptive Effects of Demand Responsive Transport (DRT) Systems on Mobility

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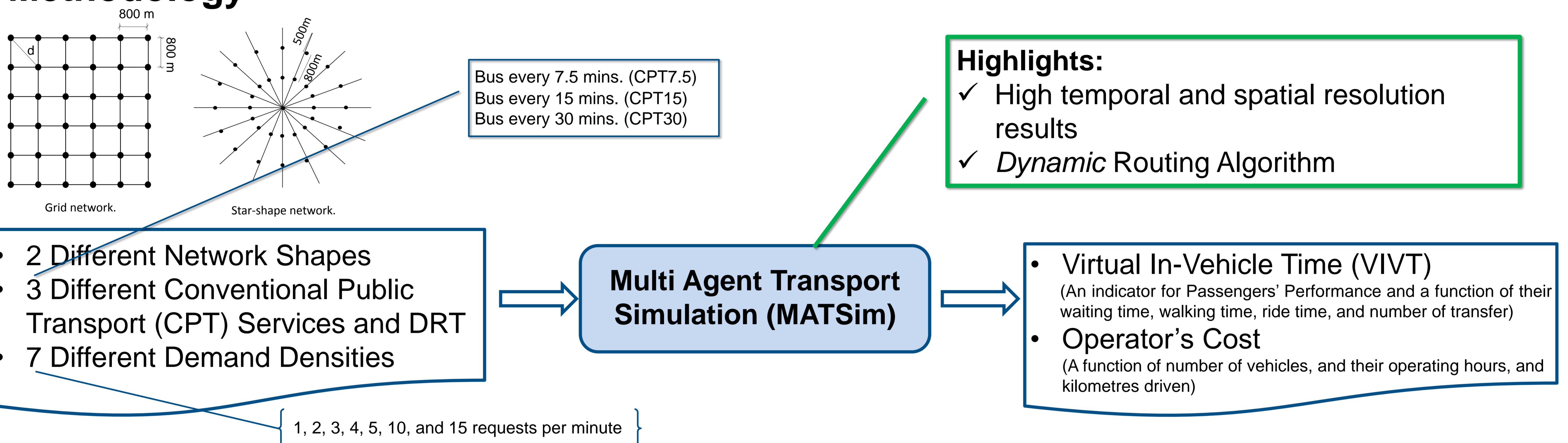
Introduction

- DRT systems (aka paratransit services) are tailor-made public transportation systems in which the stops' locations and times are requested by the passengers.
- DRT is expected to be the potential solution for unprofitable Conventional Public Transport (CPT) in low-demand areas.
- Many studies tried to model and predict the impacts of this system on mobility.
- No modelling with dynamic routing algorithm in previous studies for comparing DRT and CPT.

Objectives

- Identifying the *critical demand*, lower than which the DRT outperforms CPT
- Searching for evidence to demonstrate *the impacts of DRT* on user's quality of mobility.

Methodology



Results

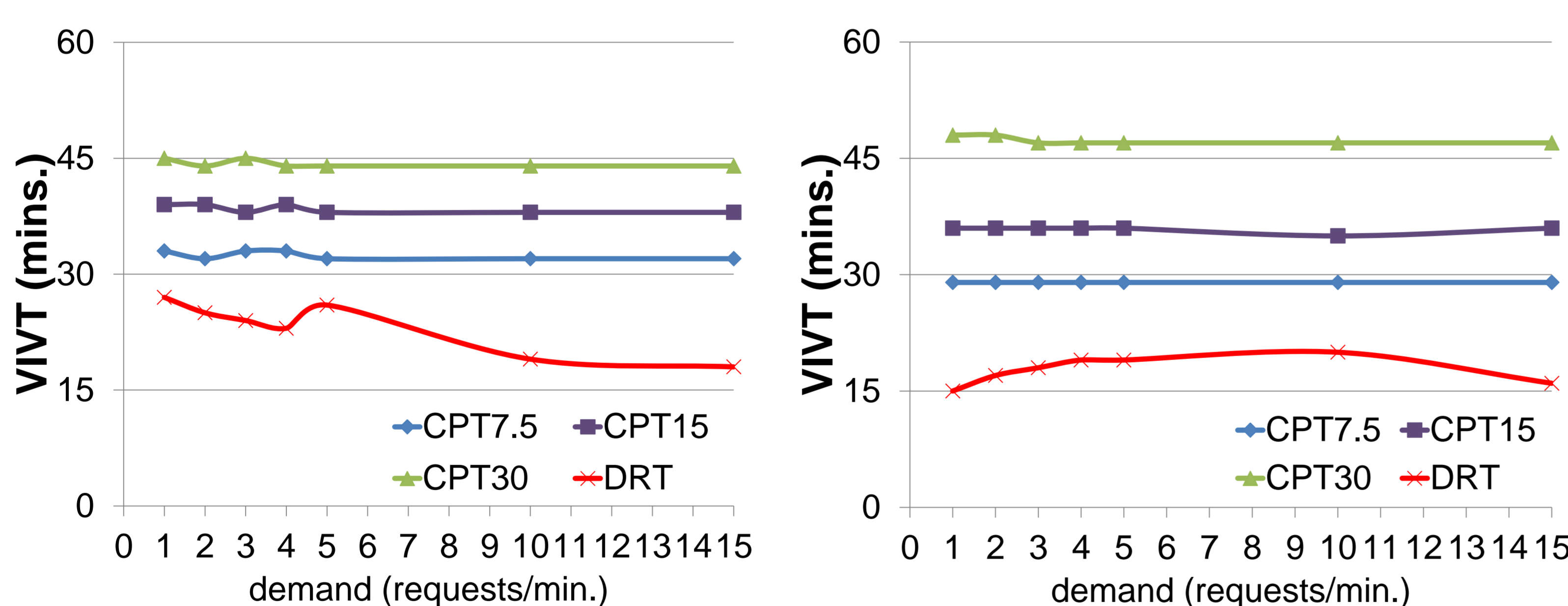


Figure 1: user performance in star-shape (left) and grid (right) network. It is shown that DRT provides the minimum VIVT (i.e. perceived travel time by passengers) and in turn a higher performance for passengers.

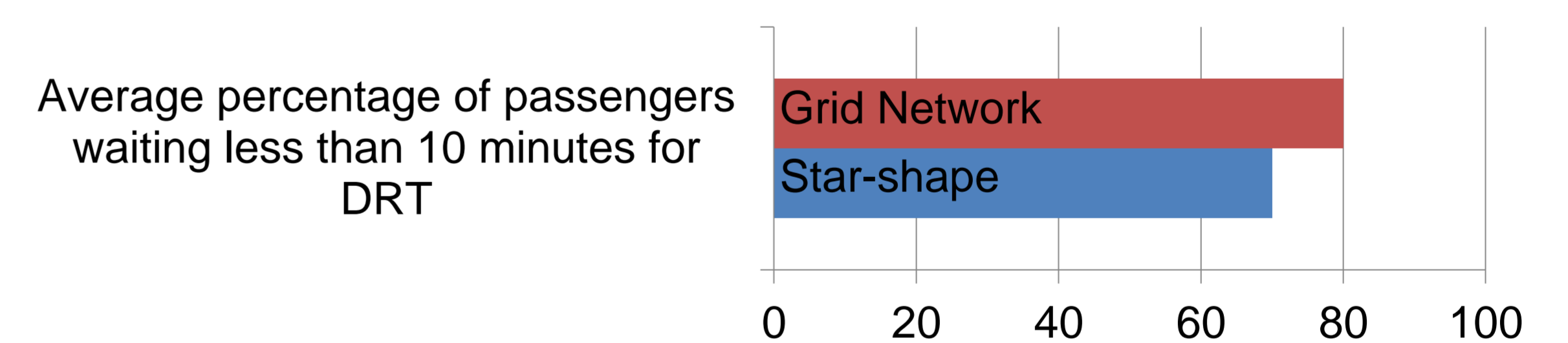


Figure 2: Average percentage of passengers waiting less than 10 minutes. It should be noted that the passengers waiting more than 10 minutes for DRT are in the minority (average 20-30%) and they wait comfortably at home instead of rather uncomfortable bus stops.

Star-Shape Network			Grid Network		
CPT7.5	CPT15	CPT30	CPT7.5	CPT15	CPT30
7	3	3	15	10	4

Table 1: The highest demand, at which the cost difference between DRT and the corresponding CPT is less than 10%.

Conclusions

- Replacing CPT with DRT leads to an increase in people's mobility due to reduction in their perceived travel time.
- **3 requests per minute** (or 11 requests/hour/km²) is the **critical demand** overall.
- The cost of **DRT operation is independent from network shape** and depends mainly on demand level.
- **Grid network** provides a **better** situation for DRT operation.

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Research partners



Research team

Intelligent Mobility on Demand (iMoD)
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