Impact of Shared Autonomous Vehicles on parking demand

シェア型自動運転車導入時の駐車場整備量への影響

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1. Shared Autonomous Vehicles & city

- Shared Autonomous Vehicle (SAV) system will be a mobility service of new era.

Image of SAV operation (ITF2017)

- SAVs will affect the transport system of today
  → **Need to study its impact**

2. Motivation

- Relocation of SAVs after one trip is possible
  → **Less need for parking space** in urban areas

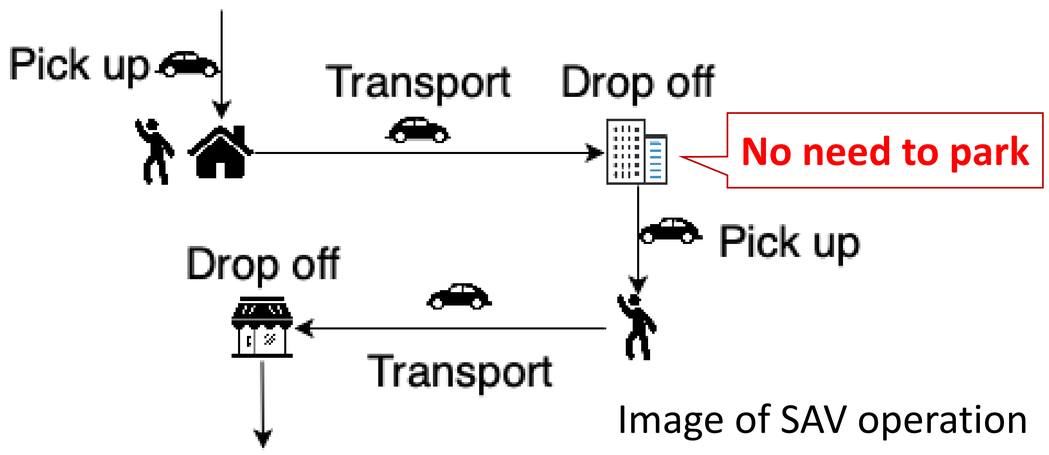


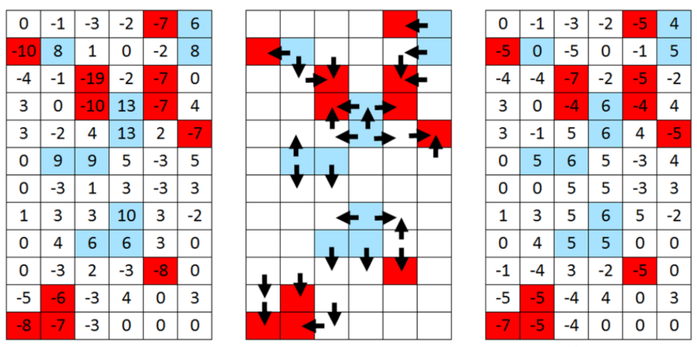
Image of SAV operation

- Study on real network → foundation of discussion on parking management
- **Possibility to transform the city into a more beneficial one for citizens**

3. Method(1): Modeling SAV Dispatcher

SAV Dispatcher determines the behavior of SAVs in order to (1) **pick up requesting travelers** and (2) **relocate the vehicles** to cover future requests.

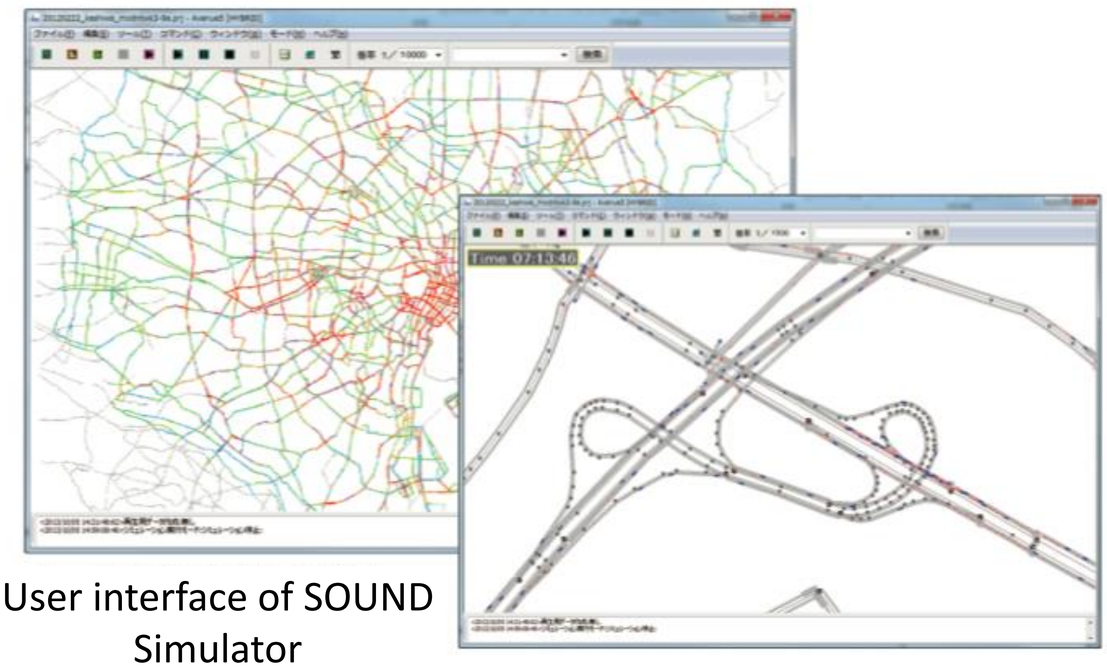
1. Matching vehicles with requests from travelers
   - For each travel request, search the closest vehicle available
2. Relocating vacant vehicles
   - "Scores" for each area are calculated
   - Move vehicles from over-supplied areas to under-supplied areas



Fagnant et al. 2015

4. Method(2): Simulation on SOUND

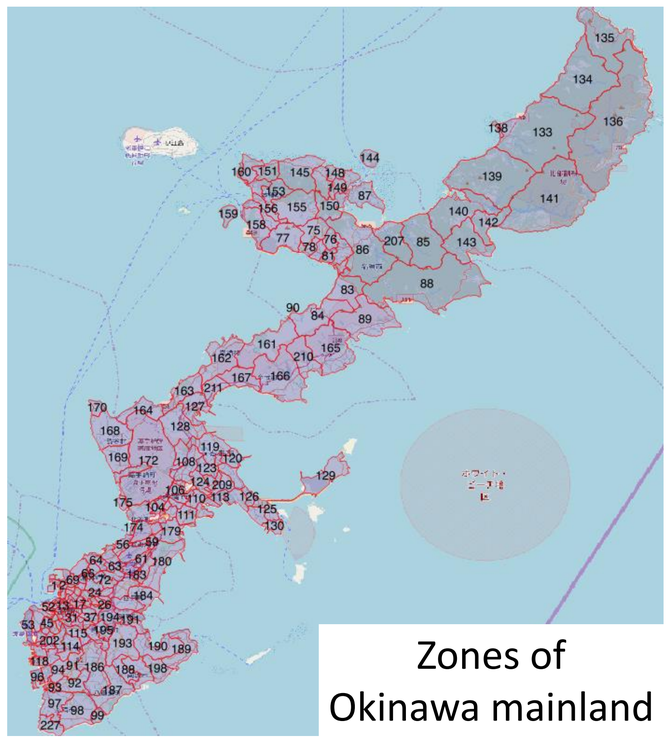
- SOUND (Simulation On Urban road Network with Dynamic route choice)



User interface of SOUND Simulator

- Case study on Okinawa Mainland

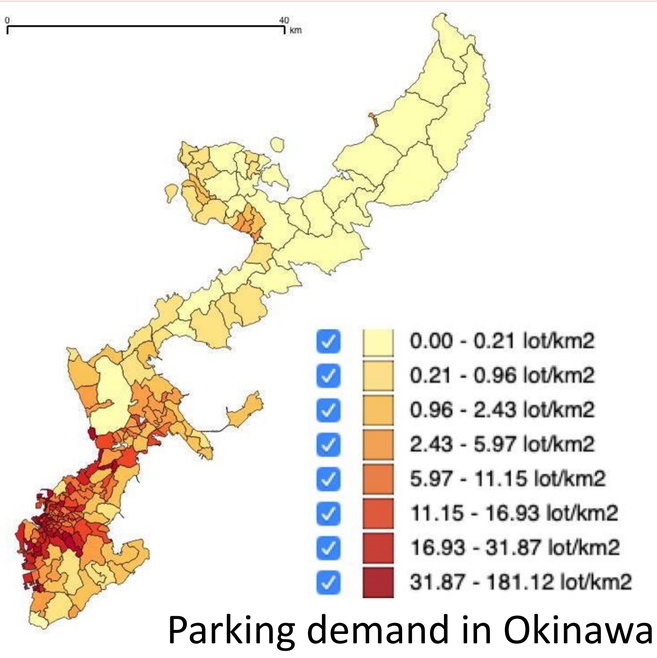
→ Evaluate parking demand in two scenarios
  - Without SAVs (= current situation)
  - With SAVs



Zones of Okinawa mainland

5. Progress & Expected result

- Simulation set-up with SAV Dispatcher is ongoing
- Current parking demand (number of parking space / km2) estimated



Parking demand in Okinawa

6. Future Development

- Implement the SAV Dispatcher into SOUND simulator so as to evaluate the parking demand variation
- Analyze the effect and its relation with network structure & trip demand distribution