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Introduction of Flying Car Research Laboratory

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1. Introduction

Collaboration research between Keio SDM and TOYOTA

(Background)

Social Demand and Technology Development

Social demand for solving traffic jams, and technology development of autonomous drones are pushing the realization of flying cars.



Flying cars being developed all over the world

(Purpose) Design of 3D Transportation System

The purpose of the lab is to design transportation, business, and aircraft systems of 3D transportation.



Image of 3D Transportation System © CARTIVATOR

2. Problems

Concept 'AIR' (Air mobility with Intelligence and Resilience)



Regular condition



Disaster situation

-Mobility service that is useful and accessible to all -Adopt and respond to emergencies flexibly and quickly

'Socio-Economical-Technological' Challenges

Social	acce	ptance
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- -Noise
- -Accidents
- -Downwash (Wind flow from rotors)

Business feasibility -Demand forecast -Business planning -Cost estimation

- Technological feasibility
- Conceptual design
- Performance estimation
- Safety risk assessment

3. Method

- 1) Interview on traffic issues and reactions to personal aerial Vehicles
- 2) Making a roadmap toward 2050 & deciding a first market
- 3) Requirement analysis and system architecting
- 4) Technological business and feasibility study

4. Results and Discussions

1) HEMS* in developed countries are likely the first use case considering social acceptance

(*HEMS=Helicopter Emergency Medical Services)

2) Around 2025 seems to be a launch timing based on maturity of technology and regulations



Context diagram of HEMS

3) HEMS operators suffer from high direct operation cost(DOC) of currently \$2M/yr & noise issue
4) Electric VTOL (Vertical Take-Off and Landing) can fit to requirements HEMS due to low DOC and noise



Future work: Research on how to realize autonomous dispatch system and capability of night operations