

Survey of Issues and Technologies Related with “Highway in the Sky”

Byung-Ho Ahn, Jongki Moon, and Woongje Sung

Aerospace Systems Design Laboratory
School of Aerospace Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332, United States

ABSTRACT

This paper addresses pivotal research questions associated with air highway systems. An air highway system is crucial factor to effective operation of personal air vehicles. In order to realize “Highway in the Sky,” it is required to identify unique features of personal air vehicles compared to general aviation systems and unmanned air vehicles. In this paper, technical requirements and issues for “Highway in the Sky” are discussed. This paper also suggests directions for future research.

I. INTRODUCTION

Personal Air Vehicles (PAVs) are an emerging field of technology exploration. The fundamental premise of this frontier technology is to make the capability of flight more convenient and for an individual with a reduction in the specialized skills required to operate an aircraft. The final goal is a practical “highway in the sky” scenario where an individual is able to fly from point to point with ease of driving an automobile.

Most current research on PAV developments focus on vehicle itself even though design of the overall operating system is also important. There are needs to investigate if current operating technologies for conventional airplanes are compatible with PAVs. In addition, it is necessary to identify future research requirements. To do this, this paper identifies three categories of system requirements, investigates current technology status, and discusses some aspects to be developed in near future.

II. Exploration Outline

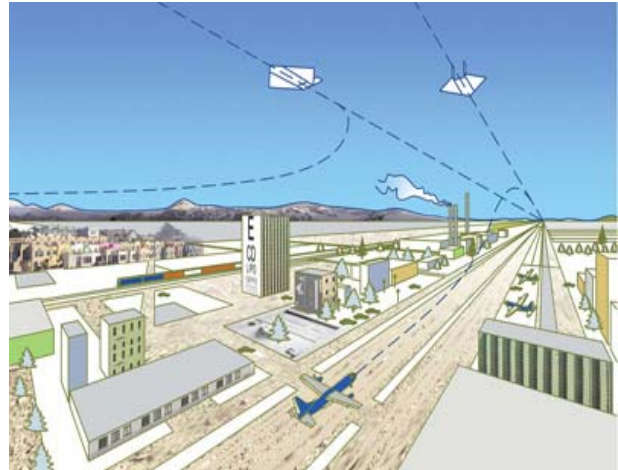


Fig. 1 Conceptual picture of “Highway in the Sky”

A. *Issues on individual PAV management*

- Performance requirement
- Scope of onboard equipments

B. *Issues on multiple PAVs management*

- Safe operation among multiple PAVs
- Communication

C. *Issues on operating system management*

- Air traffic management
- Contingency management
- Operation monitoring

III. Expected results

Final paper will includes a survey of operation management of conventional airplanes, identify unique features of PAVs, and investigate compatibility with current aviation systems. In addition, a suggestion on technology development for future needs will be included.