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CHALLENGES AND RECOMMENDATIONS FOR INTERCONTINENTAL SUBORBITAL
COMMERCIAL LINER TRANSPORTATION

Abstract

Transporting passengers and goods from one side of the globe to the other takes several hours to days of travel time, which can be a challenge for pilots, crews, and passengers. A high-speed intercontinental passenger/cargo transportation system may become commercially viable in the next decade, solving the problem of long transportation times. This research studies the state of the art of Intercontinental Suborbital Commercial Liner (ISCL) transportation to provide guidelines that decision-makers can rely upon to commercialize suborbital transportation.

The study provides a global perspective on the development of ISCL through a methodical study from the standpoints of several disciplines, including business management; human performance in space; space policy and law; space sciences; engineering; space applications; and humanities. Qualitative expert interviews, prospective customer questionnaires, and market analyses were conducted to gain insight and assess current market needs and potential.

This research uncovers various data gaps in suborbital point-to-point transportation. As a result, recommendations are provided to fill legal and technological gaps in relevant space policies, as well as the use of environmentally friendly propellants, increasing the safety and wellbeing of passengers, pre-/mid-/post-flight medical measures, reducing operational costs and economic risks, and minimizing intermodal travel times. The sustainability of the preferred ballistic trajectory is assessed in regards to propellant trade-offs that directly affect emissions. In addition, multiple transportation business models are investigated and should be improved to advance the development of commercial suborbital transport.

In summary, this study investigates numerous challenges, including the current difficulty of evaluating the effects of ISCL transportation on passengers due to lack of available data. There is a need to develop

the future suborbital ecosystem and global spaceport network, including location, physical and economic accessibility, and architectural considerations. Furthermore, suborbital passenger flights are currently situated in a space policy legal vacuum. Key stakeholders are called to address these recommendations to improve the readiness level of point-to-point Intercontinental Suborbital Commercial Liner systems as they evolve into the transportation means of the future.