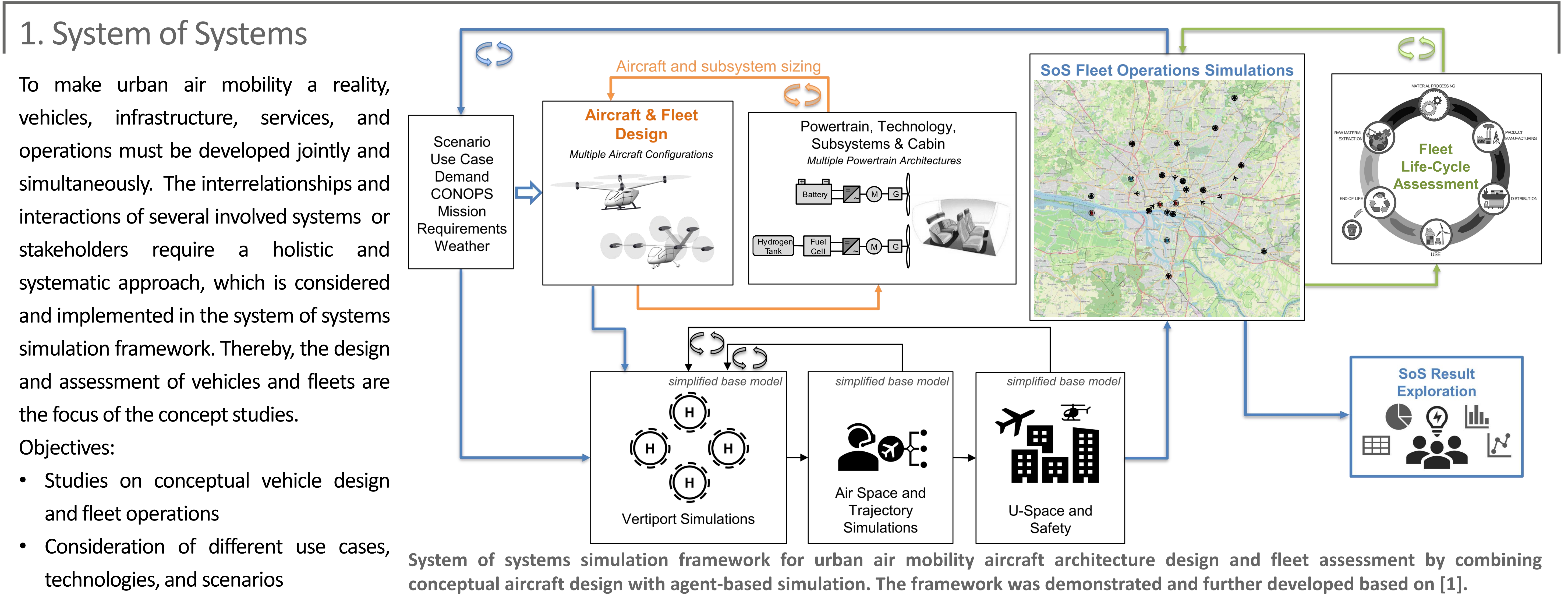


# System of Systems Explorations of Urban Air Mobility Aircraft Design and Operations: An Overview of the Conceptual Vehicle Design Approach in HorizonUAM

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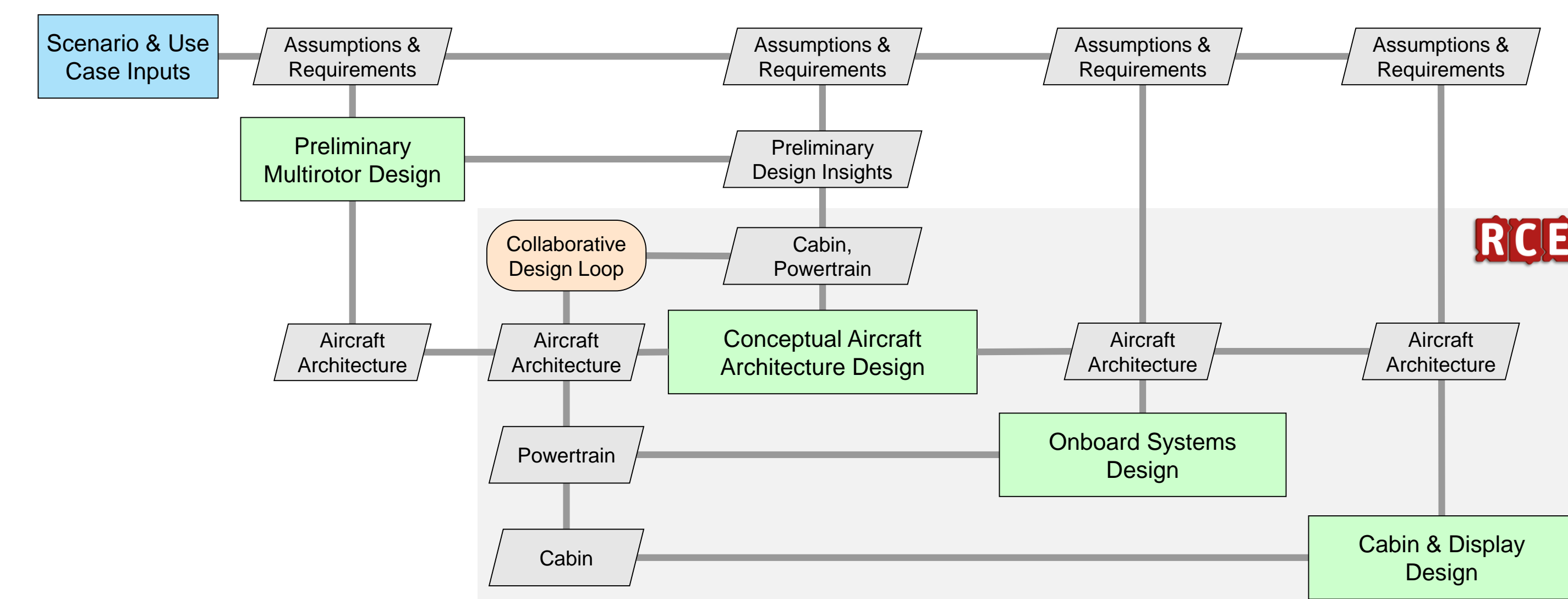
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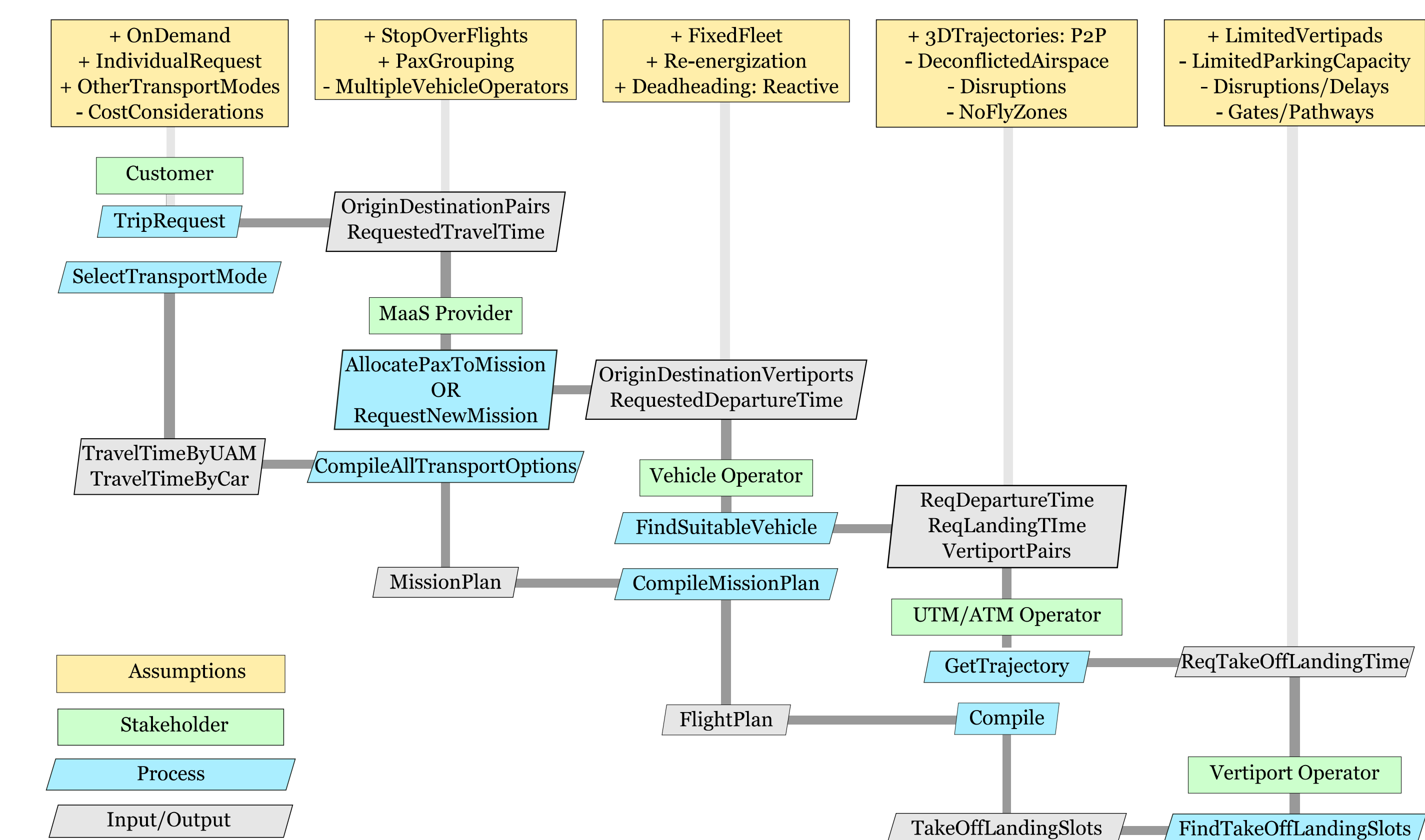
## 2. Collaborative Vehicle Design

The workflow is initiated by the top level aircraft requirements derived from the HorizonUAM use cases. Through collaboration, iterative design loops are computed between aircraft architecture, onboard systems and cabin concepts. The aircraft performance is then used as input to the aircraft agent model in the fleet simulations.



## 3. Agent-Based Simulation

This agent-based simulation is powered by an in-house modeling and simulation toolkit. The urban air mobility use case includes the main stakeholders relevant to the concept of operations, considering the following models and model interactions:

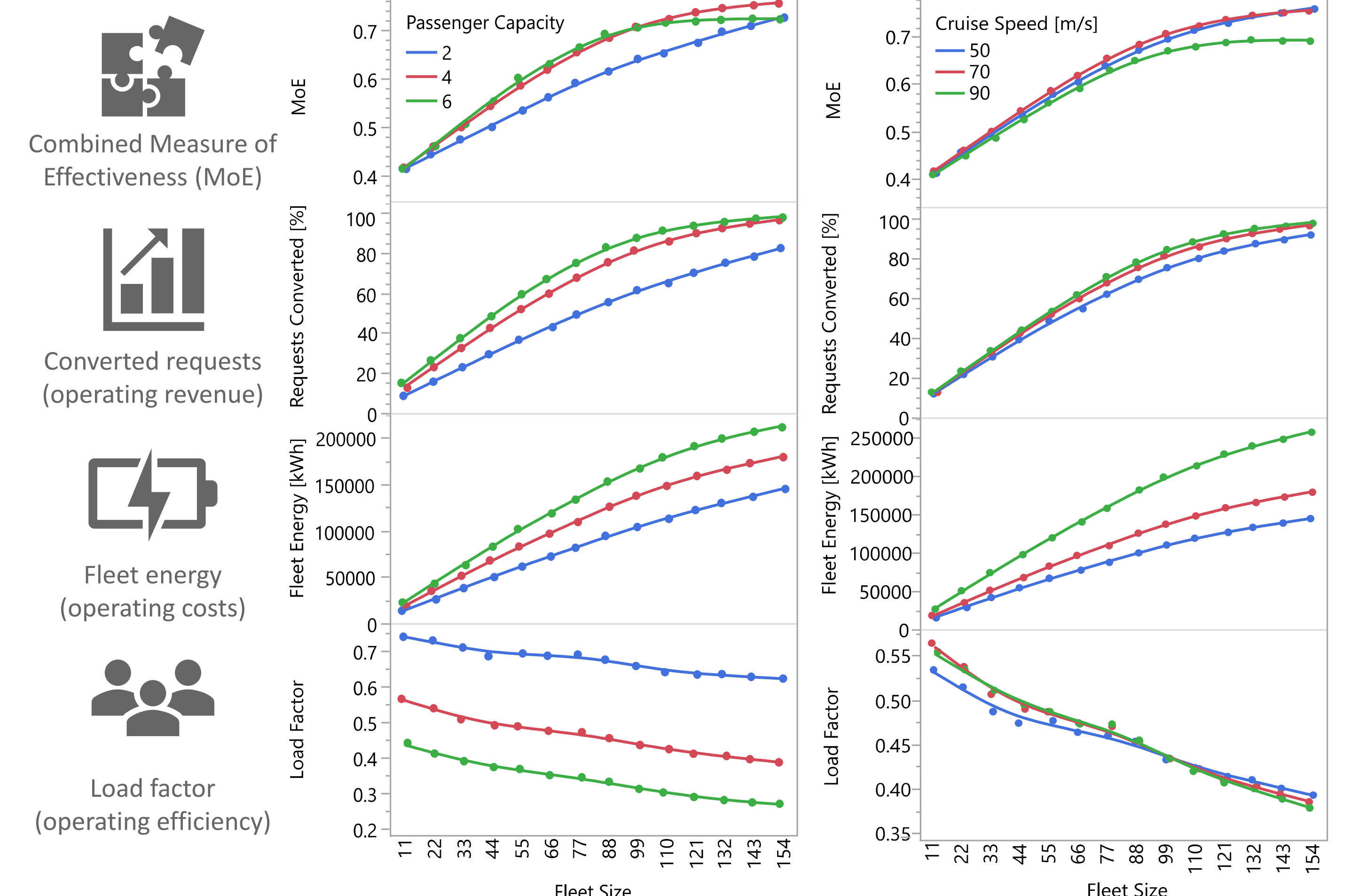


## References

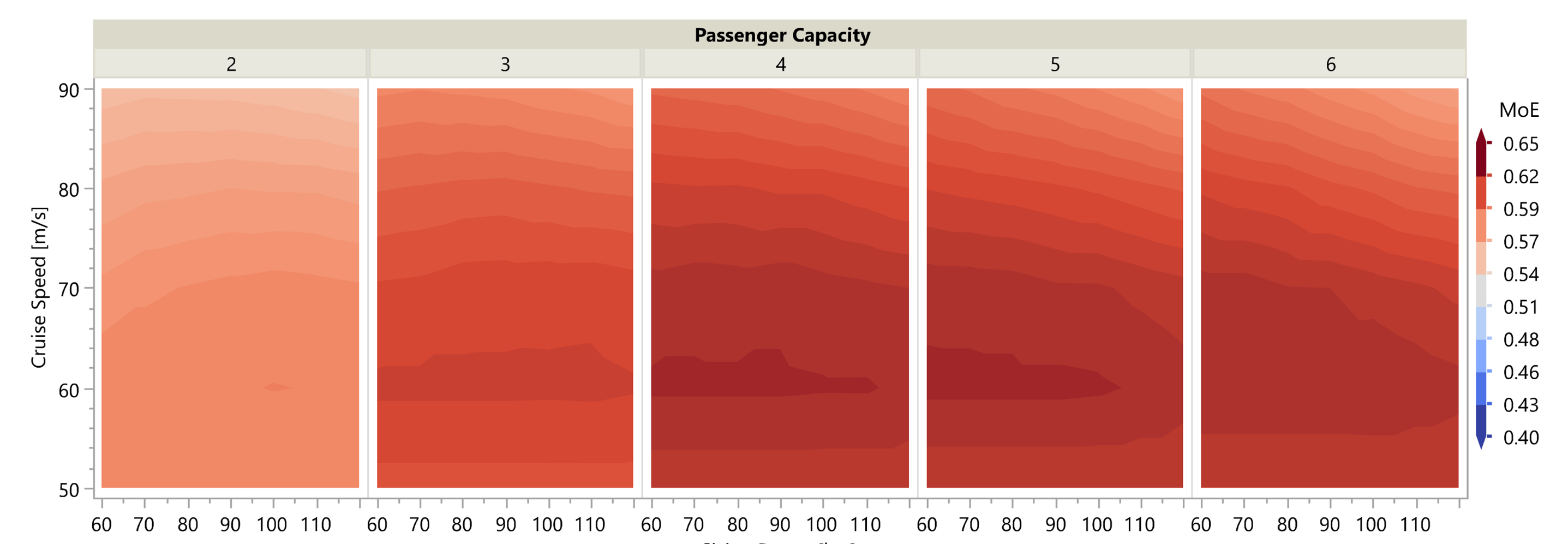
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- [4] Ratei, P., Naeem, N., and Prakasha, P. S. (2022) Development of an Urban Air Mobility Vehicle Family Concept by System of Systems Aircraft Design and Assessment. 12th EASN International Conference, 18-21 Oct 2022, Barcelona, Spain. doi: 10.1088/1742-6596/2526/1/012043.

3<sup>rd</sup> Urban Air Mobility Symposium  
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## 4. Tiltrotor Vehicle- and Fleet-level Results



Sensitivity of vehicle passenger capacity and cruise speed on the fleet-level metrics. [4]



Derivation of optimal top level aircraft requirements for the tiltrotor vehicle concept. [4]



Tiltrotor vehicle concept based on optimal top level aircraft requirements. Credits: DLR.