

# EXPANSION OF THE DESIGN PROCESS FOR AN ACCESSIBLE PASSENGER RAIL SLEEPER COMPARTMENT

**By Kamolnat Tabattanon**

**Candidate for MS in Mechanical Engineering**

Major Professor: Dr. Onan Demirel

## **Abstract**

As the trend of increasing age, weight, size, and disability within the population continues to increase, the demand for accessible transportation is expected to increase as well. Accessible transportation is key in providing independent, barrier-free mobility for individuals with accessibility needs, and providing for inclusiveness these accommodations is likewise important.

This thesis describes work completed in partial fulfillment of the Transportation Research Board Safety IDEA Project-31 to extend the design process for accessible sleeper compartments in next generation passenger rail cars. An online survey was administered to determine target population needs, values, and preferences as well as to determine whether a more specific definition of the target population was needed to ensure inclusivity while generating user requirements. Computer-aided design and digital human modeling tools were used to model data collected from human subjects to evaluate the applicability of currently available tools in the accessible design process. Results suggest that there are significant differences in accessibility preferences between persons with reduced mobility and persons without reduced mobility within the target population. Results also suggest that while currently available digital human modeling tools may approximate certain aspects of accessible design, there are limitations of how they represent accessibility needs.

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School of Mechanical, Industrial  
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**Oregon State**  
University