

Seat Project B – Light-Weight, Ergonomic Safe Driver's Seat

Status:	Available
Group Members:	TBD
Sponsor(s):	Moove Innovations
Supervisor(s):	Donald Wong, Moove Innovations Darius Saheb, Moove Innovations Farid Golnaraghi, PhD, PEng, Director/Professor, Mechatronic Systems Engineering

Project Description

Background Information:

Moove Innovations, Inc., Vancouver, BC is targeting the market in green urban mobility. The goal is to develop a state-of-the-art personal mobility vehicle for the aging population and beyond. Code named Project Insecta, the light-weight vehicle is designed to travel at urban speeds and to navigate the city intelligently and ecologically, while excelling at safety and eco-efficiency.

Project Main Objective(s):

This project focuses on 3 aspects of Insecta's seat design:

1. Light-weight design: The overall seat structure and material would be centered towards a light-weight design while meeting automotive seat crash safety standards. A standard way of cushioning the passenger in the automotive industry is through a spring-and-foam structure. Students should propose a new cushioning technology which uses elastic material such as plastics formed in special shapes and patterns in the seat base and seat back. One example implementation may use an array of elastic tubes for cushioning, and a composite material back-bone structure to provide strength and stiffness. In this example, the elastic tube pattern may or may not deliver required comfort or durability. It is possible to improve the design by using a different material, tube profile (instead of an "O" shape profile) or tube array layout.

2. Ergonomics: Study of seat ergonomics and comfort for the driver's seat. The seat should be electro-mechanically adjustable to meet t

meeting the automotive seat safety standards, the seat shall incorporate a passive damping mechanism to prevent whiplash injury.

Project Main Deliverable(s):

Students shall design and develop a proof-of-concept seat prototype which features the light-weight, ergonomic and safety concepts listed above. It is expected that students explore various design concepts, perform a feasibility study, consult with Moovee, and develop one or more test modules throughout the design cycle. The test modules are trial prototypes to test specific functionality of the seat - for example to test the feasibility of a specific material, tube profile or array structure in terms of comfort, weight and cost.

Industry Contact Information:

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Special considerations (equipment, location, constraints, existing material...):

The students are welcome to consult with Moovee for guidance, and to work on-site as required. Students may propose financial support from Moovee for their project expenditures beyond University's coverage.