IITB-Monash Research Academy

An Indian-Australian research partnership

Indian Institute of Technology Bombay | MONASH University

Project Title:	**Emergency response mobility system for fire fighting in high density city situations**	
Project Number	**ID01060**	
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Research Clusters:

Highlight which of the Academy's CLUSTERS this project will address? *(Please nominate JUST **one.** For more information, see www.iitbmonash.org)*	
1	*Material Science/Engineering (including Nano, Metallurgy)*
2	*Energy, Green Chem, Chemistry, Catalysis, Reaction Eng*
3	*Math, CFD, Modelling, Manufacturing*
4	*CSE, IT, Optimisation, Data, Sensors, Systems, Signal Processing, Control*
5	*Earth Sciences and Civil Engineering (Geo, Water, Climate)*
6	*Bio, Stem Cells, Bio Chem, Pharma, Food*
7	*Semi-Conductors, Optics, Photonics, Networks, Telecomm, Power Eng*
8	*HSS, Design, Management*

Research Themes:

Highlight which of the Academy's Theme(s) this project will address? *(Feel free to nominate more than one. For more information, see www.iitbmonash.org)*	
1	*Artificial Intelligence and Advanced Computational Modelling*
2	*Circular Economy*
3	*Clean Energy*
4	*Health Sciences*
5	*Smart Materials*
6	*Sustainable Societies*
7	*Infrastructure*

The research problem

Define the problem

India has forty-six cities with over 1 million inhabitants. The complex built environment and variety of dwellings and environments make finding, providing first aid and evacuating patients difficult.
The emergency vehicles (often termed as Quick Response Vehicles) must reach the disaster struck regions as early as possible. The worsening traffic conditions and dense urban fabric of modern cities pose serious challenges to the quick reach of large size fire extinguisher engines. The role and importance of well equipped emergency response is vital and well recognized. The compact emergency response system for high density city situations is a research area has a potential for sizeable impact through incorporation of newer technologies and being more efficient.
There is a dire need to study and research both at systems as well as vehicle level to find newer and more practical smaller, agile, efficient emergency mobility solutions with regards to the densely populated urban spaces.

Project aims

Define the aims of the project

Identify, investigate, research, design and build an effective mobility system for densely populated narrow streetscape of large cities; build or simulate the system; demonstrate effectiveness and articulate lessons learnt.

What is expected of the student when at IITB and when at Monash?

Highlight how the project will gain from the students stay at IITB and at Monash

At IITB and Monash

- **Research**: system and product level thinking to realize potential solutions for an effective comprehensive solution for reaching and deploying high density city situations during an emergency
- **Create**: identify and build specifications for a compact, modular and scalable system
- **Simulate/Test**: testing through simulation; build mockup for simulated field testing and register actual users' feedbacks;

At IITB

- **Promoting Awareness**: Spreading awareness among the neighborhood communities to adopt better practices for ensuring quicker emergency response vehicle deployment

Expected outcomes

Highlight the expected outcomes of the project

It is the aspiration of the project that the outcomes will form a body of work outlining how emergency mobility systems for urban metropolitan cities can benefit from a design methodology and what improved emergency response vehicle system could look like. Examples of such output may include:

- **Research**: system and product level thinking to realize potential solutions for an effective comprehensive solution for reaching and deploying high density city situations during an emergency
- **Create**: identify and build specifications for a compact, modular and scalable system
- **Simulate/Test**: testing through simulation; build mockup for simulated field testing and register actual users' feedbacks;
- **Promoting Awareness**: Spreading awareness among the neighborhood communities to adopt better practices for ensuring quicker emergency response vehicle deployment

Capabilities and Degrees Required

List the ideal set of capabilities that a student should have for this project. Feel free to be as specific or as general as you like. These capabilities will be input into the online application form and students who opt for this project will be required to show that they can demonstrate these capabilities.

A background in Industrial Design, preferably a Masters or high level Bachelor degree in accordance with the eligibility regulations. The candidate's portfolio should demonstrate adequate rigor and inclination towards problem identification and solution finding through research.