

## Safety and Feasibility of Uncrewed Passenger Ships

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### Background

As engineering develops the control, navigation and other systems to be used on unmanned ships, law needs to consider what changes will be necessary in order to facilitate the introduction of the new ships. It is necessary that the ships are held to the same or equivalent safety standards, that they are capable of meeting safety standards, and they are considered by the public to be as safe.

Although the technological developments are currently leading the way towards the future of unmanned shipping, the law will need to take the helm at some point. Without the law doing so, it will be harder to determine what regulations need to be met, and how it is best to do so in a standardised manner throughout engineering. For instance, classification societies, despite doing their own research, are looking to the law to determine how uncrewed ships are introduced.

The public will fear the lack of humans on-board, and artificial intelligence raises many concerns. By the law making it clear that compliance with existing and new standards is required the public will be reassured, and willing to trust uncrewed ships.

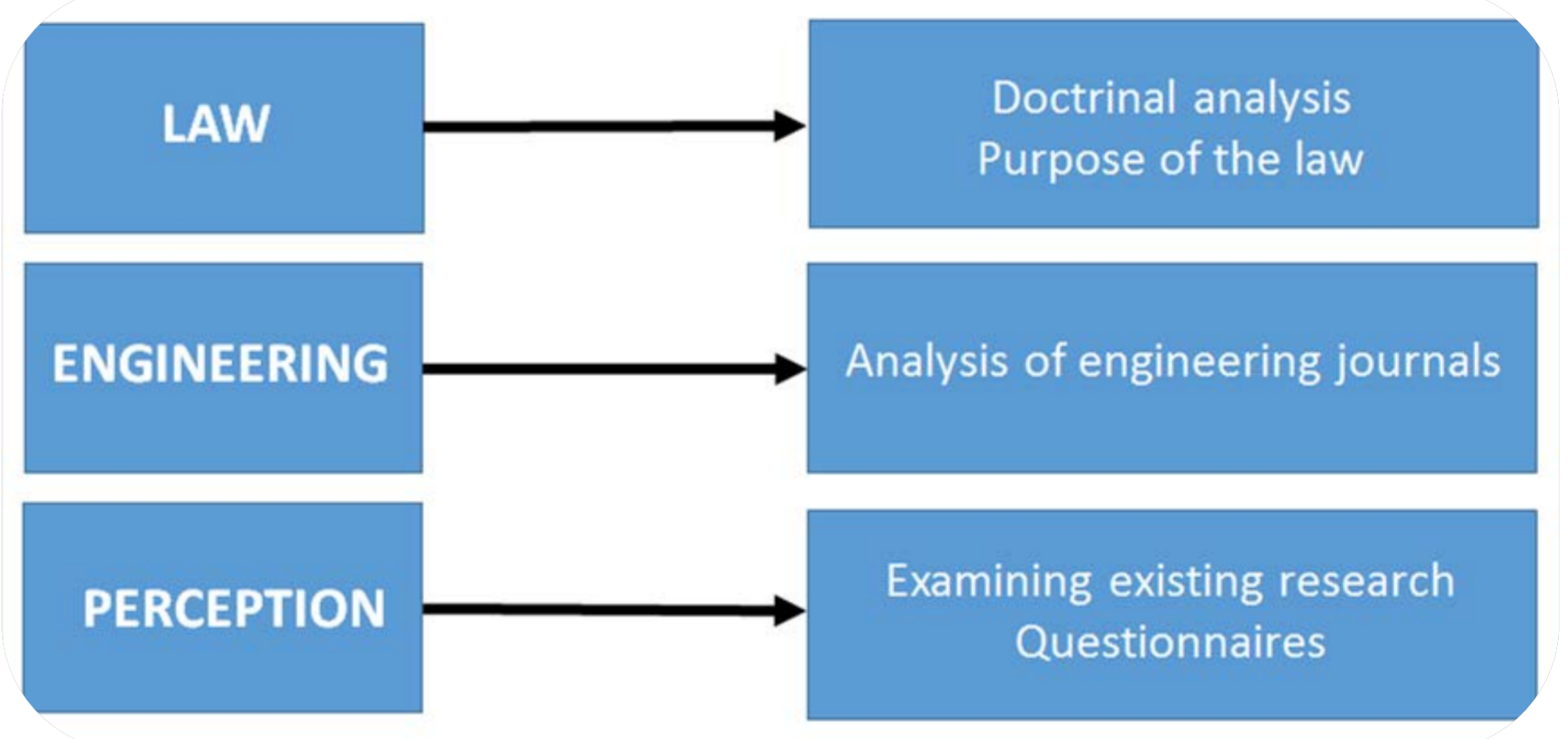


Figure 1: The research approaches taken in relation to law, engineering, and public perception.

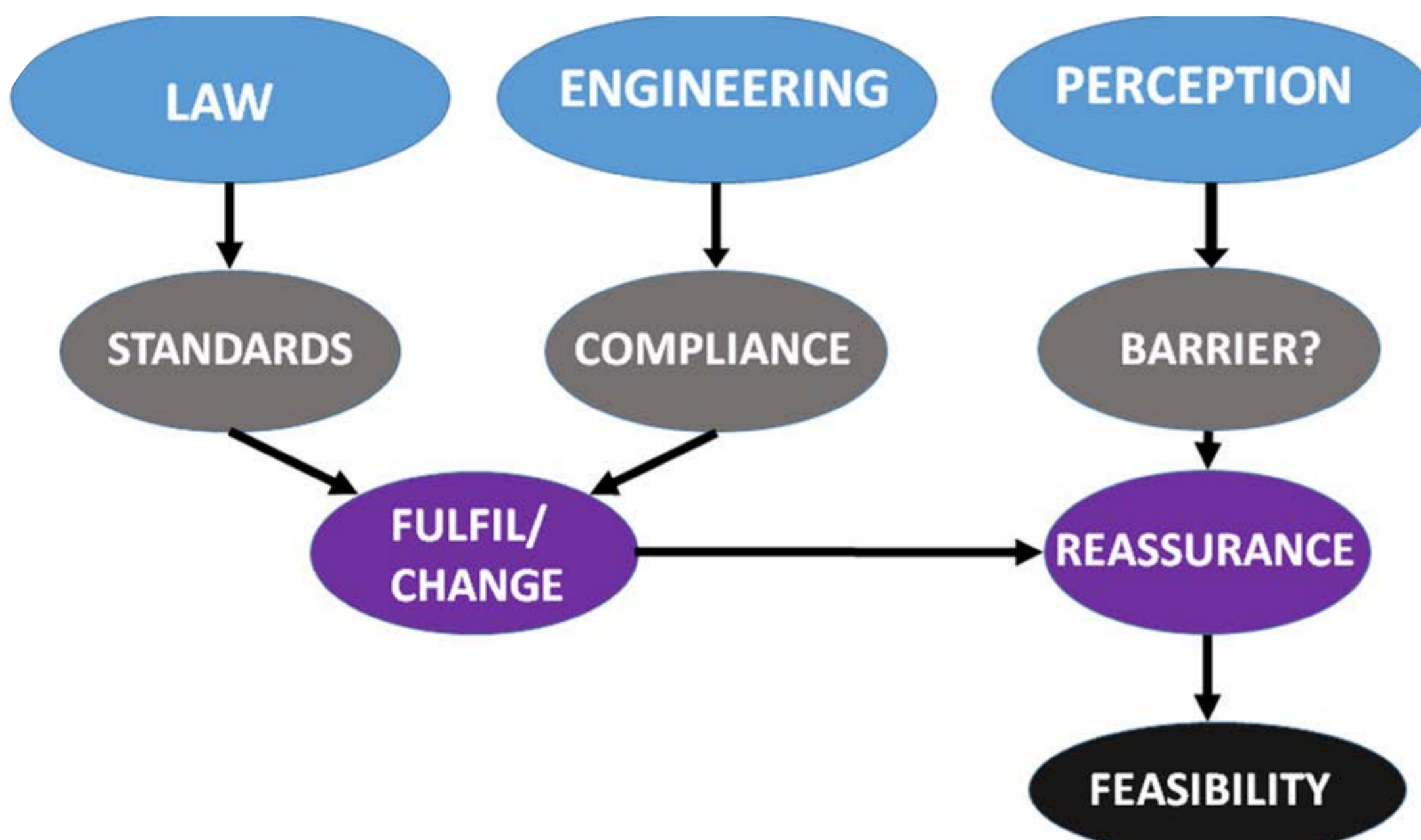


Figure 2: Illustrating how the disciplines link together to form the thesis.

### Interdisciplinary Nature and Fit with SMMI Themes

The thesis is partially supervised by engineering to facilitate an interdisciplinary approach. Throughout the thesis the law shall be referring to the engineering developments, and the engineering approaches will refer to the legal obligations that need to be met.

Law and engineering together consider the SMMI themes of technology, and culture and society. The consideration of society is further considered through the role of perception.

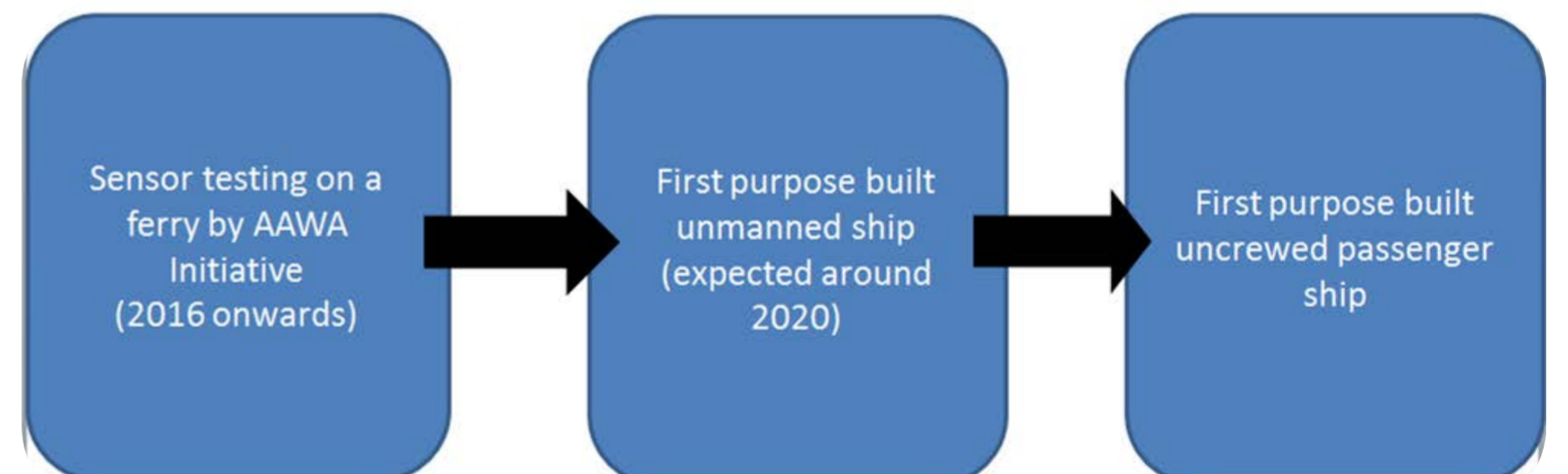


Figure 3: To illustrate the projected developments needed for the first uncrewed passenger ship to be developed and built.

### Methodology

The thesis will research three main areas: law, engineering, and perception (Figure 1). The three sections will interlink, and come together to establish whether uncrewed passenger ships can be made to at least as safe as current ships (Figure 2).

By beginning with the law, the regulations that should be complied with, amended, or introduced will become clear. This will facilitate the discussion on how best to do that in the engineering section of the thesis. Then it will be asked whether public perception could still act as a barrier to the introduction of uncrewed ships despite the efforts of law and engineering.

### Impact on Society/Business/Industry

This thesis aims to encourage further research into the feasibility of uncrewed passenger ships, and aid their introduction. By combining law and engineering in the thesis, it is hoped that further collaboration between the two disciplines will be encouraged.

By considering uncrewed passenger ships it is hoped that the discussion of uncrewed ships will no longer consider uncrewed passenger ships as impossible, or an issue to be addressed later. The thesis will be pro-active on the issues posed by having passengers on-board.

### Results/Findings/Progress So Far

To build uncrewed passenger ships, and to be able to successfully market them to passengers, unmanned ships for cargo will have to prove that the systems are safe to potential passengers. Sensor testing on current ships will also help develop passenger trust (Figure 3).

There needs to be a standardisation of terminology in the field. For instance, terms like autonomy have many different variations and definitions. Uncrewed and unmanned, are at times used interchangeably, but it may be useful to define them separately. For instance, uncrewed could refer to a passenger ship that may have domestic staff on-board who are not concerned with the operation of the ship, whereas an unmanned may have no people on-board at all.