



# IUA Survey on Developing Technologies

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## Executive Summary

- This first IUA survey on developing technology, published by the IUA's DTMG, was completed by 27 individuals representing 16 IUA member companies, one legal firm and one insurance market association.
- Eleven IUA members provided at least one insurance product for Unmanned Aerial Vehicles, only six did so for Autonomous Vehicles and one for Autonomous Vessels.
- One IUA member company was considering providing an insurance product for Unmanned Aerial Vehicles, three were doing so for Autonomous Vehicles and one for Autonomous Vessels.
- Lack of historic data and insufficient expertise were cited as more significant reasons for not providing an insurance product for the technologies listed, when compared with a lack of a suitable regulatory framework.
- The majority of insurance products provided for developing technologies covered the commercial use of such technology.
- IUA members were covering the broadest range of technology use in respect of Autonomous Vehicles, spanning across commercial, personal, testing and manufacturing / retailing and component supply.
- Coverage provided for Unmanned Aerial Vehicles had the widest geographical reach by a significant margin, with products covering the technology when utilised globally.
- Of the companies providing products for Autonomous Vehicles, the most common heads of damage covered were third party bodily injury and third party property damage representing 78% of the total responses, compared to 67% for Autonomous Vessels and 57% for Unmanned Aerial Vehicles.
- Collision was deemed to be the most significant risk presented, as an average, across the three technologies, with the lowest by a considerable margin being patent / copyright risk.
- Respondents stated that regulation at a Global level was of most importance in respect of Autonomous Vessels and least for Autonomous Vehicles.
- It was established that the greatest risk posed, on average, to the uptake of all of the technologies was the supporting infrastructure. Of the three technologies this risk was considered highest for Autonomous Vehicles.
- The risks that had the potential to impact the uptake in use of Autonomous Vehicles were stated to be more severe than for each of the other technologies.

The IUA would like to thank all survey respondents for taking the time to contribute to the first substantial project organised by the IUA's Developing Technology Monitoring Group.

# Introduction

## Objectives

The 2018 Developing Technology Monitoring Group (DTMG) Survey is the first survey to be conducted by the IUA's DTMG, formed in December 2016 as the focal group considering developing technology within the IUA committee structure.

In line with the objectives of the DTMG itself, this member survey intended:

- To capture the opinion of IUA members on three technologies within the remit of the DTMG, namely Unmanned Aerial Vehicles, Autonomous Vehicles and Autonomous Vessels;
- To provide a greater understanding of the types of product provided by member companies in respect of these technologies;
- To establish the underwriting challenges facing member companies brought by these technologies;
- To contrast the rate at which insurance products for developing technologies are emerging;
- To assess individual respondents opinions on matters such as regulation, as well as risks posed by, and threatening the uptake of, new technologies; and
- To question whether IUA services provided in relation to new technologies could be improved.

## Methodology

The survey was conducted via an online questionnaire. This allowed opinions to be sought from a wide range of member contacts, with responses not limited to those firms or individuals involved in underwriting of Unmanned Aerial Vehicles, Autonomous Vehicles or Autonomous Vessels. Opportunities to participate were communicated via both an IUA member circular and articles in the Association's newsletter edition for August 2018.

A total of 16 questions were asked in the survey, which were structured into six sections: Product Provision, Cover Provided, Future Predictions, Regulation, Technological Development and IUA Services. With regards to the last section on IUA Services, results are not provided in this report as these will be used internally to enhance member services.

A number of questions asked respondents to provide a ranking for their answer, indicating how strongly they agreed with a particular statement or valued a particular service. In order to achieve a consistent set of results, all rankings were made on a scale of one to five.

## Respondent Details

A total of 27 individuals completed at least one question within the online survey, representing 16 IUA member companies, one legal firm and one insurance market association.

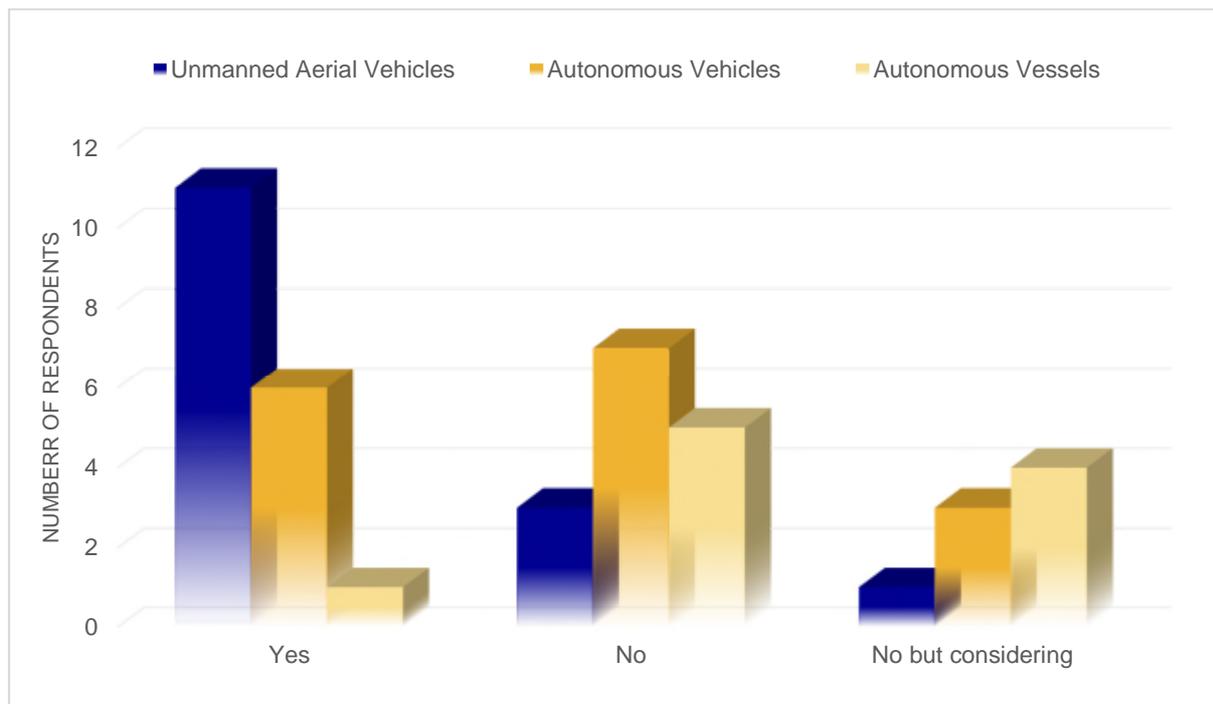
## Section 1 – Product Provision

This initial section attempted to gain a preliminary understanding of whether IUA member companies were providing a product for any of the technologies addressed. If the response to this was negative, members were asked if there was a particular reason that their company was not providing such a product.

Whilst we received 27 responses to the first question, nine of those were duplicate results from within the same member companies, whilst two were from non-IUA member companies (one insurance association and one legal firm), leaving responses from 16 IUA member companies. It was established that 11 IUA members (68.75% of member companies that responded) provided an insurance product for Unmanned Aerial Vehicles, though only six did so for Autonomous Vehicles (37.5% of member companies that responded) and one for Autonomous Vessels (6.25% of member companies that responded).

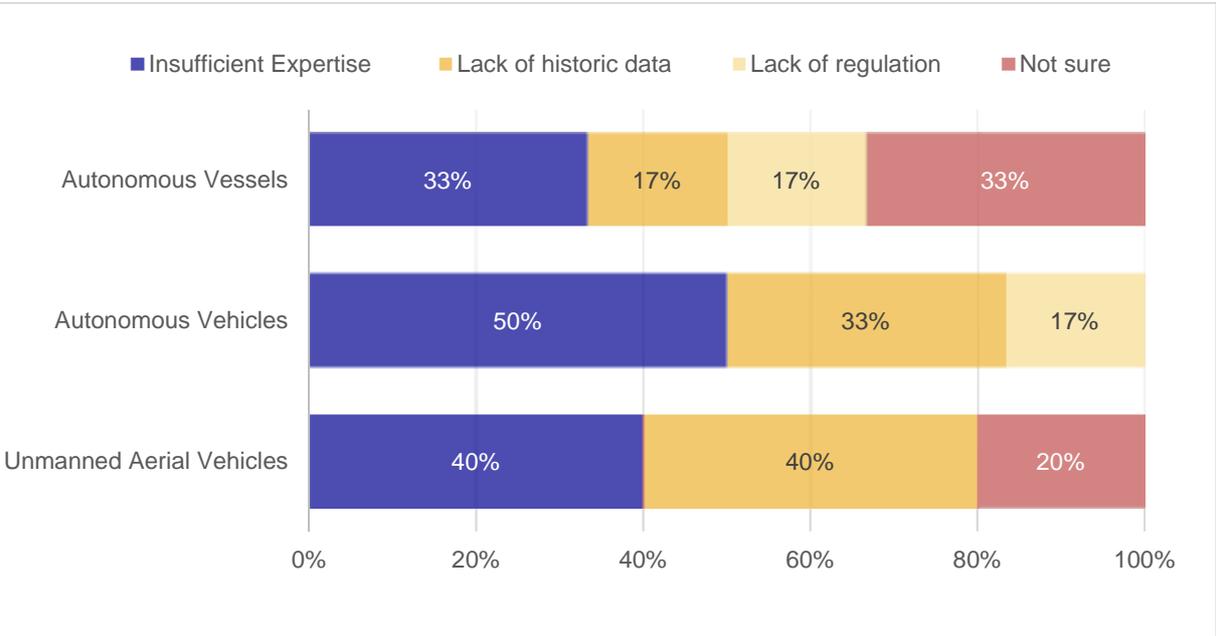
Furthermore, one IUA member company was considering providing an insurance product for Unmanned Aerial Vehicles, with three doing so for Autonomous Vehicles and four with regards to Autonomous Vessels.

**Figure 1: Is your company currently providing an insurance product for:**



The second question sought to understand if there was a specific reason for a company not providing a product for each technology and included the following options: lack of historic data, insufficient expertise, lack of regulation and aggregation concerns. Respondents were able to select multiple reasons for one technology and were given the option to provide responses for each of the technologies that they were not insuring. Five selections were made within Unmanned Aerial Vehicles, whilst six were made for both Autonomous Vehicles and Autonomous Vessels. Figure 2 below expresses the percentage of responses by individual technology and Figure 3 shows the individual responses received in a numerical form. The results did not highlight a concern relating to a lack of regulation of Unmanned Aerial Vehicles, but did so for Autonomous Vehicles and Autonomous Vessels.

**Figure 2 (chart): If your company is not providing an insurance product for the technology, why not?**



**Figure 3 (table): If your company is not providing an insurance product for the technology, why not?**

	Unmanned Aerial Vehicles	Autonomous Vehicles	Autonomous Vessels
Insufficient Expertise	2	3	2
Lack of Historic Data	2	2	1
Lack of Regulation	0	1	1
Not Sure	1	0	2

## Section 2 – Coverage Provided

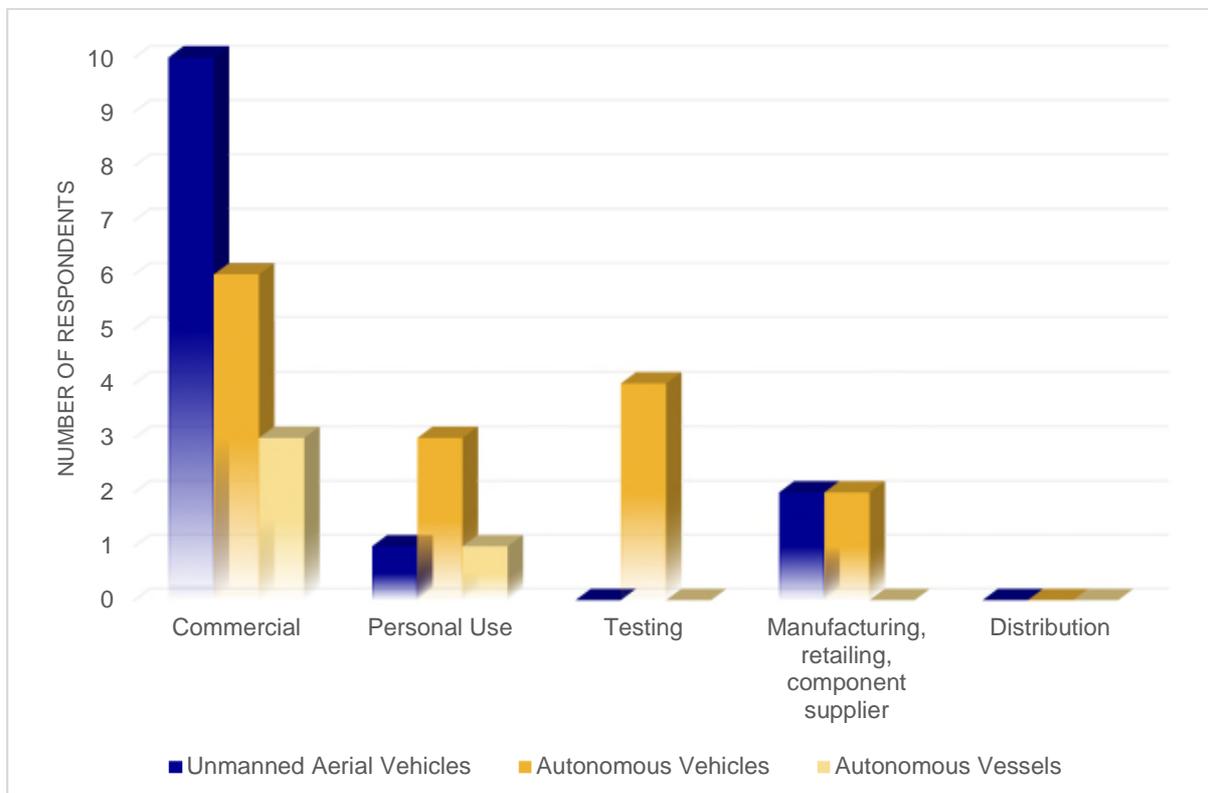
The Coverage Provided section of the Survey intended to provide further detail to the initial responses received in Section 1, with specific information requested in three key areas:

- the uses of the technologies being insured;
- the regions in which those technologies were being used; and
- the types of coverage being provided.

Not all respondents were required to complete this section, rather only those that had confirmed in Section 1 that they were providing an insurance product for one or more of the technologies.

The first question in this section asked whether cover was being provided for the following uses: commercial, personal, testing, manufacturing / retailing / component supply, distribution. Of the 11 firms providing a product for Unmanned Aerial Vehicles, ten were covering commercial use, one was covering personal use and two were covering the manufacturing, retailing and component supplier of Unmanned Aerial Vehicles. Four member firms were providing an insurance product for the testing of Autonomous Vehicles, but no firms were covering this activity for either Unmanned Aerial Vehicles or Autonomous Vessels. Furthermore, the broadest range of cover offered (four different uses), and highest number of positive responses (totalling 15), were being provided for Autonomous Vehicles, with 13 being provided for Unmanned Aerial Vehicles and only four in respect of Autonomous Vessels.

**Figure 4: What use of the technology are you insuring?**



The second question in the Coverage Provided section targeted information regarding the geographical spread of products provided. Respondents were able to select multiple options representing each region in which they offered an insurance product for the technology listed.

Coverage provided for Unmanned Aerial Vehicles had substantially the widest reach with at least one product provided in each of the regions listed.

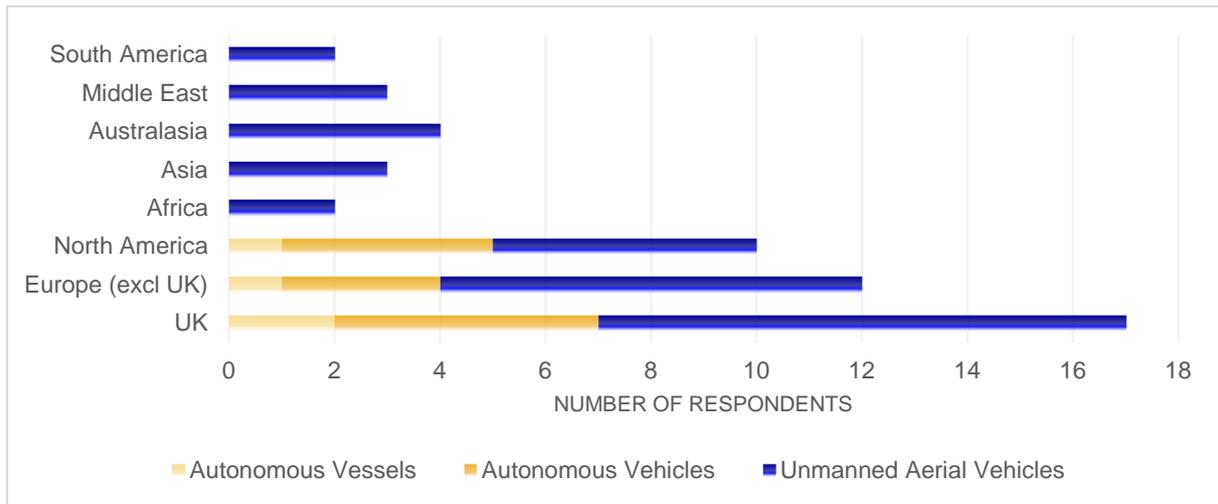
In respect of Unmanned Aerial Vehicles, 22% of the respondents provided cover for use of the technology in Europe excluding the UK, with just under half (49%) in total doing so within Europe (including the UK).

Additionally, no products were being offered for Autonomous Vessels or Autonomous Vehicles used in Africa, Asia, Australasia, Middle East or South America.

**Figure 5 (table): In which regions are you providing cover?**

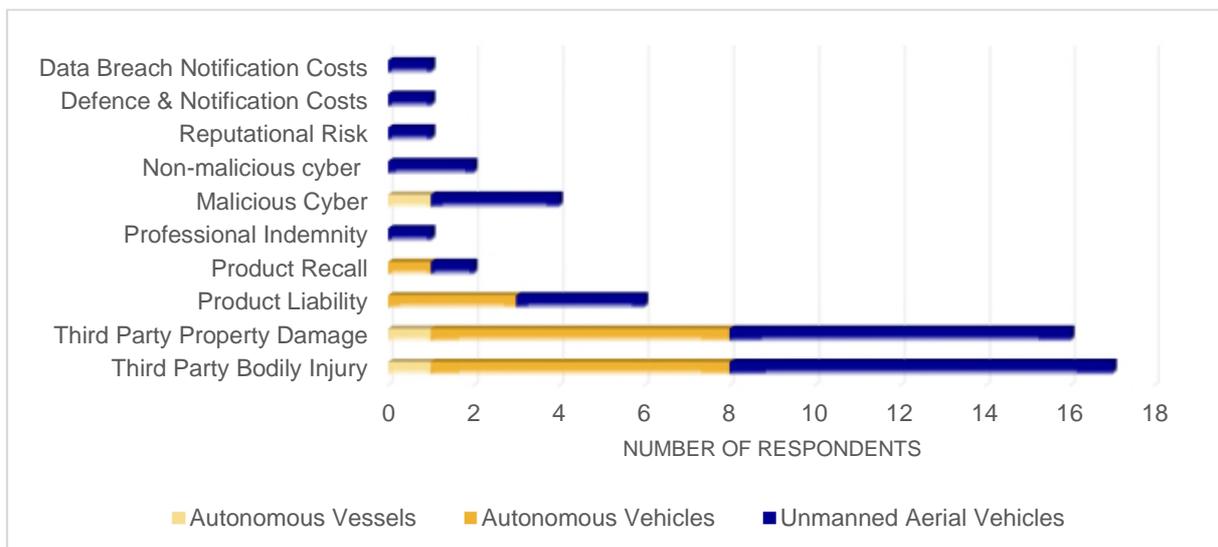
	Unmanned Aerial Vehicles	Autonomous Vehicles	Autonomous Vessels
United Kingdom (UK)	10	5	1
Europe (excluding UK)	8	3	1
North America	5	4	1
Africa	2	0	0
Asia	3	0	0
Australasia	4	0	0
Middle East	3	0	0
South America	2	0	0
<b>Total</b>	<b>37</b>	<b>12</b>	<b>4</b>

**Figure 6 (chart): In which regions are you providing cover?**



Lastly, in respect of coverage provided, respondents were asked to provide specific information surrounding the types of coverage offered for each technology. Multiple options could be selected depending on the various specific coverages offered. As with the responses received to the question above relating to the geographical scope of cover, the broadest range of coverages provided were for Unmanned Aerial Vehicles, with at least one product covering all of the categories included. Additionally, the number of covers provided for within the ten categories was highest for Unmanned Aerial Vehicles (30) followed by Autonomous Vehicles (18) and Autonomous Vessels with the lowest (three). Of the companies providing products for Autonomous Vehicles, the most common heads of damage covered were third party bodily injury and third party property damage with 78% of the total responses, compared to 67% for Autonomous Vessels and 57% for Unmanned Aerial Vehicles.

**Figure 7: Please state the type of cover you are providing for each technology:**



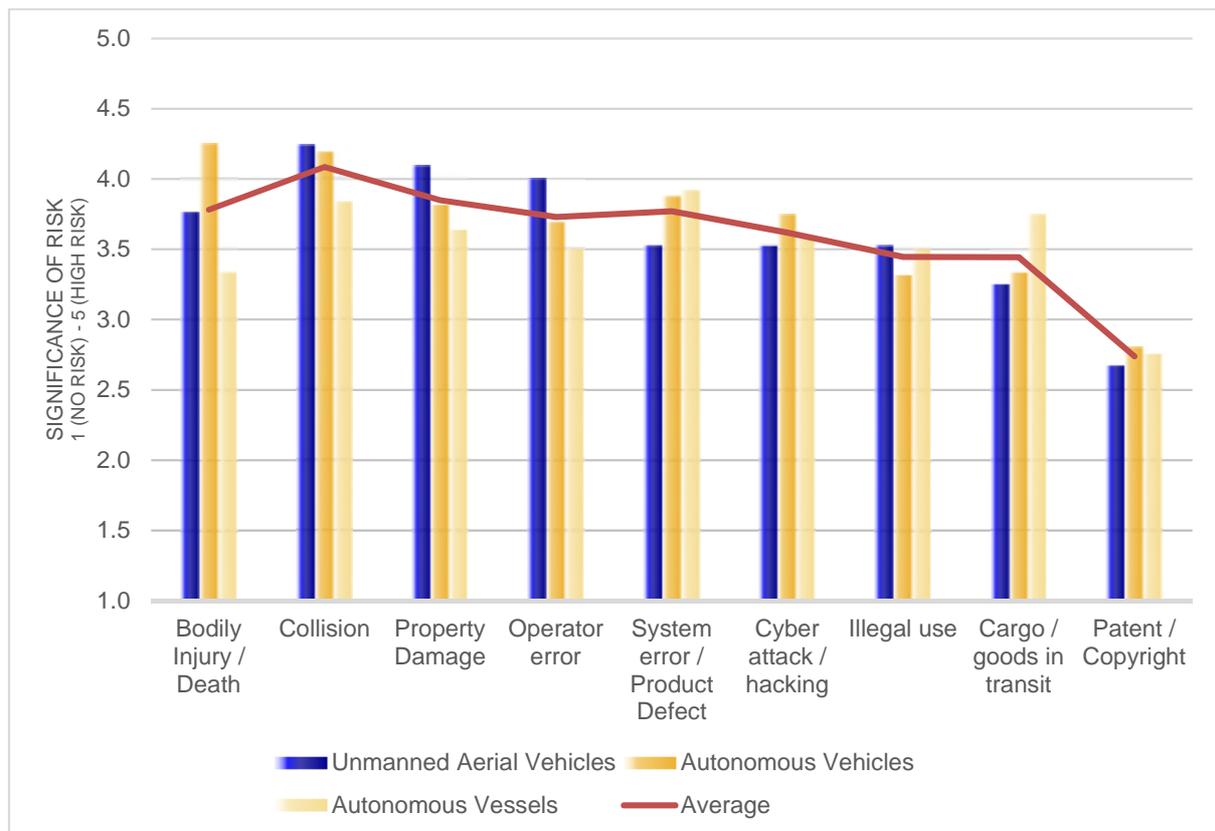
## Section 3 – Future Predictions

Only one question was posed within the Future Predictions section which attempted to establish, in the opinion of respondents, how significant the insurable risks for each technology were. Respondents were asked to rank each risk from one to five, one representing no risk and five representing high risk.

The highest risk category on average across all of the technologies was deemed to be collision (4.1), followed by bodily injury / death, property damage, and system error / product defect (3.8), the lowest was deemed to be patent / copyright risk (2.7). The risk posed by collision of Autonomous Vessels (3.3) was deemed to be lower than both Unmanned Aerial Vehicles (3.8) and Autonomous Vehicles (4.3). Property damage and operator error were stated to be of greater risk in the context of Unmanned Aerial Vehicles than both Autonomous Vehicles and Autonomous Vessels, though the reverse was true for system error / product defect and cyber attack / hacking. The risks posed by bodily injury / death, collision, property damage and operator error were all deemed to be lowest in respect of Autonomous Vessels.

As an overview, the combined risks presented by each technology were deemed to be similar, though highest in Autonomous Vehicles (3.7), followed by Unmanned Aerial Vehicles (3.6) and Autonomous Vessels (3.5).

**Figure 8: How significant do you feel the following insurable risks for each technology are?**



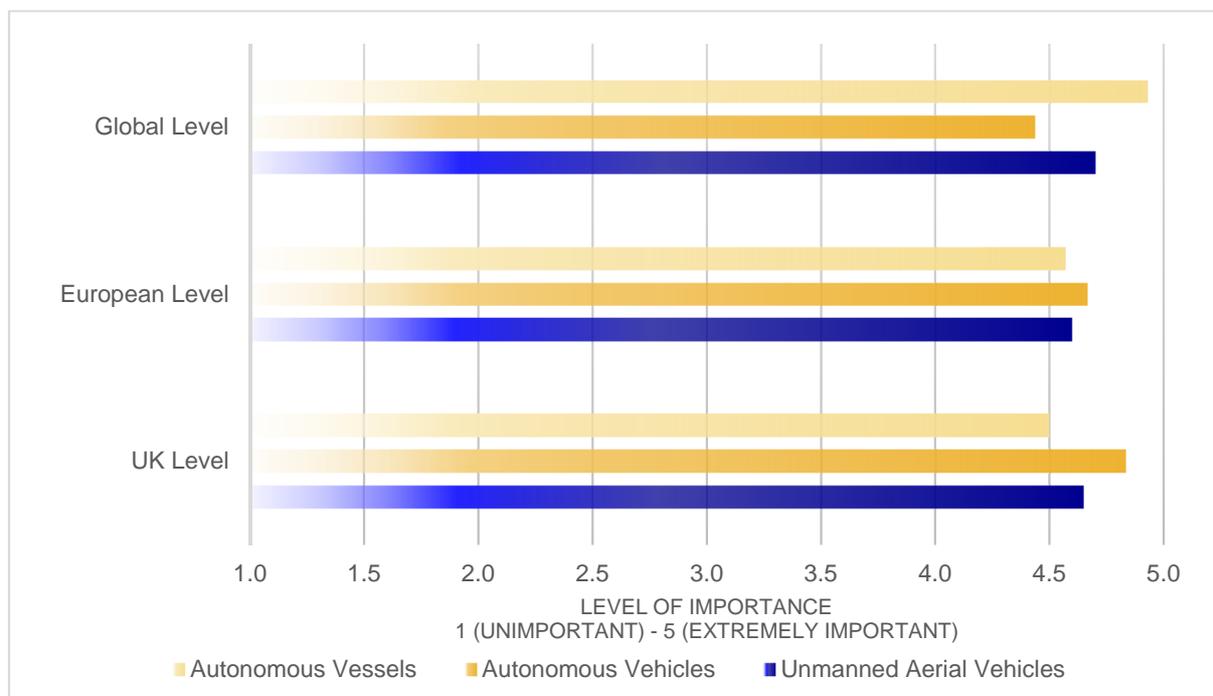
## Section 4 – Regulation

Two questions were asked in respect of Regulation. The survey intended to establish the importance of regulation at three levels: UK, European and Global. Secondly, respondents were asked to rate the quality of current regulation at each of those levels.

In respect of the first question, respondents were asked to provide a value between one and five in respect of the regulation of each technology at the three levels detailed above, one representing 'unimportant' and five representing 'extremely important'. The results detailed that regulation as a whole was deemed to be of very similar importance to each of the technologies. However, it is true to say that regulation at a global level was suggested to be of most importance for Autonomous Vessels (4.9) and least for Autonomous Vehicles (4.4), with the result for Unmanned Aerial Vehicles (4.7) between the two. The importance of EU regulation was scored relatively similarly across each technology, with only 0.1 separating the three results. However, UK regulation was deemed to be most important with regards to Autonomous Vehicles (4.8), followed by Unmanned Aerial Vehicles (4.7) and Autonomous Vessels (4.4).

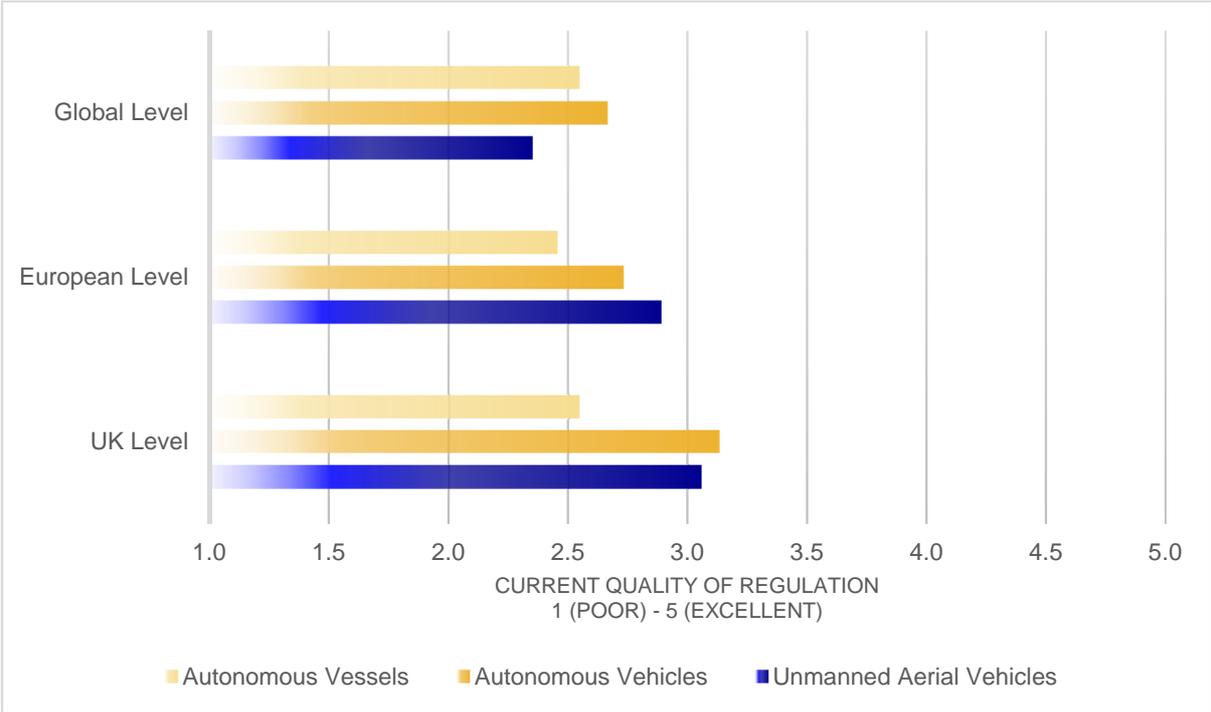
The results illustrate that regulation is deemed to be of relatively equal significance at each level for Unmanned Aerial Vehicles, with 0.1 separating the results. Though for Autonomous Vehicles, regulation was evaluated to be of most importance at UK level (4.8) and of the least at global level (4.4). Comparatively, the reverse was true for Autonomous Vessels, with UK level regulation (4.5) and EU level regulation (4.6) being noted as less important than global regulation for this technology (4.9).

**Figure 9: How important do you think good regulation is at:**



The second question sought to establish individual respondents' own opinion on the quality of current regulation of each technology at the three levels utilised for Question 8 above. A scale of one to five was again used with one being 'poor' and five being 'excellent'. Generally, regulation was deemed to be more adequate at a UK level across each of the technologies with an average result of 2.9, with this falling to 2.7 at a European level and again to 2.5 at Global level. Regulation of Autonomous Vessels was scored at an average of 2.5 across all levels, lower than both Unmanned Aerial Vehicles and Autonomous Vehicles, both scoring an average of 2.8.

**Figure 10: How good do you think current regulation is at:**

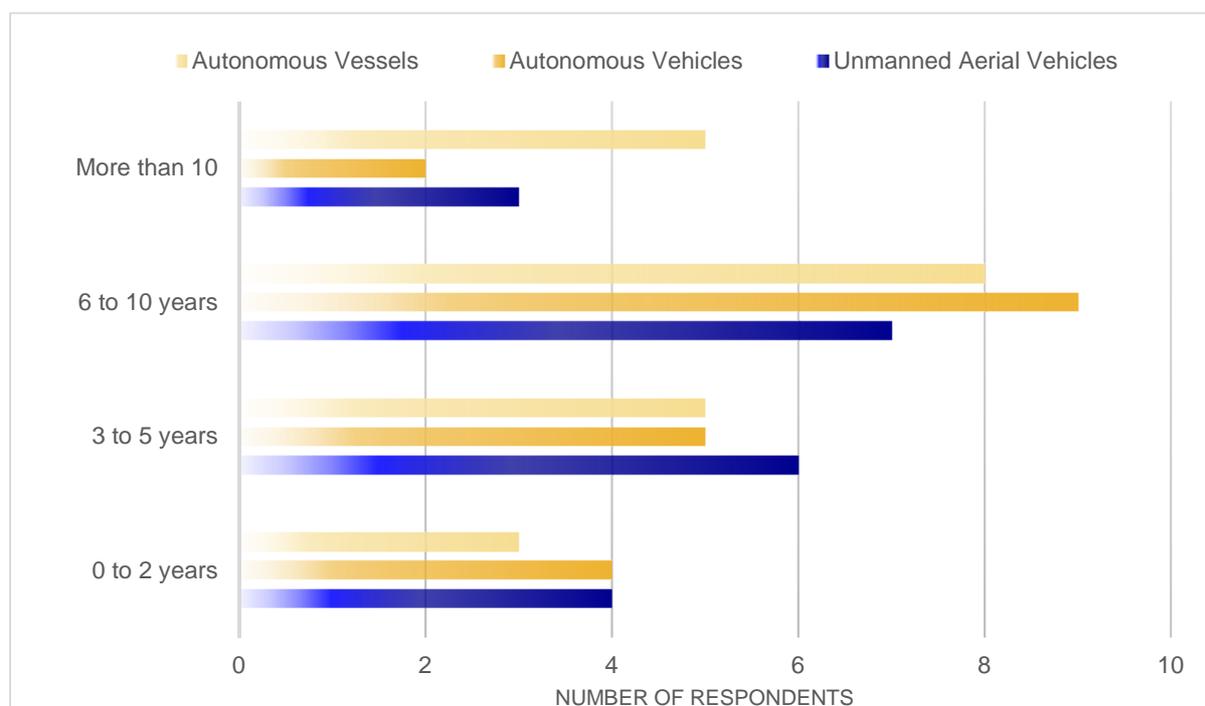


## Section 5 – Technological Development

Respondents were asked two questions within the Technological Development section. The first sought a prediction for when the three technologies would be widely used for commercial transportation purposes. Whilst this question was drafted with the intention of addressing the commercial transportation of goods, this may not have been entirely clear and, in fact, could be read as referring to the commercial transportation of people.

Nevertheless, it is still feasible to compare the rate at which individuals considered each technology would be utilised for any commercial purpose. To this end, it is predicted that Autonomous Vessels will likely be utilised for commercial purposes at the slowest rate, with five individuals selecting 'more than ten years'. Comparatively, only three individuals selected this option for Unmanned Aerial Vehicles, whilst two did so for Autonomous Vehicles.

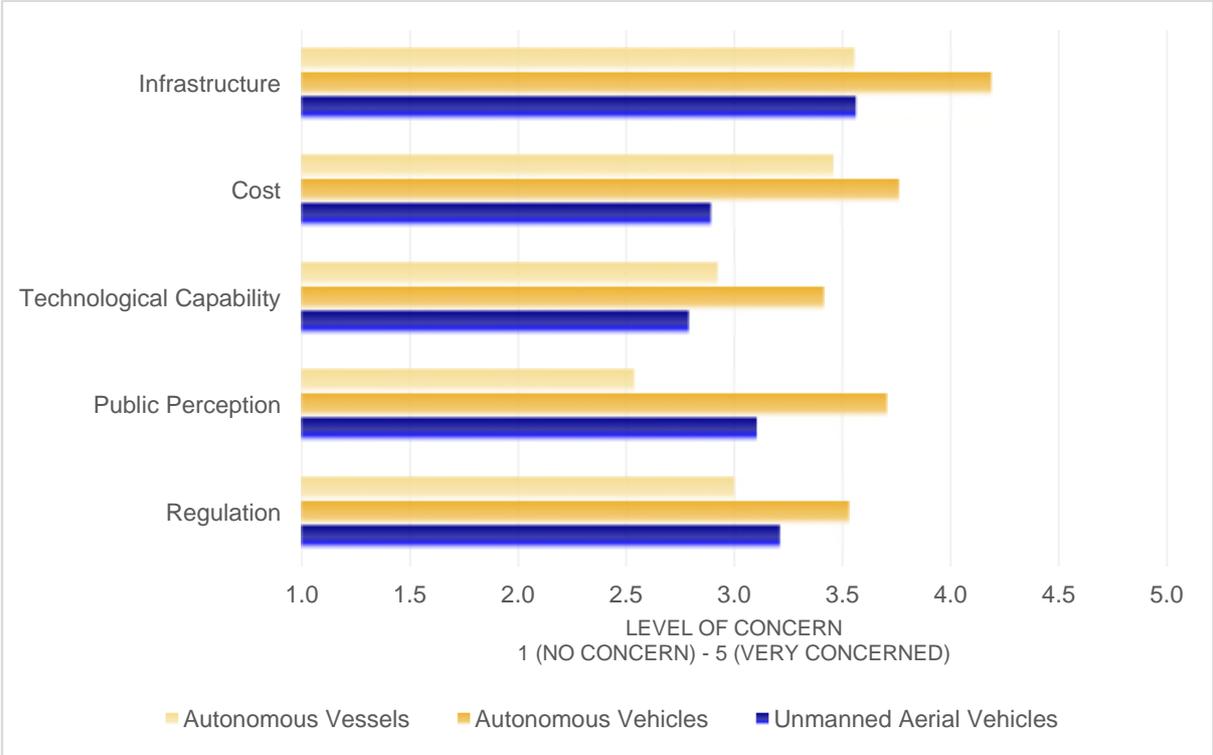
**Figure 11: When do you think that the following technologies will be widely used for commercial transportation?**



The final question relating to the developing technologies considered potential risks to the uptake of each technology. Those risks posed were regulation, public perception, technological capability, cost and infrastructure and the scale utilised was from one to five, one representing 'no concern' and five representing 'very concerned'. On average, it was established that the risk category likely to present the largest threat to the uptake of all of the technologies was infrastructure (3.8), with the lowest risk being posed by technological capability (3.0) and public perception (3.1). Respondents also anticipated that the risks posed, as a combined average, to Autonomous Vehicles (3.7) far exceeded those to both Unmanned Aerial Vehicles (3.1) and Autonomous Vessels (3.1).

Within the individual risk categories, cost was expected to present a limited risk to the uptake of Unmanned Aerial Vehicles (2.9) compared to Autonomous Vessels (3.5) and Autonomous Vehicles (3.8). The reverse was true in respect of the risk presented by the public perception of the technology, at 3.7 for Autonomous Vehicles, but only 3.1 for Unmanned Aerial Vehicles and 2.5 for Autonomous Vessels. Technological capability was perceived to pose the greatest risk to Autonomous Vehicles (3.4), but a lesser one for both Unmanned Aerial Vehicles (2.8) and Autonomous Vessels (2.9). The single largest risk presented to any technology was deemed to be infrastructure in the context of Autonomous Vehicles (4.2) and the lowest was the public perception of Autonomous Vessels (2.5).

**Figure 12: How concerned are you about the following obstacles to the uptake of each technology?**



## Conclusion

It is evident that product development in the insurance industry parallels how the respective technologies are themselves developing.

To this end, the survey illustrates that Unmanned Aerial Vehicles are currently the most widely used of the three technologies, followed by Autonomous Vehicles and Autonomous Vessels respectively. This is reflected in the number of IUA member companies providing products for this technology, and indeed is supported by the geographical spread of products available.

The maturity of the Unmanned Aerial Vehicle market may be illustrated by the fact that no respondent indicated the current provision of products in respect of testing in this area. On the other hand, four member companies were providing such products for Autonomous Vehicles. It could be speculated that the largest potential product growth may be in respect of Autonomous Vessels, with 25% of IUA member companies represented in this survey considering the development of such a product. This is, however, dependent on the availability of expertise to member companies, the growth in data available and the development of regulation.

There is a significant difference between the number of insurers providing commercial and personal use products for both Unmanned Aerial Vehicles and Autonomous Vehicles. As regulation continues to extend to small Unmanned Aerial Vehicles used in a personal capacity, we would expect the number of products provided for such uses to grow dramatically. This trend will inevitably be replicated for the other technologies as products become more easily accessible and widely used.

The most common coverages offered across each of the technologies were third party bodily injury and third party property damage. This illustrates the basic premise of insurance, particularly when a new and emerging risk is presented, to protect others from a first party's own activities in respect of that risk. The concern expressed by respondents in respect of the risk of collision may provide justification for the considerable proportion of products covering third party risks. The risk of collision may be accentuated when combined with the risks posed by operator error and system error / defect. It may transpire that as the take up of each technology grows, the risk posed by heads of damage such as malicious and non-malicious cyber events, reputational harm and product recall will create greater demands on the insurance market.

It is recognised that regulation will play a vital role in supporting the development and use of the technologies, providing a framework to manage the risks presented. However, over or under regulation may have the adverse effect. It is also worth noting that regulation can only be effective if the appropriate infrastructure is in place for each technology.

Ultimately, the formulation of regulation and the development of the required infrastructures will not only drive the level of use of each technology, it will also determine how the insurance market and its relevant products react to the changing landscape.

In summary, despite this survey having identified a number of risks that may limit the uptake of these developing technologies, IUA members are embracing technological developments and continuing to provide and develop broad and wide-reaching covers for these new technologies used around the world.

## About the DTMG

In late 2016, it was acknowledged that a number of similar technology based issues were being discussed at several IUA committees. It was further recognised that these issues had wide reaching cross-class implications for all IUA member companies.

It was suggested that in order to monitor these developing technologies, with a particular focus on Autonomous Vehicles, Autonomous Vessels, Unmanned Aerial Vehicles and the Internet of Things, a cross-class committee should be constituted as a focal point for such risks at the IUA.

This allowed for collaborative lobbying efforts in respect of Government consultations and potential legislative changes and provided a forum for individuals from various IUA committees and members companies to come together to share their own opinions, concerns and experiences.

The following committees were formally confirmed as 'Parent Committees' of the DTMG and were invited to send representatives from their respective committees to join the Group:

- Aviation Technical Committee (ATC)
- Cyber Reinsurance Committee (CRC)
- Cyber Underwriting Group (CUG)
- Casualty Treaty Group (CTG)
- Liability Underwriters' Group (LUG)
- Marine Technical Committee (MTC)
- Property & Casualty Technical Committee (PCTC)
- Professional Lines Underwriting Group (PLUG)

If you would like to find out more information about the IUA's Developing Technology Monitoring Group, or to enquire about membership, please contact Tom Hughes (Market Services Executive, IUA):

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