1. Board membership
Board membership numbers reduced very slightly during the course of 2016, with Terry Hirst (Rolls Royce Control Systems) announcing his retirement at the end of the year. The board wishes to place on record its thanks to Terry for his active participation since its inception in 2000. A further corresponding member, Richard Bolingbroke (Timet) has advised that he will step down due to his relocation to the US. Timet continue to be represented by Matt Thomas. Geoff Hartle (VSMPO) has continued to attend meetings, representing the TIG membership.

Number of full board members: 22
Number of corresponding members: 8

2. Board meetings
February 25 2016, 1710 Naval Air Squadron, Portsmouth (Attendance 11)
June 30 2016, National Space Centre, Leicester (Attendance 13)
October 29 2015, BCAST, Brunel University (Attendance 15)

3. Activities during 2016
The LMD maintained our commitment to three board meetings per year, taking the opportunity to combine our agenda with technical visits and, in the case of our summer meeting, with the highly successful ‘Future Directions for Lightweight Materials and Structures’ event organised in association with the East Midlands Materials Society (EMMS) and British Composites Society. Our visits to 1710 Naval Air Squadron and the new BCAST facility at Brunel were particularly well-received by the board members. Cheryll Pitt and Zhongyun Fan are respectfully acknowledged for opening their doors and providing such enlightening tours of their respective facilities.

In addition to our scheduled Board meetings, LMD Board members also contributed to the successful acquisition and integration of TIG into the IOM3 organisation.

3.1. Technical programme
The major event in our calendar was the ‘Future Directions for Lightweight Materials and Structures’ conference in Leicester. Although EMMS took the lead role in organising the meeting, the LMD community was responsible for providing financial sponsorship for the event via Innoval Technology and TIG. Furthermore, approximately 20% of the registered delegates and around half of the speakers came from the LMD network. The programme included an excellent keynote from Mark Jolly. His ‘Sustainability’ challenges laid down to the industry, followed by Cranfield colleague Fiona Charnley’s vision of ‘The Circular Economy’, were genuinely thought-provoking and set a very high standard for the rest of the programme.

The LMD also played a supporting role in the ‘High Temperature Uses of Light Alloys’ meeting held at 297 Euston Road in November 2016. Matt Lunt, who sits on both the LMD and HTMC was on the organising committee for the event, which
included three of our LMD board members (Terry Hirst, Marina Galano and Tim Wilks) as speakers on the day.

3.2. Web-site developments
Helen Forrest continues to maintain the LMD website to a very high standard. In addition, to support our ambitions around engagement and outreach activities, we started to explore the use of other communication tools during the course of 2016. Following a discussion on social media and digital marketing platforms, a number of potential opportunities have been identified for the LMD including Twitter, LinkedIn and The Conversation. Whether we can use social media to promote the work of the Division is something we plan to investigate in 2017.

3.3. Engagement with technical community and/or local societies
As previously reported, the LMD worked closely – and effectively – with EMMS to stage the successful ‘Lightweight Materials and Structures’ event in 2016. It was also particularly refreshing to work alongside BCS and have ‘metals’ and ‘composites’ experts come together. On the day, it was excellent to see people from these different – and often competing – technical communities interacting and recognising their common challenges and synergies.

We took the opportunity to gather feedback from attendees after the event, so we could understand what worked well and highlight any opportunities for improvement. This was done using an online questionnaire distributed using SurveyMonkey®. We achieved an excellent response rate to the survey, and the results were overwhelmingly positive (see example below). This approach is to be recommended for other Divisions wishing to evaluate the success of events in future.

![SurveyMonkey - Results](image)

Source: Analysis of SurveyMonkey results, presented by M Clinch at October 2016 board meeting

3.4. Contributions to IOM3 house journals
A feature on the Jaguar Land Rover ‘REALCAR’ programme, on which a number of the LMD board members have had direct involvement as project partners, was published in the September 2016 issue of Materials World. A review of the ‘Lightweight Materials and Structures’ event also appeared in the November issue.

Following a discussion at our October 2016 board meeting, some concerns were raised about the lack of light metals content in Materials World. A meeting is to be
arranged with the editorial team during our next board meeting at 297 Euston Road so that we can explore options to address this.

3.5. Other
LMD remains passionate and committed to promoting Materials and STEM subjects in general, and is actively pursuing innovative ways to attracting more young people into the field. This is an agenda item at all board meetings, with some good progress being made during the course of 2016. We believe that this work could further benefit by leveraging resource and effort with other divisions and IOM3 as a whole to maximise impact.

4. Strategy and Objectives for 2017 and Beyond
Looking back on our accomplishments during 2016, we can be pleased with our progress in two major strategic themes that will remain at the forefront of our thinking for the next few years:

- Light Metals as enablers for sustainability and the circular economy
- Promoting Light Metals, Metallurgy, Materials and Engineering as vibrant study and career options

4.1. Opportunities and constraints
Our developing relationship with the BLOODHOUND SSC team would appear to provide an ideal platform on which to ‘spread the word’ about Light Metals and the work of IOM3 in general. By utilising their existing programme of educational activities we will be able to engage with higher numbers of people in a more efficient manner than if we were to develop our own events schedule. Unfortunately, progress in 2016 was delayed somewhat due to financial constraints within the BLOODHOUND SSC programme, which resulted in them scaling back some plans until a new financial sponsor was found. This situation has now been resolved and it is expected that progress will continue at pace in 2017.

While in the process of focusing on industry needs and developing our own outreach strategy, the LMD has come to the realisation that the ‘skills gap’ is certainly not unique to the Light Metals sector. On the contrary, the perception of Science and Engineering as a whole needs to be addressed at both the National and International level. It is our strong belief that we will achieve more by working with other divisions, utilising the full IOM3 networking potential. We should acknowledge that we are competing with other subjects and career choices more often than within our own Materials world!

Changes to the domestic and international political landscape will inevitably impact our industry in some form, but it is too early to predict exactly how.

4.2. Specific targets for 2017
As part of the Division’s outreach activities, the committee are in the process of compiling some materials for use by BLOODHOUND SSC’s Educational Team. This team visits schools and colleges throughout the UK to engage the students in STEM subjects via the 1000mph land speed record attempt. Therefore, we are taking advantage of a delivery system which is already in place and has the capability of reaching thousands of young people throughout the UK. The aim is for the committee to prepare a Light Metals Workshop based around the Al, Mg and Ti components in the BLOODHOUND car. It will consist of a presentation, interactive sessions and samples of the metals. The workshop will be aimed at pre-GCSE level
students as the committee wants them to be inspired about Materials/Metallurgy before selecting their GCSEs.

The LMD board is in the process of preparing identically sized samples of each of the metals, to allow students to compare their weights versus other materials such as steel. The presentation content will also cover why each metal and its particular processing method (casting, forging, rolling, additive manufacture) was chosen by the BLOODHOUND Engineering Team. This project will continue into 2017.

4.3. Specific targets for the 4 years beyond 2017

We remain committed to playing our part in raising awareness of Light Metals, Materials and Science and Engineering in general. Our links with the BLOODHOUND SSC team provide a ready-made platform for achieving this in the short term, but we want to go further. Ultimately we would like to develop our own educational events and promotional materials, with the backing of IOM3. This will largely depend on the progress we are able to make in 2017.

There is still considerable untapped potential that could be realised by harnessing the synergies that exist between aluminium, magnesium and titanium to accelerate new enabling technologies and open up new markets. It seems certain that Light Metals will feature heavily in future strategies for sustainability and the circular economy (see World Economic Forum graphic below). We strongly believe that we are well-placed to respond to the opportunities – and challenges – that this will bring.


The LMD is a dynamic working community whose members have collaborated on successful R&D projects such as the Jaguar Land Rover REALCAR development. Furthermore, we have established relationships with key industrial and academic stakeholders and have developed influential positions with funding agencies such as EPSRC and Innovate UK. We continually monitor our board membership to ensure that we retain these positions of strength.

In pursuing the above strategic themes, we will continue to engage with like-minded groups in order to stage successful, informative and profitable educational and networking events. We welcome opportunities to work with other parts of IOM3, such as other technical divisions and local societies, in doing so.
5. **Other matters**
The LMD and the Chair in particular would like to formally acknowledge the support and proactive input received from Ian Warrington during the past five years. It is not yet clear how the secretarial function will be covered going forward.
## Appendix: Technical Programme as of December 2016

<table>
<thead>
<tr>
<th>Date (YY/MM/DD)</th>
<th>Status (Held /Progressing /Planned)</th>
<th>Title</th>
<th>Location</th>
<th>Organising Division(s) /Committee(s) /Collaborators</th>
<th>Financial Underwriter (IOM3/Local/Other)</th>
<th>100% Target No's</th>
<th>Actual No's</th>
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<tbody>
<tr>
<td>25/02/2016</td>
<td>HELD</td>
<td>Board Meeting and visit to 1710 Naval Squadron</td>
<td>1710 Naval Squadron, Portsmouth</td>
<td>LMD</td>
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<td></td>
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<tr>
<td>30/06/2016</td>
<td>HELD</td>
<td>Board Meeting</td>
<td>National Space Centre, Leicester</td>
<td>LMD</td>
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<td>13</td>
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<td>30/06/2016</td>
<td>HELD</td>
<td>Future Directions for Lightweight Materials and Structures</td>
<td>National Space Centre, Leicester</td>
<td>EMMS / LMD / BCS</td>
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<td>27/10/2016</td>
<td>HELD</td>
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<td>29/11/2016</td>
<td>HELD</td>
<td>High Temperature Uses of Light Alloys</td>
<td>297 Euston Road</td>
<td>HTMC</td>
<td>IOM3</td>
<td>n/a</td>
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<td>22/02/2017</td>
<td>PLANNED</td>
<td>Additive Manufacturing of Titanium Components</td>
<td>VSMPO Tirus Ltd, Redditch</td>
<td>TIG</td>
<td>IOM3</td>
<td></td>
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<td>23/02/2017</td>
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<td>Board Meeting and visit to UCL (c/o Professor Mark Miodownik)</td>
<td>297 Euston Road</td>
<td>LMD</td>
<td>IOM3</td>
<td></td>
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<td>29/06/2017</td>
<td>PLANNED</td>
<td>Board Meeting and visit to BLOODHOUND SSC</td>
<td>Bloodhound SSC Technical Centre, Bristol (tbc)</td>
<td>LMD</td>
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<td></td>
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<td>Q3/Q4 2017</td>
<td>Progressing</td>
<td>Light Metals Educational Workshop</td>
<td>Various, TBC</td>
<td>Bloodhound SSC</td>
<td>TBC</td>
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<tr>
<td>25/10/2017</td>
<td>PLANNED</td>
<td>Board Meeting and visit to Jaguar Land Rover</td>
<td>JLR, Solihull (tbc)</td>
<td>LMD</td>
<td>TBC</td>
<td></td>
<td></td>
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