Leap Seconds public dialogue

Final evaluation report

Hopkins Van Mil: Creating Connections
May 2015

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Context

This report presents the findings of an evaluation of the Leap Seconds public dialogue commissioned by the National Measurement Office[1] (NMO), supported by Sciencewise[2] and conducted by The OPM Group[3].

The public dialogue project was developed to gather evidence to either support or reject the assumption that the public feel strongly that clock time should be linked to solar time. The purpose of the dialogue was:

- To discover the diversity of opinion, and strength of opinion, of the linkage between time and the motion of the Earth through consultation with the general public, religious, and scientific communities.
- To share with different stakeholders the impacts of:
    - Maintaining the link between Earth rotation and Atomic time (keeping leap seconds)
    - Dropping leap seconds as being proposed.

Funding and governance

The dialogue was funded by NMO and Sciencewise with a budget of £175,000 including £15,000 of in-kind contributions. The programme was guided by an Oversight Group of eight members Chaired by the NMO.

Dialogue process

The project ran for about 9 months in 2014 with the following process:

- Desk research and research interviews to identify stakeholders, scope the stimulus material for the dialogues and content for the website
- The design and delivery of a stakeholder workshop at the end of April 2014 attended by 26 participants to provide input to the design and delivery of the public dialogue events
- The recruitment of dialogue participants by an external recruitment agency using a detailed recruitment specification for public participants
- The design and delivery of public dialogue sessions in four locations in summer 2014 across the UK (Edinburgh, Belfast, Tamworth and Cardiff) comprising one half-day workshop followed by a reconvened full day workshop. The total number of participants was 111. Experts were present in Belfast, Tamworth and Cardiff, but not in Edinburgh

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[1] The **National Measurement Office** (**NMO**) ensures fair and accurate measurements are available and used for transactions regulated by law. https://www.gov.uk/government/organisations/national-measurement-office

[2] **Sciencewise** is funded by the Department for Business, Innovation and Skills (BIS). Sciencewise aims to improve policy making involving science and technology across Government by increasing the effectiveness with which public dialogue is used, and encouraging its wider use where appropriate. www.sciencewise-erc.org.uk

[3] Founded in 1989, **OPM** is an independent, employee-owned research organisation and consultancy

- The design and development of the Leap Seconds website[4], launched after the stakeholder workshop to complement the public dialogue with online engagement with a wider section of the public
- The design and delivery of two pop-up events in Kingston and in Greenwich, both in Greater London. The pop-up events led to 21 conversations with members of the public in Greenwich and 12 in Kingston
- A national summit was considered for the autumn of 2014 but was not held. This was partly due to the limited number of stakeholders involved in the dialogue process and partly due to the resources available after inclusion of the digital engagement element in the project budget
- Final dialogue reports - presented in draft to the Oversight Group and NMO in September 2014, and published in February 2015.

Evaluation findings
Context
The evaluation found that effective governance and project management ensured that the project was delivered on time, to budget and met objectives. The dialogue did test effectively both the diversity and strength of public opinion on the issue of leap seconds. Stakeholders viewed the project as unusual for a public dialogue in that it set out to provide evidence for the advice to a Minister on what was essentially a yes/no decision on the retention or not of leap seconds.

The overall governance of the project was found by the evaluation team to be fairly effective although points were raised throughout the evaluation that the OG would have benefited from the creation of a tailored Terms of Reference document rather than the Sciencewise generic guidance. At some points OG members were not clear of the expertise of others in the room or the commitment they had made in agreeing to take part in the process.

Stakeholder engagement was a challenge for the project for a number of reasons. Some stakeholders were not willing to engage with the dialogue as the subject was in negotiation at a global level; others were not aware of the issue at all, or did not recognise that they had a stake in it. It was made clear to the evaluation team that, despite the dialogue contractor's best efforts to gain expert involvement, there was an insufficient number of stakeholders available to the project and gaps in expertise in specific areas such as culture, faith, IT and defence. For some this affected the balance of the dialogue. For others the work done to fill these gaps in expertise by means of video and written communications from those with a different view from the existing UK position meant that the dialogue was still an effective way of testing public views. As evaluators we conclude that the mixed methodology dialogue, the extensive research in to the issue to cover all aspects of the debate, the use of online as well as physical engagement, the production of clear stimulus materials and the very effective briefing of the facilitation teams has meant that the credibility of the findings are not compromised by a limited stakeholder engagement.

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[4] http://leapseconds.co.uk/

Scope

Participant satisfaction with the Leap Seconds Public Dialogue was high. Participants demonstrated that they were clear about what they were expecting the dialogues to discuss. For a minority this understanding of the issue took time to develop, but all felt they had received the information they needed to understand and make the most of the dialogue discussions.

The diversity of views available to the participants during the workshops was less successful due to the limited stakeholder engagement as described above, particularly in Edinburgh where no experts were able to attend. However, it is clear from the satisfaction rates that nevertheless participants were able to gain from the dialogue and knew there was a range of views to be heard on whether to retain or stop leap seconds.

The website attracted over 1,000 unique visits and OPM analysis of website traffic acquisition shows that 46% of new visitors came to the website directly which was the most popular way of visiting the site. The second most common way of arriving at the site came from twitter referrals, accounting for 146 new visitors. Google searches accounted for 6% of new users. Without agreed indicators for the numbers expected from digital engagement evaluators were unable to assess its success in those terms. However, it is clear from interviews and snap survey comments that the site was a welcome addition to the dialogue and a valuable resource for future UK and international discussions on leap seconds.

Delivery

The evaluation team found the delivery of the dialogue to be very effective. Appropriate design and facilitation tools were used to draw out views and challenge participants to work with stakeholders to think through the issues. The mixed methodology of video, role play, quiz, prioritisation exercises and small group discussion were valued as a means to understand the issues. OPM were particularly effective at researching material for the pre-materials and using it to create a design which took participants on a journey of a discovery. Given the challenge of stakeholder engagement the team noted that the more stakeholders/ experts that were present at the public dialogue events the more questions participants asked and the livelier the discussion. In Tamworth there was a very full discussion over two sessions, but in Edinburgh where there were no experts present it was much harder to engage people.

Despite facilitators having to convey more information than is normal within their remit and the fact that some of the facilitators had carried out the background research and were therefore knowledgeable on the subject, the evaluation found that the dialogue remained unbiased with objective facilitation throughout. Participants generally appreciated the discussions for being interesting, respectful and fair.

Impact

The evaluation team found that the dialogue has been effective in filling the identified evidence gap. Having gone through the process stakeholders are clear that the UK position can now be informed by public views. The majority of participants and stakeholders involved in the dialogue felt strongly that the dialogue would have an impact on the decision to be made.

During the process the Minister responsible for deciding on the UK negotiating position at the 2015 World Radio Communication Conference (WRCC) in November 2015 changed due to a Cabinet re-shuffle. However, the new Minister embraced the outcome of the public dialogue and the dialogue findings have been shared at key international meetings in preparation for the WRCC.

74% of stakeholders said that they agreed or strongly agreed that they had gained knowledge about the leap seconds policy area. In Edinburgh 87% of respondents to the evaluation form agreed or strongly agreed that they had benefited personally, in Belfast 92%, Tamworth 96% and in Cardiff 100%. They said they met facilitators, specialists and fellow participants that they enjoyed talking to; they gained an understanding of an issue which was new to them; and had the opportunity to air their views on a complex issue. Although some participants and stakeholders felt that the issue of leap seconds was not appropriate for a public dialogue because it will not affect them or their children during their lifetime, the majority of stakeholders felt that the benefits of the dialogue outweigh the costs and that it demonstrated good value for money.

Learning points
The evaluation team has identified the following as lessons for future dialogues:
- A flexible project management structure is essential for any complex dialogue
- It is important that the commissioning client has a project manager in place in the early phases of the project when relationships are being created with stakeholders
- In any Sciencewise dialogue sufficient time is required to set-up the project systems
- Dialogues are best served when stakeholders are identified well in advance of the project start
- Tailored terms of reference for the OG are beneficial in scoping their role and responsibilities
- Co-production between the dialogue contractor and Oversight Group is of value to effective design of the dialogue process and stimuli materials
- Where time is an issue for stakeholders in terms of availability, other methods such as video conferencing / online engagement should be employed
- A public dialogue with a strong impact on policy and decisions is more likely when the objective is sufficiently broad to provide rich data to influence a range of policy areas.

Conclusion
The Leap Seconds Public Dialogue was well conducted and well designed and the process and findings are credible. The majority of participants enjoyed being part of the process and it has demonstrated the value of public dialogue to the public in informing public policy decisions.

The dialogue objectives were met with the diversity and strength of public opinion about leap seconds being explored effectively and the impact of maintaining a link between the earth's rotation and time measurement being shared with a number of stakeholders.

Even though publication of the dialogue report was delayed due to an unforeseen change in Minister, the project was completed on time and on budget. It has provided evidence for the UK position on the retention of leap seconds and the dialogue outcomes have been shared at key international meetings in preparation of the World Radio Communication Conference to be held in November 2015.

HVM 18th May 2015

1. Introduction

This report presents the findings from an evaluation of a public dialogue to allow the Government to understand public and stakeholder views on Leap Seconds. Leap seconds have been added to Co-ordinated Universal Time (UTC) since 1972 to keep time measurement in sync with the rotation of the earth. The outcome of the dialogue was intended to inform the Government's thinking about its position at the 2015 International Telecommunication Union Conference.

The dialogue was commissioned in 2014 by the National Measurement Office (NMO), an executive agency of the Government responsible for ensuring fair and accurate measurements, with support from Sciencewise.

The aim of the evaluation was to provide an independent assessment of the impacts and quality of the dialogue project to demonstrate the extent of the project's success, credibility and effectiveness whilst identifying lessons learned to help develop good practice in public dialogue on science and technology issues.

2. Background

The specification of the timescale used throughout the world, currently Co-ordinated Universal Timescale (UTC), must be agreed internationally. Responsibility for this currently resides with the International Telecommunications Union (ITU). The 2012 Radio-Communications Conference of ITU considered a proposal to end the intermittent insertion of 'leap seconds' in UTC. A Leap Second is a one-second adjustment that is occasionally applied to UTC in order to keep its time of day close to the mean solar time. UK policy was to oppose the ending of the insertion of leap seconds, arguing that claims that continued use of leap seconds caused technical problems for electronic systems were overstated, and that people considered it important that the very long held linkage between time and the earth's motion should be retained. International views were strongly divided and there were a large number of countries which had not considered the issue. The Conference therefore postponed the decision until the World Radio Conference in 2015 (WRC15) to allow further studies to be carried out.

The public dialogue project was developed to gather evidence to either support or reject the assumption that the public feel strongly that clock time should be linked to solar time. The purpose of the dialogue was:
- To discover the diversity of opinion, and strength of opinion, of the linkage between time and the motion of the Earth through consultation with the general public, religious, and scientific communities.
- To share with different stakeholders the impacts of:
  - Maintaining the link between Earth rotation and Atomic time (keeping leap seconds)
  - Dropping leap seconds as being proposed. [5]

The public dialogue was commissioned from The OPM Group by the National Measurement Office via a competitive tender process in December 2013. The project ran for about 9 months, with delivery of an initial stakeholder workshop at the end of April 2014 and the public dialogue events over a period of 4 weeks from mid-June to mid-July. Hopkins Van Mil: Creating Connections Ltd was appointed as independent evaluators following a similar competitive tender process.

To ensure good governance of the project and the contribution of a range of people with specialist knowledge of time measurement and engagement processes an Oversight Group was set up comprising 8 Oversight Group Members (see figure 1). This group included experts in time measurement science and industry, navigation, astronomy, science communication, public engagement and a representative of a collective of faith groups. The Oversight Group provided impartiality and quality assurance of the dialogue materials and process. They supported NMO and The OPM

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[5] See project Invitation To tender (ITT)

Group in stakeholder engagement and provided a scientific sounding board for the time measurement issue at hand. The Leap seconds OG used Sciencewise's generic Terms of Reference for oversight groups.

Members of the Leap Seconds Oversight Group:
- Peter Wibberley, National Physical Laboratorium
- Robert Massey, Royal Astronomical Society
- Peter Chapman – Andrews, Royal Institute of Navigation
- Catherine Hohenkerk, UK Hydrographic Office
- Steve Bell, UK Hydrographic Office
- Michael Brooks, Journalist
- Usama Hassan, Quilliam Foundation
- Alison Crowther, Dialogue and Engagement Specialist, Sciencewise

Figure 1: Members of the Oversight Group

The leap seconds public dialogue and independent evaluation were funded from NMO's research budget (£75,000), a Sciencewise grant to NMO (£85,000 including non-recoverable project VAT) and in kind contributions of about £15,000: a project total of ca £175,000.

In this report 'public dialogue' is defined as, 'A process during which members of the public interact with scientists, stakeholders, and policy makers to deliberate on issues relevant to future policy decisions'. [6]

The full dialogue report has been published on the leap seconds website[7] and Sciencewise website[8]. All dialogue materials are available on the leap seconds website.

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[6] Sciencewise Guiding Principles (2013): http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Publications/Sciencewise-Guiding-PrinciplesEF12-Nov-13.pdf
[7] http://leapseconds.co.uk/reports-findings-dialogue/
[8] http://www.sciencewise-erc.org.uk/cms/leap-seconds/

3. The public and stakeholder dialogue

3.1 The public and stakeholder dialogue process

To provide an answer to the dialogue objectives as outlined in section 2, The OPM Group designed an engagement process comprising the following elements (see figure 2):

- A national stakeholder workshop
- An online survey and discussion forum
- Two rounds of public workshops in four different locations
- Two pop up dialogues
- A national summit bringing public participants and stakeholders together.
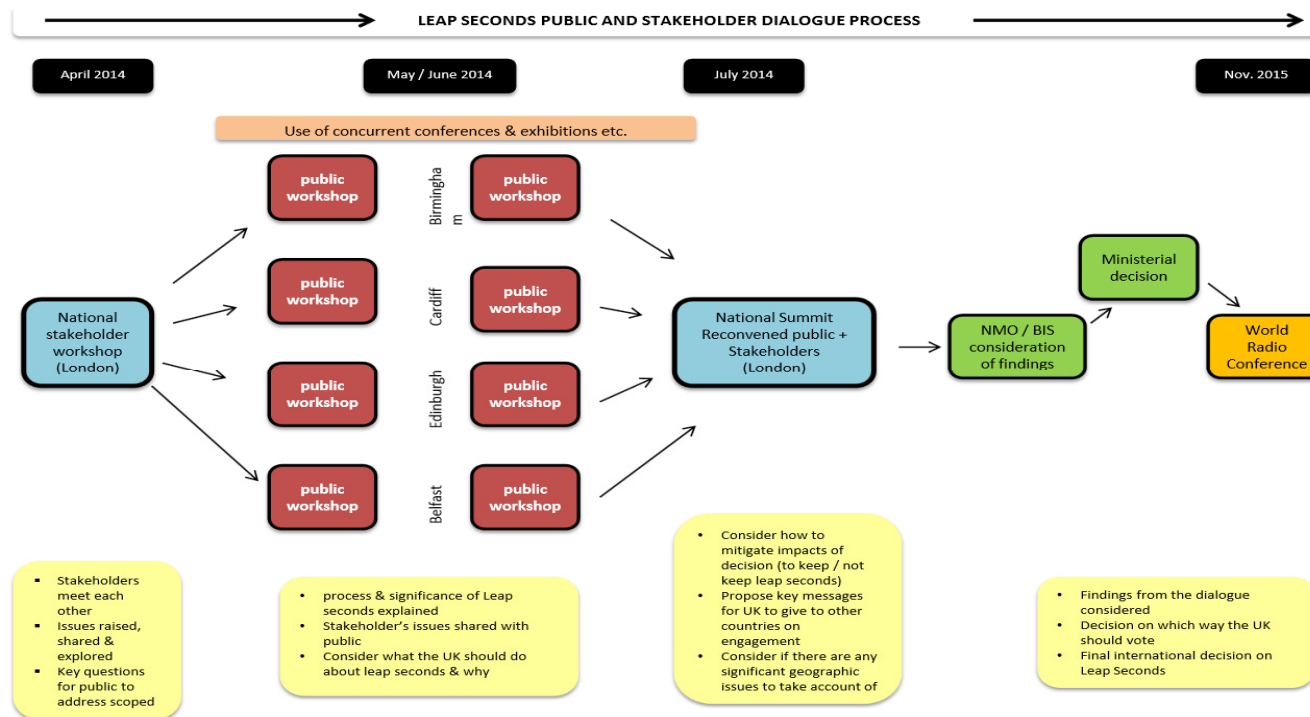

Figure 2: Leap seconds public and stakeholder dialogue process

The national stakeholder workshop was held on 30 April 2014 in London and attended by 26 stakeholders including representatives from navigation, astronomy, meteorology, IT and communications, religion, engineering and time measurement sectors. The purpose of the workshop was to explore the most important issues regarding the use of leap seconds, how they might be tackled, and how to share an understanding of those issues with members of the public. This workshop informed and contributed to the development of the public workshops that were then undertaken. The stakeholders developed a list of issues around leap seconds and weighted that list by significance. Participants to the stakeholder workshop were recruited using the networks of NMO, OG members and substantial additional research by the OPM Group.

The public workshops were held in four different locations across the UK (Edinburgh, Belfast, Tamworth and Cardiff). In each location there was one half day workshop, followed by a reconvened full day workshop (Edinburgh and Belfast round 1 on 14 June and round 2 on 28 June; Cardiff and Tamworth round 1 on 21 June and round 2 on 5 July). The same participants attended both workshops in each location. The total number of participants was 111 with 28 attending in Edinburgh, Belfast and Cardiff and 27 in Tamworth. Experts were present at 6 of the 8 workshops to discuss topics with participants and answer their questions. The public participants were recruited by a professional recruitment company, who were provided with a detailed recruitment specification by the OPM Group. (For more detail on recruitment see section 5.4)

The leap seconds website[9] was launched after the stakeholder workshop to complement the public workshops through online engagement with a wider section of the public. Close collaboration between OPM, NMO, Sciencewise and the Oversight Group led to an accessible online record of the UK dialogue process. The website includes a discussion forum, background information, Frequently Asked Questions (FAQs), a glossary and other relevant resources to which the dialogue materials were added throughout the project duration. Just under 200 users completed a survey which was a mechanism for the general public to share their views on the issue. Around 1,000 unique users mainly from the UK and USA browsed the web pages with clear spikes in usage after the website went live and after the public workshops. The number of contributions to the discussion board was negligible. The website was linked to @LeapSecondsUK twitter account which had 59 followers. The OPM Group used Google Analytics to analyse website usage and a coding frame in Excel for analysis of qualitative comments. (See section 7.3 for more detail on the online engagement element of the project).

Two pop-up events were held in London, one in Kingston town centre where OPM engaged a small number of people in the high street and one at the National Maritime Museum in Greenwich against the backdrop of the exhibition 'Ships, clocks, start: the quest for longitude'. The purpose of the pop up dialogues was to test how re-framing the dialogue questions with a focus on technical rather than cultural implications impacted on the initial responses of members of the public. The pop up events led to 21 conversations with members of the public in Greenwich and 12 in Kingston.

The national summit was not held due to the limited number of stakeholders involved in the dialogue process and diminished project resources as a result of the addition of the digital engagement element after the dialogue contractor had been commissioned.

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[9] http://leapseconds.co.uk/

3.2 Management and governance arrangements

The leap seconds dialogue was managed by NMO in close collaboration with The OPM Group with support and advice from Sciencewise. Governance of the project was in the hands of an Oversight Group comprising 8 members and chaired by NMO. The OG met 5 times throughout the process and was convened by NMO's Project Manager. The group provided input on the context of the leap seconds debate, routes of further research, the overall approach to the dialogue, the stakeholder and public recruitment approach, draft workshop designs and stimulus materials. The findings of the dialogue were discussed at the final OG meeting and feedback on the draft Dialogue report was provided via email. OG members had not committed to attending all OG meetings, which meant that only 3 to 4 members consistently took part in all the discussions. (For a detailed analysis of project governance see section 5.2)

3.3 Reporting

The OPM Group produced a range of reports, including an overview of desk research findings[10] and a summary of desk research findings for the public and a headline findings report following the stakeholder workshop.[11]

Separate reports per dialogue location were published on the leap seconds website[12] and shared with Sciencewise. The location reports have not been actively disseminated more widely as they are intended as a back-up to the final report with more detailed evidence for those interested in the dialogue process or location specific findings.

The final dialogue report[13] comprising the context, methodology and findings of all elements of the stakeholder and public dialogue process was published by NMO on 3 February 2015. Twitter,[14] the NMO website[15] and the Leap Second website were the principle channels of communication around its publication. It is also available on the on the Sciencewise website.[16] The final report was reviewed by the Oversight Group and finalised following two rounds of email comments.

Sciencewise held a webinar[17] on the dialogue process and its findings on 10 March 2015 in which Paul Broadbent, dialogue project manager at NMO shared their experience of being involved in a public dialogue with an audience of 10 webinar participants.

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[10] Leap Seconds UK Debate: Rapid Evidence Review (May 2014)
[11] Leap Seconds Dialogue: Headline Findings Report from the Stakeholder Workshop (May 2014)
[12] http://leapseconds.co.uk/knowledge-resources/
[13] Leap Seconds Dialogue: Final Report (September 2014)
[14] https://twitter.com/nmogovuk/status/562632406243758081
[15] https://www.gov.uk/government/news/report-on-findings-of-uk-public-dialogue-on-leap-seconds
[16] http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Leap-seconds-dialogue-final-report.pdf
[17] http://www.sciencewise-erc.org.uk/cms/leap-seconds-dialogue/

4. Evaluation aims, methodology and key performance indicators

4.1 Evaluation aim and overarching objectives

The aim of the evaluation of this dialogue was to independently assess the impacts and quality of the dialogue project to demonstrate the extent of the project's success, credibility and effectiveness against its objectives, covering both the outcomes and the dialogue processes. Equally the evaluation was intended to contribute to increasing the wider effectiveness and use of public dialogue in policy and decision making. The evaluation has the following specific objectives:

- To gather and present objective and robust evidence of the impacts, achievements and activities of the project in order to come to conclusions
- To identify lessons from the project to support capacity building across Government, and the wider development of good practice in public dialogue
- To identify the impacts of and lessons from the design, delivery, outputs and outcomes of the dialogue project overall
- To collect both quantitative and qualitative data to answer seven key questions relevant to the evaluation of all Sciencewise projects.

These are:

1. Has the dialogue met its objectives? Were the objectives set the right ones?
2. Has the dialogue met standards of good practice (according to Sciencewise guiding principles[18])?
3. What are the benefits and value of the project, including the role of stakeholders, oversight groups, the commissioning body and Sciencewise?
4. How successful has the governance of the project been, including the extent to which those involved have been satisfied with the dialogue outcomes and process?
5. What difference/ impact has the dialogue made on policy and decisions, on organisational learning and change, and on policy makers and others involved (including relationships with and between stakeholders and public participants)?
6. What was the balance overall of the costs and benefits of the dialogue (including potential future costs avoided)?
7. What are the lessons for the future (what worked well and less well, and more widely)?

4.2 Evaluation methodology

Hopkins Van Mil: Creating Connections (HVM) provided an initial evaluation methodology in their tender document and designed a more detailed approach to answer these questions on commissioning in February 2014. This evolved as the process developed and the team worked flexibly to respond to newly identified needs such as the inclusion of a digital engagement aspect to the programme which was not anticipated when the

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[18] Sciencewise (2013) *The Government's approach to public dialogue on science and technology.* *http://www.sciencewise-erc.org.uk/cms/guiding-principles/*

dialogue contractors were originally commissioned. The evaluation plan is included at Appendix 1 of this report integrated within the Baseline Evaluation Statement. The findings within this evaluation report are based on the following data collection and analysis methods worked on between April and November 2014.

Structured observation was used at:
- 5 Oversight Group meetings
- The stakeholder dialogue workshop held on 30 April in London
- The round 1 and round 2 public dialogue workshops in Edinburgh on 14 and 28 June

An example of the observation guide used to collate data from the observation process is at Appendix 2.

Evaluation questionnaires were completed by participants at:
- The stakeholder dialogue workshop held on 30 April in London (81% response rate)
- 8 public dialogue sessions held over two rounds in Belfast, Edinburgh, Tamworth and Cardiff (98% response rate)

The summary survey findings are available as a separate Appendix 5 published alongside the evaluation report.

Desk research was used in the baseline and formative phases of the evaluation to:
- Review the stakeholder map
- Review the desk research undertaken by the dialogue contractor
- Review the discussion guides/ process plans used for stakeholder interviews and to run the stakeholder and public dialogue workshops
- Monitor the website: number, type and timing of contributions
- Analyse the recruitment screener/ profile dialogue participants
- Analyse the analysis and reporting on dialogue findings
- Review the plans for using dialogue results including report dissemination strategy
- Investigate the overall costs/ funding

The desk research was linked to *Information review and analysis* also used throughout the process as follows:
- Review of materials[19] prepared by the Dialogue contractor and the OG in preparation for the dialogue including:
  - The evidence Review Report (April 2014: OPM)
  - Stakeholder Workshop Headline Findings Report (May 2014: OPM)
  - Public workshop stimulus materials (Jun 2014: OPM)

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[19] Available here: http://leapseconds.co.uk/knowledge-resources/

- - Navigation sheet
    - Culture sheet
    - Religion sheet
    - Finance sheet
    - Cultural heritage sheet
    - Astronomy sheet
    - Computer sheet
  - Responses from experts to the questions asked at the public workshops
    - Understanding the costs
    - The international decision making process
    - Science and background
    - Religion
    - Navigation and air traffic control
    - Astronomy
    - Computers and finance
  - Plus a personal response on the dialogue materials from a US expert
- Material produced specifically for digital engagement including the website (leapseconds.co.uk) and monitoring of tweets (@leapsecondsUK)
- Headline finding reports from the individual public dialogue workshops
- The final dialogue report.

Evaluation Interviews were used at the baseline, formative and summative stages of the evaluation as follows:
- 6 pre-dialogue interviews with project owner, dialogue contractor, Sciencewise and OG members
- 5 post-dialogue interviews with experts
- 8 post-dialogue interviews with project owner, dialogue contractor, Sciencewise and OG members
- 6 post-dialogue interviews with participants.

Participant journey trackers were used as a tool to pick up with six participants in between each dialogue round using both telephone interviews and emailed questions.

Media and parliamentary tracking was conducted through weekly monitoring of Hansard and Google Alert tracking of news stories.

4.3 Evaluation scope

The dialogue on Leap Seconds has developed over time. The evaluation team has worked flexibly to make as full an assessment of the process as possible. Nevertheless it is important to be clear what elements of the dialogue have not been included in the evaluation process.

- Some of the workshops were not observed but evaluated in other ways such as the Journey Trackers and telephone interviews with participants.
- Pop-up engagement activities – as the evaluation team was given very little notice of when they were taking place.

In the following chapters of this report we consider the seven key questions asked of all Sciencewise projects (see section 4.1) in relation to the key indicators set for the evaluation which are summarised below and included within the Evaluation Plan at Appendix 1.

CONTEXT

1. *Governance & project management*
2. *Stakeholder engagement*
3. *Representation of cross section of the public*
4. *Sufficiency of resources*

SCOPE

5. *Clarity about the scope of the discussion*
6. *Involvement of a diversity of perspectives*

DELIVERY

7. *Appropriateness of the dialogue environment (venue/ catering/ accessibility)*
8. *Appropriateness of the dialogue techniques, process and tools representing range of views*
9. *Dialogue conducted fairly, respectfully and with no in-built bias*
10. *Dialogue outputs which are relevant to and can easily be understood by the public, policy-makers and other stakeholders*

IMPACT

11. *NMO has filled evidence gap for or against Minister's statement*
12. *Policy influenced by dialogue*
13. *Evidence has influenced international opinion*
14. *Participants have benefitted from the dialogue*
15. *Dialogue process is valued and recognised as being open and credible*
16. *Dialogue benefits outweigh the costs*

5. Dialogue context

5.1 Setting and meeting objectives

The two stated purposes of the dialogue are set out in Chapter 2 of this report. As we will describe, the evaluation shows that the dialogue did test effectively both the diversity and strength of public opinion on the linkage between time and the motion of the earth. Equally the dialogue was able to share with different stakeholders the impacts of (1) maintaining the link between earth rotation and atomic time (keeping leap seconds) and (2) of dropping leap seconds as being proposed at the 2012 Radio-Communications Conference of the International Telecommunications Union.

This was an unusual dialogue project in that it aimed to advise the Minister on what was in effect a yes or no decision. As one stakeholder put it,

"It was a very unusual project for Sciencewise as it was a binary issue with a 'yes' or a 'no' to abandoning leap seconds. It was justified as it met the Sciencewise indicators in the sense that it was morally justified to have a dialogue about the issue and there was a decision to make."
(Post-dialogue stakeholder interview)

Figure 3: developing the project plan

There was a time pressure to the dialogue in the need to gain stakeholder and public views on the issue to inform Ministerial decisions within the timeframe set to prepare for the World Radio Conference in 2015 (WRC15). The evaluation shows that there was a clear need to move forward with the dialogue and objectives were set which found a way of doing this within the necessary timescale,

"It needed to be done. It is an important issue because time affects us all. Our time measurement is connected to the movement of our planet and therefore it is something the public should be made aware of." (Post-dialogue stakeholder interview)

5.2 Governance and project management

The document *Roles of a Sciencewise Oversight Group* (Appendix 1) has informed the analysis of the work done by the OG for the Leap Seconds dialogue. The NMO team had not worked on a Sciencewise dialogue project before and due to illness had no project management resource in the initial stage of the project. Therefore the Sciencewise Dialogue Engagement Specialist (DES) was more involved in the early stages of the project to ensure that the processes were in place to deliver the programme effectively. This impacted on the time available for building relationships with

stakeholders (see Section 5.3). A NMO intern was appointed after the first Oversight Group meeting where the Invitation to Tender was written to work with senior NMO staff and the dialogue contractor, The OPM Group, to project manage the dialogue.

From the evaluator's observation, desk research and information review we note that the project plan evolved from The OPM Group's initial proposal to deliver the work and at early discussions at the inception meeting. In preparation for the inception meeting The OPM Group set out a proposal for delivering all the elements of the dialogue using post-it notes on the wall (see figure 2). The evaluation team found this an effective way for OPM to work at the inception meeting and initial OG meeting. It enabled changes to be made to the timescale and the work content at the initial stages of the dialogue planning, with clear explanations given for each element of the plan by the Lead Facilitator and Project Manager from OPM. It also modelled some of the tools used by the facilitation team providing a small but useful indication to those new to dialogue of how the process works. The evaluation team did not see further iterations of the project plan. However, the team in place at the OPM Group demonstrated consistently good project management delivering each element of the dialogue flexibly allowing for change whilst delivering to time.

The OG meetings were chaired by the NMO and always attended by the project team from The OPM Group as well as the OG members who were able to attend on any given date. The view has been expressed by some OG members that from the beginning of the process it would have been helpful if a clearer definition had been given of the expertise they were bringing to the table and their role on the OG,

"I felt the governance of the project would have benefitted from a clear definition of areas of expertise of OG members rather than an introduction by names and affiliation only. Although my input was valued and never dismissed, giving authority to OG members and being clear from the outset why we have been invited to be part of the process would have been helpful. It would have enabled the Chair of the meeting to proactively ask for input from a specific OG member." (Post-dialogue stakeholder interview)

It was also clear that some OG members had not understood when they agreed to be involved that this commitment would mean attending some of the public workshops as well as the stakeholder session. As one said,

"We noted the low attendance at public events by OG members. However, we weren't told when we got involved that there was an expectation that we would be going around the country. I thought it was just about meeting in London and reading reports / emails." (Post-dialogue stakeholder interview)

Using the Sciencewise Terms of Reference for Oversight Groups it is clear that they are expected to:
- Input on where to find the best science and scientists
- Demonstrate impartiality to ensure the dialogue is balanced
- Act as an ambassador for the project.

The evaluation has revealed mixed views on the extent to which these roles have been fulfilled. For some the OG ran well and was helpful to The OPM Group, NMO and Sciencewise. The following summarise the views,

"The OG meetings were carried out in a very business-like and friendly manner. Robert, Paul and Alison seem to take the role of Chair, the discussions kept moving, it didn't drag on. They did a good job." (Post-dialogue stakeholder interview)

"The OG worked well I thought. It was well chaired. The clarity and focus of the agenda enabled us to make progress. The process was certainly useful when selecting the successful contractor." (Post-dialogue stakeholder interview)

"It has been good to have the OG engaged. A number have attended regularly because they are stakeholders themselves. Some offered very good value…particularly those who were able to provide us with a perspective none of us had." (Post-dialogue stakeholder interview).

The Sciencewise guidelines state that,

> It is not the role of the oversight group to discuss the intricacies of the science at meetings. Where a member is also a leading scientist, their detailed expertise will be welcomed at the stakeholder interventions and in the public workshops. Rather, at an oversight group meeting they use that knowledge to guide the process, ensuring that the right questions have been asked at the right time and that the right people are in the room.

There were some involved in the dialogue who found for this reason that some of the work of the OG was less useful. A small group of those interviewed before and after the dialogue raised the point that the OG meetings could get off track with technical, scientific issues rather than a focus on what was necessary to deliver the dialogue. The majority of those that raised the point did so in relation to the areas of leap seconds that those in the OG represented, and where there were areas of knowledge missing from the OG. As one said,

"The initial OG debates were slightly off the wall. We need to add more technical people to the OG. At the moment there are only two time professionals involved." (Pre-dialogue stakeholder interview)

And another,

"It wasn't a good [enough] representation of stakeholders across sectors. They couldn't guide us and tell us what the topics should be." (Post-dialogue stakeholder interview)

A third interviewee commented on the impact this had on the management of the OG meetings,

"It got led a bit astray. The issue was that there were few non-sciencey people. Ultimately it was a very technical panel, it ought to have been half and half, a better balance of technical and cultural people and those people should have been brought in from the outset." (Post-dialogue stakeholder interview)

There were some areas of specialist knowledge which were felt to be lacking from the OG specifically around cultural and heritage issues which is also reflected in the wider stakeholder engagement, an issue we pick up again in section 5.3. To some extent this issue did change the types of roles and responsibilities that The OPM Group had for the delivery of this dialogue in contrast with other Sciencewise dialogues. It was recognised by some that the OG did play a role in stakeholder engagement,

"The OG has really made a difference to who will be at the stakeholder workshop and how it will run as well as flagging all the stuff that was missing." (Pre-dialogue stakeholder interview)

For others a lack of knowledge in some areas and a lack of clarity on roles and responsibilities was a challenge to the management of the project. It was evident from observation of OG meetings and reviewing the stimulus materials produced, that this led to The OPM Group taking on more responsibility for researching the subject content than might otherwise be expected from such a project, particularly in those areas where the OG had little expertise. This quote reflects the feelings expressed by some,

"Initially [OPM] operated as a research team rather than a dialogue team. It was complex, a lot of the cultural, social and religious side hadn't been touched on before." (Post-dialogue stakeholder interview)

And another stated,

"The stimulus materials and copy for the website were all done by OPM. They were sent to the OG for comments and discussed. They were generally fine about everything, including the website." (Post-dialogue stakeholder interview)

In addition to gaps in knowledge identified by some of those interviewed by the evaluation team another point raised amongst some of those HVM spoke to was the lack of consistency of attendance at the OG meetings, with no overt commitment made at the beginning to ensure that the same people from each organisation came to each meeting.

"People [on the OG] could be substituted, which was unhelpful, there was no consistency. Of the three meetings we have had only 3 [of 8] OG members attended all three. We were all told it was okay to send a substitute but I'm not sure about this. We've had the most useful input from those who attended all meetings. My concern is that they will come back into the loop and will want to comment further on drafts as they start from a different place." (Pre-dialogue stakeholder interview)

Although Sciencewise confirmed that on this occasion substituting was agreed to due to the small number of stakeholders available for the Oversight Group, this did raise challenges for the dialogue delivery team, which were observed by the evaluation team at least at two of the OG meetings. These included not everyone knowing who was in the room and as discussed at the beginning of this section the lack of understanding of the expertise the OG was able to cover, and where the gaps in expertise were.

It must also be noted under project management that it was only at the inception meeting that it was realised that the programme was missing a very significant element in not including digital engagement. As one evaluation interviewee stated,

"Well there was a glaring omission in the task as the digital bit was not within the scope of the ITT...In terms of credibility/ transparency we would have been a laughing stock if it had not been included in this day and age and for a subject which is reliant on IT and digital resources. Social media is really essential to this dialogue." (Pre-dialogue stakeholder interview)

The dialogue contractor's response to the challenge of including an unplanned for digital engagement programme within the dialogue was prompt, responsive and met the programme needs. As another interviewee stated,

"The website is a wonderful addition to the dialogue. Whether it was left off the initial contract or not it was excellent that OPM could subcontract this element to another company and get on top of it quickly and to such good effect. I am very glad they were able to pick up on it and they've done a really good job." (Post-dialogue stakeholder interview)

5.3 Stakeholder engagement
The process for engaging stakeholders in the leap seconds dialogue was that the NMO had developed a list of potential stakeholders which was passed to The OPM Group to develop and follow up. It was known and mentioned at the interview that less had been done on the list than expected due to lack of staff resource, and that the NMO were having difficulty finding stakeholders. The OPM Group prepared a stakeholder map and then spent a considerable amount of time researching additional stakeholders to create a full list which would reflect the diverse organisations such as faith, heritage, academic, ICT and communications, time-keeping, navigational, regulatory and scientific interests affected by the issues within the leap seconds debate. These stakeholders were then invited to engage with the project by means of introductory letters and persistent follow-up emails and telephone calls.

It has been acknowledged by the majority of those spoken to as part of the evaluation process that it was a challenge to engage stakeholders in the process. In the section that follows we reflect on what the evaluation has revealed as the four main reasons for this lower level of engagement than is usually expected in a public dialogue project.

5.3a) Initial stakeholder list
Some considered the initial list of stakeholders provided by the NMO to be shorter than one might normally see for a dialogue of this scale, thus placing the onus on the dialogue contractor to build a viable list of stakeholders and invite them to engage. One interviewee said,

"There was a very limited initial list of stakeholders…and few existing links to experts. [The first list] had just 10-15 names, some of them were already on the OG and others were just names of organisations with no named individual. [The OPM team] were basically compiling lists and cold calling."
(Post-dialogue stakeholder interview)

This is an unusual situation as often a much longer list is available to the dialogue contractor who then works with the OG using stakeholder analysis tools to create a workable invitation list.

5.3b) Less engagement with the issue from some stakeholder groups
Whilst there was some engagement with the project from the scientific and technical communities there was much less so from those with a cultural, social or heritage perspective. The main issue was that many of the organisations approached simply did not know about the issue,

"A lot of people may not be aware of the whole idea, I certainly wasn't until I was invited to sit on the OG. I got involved through recommendation of others. If I had had a cold call I would have been a lot more sceptical." (Post-dialogue stakeholder interview)

Others, particularly culture and heritage organisations and charities, did either not recognise that they had a stake in this issue whether or not they knew about it or didn't feel it was relevant enough to them to justify allocating their limited resources to commit to the process. As one interviewee said,

"One of the unusual aspects of this project has been that the religious and cultural stakeholders have not known they were stakeholders. Moreover, although they may be interested to start with, sometimes after reading [the] briefing materials and talking further some organisations have rejected the idea that there will be an impact for them." (Pre-dialogue email exchange)

The date for the stakeholder workshop was pushed back by two weeks to give more time to identify and gain buy-in from certain sectors and the OG were asked to support the identification of stakeholders. After the round 1 public dialogues OG members were emailed to request further

stakeholder engagement support at the round 2 workshops, particularly to identify stakeholders close to the dialogue session venues. They were offered participation via skype if travel was an issue as for some lack of attendance of the dialogue sessions was not about their potential interest in the subject but rather about their limited availability,

"An issue is simply lack of time. A lot of religious groups have very little capacity. I recommended Hindu and Jewish scientists but they didn't have the time to commit." (Post-dialogue stakeholder interview)

"I was surprised by the lack of response of religious groups. [The team] wrote and called, often without result. Perhaps they are so little resourced that they simply don't have the capacity to respond." (Post-dialogue stakeholder interview)

There is no doubt that the OPM Group worked extremely hard to attract stakeholders to attend the stakeholder workshop and to engage throughout the process. It was agreed that stakeholders should also be offered an incentive to attend. In the event 26 people attended the stakeholder workshop from IT/communications sector; faith groups; navigation; meteorology; astronomy; philosophy of science; engineering and timekeeping. There was, however, no representation from defence, heritage or finance organisations.

From observation and interviews it is clear that for some this left an imbalance in the views heard during the dialogue. The feeling was expressed that the imbalance in knowledge available through the stakeholder engagement process may have had an impact on the discussions. As one interviewee put it,

"Lack of representation of cultural and religious groups at the stakeholder workshop meant that the session was a bit too one-sided. I don't think it was OPM's fault, they clearly worked very hard to get a wider range of stakeholders interested. People in the room were mainly from businesses that would prefer leap seconds to disappear, it wasn't a balanced two-sided representation of the different views." (Post-dialogue stakeholder interview)

For others this imbalance had its positive side,

"We had difficulty getting representatives from the finance and IT community. It's such an obscure subject, they didn't see it as important enough to get excited over. In a way it was positive that they didn't engage with it as that supported the view that nothing should change." (Post-dialogue stakeholder interview)

The post workshop evaluation forms at the stakeholder workshop suggest that the facilitation of the stakeholder session by The OPM Group was very strong, encouraging all those present to speak and ensuring a range of views were heard. As one participant said,

"The stakeholder workshop was handled very well by OPM. It was amazing how they managed to get everyone talking. Specialists generally keep their mouths shut until they know for certain what they are talking about." (Post-dialogue stakeholder interview)

This was a view echoed by the observation notes from the evaluator at the session. In addition 100% of respondents to the evaluation form completed by participants at the end of the session agreed or strongly agreed that the facilitation of the session was independent and effective.

5.3c) Timescale for impacts

Another barrier to stakeholder engagement was the time-scale over which the impact of the removal of leap seconds would be felt. The FAQs on the leap seconds website[20] explain this clearly,

> *For some communities – such as astronomers – the effects would be noticeable quite quickly, as they depend on the global timescale being in sync with the earth's rotation. For normal, everyday purposes, we might not notice it for several hundred years.*

As one interviewee stated,

"Lack of stakeholder engagement is a reflection of the timeline over which the issue will have an effect. The decision about leap seconds is going to be finite in October 2015 but the effect of the decision is not going to be noticeable in anyone's lifetime." (Post-dialogue stakeholder interview)

5.3d) Broad perspective not relevant to all stakeholders

Linked to that, some stakeholders were specifically interested in their own area of work and how the decision would impact that, with the view expressed in one interview that the broader interest in the impact of retaining the link between atomic and solar time is not relevant to everyone,

"At the expert stakeholder workshop back in April it was interesting to see that technical people just want to discuss technical things. They are far less interested in the cultural and social aspects of the issue. The technical people want to know how to handle things if a leap second is not added and the link between atomic and solar time is not maintained. They are not interested in hearing a wide range of discussion to inform the Minister's view."
(Post-dialogue stakeholder interview)

And for some the issue was marginal to their work and lives,

"The question on the face of it looks really obscure. It looks like scientific hair-splitting and doesn't seem a major issue." (Post-dialogue stakeholder interview)

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[20] https://leapseconds.co.uk/faqs/

5.3e) Lack of clarity of overall purpose

For some stakeholders the point of the dialogue programme was not clear to them. When asked if they felt clear about what the stakeholder workshop would achieve the majority of stakeholders (58%) said they agreed or strongly agreed. However, a significant minority (21%) neither agreed nor disagreed with the statement and the same percentage (21%) disagreed or strongly disagreed. All stakeholders agreed or strongly agreed though, that they were clear how the day would run after the initial explanation by the lead facilitator and the majority (74%) said they were clear about how the findings from the discussion would be used.

The evaluation shows that despite the challenges in attracting stakeholders to the process and retaining them as topic specialists for the public dialogue great efforts were made by the project team to address the issue by:
- Delaying the stakeholder workshop to give more time for stakeholders to respond
- Increasing the number of research days to the project so that stakeholders in a broad range of fields who had not yet been included in the stakeholder map could be identified and approached
- Finding alternative ways of informing the public of key issues when the stakeholder workshop identified that specific stakeholder groups were missing from the discussion. The OPM Group researched new stimulus materials to fill the gaps where stakeholders couldn't be present and give presentations at the public dialogue sessions. This is explored further in section 6.1.

5.4 Representation from a cross-section of the public

The recruitment specification is included at Appendix 5 and is considered appropriate for public dialogues using the Sciencewise Guiding Principles which state that:

> Public dialogue does not claim to be fully representative, rather it is a group of the public, who, after adequate information, discussion, access to specialists and time to deliberate, form considered advice which gives strong indications of how the public at large feels about certain issues.

A recruitment fieldwork agency was used to deliver against the recruitment specification. The total number of participants was 111 with 28 attending in Edinburgh, Belfast and Cardiff and 27 in Tamworth. The targets set for the number of participants in each location were therefore met in each area. Criteria were set for age, gender, demographic classification and level of scientific knowledge. The specification specifically excluded recruitment from lists and those who had taken part in public consultation or market research within the last year. Importantly the participants needed to come from the local area and to be able to commit to attending both rounds of the dialogue. In three of the four locations (Tamworth, Cardiff and Edinburgh) the following targets were set for religion: At least 7 of participants reporting no religion; remainder must include at least 6 Christian and 8 from a mix of Muslim, Hindu, Buddhist, Pagan, Sikh, Jewish. Targets for reported religion as Christian were met in each location while targets for no religion were met in Edinburgh and Tamworth, but only 4 participants reporting they had no religion in Cardiff. Other religions were represented to a limited extent in other regions, and least of all in Edinburgh. The evaluation team understands from email communication with the

dialogue team that the recruiters in Edinburgh struggled to find the diversity of religions required by the specification and warned the team in advance that this was the case. In Belfast there were no criteria set in the specification for reported religion due to the religious sensibilities in the area and the lack of 'other' religions.

The evaluation team has seen no evidence to suggest that not being able to meet the reported religion criteria affected the quality of the public dialogue discussion. One evaluation interviewee did question the depth of the discussion possible. He said that he felt that participants at the session he observed in Edinburgh were able to discuss and consider significant issues to some extent. He though expressed his surprise that in his view,

"They didn't have the educational attainment or the curiosity to cope with anything which was any more in-depth than they had. I must say that I had been looking for a bigger range of intellectual engagement and sophistication in the participants, but we didn't get that in those that had been recruited. Some people were fairly disengaged from start to finish." (Post-dialogue stakeholder interview)

This is not reflected in comments made by others, nor backed up by the participant profile which for Edinburgh shows that 9 out of 28 (32%) participants report a good or very good standard of scientific knowledge.

The online survey hosted on the leap seconds website was specifically developed to provide some quantification of the general public's opinions of leap seconds by asking a limited amount of information about who was interested in the issue. The survey collected demographic information around nationality, gender, religion and age. Other questions were aimed at understanding whether the respondents were experts or stakeholders in the leap seconds decision. From the 161 respondents to the survey who answered the demographic questions, we note that the majority of respondents were male (129 male, 32 female) and that there was a good spread of ages for the respondents. While the UK census data reveals around 25% of the UK population have no religion, the leap seconds survey had over 50% respondents self-reporting as atheist or having no religion. Of those stating they had a religion, all but 12 classified themselves as Christian; with only one Jewish and one Muslim respondent, the demographics of the survey participants were less diverse than the population as a whole.

The OPM Group examined the respondents' knowledge about leap seconds to reveal they have far higher levels of knowledge than we would anticipate in the UK population. In total, 47% of the sample felt they knew a lot about leap seconds and 43% felt they knew a bit about them. This figure was even higher for the non-UK respondents, with 71% stating they knew a lot about leap seconds.

Therefore the evaluation finds that the recruitment for the public dialogue did deliver representation from a cross-section of the public. The digital engagement level demonstrated a spread of age groups, less diversity in faiths than anticipated and a greater technical knowledge of the issue than might be expected in a sample of the UK population. We find that in broad terms the study did meet objectives in terms of having a largely representative sample in place for the discussions. As one interviewee said,

"The [previous] Minister said publicly that the current policy is based on public views, but we have no evidence for this at all. We can't say that the sample of the public we are talking to is representative, but to say we have a sample of the public involved which has been selected fairly and objectively is still very important." (Pre-dialogue stakeholder interview)

5.5 Sufficiency of resources

Different views were expressed on the resources available to the project. Some felt that the budget of £175,000 was sufficient to deliver the stakeholder, public and digital engagement programme and to provide flexibility within the programme to respond to taking on the digital engagement programme. However, there was also a view expressed that the role of and resources drawn on by the dialogue contractor had to change significantly on commissioning which was an unexpected drain on their planned budget. The evaluation team were told that this was due to the lack of a well-developed stakeholder network in place before the dialogue began (see 5.3) and lack of clarity on the full range of work required in the ITT. In the eyes of some therefore, there were in fact insufficient resources to cover the full range of activities required,

"We were not anticipating from the ITT that we would have to be knowledge providers. [...] We spent a long time learning the subject and due to a lack of experts at the dialogue sessions we had to develop more materials for the second round. [As a result] we logged 38 days as unbillable due to stakeholder engagement and research, which we had anticipated would take 6 days each. Some of it was paid for by NMO out of the summit budget." (Post-dialogue interview dialogue contractor)

The benefits of the project in relation to the costs are discussed in section 8.6.

6. Dialogue scope

Participant satisfaction with the Leap Seconds public dialogue was high. In Belfast, Cardiff and Tamworth 100% of the participants indicated that they agreed or strongly agreed that they were satisfied with the two workshops they attended; in Edinburgh 90% agreed or strongly agreed.

6.1 Clarity about the scope of the discussions
At the beginning of the public dialogue sessions objectives were very clearly explained by OPM, both verbally and in summary on pre-prepared flip charts. The objectives were re-emphasised by a representative from NMO who provided a useful overview of the context of the dialogue, including reference to the Minister's point of view and the timeline for decision-making leading up to the World Radio Communication Conference in 2015.

Between 76% and 91% of public participants agreed or strongly agreed that they were clear why they should attend the public dialogue. However, when asked whether had been clear when committing to the workshops what they would achieve there was a relatively high number of participants who said that they neither agreed nor disagreed, ranging from 21% in Belfast to 33% in Edinburgh. Due to an excellent explanation of the dialogue process by OPM, 82-100% of public participants agreed or strongly agreed that they were clear how the first session would run. Equally, 88-95% indicated that they understood how they would work together at the second workshop and, after the second dialogue session, 76-95% agreed or strongly agreed that they were clear about what will be done as a result of the discussions. As one participant explained,

"It was made quite clear from the outset what we would be discussing and what we were trying to achieve. The moderator explained in very clear terms what would be achieved and why we were doing it. Even though the subject matter was complicated it was explained very well." (Post-dialogue participant interview, Edinburgh)

"At the start they explained what was happening and they said we'd have independent people and we'd all get a chance to give our views, I understood the progression of the workshop perfectly." (Post-dialogue participant interview, Tamworth)

For others clarity came as they spent more time with the subject matter,

"More so in the afternoon, it clicked then rather than in the morning. We understood the effects by the afternoon but it was a bit slow to start. It's not a widely discussed topic so it took a while to get in to it." (Post-dialogue participant interview, Belfast)

"It worked out in the end but it took us the full morning of the first day to understand what anyone was going on about." (Post-dialogue participant interview, Belfast)

6.2 Diversity of perspectives

Structured observation of the dialogue session in Edinburgh showed that dialogue participants responded well to the talking heads video which gave them an opportunity to see for the first time the diversity of views on leap seconds. They also engaged with enthusiasm in discussions about the information presented to them by facilitators in their small group discussions. When asked what one thing they would have changed about the first workshop however, some mentioned that they would have liked to hear from a wider range of stakeholder opinions, particularly from different faiths groups, the military and the finance sector,

"We needed more information from religious specialists." (Post-dialogue participant interview, Tamworth)

"Talk about defence." (Post-dialogue participant interview, Belfast)

"I felt that some of the evidence for the financial and IT sector lacked substance against the continuation of leap seconds." (Journey tracker, Cardiff)

Other comments demonstrated a desire for a better balance between the arguments for and against retaining or losing leap seconds,

"More people to give their opinion for or against." (Post-dialogue participant interview, Tamworth)

"Positives and negatives, advantages and disadvantages of both." (Post-dialogue participant interview, Tamworth)

Evaluation interviews with OPM's Lead Facilitator and Project Manager demonstrate that the dialogue contractor has made every effort to present as many views as possible in the dialogue. For example, when it became clear that it wouldn't be feasible to have three to four experts present in each location they gained written responses to participant questions for discussion in round 2. As OPM's Project Manager said,

"We have various degrees of stakeholder turnout in the 4 regions. Because of this we have ensured the process is robust yet flexible enough to incorporate different mixtures of stakeholders versus written answers. Hence, every workshop will be slightly different and has to react to who is in the room. This is reflected in the responsive design to workshop 2." (Email correspondence, 10 July 2014)

In round 2 an American perspective was brought in based on a written contribution by a US Naval Observatory representative who had emailed the leap seconds website. The email was read out in full by the Lead Facilitator and key points summarised by one of the Facilitators. Although participants appreciated hearing about the US perspective, some in Edinburgh commented that they would like to have had people in the room discussing the pros and cons, and listen to the disagreement between both sides. A stakeholder who attended the session in Edinburgh said,

"There was certainly a level of concern after the first session that, because of the lack of experts in the room, questions were left unanswered but the facilitators handled the Q&A sessions very well. There is no doubt though that the presence of stakeholders would have benefited the second session. There is a limit to the interaction you can have via videos and with written responses." (Post-dialogue stakeholder interview)

The evidence for this is seen in how participants answered the question about the extent to which the information they received gave them a well balanced view of the issues. In Edinburgh, where no experts were present, 32% neither agreed nor disagreed and 68% agreed or strongly agreed. The highest level of satisfaction in this context was measured in Tamworth where 92% of participants agreed or strongly agreed that the information received had given them a well balanced view of the issues. The dialogue in Tamworth was attended by four experts.

Some, but not all, of the experts who attended one of the dialogue sessions and were interviewed afterwards said that they felt positive about the range of views presented to participants. One commented in particular about how OPM managed to bring in an American point of view,

"I was impressed about the lack of bias. At the session I attended they presented the view of an American expert who had written in as he didn't agree with what was written on the website. It was read out word for word, I thought that was very good." (Post-dialogue expert interview)

However, another expert agreed with the view that dialogue participants weren't offered enough insight on arguments against keeping leap seconds,

"They didn't hear enough positive reasons to abandon leap seconds and make change, for example a detailed point of view from the USA or representatives from the Asian financial sector such as Japan who are affected in a different way as leap seconds occur in the middle of a trading day." (Post-dialogue expert interview)

A dialogue participant said he had expected more from the second dialogue as it was meant to be a 6 hour long event as opposed to 3 hours in the first dialogue,

"Given the basic and background knowledge in workshop 1 I had expected more 'forceful' arguments from the stakeholders leading to perhaps a 'meatier' discussion. (Journey tracker, Edinburgh)

A participant in Belfast made a similar observation. Asked to what extent the second dialogue built on the information given in round 1, he said,

"Not to that great an extent. Certainly the longer you discuss a subject the more comfortable you become, but I thought there was not a great deal of value second time around as there were at times silences at the tables in the room and I considered this due to repetitive viewpoints." (Journey tracker, Belfast)

An initial review of the desk research that informed the design of the dialogue shows that OPM thoroughly researched a wide range of issues and views related to leap seconds,

> *The public needs to have a balanced picture of the issues surrounding the international decision on leap seconds. This balance means we have to be able to provide the public with information about cultural as well as technical considerations.* (Leap seconds: the UK public dialogue – Background review, OPM 2014)

For some the arguments presented at the sessions and on the website were balanced, as pointed out by participants in Belfast and Edinburgh,

"I felt that the balance between arguments to keep or scrap them was equal and very balanced, the hand-outs were particularly good in explaining views from the different sectors." (Post-dialogue participant interview, Belfast)

"Yes, it was quite wide ranging, they had the religious aspect. They had a short video of experts and they categorised it into different topics like religion, science and technology and I think at one point they had some feedback from some US naval expert, so yes, it seemed fairly wide-ranging. (Post-dialogue participant interview, Edinburgh)

However, it is clear that despite their concerted effort it has been a challenge to find substantial information about cultural including religious considerations around changing timescales and the costs of stopping or maintaining leap seconds. As a consequence not all public participants felt they could make a fully informed decision about keeping or losing leap seconds at the end of the dialogue process. As a participant in Cardiff said,

"I still felt at the end of the discussion that I would have liked to know more. I think this is possibly because I felt there was not enough evidence to support any change to the current system." (Journey tracker, Cardiff)

The diversity of views of participants on who was best, or should have been best represented at the public dialogues was quite wide. One participant said that they felt the cultural consideration should outweigh all others,

"I think the cultural influence should be the biggest player here. I do also think the cultural implications are not properly considered. I do not feel the technical influence should be as significant as it is." (Journey tracker, Cardiff)

Some participants were disappointed not to hear more from a religious perspective,

"I feel disappointment at the lack of any religious perspective, everyone else was represented fine…This was a vital part missing for me because I'm a Christian. No-one could answer those questions. I was very interested in what they thought in India because they use time differently. I wanted to know about it from a Hindu rather than just an Indian perspective. I thought this was a real flaw of the workshop." (Post-dialogue participant interview, Tamworth)

Others felt that technical, computer and IT organisations should have been present to answer questions. One stakeholder felt that some of the technical issues were not well answered at the sessions,

"That's why I feel bad that I wasn't able to attend one of the public workshops. Although I'm not very good at explaining things [participants] probably didn't have anyone with a good knowledge to put it over really, really clearly. This doesn't detract from the outcome, overall it was fantastic." (Post-dialogue stakeholder interview)

This was echoed by some participants who felt that not all their questions could be answered during the process,

"The information provided at the workshops was useful in that it provided a good general background to the issue, but it wasn't able to provide definite answers to questions raised. But I suppose the nature of leap seconds and the fact that many experts disagree would lend itself to more questions than answers." (Journey tracker, Edinburgh)

Some felt that there was little evidence or strength of evidence on either side of the argument as two participants in different locations mentioned,

"I would have much rather had the views of six people for retaining leap seconds and the views of six against. What most said is that it wouldn't really affect us that much, no strong views, it was as if everyone was just petering out." (Journey tracker, Edinburgh)

"We did say to the woman on the second day that things really contradicted themselves. There wasn't much back up of why we should be for and why we should be against, there was no hard evidence and not enough issues covered…We didn't learn enough about the topic to be for or against because it didn't show proper evidence." (Post-dialogue participant interview, Belfast).

Participants said in their feedback that they would have liked a clearer explanation as to why some countries and sectors are not in favour of leap seconds. One stakeholder provided an explanation for the focus on the UK position,

"This was about the UK position and focused on the UK perspective, not the international perspective. Therefore it was inevitably more about why stakeholders were in favour of keeping the leap second. We weren't looking for dialogue participants to consider the needs of other countries. We asked them to consider the issue for the UK, which was a conscious decision." (Post-dialogue stakeholder interview)

It is clear that the lack of a strong expert presence in some of the locations did impact to some extent on what the participants felt they were able to achieve. This is tempered by a recognition that an awful lot of work was done to provide a range of views via other means including video and written statements.

7. Dialogue delivery

7.1 Appropriateness of the dialogue environment

After the first dialogue event 85-96% of the public participants agreed or strongly agreed that the venue where the dialogue was held was suitable for the discussions. Some felt the rooms in Edinburgh and Belfast were a bit stuffy and warm. In Belfast people complained about their view was obscured by a chandelier. After the second dialogue event satisfaction with the venues was higher, 91-96% of the participants agreed or strongly agreed that the venue was suitable.

As in all dialogue events the rooms came in different shapes and sizes. However, OPM ensured consistency by using branded signposts to the rooms and putting up A3 size posters around the rooms containing basic information about leap seconds. This included a glossary of terms and visuals to illustrate atomic time, solar time and Co-ordinated Universal Timescale (UTC). In Edinburgh there were no break-out rooms for small group discussions. This didn't seem to be an issue as there was enough space between the tables to prevent the sound travelling and interfering with participants' ability to hear their own table's discussions.

Very few comments were made on the feedback forms on the refreshments provided during the sessions. In Edinburgh, where HVM conducted a structured observation, the catering was excellent, both in terms of quantity and quality.

7.2 Appropriateness of dialogue techniques, process and tools

Structured observation of the dialogue events in Edinburgh and a review of the process plans showed that OPM had designed a dialogue process that provided a good balance between information sharing and opportunities to discuss the evidence for and against leap seconds. Clearly facilitator briefing was very effective so that the team worked well together to provide an environment in which public participants were able to share and learn from the evidence provided, from their peers and from the specialists and experts where present. The momentum from the stakeholder workshop process design to the public workshop design was very effective with the former providing the right level of input to the design for the latter. OPM produced a process design which led from the general to the specific with appropriate inputs from a range of methodologies (presentation, video, role play) to allow participants to discuss the issues in small groups to great effect.

Once commissioned as dialogue contractors, OPM swiftly produced a body of knowledge based on extensive desk research. The findings were summarised in two documents[21] and shared with facilitators. This enabled OPM to develop a design which took public participants on a journey of discovery. The issue of leap seconds was new to pretty much all dialogue participants and at the end of round 1 all agreed or strongly agreed that they had learnt about the issues and saw why public views are important in informing Ministerial decisions.

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[21] *Rapid Evidence Review* (OPM 2014)*; Leap seconds: the UK public dialogue – Background review* (OPM 2014)

Feedback from participants showed that the knowledge building process was effective as facilitators had a good grasp of the issue and the dialogue design catered for different learning styles,

"They showed good explanations of leap seconds and the issues that may arise if they were kept or removed. They had a breakdown of each section and topic so it was easily identified and presented the facts really well through speech and demonstration." (Journey tracker, Cardiff, Round 1)

A participant said that she had been able to consider significant issues with the material presented at the workshops,

"Thanks to the crib cards that were provided in hard copy, and using all senses, as facilitators read them aloud too. Information disseminating was excellent: visual, aural etc." (Post-dialogue participant interview, Cardiff)

Participants in other locations shared the view the cards presented information in a straight forward way on seven diverse themes: cultural heritage; computers; navigation; religion; culture; finance and astronomy. A participant from Tamworth said,

"They were very, very informative. I thought they were very good. We could keep them as well which I liked. I've got mine open in front of me now…They were like flashcards and so conveyed the information in a very good way that was easy to understand." (Post dialogue participant interview, Tamworth)

Participants were introduced to the concept of time by means of a warm up quiz using hand held voting pads, followed by a presentation of leap seconds by a representative from NMO. The knowledge gained from the presentation was reinforced in a role play by two of the facilitators, one representing atomic time and one solar time. A participant in Cardiff said,

"The physical performance was very helpful. It made it very clear and easy to understand what atomic and solar time is and what would happen if leap seconds are not inserted, a really good way to remember." (Post-dialogue participant interview, Cardiff)

Having been presented with the views of key stakeholders through a video of talking heads, participants took part in a second quiz aimed at consolidating the knowledge gained before they embarked on more detailed discussions around a range of key themes.

The view that the material presented in the dialogue was helpful in developing public understanding was echoed by users of the website, one of whom said,

"Nice to be consulted and I doubt whether things could have been made clearer to the layman without so much wordage that his attention would have strayed." (Snap survey comment)

In round 2 of the public dialogue events participants had an opportunity to watch the talking heads video and physical role play again before they moved around in carousel discussions to discuss answers to questions posed by the public in round 1. The questions and answers were presented on double sided A4s and grouped under themes. In the penultimate session participants discussed two to three scenarios about time in the future showing the potential impact of losing or keeping leap seconds on everyday life.

In Edinburgh and Tamworth there was less appreciation of the future scenarios than in Belfast and Cardiff (59% in Edinburgh and 72% in Tamworth as opposed to 83% in Cardiff and 88% in Belfast). In Edinburgh 36% neither agreed nor disagreed that the scenarios helped to consider the significant issues and 5% disagreed.

A point which continues from the discussion of stakeholder engagement in section 5.3 is that public dialogue in Sciencewise-funded projects involves public participants being able to discuss an issue on an equal footing with scientists, specialists and topic makers. In the three other locations stakeholders were present in varying degrees, but in Edinburgh despite great efforts by the project and delivery team no specialists in leap seconds were available. For some this presented a challenge,

"Edinburgh wasn't public dialogue. A minimum requirement is that we have the public and experts together in one room to have a conversation."
(Post-dialogue stakeholder interview)

We note from observation and from feedback from the dialogue contractors that the more stakeholders/ experts present at the public workshops, the more questions participants asked and the livelier the discussion. In Tamworth there was a very full discussion over two sessions, but in Edinburgh it was much harder to engage people.

Overall the majority of public participants were satisfied with the information received. In Cardiff 95% of the participants said they strongly agreed that they had received enough information to contribute their views, in Tamworth 86%, In Belfast 80% and in Edinburgh 77%.

"Round 2 familiarised me about what I learnt in workshop 1. It also helped me learn more about the effects/ issues of leap seconds and the science behind it. The use of scenarios made it easier to picture the long-term effect of both outcomes as well." (Journey tracker, Cardiff)

"The information given to us within the first session to take away combined with the information given to us in workshop two were both very informative and provided me with a good basis to make an informed decisions." (Journey tracker Edinburgh)

Some commented on the lack of information about cost,

"The one thing that nobody could put their finger on was cost. Nobody could tell us about the issue of cost. No facts or figures or data on the cost of either keeping leap seconds or removing them – I feel like the cost of the process is especially important in today's climate." (Post-dialogue interview participant, Belfast)

The participation packs provided at both sessions included a programme for the day and photocopies of the stimulus materials. Asked to what extent the information in the packs enabled them to take as full a part as possible in the discussion one of the participants said,

"It did. It was given on arrival to have a glance at whilst drinking tea and coffee. It was central to all the discussions so very helpful to have it there and a good idea to have these complicated issues both in written and verbal format because it made it much clearer." (Post-dialogue participant interview, Tamworth)

It was clear that the majority of people, whether participants, specialists or stakeholders felt the participation packs had been effective. As a stakeholder said,

"I felt the information provided in the packs was simple, clear, more than adequate for the participants' needs and OPM did a really good job in pulling it all together." (Post-dialogue stakeholder interview)

The evaluation has demonstrated that OPM conducted a professional dialogue using a range of appropriate dialogue tools. A stakeholder summarised this as follows,

"I've been very impressed with the methodology applied by OPM. We managed to cover multiple areas. From electronic engagement versus the dialogues, pop-ups and stakeholder workshop. OPM gave a good rationale as to what the different elements would show. The variety of approaches puts [us] in a good position [to move forward]." (Post-dialogue stakeholder interview)

7.3 Digital engagement
The digital engagement was a substantial addition to the project, one that added value and reach. It provided a link between the public dialogue and additional resources as participants were signposted to the website at the end of round 1. However, OPM said that anecdotally few participants in round 2 mentioned visiting the site. The information on the website was seen as highly relevant, easily understood and a balanced representation of views. As one user said,

"The website is excellent, it documents well the cultural and technical considerations." (Snap survey comment)

Others saw it as a useful place to interact with the issue where they wouldn't otherwise have had the opportunity,

"Interesting subject, thank you for the opportunity to participate in the consultation process." (Snap survey comment)

No objectives or indicators were specifically set by the project for digital engagement and as such there is no obvious way for the evaluation team to assess the extent to which the use of the site has achieved its goals. From the internal digital engagement report[22] we know that a total of 1,087 unique users had conducted 1,720 sessions of the site by early August with 46% of new users coming to the site via the URL, demonstrating that the promotion of leapseconds.co.uk was effective. There are three areas of value for digital engagement if used well, it can[23]:

- Amplify the impact of offline engagement and create better starting conditions for offline events
- Help to build a baseline of technical knowledge to inform discussion
- Widen access and increase transparency.

From reviewing the website it is clear that in reaching over 1,000 unique users the website did widen access to some extent and it certainly was a focus for the development of excellent resources which informed the discussion. As the digital element of the dialogue was only included once the dialogue contractors were appointed at the first OG meeting, the opportunity to amplify the impact of the offline engagement was perhaps not as effective as it could have been, but was nevertheless successful. As one stakeholder said,

"We should have thought of including the digital element sooner, although I think we back-fitted it pretty well." (Post dialogue stakeholder interview)

Another considered the amount of usage to have been effective for the programme,

"[We] are always told to be digital by default so not to have done this would have been a huge mistake. You would certainly have to explain why and it makes such a lot of sense in terms of the project reach with over 1,000 unique visits and each person spending three minutes per page." (Post dialogue stakeholder interview)

The website has been considered a useful resource by stakeholders and as such will be transferred from The OPM Group to NMO so that the latter can continue to maintain it and use it as part of the package of material they show to other countries until December 2015.

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[22] Digital Engagement Report (OPM: 8 August 2014)

[23] *In the goldfish bowl: science and technology policy areas in the digital age* (Sciencewise: Susie Latta, Charlotte Mulcare and Anthony Zacharzewski, 2013)

Linked to the website a Twitter account was established @LeapSecondsUK. The account followed 96 people, had 59 followers and 10 tweets had been favourited, some by those in the dialogue field such as @sburrall; others with technical knowledge of, or a professional interest in, the subject such as @NPL and @landonnell.[24] 25 Tweets were written during the dialogue process either to call for expressions of interest from experts; 'do you care' or 'have your say' type tweets to encourage traffic to the website and some which thank those who have taken part in the pop-up elements of the dialogue. The evaluation team observed that Twitter was in some ways effective as a communications channel. OPM analysis of website traffic acquisition shows that the second most common way of arriving at the website came from twitter referrals, accounting for 146 new visitors demonstrating its effectiveness in pulling traffic to the site. It is also clear that Twitter did provoke some interest evidenced by the number of favourites but, perhaps given the nature of the subject matter, did not gain a wide following.

The evaluation team noted that the Sciencewise webinar to present findings from the dialogue was postponed to March 2015 due to the postponement of the dialogue findings report publication.

Given the extensive detailed and technical discussions on the *leap seconds digest*, an online discussion list which has been in existence since 2000[25], it is interesting to note that the discussion forum on the website which was intended to provoke thought and comment around the issue remains largely unused. The comments were made by people with a good knowledge of the subject the platform,

"They have far higher levels of knowledge than we would anticipate in the UK population. In total, 47% of the sample felt they knew a lot about leap seconds and 43% felt they knew a bit about them. This figure was even higher for the non-UK respondents, with 71% stating they knew a lot about leap seconds." (OPM, Digital Engagement Report, August 2014)

It is hard to assess why the discussion forum was not an effective tool. Possibly this was due to the fact there are fora elsewhere for such discussions such as the *leap seconds digest*, or the material produced for the site didn't provoke questions for users, or, perhaps more likely, the relatively low number of stakeholders affected by the leap seconds decision had a knock-on effect on usage of the discussion area as stakeholders often act as amplifiers.

The intensive work on the website by the dialogue delivery team, supported by the OG, ensured that the website was an appropriately designed and built site for hosting technical information on leap seconds which was accessible to a broad public as well as those with a specialised knowledge of the subject.

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[24] Data November 2014
[25] https://pairlist6.pair.net/mailman/listinfo/leapsecs

7.4 Dialogue conducted fairly, respectfully and with no in-built bias

The facilitation of the public dialogue was rated very highly. At the end of the first public dialogue 100% of the participants in Edinburgh and Belfast agreed or strongly agreed that the facilitation was independent and effective, in Tamworth 92% and in Cardiff 86%. Participants generally felt that there was enough opportunity to express their views and thoughts. Satisfaction rates remained high throughout the second round where 95-100% of participants indicated they agreed or strongly agreed that facilitation was independent and effective.

Due to the lack of experts at the workshops, facilitators had to convey more information about the dialogue topic than is usually within their remit. This had the potential to jeopardise their neutrality, which is not desirable in a public dialogue. For example facilitators answered questions from participants in round 1 regarding the content they had relayed to the group. Although their brief was to stick to the information printed on the card it is tempting to build on that, particularly as some of the facilitators had been involved in the desk research and were quite knowledgeable about the issue. However, structured observation of the dialogue in Edinburgh showed that this wasn't the case, and given the 100% satisfaction rate of participants about the independence of the facilitation team it can be concluded the OPM did an extremely good job in maintaining an unbiased attitude in challenging circumstances. The following comments give an insight in participants' observations,

"I found the discussions to be open and unbiased. We were able to freely give our opinions and ask lots of questions. The group was held by people who just portrayed factual information and never gave their opinions. This ensured no bias from the public taking part." (Journey tracker, Tamworth)

"I had no idea how the experts or the facilitators felt about keeping or removing the leap seconds as they were so neutral. Always asked whether we had any questions at every stage so gave opportunity to explore everything in detail. All very informative but not leading in any way" (Post-dialogue interview participant, Belfast)

The discussions were generally appreciated as being interesting, respectful and fair. Feedback in journey trackers and post-dialogue interviews included comments like,

"I think the dialogue was fairly free flowing and the facilitators kept it moving along when required. From what I experienced there was respect for each other's opinions." (Journey tracker, Edinburgh)

and,

"With every opinion there was a balanced view. Facilitators were neutral and experts said they will speak their personal opinion at the end. We were never pushed to believe anything; everyone's opinion was listened to." (Post-dialogue participant interview, Tamworth)

In post-dialogue interviews participants in Cardiff and Tamworth expressed their admiration for how the facilitation team handled issues of fairness and respect,

"There were some racist participants in my group, members of the group who were Islam phobic. Facilitators spotted the tensions and split us up for the second session. I thought that was very observant, and I was proud of them." (Post-dialogue participant interview, Cardiff)

"I thought the way that the facilitators dealt with the more 'passionate' members of the group was great. They didn't shout them down at all but still managed to let everyone speak." (Post-dialogue participant interview, Tamworth)

Observation of the workshop in Edinburgh showed that the majority of participants engaged fully with the discussion with some quieter individuals who seemed less engaged despite persistent efforts made by facilitators to draw them in. In Belfast one of the participants made the following point,

"My only small criticism is that there were one or two shy or not confident individuals who had valid and interesting viewpoints, and to that end I felt the facilitators should have shown support to their views by asking them directly for their opinions at appropriate times." (Journey tracker, Belfast)

However, this was balanced by other comments,

"A few very passionate participants, a bit angry, but they were dealt with well. And the quieter people like myself were encouraged to speak out. Very well facilitated." (Post-dialogue participant interview, Tamworth)

The limited availability of experts in some locations may have impacted on the liveliness of the sessions. Feedback from the session in Tamworth where the second dialogue was attended by four experts included comments such as,

"In Tamworth people didn't stop talking, even after the session they carried on talking about leap seconds." (Post-dialogue stakeholder interview)

Despite a high level of interest in continuing the discussions in some locations, in others people did feel that by the end of round two they had covered all the ground they could and wouldn't have needed more time to continue the discussion,

"Definitely enough time, we'd exhausted the subject by the end. There was nothing more to say." (Post-dialogue participant interview, Tamworth)

This was more in line with what the evaluator observed in Edinburgh, where the second dialogue session ended 40 minutes ahead of schedule because participants and facilitators seemed to have run out energy around further exploration of the issue which they felt they had already fully

discussed. One stakeholder at the session linked this to the lack of expert involvement but also to the extent to which leap seconds is an accessible scientific issue for some public participants,

"There could have been a richer conversation if there had been experts in the room and if there had been a greater level of intellectual sophistication and curiosity in the room from participants." (Post-dialogue interview NMO representative, present at Edinburgh workshops)

The second dialogue event was attended by four specialists in Tamworth and two in Cardiff. In both locations 100% of participants said they agreed or strongly agreed that their knowledge of the implications of retaining or removing leap seconds had increased. This dropped slightly to 96% in Belfast where dialogue participants had the opportunity to have conversations with two experts and 82% in Edinburgh where no expert was present other than the Head of Communications NMO, who said in his presentation,

"I'm not an expert in leap seconds." (Structured observation dialogue process, Edinburgh)

Overall dialogue participants felt comfortable with experts in the room. In Belfast and Cardiff 100% said agreed or strongly agreed that they felt comfortable with the specialists and were able to ask questions, in Tamworth 96% and in Edinburgh 91%.

"I felt very comfortable talking to them." (Post-dialogue participant interview, Tamworth)

In general public participants appreciated the involvement of experts. 87% - 95% of the public participants felt that the specialists were helpful and open for questions. A participant in Cardiff said,

"Excellent specialists, it was great to have both computer experts and philosophical experts. I am a Chomsky fan! And I am forever questioning, but all of my questions were answered by the experts." (Post-dialogue participant interview, Cardiff)

7.5 Dialogue outputs which are relevant to and can easily be understood by the public, policy makers and other stakeholders
It is clear to the evaluation team the dialogue contractors had the knowledge, skills and experience to produce excellent dialogue outputs, tailored for the appropriate audience whether internal reports on digital engagement or public documents for publication on the website. As we have seen in the previous sections the outputs were well researched, clear to participants and valued by stakeholders. It is particularly helpful to see a good balance between textual and visual information in the public stimulus materials to support the engagement of the diverse participants in the dialogue.

The final report was completed in September 2014 and shared with the Oversight Group and evaluation team. It provides the National Measurement Office and Sciencewise with a complete overview of the work undertaken, the dialogue and stakeholder engagement methodology used and detailed dialogue findings backed up by participant quotations, presented in a well-written and well-structured document. OG members generally felt the report would be very useful in meeting the project's evidential objectives.

The final dialogue report was published in February 2015, five months after completion. As some stakeholders have pointed out there is a highly political dimension to the report and so extensive consideration was given to how and when the document should be released, particularly following the change of Minister.

"The report is an important document for us to take to international meetings. It's the evidence we need to back up the UK position and there are around 195 countries involved." (Post dialogue stakeholder interview)

All public participants, and the stakeholders at the stakeholder workshop were informed at the end of the sessions that they would be contacted again with a link to the Dialogue report after publication, this link was emailed as promised in March 2015.

8. Impact

8.1 Filling the evidence gap

The leap seconds public dialogue process has been extremely thorough, including stakeholder engagement, public workshops and digital engagement and has undoubtedly filled the identified evidence gap. In the initial stages of the project one stakeholder described the evidence gap as follows,

"What we want and need is something to support the Ministerial decision. The Minister has said publicly that the current policy is based on public views, but we have no evidence for this at all. We can't say that the sample of the public we are talking to is representative, but to say we have a sample of the public involved which has been selected fairly and objectively is still very important." (Pre-dialogue stakeholder interview)

Having gone through the process stakeholders are clear that the UK position can now by informed by public views. As one stakeholder said,

"Having had absolutely zero evidence for what the Minister was saying we now have a nice thick report from OPM. It will add to the Ofcom consultation. I think it has gone a long way in filling the evidence gap." (Post dialogue stakeholder interview)

Soon after completion of the public dialogues a Government reshuffle led to a Ministerial change. This potentially threatened the impact the public dialogue could have. One stakeholder said,

"The dialogue has done all that could be done. It is hard to fill the evidence gap for such an esoteric issue. It was certainly important and worth a try and it was a job well done. The issue was that David Willetts is no longer the Minister who is going to make the decision. I hope that his successor will use it and that the dialogue will not be buried and forgotten." (Post-dialogue stakeholder interview)

However, following meetings with the NMO in the autumn of 2014 the new Minister for Universities and Science, the Rt Hon Greg Clark MP, accepted the dialogue findings as evidence for the previous Minister's position that the UK is in favour of retaining leap seconds.

Between September 2015 and March 2015 NMO discussed the dialogue findings at three meetings with Ofcom. Ofcom leads the UK delegation at the World Radio Conference 2015. At these meetings the main findings of the dialogue report were explained, and UK delegates were encouraged to discuss the dialogue findings at international meetings with representatives of other countries. The website was mentioned as a resource to look at for representatives of other countries should they wish to learn more about the dialogue process and the stimuli created.

In addition, Robert Gunn, Director of Programmes and Estates at NMO, attended a Conference Preparatory Group (CPG) meeting of the Electronic Communications Committee (ECC) in Malta between the 12 and 16 January 2015. The ECC's CPG is responsible for developing briefs, studies, and European Common Proposals for the World Radio Communication Conference in November 2015. Robert informed the representatives of other countries about the findings of the dialogue, encouraged them to undertake similar work, and pointed them to the website if they wanted to find out more.

8.2 The influence of the dialogue on policy

For some participants knowing that their voices were being heard was reassuring and some were surprised that gaining public views hadn't happened before. As one participant said,

"It is extremely important [that public views are heard] I was quite shocked at the fact so many people have never heard of leap seconds including me and how the decisions could have been made with no mention to the public." (Journey tracker Cardiff)

Some participants had absolute confidence that the process would have an impact on policy in the future. They felt that they had every opportunity to understand the issue and come to a view through the process. As one participant put it,

"I had totally made up my own mind by the time I came out. I felt extremely clear about the influence of it, everybody was listened to carefully and I feel confident that the conversations from the workshop would get back to the relevant people." (Post-dialogue participant interview, Belfast)

A participant in another location felt the same as long as the dialogue outputs were effective. They said,

"If the reports are done well, and the video recordings are done well I think Government will take more notice and this will show how engaged we all were in the discussion and how we formed our opinions on facts. I feel the public discussion was a good thing and I truly hope the Government takes this into account." (Journey tracker, Tamworth)

The minority view was that the process might have an impact on UK ministerial decisions, but little impact internationally. Despite that it was felt that the dialogue was worth doing. This is summarised by the comments made by a third participant,

"I honestly feel [the dialogue findings] will not be taken on board enough. I think it is something they will acknowledge but not allow it to sway their decision. However, I feel this is the only way to really resolve the issue, by allowing the public in each country to learn of the issue and take part in a workshop to put their views forward." (Journey tracker, Cardiff)

The evaluation has found no evidence of a significant increase in interest on the issue in the media as a result of the dialogues. When the press release was launched in May 2014 four[26] newspapers picked up the story, however, these simply rehearsed the material in the release. On 6 January 2015, before the publication of the dialogue report The Telegraph[27] published a story highlighting the debate and the UK's position, however, this did not mention the public dialogue as part of the process. At the final OG meeting in July 2014 NMO shared its intention to issue a press release with an exclusive to one main newspaper following the publication of Dialogue report. A simple announcement from the Minister was published on 3rd February 2015. Since the report's publication in February 2015 four[28] Google Alerts have been received by the evaluation team, none of which mention the report and all of which are from specialist and technical media rather than the UK's broadsheet press. The full impact will not be seen until the 2015 conference is held and an international decision is reached. The evaluation team has found no parliamentary discussion of leap seconds during the dialogues or following the report's publication as recorded in Hansard Parliamentary Proceedings in 2014 or 2015.

8.3 Extent to which participants benefitted from the dialogue

74% of the stakeholders at the stakeholder workshop agreed or strongly agreed that they gained knowledge about the leap seconds policy area. Responses to the question about the most valuable element of the workshop centred on an appreciation of the opportunity to listen and discuss a range of views. One stakeholder said that he particularly valued,

"The opportunity to learn from two dozen rare experts in their fields. [It has] enriched my knowledge and understanding hugely." (Participant, stakeholder workshop)

The majority of public participants in all dialogue locations felt they had gained from taking part in the process. In Edinburgh 87% of respondents to the evaluation form agreed or strongly agreed that they had benefited personally, in Belfast 92%, Tamworth 96% and in Cardiff 100%. They said they met facilitators, specialists and fellow participants that they enjoyed talking to; they gained an understanding of an issue which was new to them; and had the opportunity to air their views on a complex issue. This is summed up well by one participant who said,

"I feel I benefited a lot from the workshops for several reasons. The opportunity to learn about something new. The opportunity to meet new people. The opportunity to voice our opinions and concerns. Finally the opportunity to have a say on this issue." (Journey tracker, Tamworth)

For many learning about leap seconds and from other people's views was the most valuable element of the first workshop specifically. This is summarised in the words of two participants in different locations when asked what they valued most they responded,

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[26] The New Statesmen, The Financial Times, the Daily Telegraph, the Independent
[27] The Telegraph, 6 January 2015
[28] Here & Now, US radio programme interview with the US Chief Scientist for Time Services, GPS World Magazine, Inside GNSS, Terrace Standard

"Finding out that there actually is a leap second!" (Public participant, Belfast)

"Discussions within the group, hearing other people's views." (Public participant, Tamworth)

Another benefit described by a minority of participants was that it would make them more aware of the issue when they heard about it in the media, and not only that but more aware of broader scientific issues,

"It's opened my mind a bit more, and I now listen to, watch and read the news more in case I hear anything about leap seconds. So yes, it's made me more open to science too." (Post-dialogue interview, Tamworth)

The opportunity to learn was cited by the majority as a clear benefit in their attendance,

"I knew about leap years but nothing else. This has hugely increased my knowledge and I'm grateful for the opportunity to have learnt so much."
(Journey tracker, Tamworth)

This learning was an opportunity for some to share knowledge with friends and family,

"It's given me an insight in something I didn't even know existed. I feel it's good to learn more and this was something I might be able to tell my friends and family about." (Journey tracker, Edinburgh)

And for other participants the experience was somewhat life-changing,

"It has made me think about time so much more since attending the workshop. It's almost as if it's sparked some incentive for me to do all the things I want to achieve from life before it's too late!" (Journey tracker, Edinburgh)

A small minority didn't feel that they had benefited from the process for two main reasons: either because it didn't affect them personally or that the issue felt obscure and unimportant and there are other issues which they feel should be discussed as a bigger priority. As one participant said,

"I feel that in the context of world and economic issues, the subject for discussion as presented by the stakeholders still ranks pretty low in the grand scheme of things." (Journey tracker, Belfast)

And another,

"I haven't benefited personally. However, in the future a decision will be made on this and I selfishly hope that whatever way that goes the result does not cause personal inconvenience or disruption." (Journey tracker, Belfast)

It is clear that participants have benefited from the dialogue in terms of learning, social interaction and gaining an interest in a new issue.

8.4 The dialogue process is valued and recognised as being open and credible
The majority of the respondents to the evaluation process when asked about the value, openness and credibility of the dialogue process were extremely positive. The public felt that the group discussions within the dialogue helped them to come to a view by listening to others which opened their minds to things they hadn't considered before. As one participant put it,

"Other people's views make your opinion. You may think one thing to start with but when listening to others it evolves. It's a healthy way of exploring other avenues." (Journey tracker, Edinburgh)

This led to some participants concluding that more policy should be informed by public views gained through the dialogue process. This view is summed up by one participant who said,

"I most certainly feel it is important for the Government to hold public dialogues on such important issues. I feel the Government can learn a lot by listening to members of the public's views." (Journey tracker, Edinburgh)

However, this majority view is not shared by all as evidenced by this comment made through the leap seconds website,

"A scientific question should not be open to public opinion." (Snap survey comment)

And another on the leap seconds discussion list,

"As a social scientist who watched the British process from the outside, I had some concerns about it. In particular, I was bothered by Minister Willetts announcing his feelings and THEN hiring the outside consulting group to write a report. Social and cultural dimensions do matter, but if researched in a way that can be labelled as biased, then the results are easily dismissed." (New York scientist contribution to the leap seconds discussion list during the Geneva conference October 2014)

However, by far the majority of those who expressed a view on the subject said that they did see the value in the process as summed up in the

following quotations,

"It should be done more. It's not easy to do, they had such a good range of people in the room. It's very good as well they use people like me to open up a space for more people to engage with the topic. I blogged about it as I work in a space between research and the public domain." (Post-dialogue expert interview)

"We've done something nobody else has done in the world." (Post-dialogue stakeholder interview)

8.5 Dialogue benefits outweigh the costs
As stated earlier in the report the total cost for the dialogue part-funded by Sciencewise was almost £175,000. The majority of stakeholders interviewed by the evaluation team on the benefits in relation to the cost of the dialogue believe that the process was value for money because in their view if the dialogue provides the evidence necessary to inform the Minister's view it has provided good value. One stakeholder said,

"If the dialogue changes the Minister's point of view the costs of the dialogue will outweigh the benefits by far. Major telecom operators are aligned to UTC. If UTC was to be redefined contractual arrangements would need to be revisited including those with Government." (Pre-dialogue stakeholder interview)

And a similar point is put simply by another stakeholder who said that value for money is achieved if,

"Ministers are happy that they've been given good advice with good supporting evidence." (Pre-dialogue stakeholder interview)

And a third said,

"It is definitely money well spent. We were making very bold statements on the public's view on absolutely no evidence. If anyone had challenged us the Minister would have ended up with egg on his face." (Post-dialogue stakeholder interview)

For others evidence for negotiations at an international level demonstrates that the benefits outweigh the cost,

"I don't know at all in Government what these things cost. They've got evidence when they go to international colleagues which is always good." (Post-dialogue stakeholder interview)

"The trouble with leap seconds is that we are up against countries such as America and France. There hasn't been enough dialogue about this

anywhere in the world. It was necessary for the British Government to do this in order to convince the USA and others that they've got it wrong. That seems to have been the purpose of this dialogue, it was necessary to back up the UK's position." (Post-dialogue stakeholder interview)

The importance of having gained evidence from public views is seen by some as a valuable benefit in relation to cost in itself. One stakeholder said,

"Yes it is money well spent. To engage with the general public you have to go out and spend money. It is fundamental that an attempt has been made to talk to the man in the street. It's become endemic in society that experts and talking heads talk amongst themselves, for example on television."
(Post-dialogue stakeholder interview)

Another highlighted the value of the evidence in the context of recent political changes,

"It is perhaps slightly less value now Willetts is not in the role of Minister anymore. It is not a waste of money though. The materials through the website and the report that have been created are valuable and have/ will become a resource that we can make available to the world." (Post-dialogue stakeholder interview)

There was another view, given by a very small minority, who said that they were not convinced about the value for money of the process,

"The brief was that the public dialogue would either validate the Minister's statement or not. They got what they wanted and the evidence gap was filled. Whether you could have found this out in a more efficient way, I would say 'yes'. I don't think this was a subject ready for public dialogue."
(Post-dialogue stakeholder interview)

The same interviewee felt that the lack of stakeholder engagement from the beginning of the process was the main reason for the costs outweighing the benefits,

"You need stakeholders for a public dialogue. If there aren't any it indicates it isn't a controversial issue so why do we spend public money on running a public dialogue?" (Post-dialogue stakeholder interview)

A minority of participants agreed that the issue was not appropriate for consideration of public opinion. As one put it,

"Governments are elected to make decisions on our behalf and certainly where the effective change is wide ranging and of current public interest or concern, then they should seek that particular opinion. I cannot see how this matter falls into that category and in terms of value, I am concerned at the decision to seek this consultation given the costs of doing so therein." (Journey tracker, Belfast)

9. Learning points

It is an important part of the evaluation process that consideration is given to what went well and what went less well so that subsequent public dialogues can learn from and build on the process.

9.1 Project management - A flexible project management structure is essential for any complex dialogue
The dialogue contractor set the scene extremely well for excellent project management by setting out actions against timescales using post-it notes presented on the wall at the inception meeting. This gave an immediate opportunity to the project team to work flexibly, adjust the activity timescales and include additional actions before the plan had been finalised in a project management tool. It is clear that the project was delivered on time and on budget. However, the addition of website development and the need to do significant research to identify stakeholders had a knock on effect on resources and staff capacity. The dialogue delivery contractor handled this situation well.

9.2 Time allocation - In any public dialogue sufficient time is required to set-up the project systems
Due to the fixed deadline of the 2015 conference there was no flexibility in time-scales. The programme inception meeting with the dialogue contractor was held on 10 March 2014 and the stakeholder workshop held the following month. From observation and evaluation interviews it was clear that more time would have been helpful in this period, particularly to allow for more project team and OG involvement in gaining stakeholder engagement, described as a challenge to the programme in section 5.3, so that the task did not fall in the main on the dialogue contractor.

9.3 Stakeholder engagement – Dialogues are best served when stakeholders are identified well in advance of the beginning of the programme
This area was a key challenge for the project. As one stakeholder said the process could have been much more effective if an existing comprehensive stakeholder map had been developed before the dialogue planning and research began.

"Pick the experts beforehand and target individuals for particular sessions with a longer lead in time. OG members only received a generic email with a call to indicate at which of the sessions they could have a presence. However, it was only about two dates as sessions ran concurrently. It would have been better if we had had a choice of 4 different dates. Perhaps all OG members should have been offered a fee for weekend attendance." (Post-dialogue stakeholder interview)

The challenges for the engagement process have been well rehearsed in section 5.3. It should be noted here that dialogues are best served, with an effective interaction between the public, topic specialists and experts when those experts have been identified and brought in to the project well in advance.

9.4 Co-production – Co-production between the dialogue contractor and Oversight Group is of value to effective process design.

From evaluator observation the time allocated to process design seemed to be very effective, allowing the design to evolve from initial discussions with the OG to detailed process plans with integrated facilitation team briefing. This was in part due to the extensive experience of the dialogue contractor which knew the expectations of a Sciencewise-funded dialogue well and could ensure that the dialogue design was fit for purpose without a great deal of input from a wider project team. The delivery of the process plan through the workshops was found, by the majority of participants to be very supportive of their information needs and to meet the dialogue objectives very well. However, it would have helped the process if there could have been rather more co-production between the dialogue contractor and the Oversight Group on the website and stimulus materials, leaving less reliance on the dialogue contractor to research the key issues particularly in areas where there was not sufficient stakeholder resource to draw on from the OG.

9.5 Aims, objectives and terms of reference

The OG employed the generic Sciencewise Terms of Reference (ToR) for their work, but it would have been extremely helpful at the first meeting if time had been allocated to agree a tailored ToR which set out roles and responsibilities in terms of building the stakeholder map and attending a number of the public workshops. In addition we found that stakeholders would have welcomed further clarity at each meeting on who was present, what their roles were and what the objectives for that specific meeting were.

There remains in the minds of some stakeholders the question as to whether a public dialogue should be held if its purpose is solely to inform a Ministerial decision. There is enough evidence to suggest that stakeholders and public alike saw the value in the dialogue process for this purpose, particularly as it provided significant benefits for participants in learning from others, learning about an issue they hadn't heard of before and opening their eyes to the interesting aspects of science which they had not perceived as yet. However, the evaluation of the process has highlighted a significant learning point for future dialogues in the inherent risk in launching a public dialogue to inform a specific decision by a specific decision-maker at a specific time. A change-over of Ministers is always a challenge when a public dialogue is well under way. However, the impact a public dialogue might have is less likely to be affected when the objective is sufficiently broad to provide rich data to influence a range of policy areas and decision makers.

Moreover, when the dialogue revolves around an issue for which there is a relatively small stakeholder base, present from the outset, there is a risk that the outcome is not as sound as it should be. Participants decided there was insufficient evidence to change the current UK position (to keep leap seconds) and as such provided a 'yes' answer. However, there is no guarantee that a process in which a wider range of perspectives had been presented would have led to the same dialogue outcome. Even though every effort was made to engage a wide range of stakeholders, a lack of awareness of the issue and recognition of its significance, particularly with cultural, faith and heritage groups meant that the public was not presented with a full range of views with which to deliberate all aspects of the role of leap seconds in time measurement.

9.6 Report writing and other outputs

The high quality of report writing, website content and stimulus materials will be of value as an example of providing resources for stakeholders and the public for future dialogues. The OPM reports provided a clear framework from which to understand the dialogue findings. The website provided the right level of content for the variety of users and generated over 1,300 unique visits which is significant in the time-frame and given the binary nature of the issue at hand. The stimulus materials were highly valued by participants and stakeholders alike.

10. Conclusions

The leap second public dialogue was well run and designed. The majority of participants enjoyed being part of the process and it has demonstrated the value of public dialogue to stakeholders and the public. The dialogue objectives were met: the diversity and strength of public opinion about leap seconds was explored and the impact of maintaining a link between the earth's rotation and time measurement was shared with a number of stakeholders.

Evaluation of the process has highlighted two significant learning points for future dialogues. It has become clear that there is a risk in launching a public dialogue to inform a specific decision by a specific decision-maker at a specific time. A change-over of Ministers is always a challenge when a public dialogue is well under way. However, the impact a public dialogue might have is less likely to be affected when the objective is sufficiently broad to provide rich data to influence a range of policy areas and decision makers.

When the dialogue revolves around an issue for which there is a relatively small stakeholder base present from the outset, there is a risk that the outcome is not as sound as it could be. In this case the dialogue contractor mitigated this risk by providing a range of views in alternative ways such as stakeholder vox-pops and written statements. The UK public decided there was insufficient evidence to change the current UK position (to keep leap seconds) and as such provided a 'yes' answer. In future dialogues having a broad stakeholder base from the outset is an important aspect of the set-up phase.

The Leap Seconds Public Dialogue was well conducted, well designed and the process and findings are credible. The majority of participants enjoyed being part of the process and it has demonstrated the value of public dialogue to the public in informing public policy decisions.

Even though publication of the dialogue reports was delayed due to an unforeseen change in Minister the project was completed on time and on budget. It has provided evidence for the UK position on the retention of leap seconds and the dialogue outcomes have been shared at key international meetings in preparation of the World Radio Communication Conference to be held in November 2015.

11. Acknowledgements

Hopkins Van Mil: Creating Connections Ltd is very grateful to all those who have given their time for interviews to inform the evaluation. The willingness of dialogue participants, stakeholders, experts as well as the dialogue contractor, project owner and Sciencewise DES to share their views has been immensely helpful to contextualise observations and survey data.

It has been a pleasure to work with Paul Broadbent and Robert Gunn at the National Measurement Office. We thank them for wholeheartedly embracing the evaluation process and being available to meet the needs of the evaluation team. Drawing on a wealth of experience in monitoring and evaluation Diane Warburton, Evaluation Manager at Sciencewise was always available for expert advice. HVM is equally grateful to her.

Appendix 1: Evaluation plan

Leap second public dialogue
Baseline evaluation statement

1. Purpose of this document

The purpose of this baseline evaluation statement is to propose an evaluation plan for the leap seconds public dialogue and provide an overview of the expectations of the project owner (National Measurement Office), project funder (Sciencewise), dialogue contractor (OPM) and a small number of stakeholders. This statement is informed by written responses to a project initiation questionnaire (see Appendix 1) and 6 telephone interviews (see Appendix 2: Discussion guide).

2. Objective of the dialogue

The Invitation to Tender (ITT) specifies that the overall objective of the public dialogue is:

'To determine the importance to the public of a link between time and earth's movement, in order to inform a ministerial decision on how the UK should vote on an issue which is internationally controversial.'

3. Indicators of success

HVM will evaluate this project in line with the *Sciencewise Guiding Principles for Public Dialogue* and assess the Context, Scope, Delivery and Impact of the public dialogue. In addition we have used the seven key questions in evaluating Sciencewise projects[29] to determine further indicators of success:

1. Has the dialogue met its objectives? Were the objectives set the right ones?
2. Has the dialogue met standards of good practice?
3. The value and benefits of the project, including the extent to which all those involved have been satisfied with the dialogue outcomes and process.
4. How successful has the governance of the project been, including the role of stakeholders, oversight groups, the commissioning body and Sciencewise?
5. What difference / impact has the dialogue made on policy and decisions, on decision making, and on policy makers and others involved including public participants, expert speakers and other stakeholders?
6. What was the balance overall of the costs and benefits of the dialogue?

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[29] http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Publications/SWP07-Evaluating-projects-27March14-FINAL.pdf

7. What are the lessons for the future?

The seven questions specified in the Sciencewise guidance broadly reflect the views of the project owner, project funder, dialogue contractor and two other stakeholders who indicated in telephone interviews that they expected to see the following changes as a result of the public dialogue:
- The Secretary of State's position will be informed by stakeholder and public views on the implications of retaining or removing leap seconds.
- The NMO will have filled the evidence gap for (or against) the minister's statement that the public are concerned about maintaining a link between time and the sun.
- Stakeholder awareness of the leap seconds and the implications of retention/ removal will be raised.
- A small section of the public will have an increased knowledge of the implications of retaining/ removing leap seconds and the importance of time in everyday life.
- Increased discussion of the leap seconds issue in the public domain.
- The NMO and stakeholders in the projects will have a better understanding of the place and value (and limitations) of public dialogue and be more willing to be involved in / use public dialogue in future.

In section 6 the indicators of success are matched with evaluation activities to ensure all relevant areas of the project are assessed in as much detail as possible.

4. Key steps towards success
The stakeholders interviewed in the initial stages of the project identified a number of key steps towards success
- The process has to be transparent (open and accountable with an auditable trail).
- Representation of a wide range of issues and options.
- Dialogue results have to be credible.
- Dialogue participants need to be provided with accessible and objective stimulus materials and presentations.
- Dialogue results need to be reported and disseminated effectively.
- Senior policymaker involvement from the start of the project.
- Key stakeholders willing to engage with the project as it proceeds.
- Recruitment of a representative sample of the public to the workshops.
- Digital engagement of wider range of stakeholders and cross section of the public.

HVM will keep a close eye on progress in these areas and use the formative project management updates with the project owner to report on observations.

5. Challenges

Based on the stakeholder interviews it has become clear that gaining buy-in from a wide range of stakeholders is the main challenge at this stage in the project. The dialogue contractor reports that they have spent more time than planned on identifying, contacting and involving stakeholders. There are particular concerns around effective engagement with the Ministry of Defense and ensuring representation of a range of cultural/ faith groups. This has prompted the decision to postpone the start of the public dialogues by two weeks to gain time and to offer stakeholders an incentive for participation.

A second challenge is that the project scope has changed with the inclusion of a digital platform. Whilst this increases the visibility of the project and the opportunity for wider stakeholder and public engagement it also adds a layer of complexity in terms of reporting on the outcome of the process. Digital responses will not necessarily be given following deliberation of the issue, whereas participants in the public dialogue will be taken on a journey during which they will gradually increase their understanding of the issue based on interaction with experts and stakeholders. It is likely that the website will see contributions which clearly are a result of reflection on either the dialogue sessions or the resources available online and others that are more front of mind comments. The evaluation will need to review how responses will be weighted for reporting purposes.

6. Mapping the journey: evaluation plan

HVM's evaluation plan balances the need for formative evaluation input and a summative evaluation to assess the impacts of and lessons from the public dialogue. Due to the importance of post-dialogue stakeholder interviews about the impact of the project and the addition of a project website we propose observation of fewer dialogue sessions than included in HVM's tender. See table 1 for an overview of evaluation activities and table 2 for a detailed evaluation plan.

Evaluation activities	Numbers
1. Structured observation decision making process at OG meetings	Attendance 5 meetings
2. Structured observation dialogue sessions	4 sessions: stakeholder workshop; round 1 and round 2 dialogue Edinburgh; summit London
3. Pre- and post-dialogue interviews dialogue contractor, project owner, OG members, policymakers	6 pre- and 12 post-dialogue interviews; expert interviews Edinburgh
4. Desk research	• review stakeholder map • review desk research dialogue contractor • review discussion guide/ process plan • monitoring website: number, type and timing of contributions • analysis recruitment screener/ profile dialogue participants

	• analysis and reporting of dialogue findings
	• plans for using dialogue results including report dissemination strategy
	• overall costs/ funding
5. Self-completion questionnaire	At all dialogue events
6. Journey tracker	8 dialogue experience logs, 2 participants per public dialogue location
7. Post-dialogue participant interviews	4 interviews, 1 per location
8. Media and parliamentary report tracking	Weekly Google alerts and Hansard review

Table 1: Evaluation activities

Evaluation plan Leap seconds dialogue	April-October 2014	
What we are looking for / Indicators	**How are we going to find out/ Evaluation activities**	**When**
CONTEXT	The conditions leading to the dialogue process are conducive to the best outcomes	
17. Governance & project management • Input OG • Management of meetings • Roles and responsibilities	Structured observation decision making process at OG meetings; pre- and post-dialogue interviews dialogue contractor, project owner and OG members	March-Sep
18. Stakeholder engagement • Methodology • Extent to which it strengthens dialogue	Review stakeholder map; pre- and post-dialogue interview project owner, contractor and OG members; structured observation stakeholder workshop and dialogue sessions	Apr-Jul
19. Representation of cross section of the public	Analysis of recruitment screener/ profile dialogue participants	June
20. Buy-in from policy actors	Pre- and post-dialogue interviews policy-makers & OG members	Apr-Oct
21. Sufficiency of resources	Pre- and post-dialogue interviews project owner, funder and dialogue contractor	Apr-Sep
SCOPE	Range of issues covered reflect stakeholder and public participants' interests	
22. Clarity about the scope of the discussion	Structured observation dialogue sessions; self-completion questionnaires; journey tracker; post-dialogue interviews	Apr-Jul
23. Involvement diversity of perspectives	Structured observation dialogue sessions; self-completion questionnaires; journey tracker; post-dialogue interviews	Apr-Jul

DELIVERY	The dialogue process represents best practice in design and execution	
24. *Appropriateness dialogue environment (venue/ catering/ accessibility)*	Structured observation dialogue observation; self-completion questionnaires	Apr-Jul
25. *Appropriateness dialogue techniques, process and tools representing range of views* • Dialogue design • Expert involvement • Participant packs • Stimulus materials	Review discussion guide/ process plan; structured observation dialogue sessions incl expert interviews; self-completion questionnaires; journey tracker; post-dialogue interviews OG members and participants	Apr-Jul
26. *Dialogue conducted fairly, respectfully and with no in-built bias*	Structured observation dialogue sessions; self-completion questionnaires; journey tracker; post-dialogue interviews participants	Apr-Jul
27. *Dialogue outputs which are relevant to and can easily be understood by the public, policy-makers and other stakeholders* • Leap seconds website • Reports	Review web interventions and reporting; post-dialogue interviews participants, policy-makers and OG members; review of data analysis / reporting and plans for use of report	May-Sep
IMPACT	The dialogue can deliver the desired outcomes	
28. *NMO has filled evidence gap for or against Minister's statement*	Pre- and post-dialogue project owner and OG interviews	Apr-Jul
29. *Policy influenced by dialogue* • Mentioned in media • Referred to in parliamentary reports	Weekly media tracking (Google alert); weekly parliamentary report tracking (Hansard); pre- and post-dialogue interviews OG members & policymakers; structured observation summit	Apr-Oct
30. *Evidence has influenced international opinion*	Weekly media tracking (Google alert); monitoring contributions to leap seconds website	Apr-Oct
31. *Participants have benefitted from the dialogue*	Journey tracker; post-dialogue interview participants; self-completion questionnaires	Jun-Jul
32. *Dialogue process is valued and recognised as being open and credible*	Self-completion questionnaires; structured observation dialogue sessions; journey tracker: post-dialogue interviews with	Apr-Sep

	policymakers, OG members, project owner and dialogue participants; monitoring website postings	
33. Dialogue benefits outweigh the costs	Summary overall costs/funding; post-dialogue interviews policymakers and OG members ('money well spent?')	Apr-Sep

Table 2: Evaluation plan

Appendix 2: Observation Guide – Oversight Group meetings

1. Meeting aims

By the end of the meeting we will have (these are being stated / agreed at the meeting):
Are the objectives clear?

2. Observation in line with the agenda

Introductions • Efficient • Clarity on who is in the room / phone?	
Stakeholder workshops • Learning gathered • Consideration of questions asked & way they are addressed	
Public workshops • Clarity on plans • Variables on recruitment explained • Stakeholder attendance explained • Change in timetable • Impact on summit event • Consideration of questions asked & way they are addressed	

Website & digital engagement • Update • Post launch plans • Consideration of questions asked & way they are addressed **[note – this section may not be possible on the phone]**	
Press & comms • Update • Consideration of questions asked & way they are addressed	
AOB • What comes up that hasn't already been covered	

3. General points arising from process

• Good / clear meeting chairing • Professional responses from facilitation team • Consideration of responses from commissioning bodies • Consideration of responses from OG members • Has the session met agreed aims?	

Appendix 3: Baseline stakeholder telephone interview discussion guide

Thank you for agreeing to speak to us today. Hopkins Van Mil (HVM) is conducting an independent evaluation of the Leap Seconds Public Dialogue commissioned by the National Measurement Office, jointly funded by Sciencewise and delivered by the OPM Group. The purpose of this discussion is to understand the views of key stakeholders before the public dialogue delivery begins. It is important that the evaluation provides an insight into the impact of the public dialogue and any lessons learnt. All comments will be non-attributable in the evaluation report.

1. The results of the dialogue are intended to inform the ministerial decision on how the UK should vote on the issue of leap seconds. What are the main steps to ensure that this is the case?
2. What needs to happen to make sure the results of the dialogue are credible?
3. How do you expect participants in the dialogue to benefit from it?
4. To what extent is it important for stakeholders / public participants to buy in to the dialogue process?
5. A cost benefit analysis is a significant part of the evaluation:
    a. What are the benefits you would expect to see from the dialogue to make it worth the cost?
    b. How should intangible benefits be monetised in order to asses this?
    c. How will you know money has been well spent?
6. What do you expect from the Oversight Group in preparation for, during and after the dialogue?
7. What has changed in the project since the inception meeting?
8. Is there anything else HVM should know before the dialogue begins?

It will be helpful to the evaluation to be able to speak to you again at the end of this process. We will be in touch after the last dialogue session to arrange that. Many thanks for your time.

Appendix 4: Interviewee list overview

Leap seconds interviews completed		when	number	role
Tracey Bedford	The OPM Group	pre- and post-dialogue	2	dialogue contractor
Rob Angell	The OPM Group	pre- and post-dialogue	2	dialogue contractor
Alison Crowther	Sciencewise	pre- and post-dialogue	2	Sciencewise DES
Robert Gunn	NMO	pre- and post-dialogue	3	project owner
Usama Hassan	Quilliam Foundation	pre- and post-dialogue	2	OG member
Charles Curry	Chronos	pre-dialogue	1	OG member
Michael Brooks	Journalist	post-dialogue	1	OG member
Catherine Hohenkerk	UK Hydrographic Office	post-dialogue	1	OG member
Robert Massey	Royal Astronomical Society	post-dialogue	1	OG member
Steve Bell	Ofcom	post-dialogue	1	OG member
Bharat Dudhia	Ofcom	post-dialogue	1	OG member
Niall Boyle	NMO	post-dialogue	1	expert present at dialogue session
James Blessing	Internet Services Providers	post-dialogue	1	expert present at dialogue session
Stephen Colbourne	software engineer	post-dialogue	1	expert present at dialogue session
Bronac Ferran	Royal College of Arts	post-dialogue	1	expert present at dialogue session
Rory McEvoy	National Maritime Museum	post-dialogue	1	expert present at dialogue session
Public participants		post-dialogue	6	
			28	

Journey trackers

6 completed in 2 rounds