INDUSTRY CANADA

EVALUATION OF THE TECHNOLOGY ROADMAP FOR INTELLIGENT BUILDING TECHNOLOGIES

March, 2005
Executive Summary

This document presents the findings from an evaluation of the Technology Roadmap for Intelligent Building Technologies that began in the fall of 1999. The Technology Roadmap Report was released in December 2002.

A Technology Roadmap (TRM) is a process tool to help Canadian industries, or sectors within an industry, identify and address the technology challenges that are critical to their future.

The TRM for Intelligent Building Technologies (the “IBT TRM”) was a collaborative research project between industry and five Canadian federal government organizations. The TRM project was managed by the Continental Automated Buildings Association (CABA).

The purpose of the TRM was to clarify the challenges and opportunities in the general area of “intelligent building technologies” (IBT). The lack of understanding of IBTs by the construction industry was identified by TRM participants as a significant national issue because it was the major obstacle to the adoption of those emerging technologies.

Evaluation Findings

Results from the IBT TRM

The evaluation revealed that the IBT TRM has produced results that are important to industry. First the IBT TRM Report was considered to be useful and was used by industry members. Also several new initiatives were launched as a direct result of the IBT TRM, and others were indirectly attributed to the TRM initiative. These initiatives include

- The creation of the Intelligent and Integrated Buildings Council (IIBC) sub-committee of CABA to act on the recommendations of the TRM initiative,
- Planning by CABA (independently from Industry Canada) for a new Technology Roadmap initiative, modelled on the IBT TRM, to focus on residential, rather than commercial, buildings, and
- Indirectly and difficult to attribute, the adoption of new divisions in the Master Format for building design in the United States.

One of the most significant results achieved from the IBT TRM has been the creation of networks of contacts that have continued to pursue the objectives of the TRM. Also, CABA used the release of the IBT TRM Report as an opportunity to promote its own role to its membership and to other stakeholder groups.

The evaluation findings indicated that, even after Industry Canada was no longer involved, follow-on impacts from the IBT TRM continued to occur and new
projects were launched. In essence, the TRM process appears to have become self-sustaining.

**Findings Related to the IBT TRM’s Process**

The evaluation of the IBT TRM revealed that, although the process started slowly, the timing of the TRM was right, the right participants were selected, the level of interest and participation were strong and the right areas of study were selected:

- TRM was undertaken at a time when the industry could benefit from the results, primarily because of the general focus in 1999 on the significant uses and benefits of interconnecting information technologies.

- There was general consensus among interviewees that Continental Automated Building Association (CABA) was the right choice as facilitator of the IBT TRM process. The organization’s objectivity and independence, and the close linkage between CABA’s mandate and the TRM’s objective contributed to the initiative’s success.

- Participants from both the private and public sectors showed a strong commitment to the process throughout, thereby supporting the view that the TRM added value to participants’ organizations.

- The individuals brought together to participate in the IBT TRM came from diverse backgrounds. While this presented some challenges in terms of developing consensus on the TRM’s direction, it enabled the TRM to reflect a broad perspective of the issues facing the adoption of IBTs by industry.

- The TRM appeared not to have an identifiable industry champion. A well-performing industry champion might have encouraged the process to move ahead more deliberately, thereby saving some time and frustration.

- The areas of study chosen by the Steering Committee addressed the most important obstacles to IBT’ future success.

**Industry Canada’s Involvement**

Once the IBT TRM Report was issued, Industry Canada and the other federal organizations discontinued their involvement in the TRM process, even though there may still have been opportunities for Industry Canada to add value. Given the findings from the IBT TRM and Industry Sector’s mandate, the Sector’s officers could likely play a facilitation role vis-à-vis several drivers of the technologies’ development, although the feasibility of each of these potential roles would need to be explored. It would seem to be in Industry Sector’s interest to invest in a more sustained way in TRMs that support the sector’s more strategic objectives, and IBTs seem to be good examples of such technologies.
# Industry Canada

Evaluation of the Technology Roadmap for Intelligent Building Technologies

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EVALUATION OF THE TECHNOLOGY ROADMAP FOR INTELLIGENT BUILDING TECHNOLOGIES

This document presents the findings from an evaluation of the Technology Roadmap for Intelligent Building Technologies that began in the fall of 1999. The Technology Roadmap Report was released in December 2002.

The purpose of the evaluation was to obtain information on the results achieved through Phase 1 of the Technology Roadmap for Intelligent Building Technologies, and on the success of the process followed in that first phase. The three phases of Technology Roadmaps are described in the next section.

1.0 Background

1.1 Overview of Technology Roadmaps

A Technology Roadmap (TRM) is a process tool to help Canadian industries, or sectors within an industry, identify and address the technology challenges that are critical to their future. Developing and implementing a TRM involves a three-phase process, as follows:

**Phase 1:** Developing a formal TRM for an industry, a sector, or common areas of interest. Results from this developmental phase are captured in a formal Technology Roadmap Report, which is an important deliverable from Phase 1 of a TRM initiative. A Technology Roadmap Report typically captures the following information that was developed during the Phase 1 process:

1) The technologies that are critical to future competitiveness of an industry or of related industries, based on the participants’ knowledge and analysis of future requirements;

2) Technological requirements and opportunities for the industry’s supply chain; and

3) Recommendations for action on how multiple organizations from industry, academic institutions, research organizations, and governments can work together to crack those technologies.

**Phase 2:** Selecting and undertaking projects identified in Phase 1 of the TRM to crack the identified critical technology challenges.

**Phase 3:** The adoption by an industry, a sector, and/or other concerned organizations of a “culture of collaborative technology development” as part of their normal method of operation.
The life-cycle of all three phases of a TRM will most often cover a period of several years.

A key characteristic of TRMs is that they are “industry-led.” This approach helps industry to buy into the results, and is a contributing factor for the initiative to proceed through all three phases, ultimately leading to ongoing collaborative technology development.

The process for developing a TRM typically involves several companies from an industry (or from one or more industrial sectors within an industry) that come together to identify the technologies that are critical to their collective future, and to establish a collaborative approach to developing those technologies. The key objective of a TRM initiative is to provide a mechanism to enable organizations within an industry or a sector to achieve a collective decision on future technology development, and to establish a commitment to work together in addressing the related technological challenges.

### 1.2 Overview of the Intelligent Buildings TRM

The TRM for Intelligent Building Technologies (the “IBT TRM”) was a collaborative research project between industry and five Canadian federal government organizations: Industry Canada, the National Research Council, Public Works and Government Services Canada, Natural Resources Canada, and the Canada Mortgage and Housing Corporation.

Private sector participants included representatives from Siemens Energy and Automation Inc., Tridel Corporation, Nortel Networks, Hydro-Québec, Honeywell Limited, and Bell Canada.

The TRM project was managed by the Continental Automated Buildings Association (CABA), located in Ottawa.

The representatives from above organizations came together as a Steering Committee to select areas of study for the TRM. The study work was undertaken for CABA by a consulting firm, IBI Group.

The purpose of the TRM was to clarify the challenges and opportunities in the general area of “intelligent building technologies” (IBT). The lack of understanding of IBTs by the construction industry was identified by TRM participants as a significant national issue because it was the major obstacle to the adoption of those emerging technologies.

The Steering Committee focused the TRM on commercial, institutional and high-rise residential buildings, both new projects and retrofits. This scope was chosen primarily because those segments of the industry were seen to be the ones that could potentially benefit most from IBTs and would be the most likely to adopt these technologies.

The TRM initiative had the following five main objectives:
• Develop a clear definition of “intelligent building technologies”;
• Identify what was currently available in terms of those technologies;
• Identify obstacles to the implementation of IBTs in building projects;
• Identify any gaps in industry knowledge; and
• Make recommendations to overcome the challenges identified.


The IBT TRM differed from other Industry Canada Technology Roadmap initiatives by focusing more on the cultural and behavioural obstacles to technology adoption, rather than on the development of a technology itself, or on the “cracking” of a technological challenge. It was recognized early in the IBT TRM process that the technologies already existed, but that non-technological factors impeded their adoption by the building industry. To date, the development of IBTs has been led by those who understand the technologies and their potential, rather than in response to an identified market opportunity -- they have been technology-driven, rather than market driven. For this reason the TRM focused on strategies to encourage the understanding and adoption of IBTs by the marketplace.

A second reason supporting this direction came from the industry’s slow take-up of new technology. Because of the considerable length of time that the building industry has traditionally taken to adopt new technologies, identifying strategies to encourage the adoption of IBT, rather than technology issues per se, was a sensible focal point of this TRM. This characteristic was considered to be even more pronounced in the commercial building industry sector. Commercial buildings are more complex and, in their construction, there is an even greater aversion to implementing new unproven technologies that could adversely affect long-term financial returns. As one interviewee noted, “one major barrier to intelligent buildings is the slow pace of innovation in the building industry. It doesn’t pay to innovate because there are often few financial benefits, and there may be long-term risks.” Of the 10 interviewees, seven commented explicitly that the industry’s slow pace to take up new technologies was the main driver to choosing the direction of the TRM, and no interviewee identified any other main industry characteristic affecting the TRM’s direction.

Industry Canada involved four other federal government organizations because these organizations also had a potentially strong interest in the use of IBT, either as users, or as supporters of research in this technology area. They also became funding partners for the TRM initiative.
1.3 Evaluation Methodology

The methodology for this evaluation included the review of relevant documents and interviews with members of the TRM Steering Committee and others involved in the TRM process.

The following documents were reviewed:

- The IBT TRM Report, titled “Technology Roadmap for Intelligent Buildings”;
- Technology Roadmaps: Progress Report and Contribution to Canada’s Innovation Strategy (Industry Canada); and

Interviews were carried out during January, February and March 2005. Representatives from the following organizations were interviewed:

- All government departments and agencies involved except for CMHC (the representative was not available for interview during the study period);
- All private sector companies except two (one declined the interview, and the other could not be located);
- The Continental Automated Building Association; and
- Precarn Incorporated, a national, member-owned industrial consortium supporting the development of intelligent systems technologies through its network of corporations, research institutes and government partners.
2.0 Findings

This section describes the findings from the evaluation. The first part highlights the results achieved from the IBT TRM initiative, and the second describes the effectiveness of the process undertaken to achieve those results.

2.1 The IBT TRM Generated Significant Results

The evaluation findings suggest that the IBT TRM has produced results that have added value and have continued to do so since the publication to the report. The following sub-sections discuss the utilization of the IBT TRM report, new projects and new initiatives, promotional initiatives, and network building.

2.1.1 The report was useful and used

Feedback from interviewees and industry members supports the view that the IBR TRM Report was useful and used. Interviewees indicated that the report provided a useful reference for describing IBTs and their potential. Also, continued distribution of the TRM Report suggests an interest in the report. According to CABA, all 1,000 hard copies were distributed within months of the report’s release, and, as of March 2005, the electronic version of the report was downloaded 1,962 times since it was first uploaded onto CABA’s web site in 2002. This level of activity suggests that the IBT TRM Report is of interest to the industry’s stakeholders.

Comments on CABA’s web site also show support for the TRM report. A quote from a representative of Johnson Controls indicates that "the CABA Technology Roadmap for Intelligent Buildings is a well researched and written document that I promote as recommended reading for our people as well as architects, engineers and owners. It presents a solid portrait of the state of our industry and a clear vision of where we are headed." A comment from AutomatedBuildings.com says "the roadmap is an excellent starting point for our large building automation industry to begin its re-invention and re-packaging."

Overall, these views indicate that the report has added value to the industry and continues to be useful.

2.1.2 New projects and initiatives

The evaluation determined that several new initiatives were launched as a direct result of the IBT TRM, and others were indirectly attributed to the TRM initiative. Examples of these include the following:

- The creation of the Intelligent and Integrated Buildings Council (IIBC), a sub-committee of CABA, to act on the recommendations of the TRM initiative. Since its creation, the IIBC has developed three white papers on
IBTs and related tools, including a life-cycle cost calculator, in order to help educate stakeholders about IBT. An interview indicated “the IIBC deals directly with issues identified in the TRM. The TRM was the trigger.”

- CABA is planning a new Technology Roadmap initiative, modelled on the IBT TRM, to focus on residential, rather than commercial, buildings. This new TRM is expected to be led and funded entirely by the private sector.

- A possible indirect result of the TRM is the adoption of new divisions in the Master Format for building design in the United States. One of the barriers to the adoption of IBTs has been the exclusion of IBT experts from the design and development stages of building projects. The IBT TRM highlighted this issue as a major barrier to the industry’s progress. In 2004, the Master Format was changed to include several new divisions, including ones for communications and for fire and safety.

Private sector companies have also launched new projects as a result of the IBT TRM. For example, one new private sector project resulting from this TRM involves the development of a technology that regulates heat to save on energy costs.

All interviewees from the private sector agreed that the IBT TRM initiative was useful in gaining a greater understanding of IBT, which has helped to shape the activities that their companies since that time. As one interviewee said, “the lessons learned were applied to our business. It prepared us for selling different elements and concepts of IBTs to our customers.... “

Several interviewees mentioned that even more projects may have resulted indirectly from the IBT TRM initiative. However, the attribution of these to the TRM is not easily identifiable or measurable. For example, other organizations may have adopted the knowledge from the TRM exercise and developed new technologies that are more difficult to tie directly to the TRM. As one interviewee said, “Some work has gone on in Japan, China, Thailand, and maybe one or two projects in the US. But they wouldn’t necessarily flag the IBT TRM as the inspiration for their designs. They might well have read the report and used the knowledge, and made up their own terminology (different from that used in the TRM) and taken ownership of the ideas.” As could be expected, some results from the TRM are evident, whereas other results are difficult to identify and attribute.

While not all of the above-mentioned activities can be attributed to the TRM initiative with certainty, many of them can. These outcomes show that the IBT TRM has achieved concrete results and continued to have an influence on the industry since the release of the TRM Report.
2.1.3 Network-building resulting from the TRM exercise

One of the most significant results achieved from the IBT TRM has been the creation of networks of contacts that have continued to pursue the objectives of the TRM.

Virtually all interviewees agreed that collaboration across the industry has been fostered as a result of this initiative, both during the TRM and still today. Specifically, a network of contacts has been maintained that interviewees continue to find useful. As one interviewee noted, “links were made, and a network was established that is still used today. When we have something to announce, or when we are looking for support on some project, we call on the network of people we established in this project.”

2.1.4 Promotional initiatives

CABA used the release of the IBT TRM Report as an opportunity to promote its own role to its membership and to other stakeholder groups. Some of the promotional initiatives included a workshop put on by CABA in 2002, and another a year later sponsored by Precarn Incorporated.

Furthermore, according to several interviewees, the TRM report is used by organizations other than CABA for promotional purposes as well. For example, PWGSC has used the report to describe its role with respect to the use and development of IBT.

2.1.5 The results from the IBT TRM have become self-sustaining

The evaluation findings indicated that, even after Industry Canada was no longer involved, follow-on impacts from the IBT TRM continued to occur and new projects were launched. In essence, the TRM process appears to have become self-sustaining. This is a significant finding, given that many past Industry Canada TRM exercises lost momentum once Phase 1 had been completed and the report distributed.

The evaluation findings suggest that the IBT TRM’s continued momentum can largely be attributed to the involvement of CABA, an organization that shared the objectives of the TRM and was motivated to use the TRM’s knowledge and lever it to pursue new activities. This finding provides Industry Canada with useful guidance for the selection and design of future TRM initiatives. Specifically, a TRM’s immediate success and continued contribution to industry can likely be maximized by involving an organization that has an inherent interest in promoting the knowledge generated during a TRM exercise and fostering activities that contribute to the evolution of the subject technologies. This is different from involving organizations that are only users of technologies, such as industrial performers. Also, the involvement in the TRM of a participant that would promote technologies would help to guide the TRM’s direction toward
knowledge and technology areas that have a sustained and broader interest and relevance to the industry.

Overall, the evaluation indicated that the IBT TRM generated significant and useful results for the industries concerned. While it would be expected that the release of a TRM report would generate industry interest for a period of time, it is noteworthy that organizations involved in this initiative have built on the TRM to produce follow-on results. This outcome from the TRM indicates that, with the proper mix of success factors, a TRM’s influence can continue well past the release of the report, which is consistent with the three-phase design of Industry Canada’s TRM initiatives.

2.2 The IBT TRM Process Was Successful

This section discusses the process undertaken to achieve the above-mentioned results. The evaluation of the IBT TRM revealed that, although the process started slowly, the right participants were selected, the level of interest and participation were strong and the right areas of study were selected. As indicated above, these all contributed to a successful outcome.

2.2.1 The IBT TRM was timely

The evaluation findings indicated that the TRM was undertaken at a time when the industry could benefit from the results, primarily because of the general focus in 1999 on the significant uses and benefits of interconnecting information technologies.

All interviewees agreed that it was a good time to carry out the TRM, given the characteristics of the industry in 1999 when the TRM was started. As one interviewee stated, “We were on the cusp of Y2K, and there were changes in PC (personal computing) technology. It was time to understand the impact of these technologies on buildings.” Another noted that intelligent buildings use “the same underlying technology that drives telecommunications and the internet. IP (Internet Protocol) technologies are all interwoven.... [At the time when the TRM was started,] all the different systems in a building – the fire system, the heating system – all were parochial, stand-alone systems.” As a result, the opportunity to increase the industry’s awareness of integrating intelligent building technologies and approaches was timely in 1999.

Another reason that the timing was considered good was that, traditionally, the building industry’s planning practice made the inclusion of IBTs difficult. Under typical industry practice, communications experts were not included in the early planning and design of a building, and those technologies were only added in after the major design elements were decided. As a result, the buildings did not
take full advantage of the benefits available from the related “intelligent”
technologies.

Furthermore, as a result of this “add-on” approach and non-integration of IBTs in
the planning of building projects, the different IBT component areas were also not
well integrated with one another at that time. The IBT TRM was timely in that it
shed light on the need and opportunity for interoperability between different
systems and the need to develop the required standards.

Therefore, the potential in 1999 for increasing the uptake of IBTs by the building
industry, the opportunities for interoperability and developing standards across
IBT, and the need for further education of stakeholders made it a beneficial time
to conduct this TRM.

2.2.2 CABA was the right choice

There was general consensus among interviewees that Continental Automated
Building Association (CABA) was the right choice as facilitator of the IBT TRM
process.

In addition to chairing the Steering Committee meetings, CABA acted as the
secretariat and provided the Project Manager to lead the project. CABA was
seen by interviewees as a natural choice for performing these roles for two
reasons. First, because CABA was an association, it was considered by
participants to be independent, objective, and credible, without the
preoccupations or perception of bias that were seen to be associated with
government organizations or individual private companies. As one interviewee
put it, “CABA is an example of a body that brings together the various agents
from both government and industry and has good working relationships with the
private sector and the public sector.” This characteristic was seen to help bridge
the gap between public and private participants in the TRM Steering Committee.

Second, CABA was seen to be a good choice because its mandate aligns well
with the objectives of the TRM. CABA’s stated mission is “to encourage the
development, promotion, pursuit and understanding of integrated systems
and automation in homes and buildings.” As a result, the objectives of the
IBT TRM were fully congruent with CABA’s, which in turn contributed to
ensuring its active participation and follow-through on recommendations. One
interviewee said, “CABA saw this TRM as an opportunity to fulfill its mandate,
which is to promote interoperability between intelligent building technologies.”
Furthermore, given CABA’s large membership it made sense to include it in the
process to facilitate distribution of the IBT TRM report.

Therefore, the choice of CABA as a central participant in the IBT TRM was
considered to be one of the principal factors that led to the TRM’s success and
continued momentum.
2.2.3 There was a strong commitment to the TRM

The evaluation findings indicated that participants from both the private and public sectors showed a strong commitment to the process throughout, thereby supporting the view that the TRM added value to participants’ organizations.

Eight out of the nine interviewees involved in the TRM process felt that the level of interest was very good. The majority of interviewees (six out of nine) stated that there was a productive working relationship between the participants, even though (as discussed later) there were early disagreements on key matters related to the TRM’s direction. As one interviewee indicated, “There were no major fights or confrontations. Certainly, there was the potential for trouble because of participants’ different directions, but issues were ironed out.”

Participation by government officers was considered to be significant, and participation by private sector members was generally considered to be good. Two interviewees commented on the variable attendance of some private sector participants. However, it was recognized that private sector participants might have had less flexibility in their schedules, and this was not seen as adversely affecting the TRM’s results.

A strong level of interest and commitment to the project by all TRM participants is a strong indicator that the objectives of the TRM were considered to be worthwhile.

2.2.4 The diversity of the participants strengthened the value of the TRM

The individuals brought together to participate in the IBT TRM came from diverse backgrounds. While this presented some challenges in terms of developing consensus on key points, it enabled the TRM to reflect a broad perspective of the issues facing the adoption of IBTs by industry.

The TRM participants included individuals from different user groups and also from different intelligent building technology areas. As one interviewee said, “For this project, we brought in a variety of stakeholders, both government and private sector, both users and suppliers of the technology; the people who build, and the people who occupy.”

The diversity of participants reflected fundamental differences in how participants defined and used IBT, which in turn posed a challenge in defining the TRM’s direction at the outset. On one hand, the diversity of participants was seen to strengthen the TRM process. Specifically, it enabled an examination of the definition of IBTs that was as inclusive as possible. Also, many interviewees said that the broad mix of people participating in the TRM allowed for a more complete understanding of all the issues at play, from all the different perspectives. For example, having experts in control systems and energy interact with those involved in the economics of buildings and major owner/operators of buildings enabled the TRM’s direction to reflect the needs to a wide range of stakeholders.
In addition, it was felt that the diverse participants brought an array of skills and experience to the table, which added credibility to the process. Many of the interviewees commented positively on the extensive skills and experience of participants. Eight of the nine interviewees who commented on this agreed that the diversity of backgrounds, skills and experience contributed to the advancement of the project.

On the other hand, the diversity of participants’ background also contributed to challenges. In particular, the differences in participants’ interests complicated the process of selecting objectives for the TRM.

As one interviewee stated, “Clearly, the different groups had different agendas. Having different groups involved didn’t work well in that respect. On the flip side, you can’t avoid it if you want to consider the broad application of these technologies.” This diversity of participants’ agendas led to differing views when deciding the objectives of the project. Seven of the nine interviewees who commented on this point stated that the process was made more difficult by a lack of shared objectives and lack of a clear direction at the outset the project. One interviewee said, “There were different individuals, from very different backgrounds, with no shared objectives. It was an open-ended.” Another interviewee illustrated the initial differences in viewpoints, saying that some of the government departments were more interested in the energy-saving potential of IBT, while CABA was more interested in automation.

According to interviewees, this difference in objectives slowed down the process in the initial stages, which presented a challenge at the start-up. As one interviewee said, “the Steering Committee took a long time at the start…. There was a lot of discussion on Terms of Reference, definitions, etc. Many private sector members were getting frustrated at this.”

The diversity of participants widened the scope of the project. Some interviewees suggested that the TRM’s scope should have been narrower and/or pre-defined at the outset, given the limited funding and time constraints. However, based on the comments received, it appears that such an approach would likely have reduced participants’ interest and commitment to the TRM process, and might have reduced the usefulness of results.

All of these factors provided challenges to launching the TRM’s process. However, given that the diversity of participants provided a more comprehensive discussion of IBT issues, the benefits to the TRM process from the diverse participants appeared to outweigh the complications. Overall, the diversity of participants strengthened the results and usefulness of the TRM. This finding supports the view that a TRM exercise that includes a diversity of stakeholder interests can strengthen the TRM process and add significant value.
2.2.5 Having a clearer industry champion might have benefited the TRM

Overall, the TRM appeared not to have an identifiable industry champion, which may have adversely affected the progress of the initiative.

One of the important success factors of a TRM is to include an industry champion in the process to increase credibility and industry buy-in, and to provide some level of leadership. However, this TRM did not include a clear champion. When asked who the primary champion was, four of the nine interviewees stated that no one played that role. Of the other five, most mentioned more than one participant, with CABA and Honeywell being the most-often mentioned.

There were also different views about whether the process would have benefited from having a champion. According to one interviewee, “We needed to have companies like Honeywell in order to succeed.” Another stated that “There was no clear leader”, which caused “a lot of uncertainty at the beginning” of the project. However, a number of interviewees believed that having a champion would have been detrimental to the project by biasing the directions taken: “I don’t think it’s good for this process to have a champion. One company shouldn’t be allowed to take this on themselves, because the project would be driven by their agenda. In my view, it would be good for [my firm] to be the champion, because then all of our objectives would be met, but in terms of the overall objective, it’s not really a good thing.”

These comments indicate that some participants perceived value in having a strong industry champion, whereas others saw this as a potential threat to achieving broadly useful results. Some of the comments also suggested that the “champion” role was misunderstood as being one of control, rather than providing credibility, perspective, and leadership. Based on the experience of other TRM exercises, successful champions can bring credibility and knowledge to the process without biasing the direction of the exercise. As a result, a well-performing champion might have encouraged the process for the IBT TRM to move ahead more deliberately.

In conclusion, it is not clear that the lack of a clear champion was detrimental to the success of the TRM overall. However, the comments suggest that having a champion might have saved some time and frustration.

2.2.6 The TRM included the right areas of study

The evaluation findings indicated that the areas of study chosen by the Steering Committee addressed the most important obstacles to IBT’s future success.

Interviewees indicated that there was a good level of consensus on the important areas to study, which were related to increasing awareness about IBT. Seven of the nine interviewees who provided an opinion on this matter indicated that the problem that had to be addressed by the TRM exercise became self-evident quickly due to participants’ collective difficulty in discussing IBT. “The problem is
not the technologies. It's the capacity of the people to apply them, and the lack of interoperability between existing IBT. At the first meeting, the problem became clear. We had specialists in many areas, but they did not understand one another. They were working from different systems.” The inability to speak to one another made the problem self-evident.

Based on the broad problems of “communication” and “interoperability”, the scope of the TRM project was refined using a consensus-based approach. One interviewee indicated that this approach built on the differing views, and made acceptable compromises: “Choosing the topic was a result of consensus. The scope of the TRM project was limited, so we had to make concessions. Everyone’s point of view was considered, and there was no one person who influenced the process more than any other.”

One area of study that was excluded, and that some interviewees mentioned should have been examined, was the “marketability” of IBT. As one interviewee started, “We had a bunch of hypotheses about the audience, but we never validated that. We never conducted market research.”

Even though the TRM may not have addressed all areas affecting the success of IBT, there was general agreement that the most important areas of study had been included, and that the report had captured well those important issues.

2.2.7 Industry Canada could play a continued role in the TRM

According to interviews, once the IBT TRM Report was issued, Industry Canada and the other federal organizations discontinued their involvement in the TRM process. However, there may have been opportunities for Industry Canada to add value after the completion of Phase 1.

The complete TRM process includes three phases, and it could be argued that Industry Canada could or should play an active role in enabling all three phases, as it does frequently in launching first phases of TRMs.

Interviewees in the IBT TRM were not able to readily identify what added value might come from continued participation by federal organizations, other than a continued source of funding. However, that may not be sufficient reason for Industry Canada to withdraw from the IBT TRM process after publication of the Phase 1 report. After all, Industry Canada initiated the TRM even though industry participants never realized that such a useful process was possible.

Given the findings from the IBT TRM and Industry Sector’s mandate, the Sector’s officers could play a facilitation role vis-à-vis several drivers of IBT’s development. For example, an Industry Canada officer’s knowledge and contacts could assist in addressing other issues that affect IBT’s full dissemination and commercialization, including for example:

- Fostering and facilitating the development of regulations and standards,
Further leveraging the expertise of federal research facilities, including the NRC and the Communications Research Centre,

Encouraging international trade efforts that would capitalize on Canada’s progress in IBT, and

Exploring the application of IBTs to other industries (as a broader enabling technology).

Furthermore, an Industry Sector officer could encourage progress toward phases 2 and 3 of the TRM, which involve increasing levels of cooperation and collaboration in technology development.

The feasibility of each of these potential roles would need to be explored. However, they illustrate that Industry Canada could continue to perform a value added role in the IBT TRM.

Furthermore, it seems reasonable for Industry Canada to become involved in TRMs that have a continued strategic interest to the Department, as opposed to undertaking TRMs that have only a limited contribution to the Department’s longer term agenda.

Overall, it would seem to be in Industry Sector’s interest to invest in a more sustained way in TRMs that support the sector’s more strategic objective related to the “development, adaptation, diffusion and use of strategic and sustainable technologies”, and the Intelligent Building Technologies seem to be a good example of such technologies.