

Dear Vern,

Thank-you for your invitation for input into the development of the National Enabling Technologies Strategy being developed by DIISR. The CRC for Rail Innovation's role is to carry out applied research that will benefit our participants, the rail industry and the Australian public. As such we are interested to explore the benefits which may emerge from enabling technologies such as nanotechnology and biotechnology. The CRC believes that the rail industry currently is not well informed about the potential benefits and applications of developments in these fields. There may be significant benefits to be obtained from the adoption by the industry of developments in these fields of which the industry is not aware.

We have summarized our input below in response to the questions posed in your discussion paper:

1. What are the key issues and challenges that need to be addressed by the National Enabling Technologies Strategy?

As stated above, we don't believe that there is a high level of awareness in the rail industry about the potential benefits that may arise the application of enabling technologies including nanotechnology and biotechnology. There may be significant benefits to be obtained from the adoption by the industry of developments in these fields of which the industry is not aware. Our early thinking is that nanotechnology may be of interest to rail particularly in the area of "clever materials", including "clever surfaces" and "clever surface treatments", with emphasis on special surface properties, corrosion resistance, lower friction, self lubricating surfaces, and lower wear rates. Another area of interest might be chemical cleaning systems with emphasis on bio controls, inspection robots, self cleaning/maintaining systems, new ways to clean graffiti, pipes and drainage systems.

There is an expectation by our participants that our research will lead to the development of products which are immediately useful to the rail industry. So it is important for us that enabling technologies are very mature before we get involved. Our understanding is that It might take more than 7 years to develop a smart material, and this is required to be completed before the product development process itself can begin. It should be noted that previous quite modest research efforts in the rail industry to develop alternative materials or processes have failed spectacularly, so the industry is wary of the benefits that are being stated to accrue from enabling technologies. For example, a shift from steel wagons to aluminum wagons was and is problematic all over the world. This change in material application was a much more modest change than a shift to nanotechnology, which would introduce a whole new range of risk factors into railway operations with which the industry has little or no experience. However great advances in industry over time can be linked in no small way to developments in materials science.

2. How should these issues and challenges be addressed? What is your organization doing to address those issues and challenges?

An industry wide education and communications strategy in relation to enabling technologies will be essential in informing the industry and allaying fears about the use of new technologies. The communications strategy should feature practical success stories of the adoption of enabling technologies in other industries and applications. One way to mitigate the risk of adoption of enabling technologies in new applications would be to

transfer nanotechnology or biotechnology developments currently close to market in other fields to rail applications on a trial basis.

The peak rail industry body, The Australasian Railway Association (ARA), is one of the CRC's participants and has the role of representing the entire industry. It would be logical for DIISR to explore the concept of the development of an industry wide enabling technologies communications strategy with the ARA. The CRC is well placed to underpin efforts to inform the industry about developments in enabling technology and to carry out research into potential new applications. Allaying fears of the application of unknown enabling technologies is a matter that the CRC could address by research into successful application of these technologies in other fields.

3. What would you like to see as the main outcomes for the National Enabling Technologies Strategy?

The first step is dissemination of a rail industry wide communications strategy covering the latest developments in "Smart Materials" and "Smart Surfaces", targeted to the rail industry in easy to understand language and with practical examples of applications in other fields which may be pertinent to the rail industry and candidates for technology transfer. The CRC's expected involvement in the development of the communications strategy would be to provide the background research into nanotechnology and biotechnology outcomes that are of most interest to the rail industry.

4. How do you think your organization could work with the Enabling Technologies Policy and Public Awareness Sections and others to address those issues and challenges?

The CRC would be prepared to explore how to engage with DIISR in the provision of the research to underpin the development of a communications strategy for informing the rail industry about developments in enabling technologies such as nanotechnology and biotechnology. We also suggest that DIISR explore the opportunity of engagement with the ARA on informing the industry about enabling technologies.

Regards,

David George
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CRC for Rail Innovation