



Dr Michael Spence
Vice-Chancellor and Principal

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Ms Sharon Bird MP
Chair
Standing Committee on Infrastructure and Communications
House of Representatives, Parliament of Australia

By email: ic.reps@aph.gov.au

Dear Ms Bird,

The University of Sydney is pleased to make a brief submission to the Committee's inquiry into the National Broadband Network (NBN).

In summary, we expect that the establishment of a national high-speed broadband network, based predominantly on optical-fibre technology, is likely to transform Australia's education sector – from our pre-schools to our universities.

While we are not able to predict the full extent of the innovations that will occur in the educational sphere following the creation of the NBN, nor quantify the economic, social and cultural benefits that are likely to flow, we expect that on all counts the impact will be significant. Combined with the benefits that are expected in other areas covered by the terms of reference of the inquiry, we believe that investing in a future proof optical-fibre network represents a sound long term investment in Australia's future prosperity.

Through the Australian Research and Education Network (AREN), Australia's universities are connected by optical-fibre to a wide range of other education and research organisations. This network, which in turn connects our researchers to colleagues to some 118 similar networks internationally, has revolutionised the way that our researchers interact, particularly in data-intensive areas. It has allowed physically isolated researchers to form virtual collaborative research communities, enabling them to communicate in real time if required, access specialised research services, as well as share and access enormous data sets.

Providing the vast majority of Australian homes, schools and businesses with an optical fibre connection to a national network, will mean that high speed broadband connectivity will no longer be limited to a relatively small number of public and private sector organisations. While the NBN is not designed to provide the same level of specialised service as AREN, it will provide sufficient capacity to increase participation and collaboration by linking small and remote sites, and by connecting staff and students in their homes. As a result, we expect that the capacity for collaboration in teaching, training and research between employers, schools, vocational education providers, universities and other organisations will be enhanced greatly.

The NBN is likely to transform the way that students and members of the public access education and information from universities. Already at the University of Sydney we record thousands of hours of lectures each semester, allowing students to review material and ensuring that they need not miss a class due to work or other commitments. However, access to this service is currently limited to students while on campus, or to those with access to a sufficiently fast internet



service. The NBN will provide students with great choice and flexibility to control how they wish to interact with their university. It will stimulate the development of new approaches to learning and teaching as providers develop new methods of delivery in response to competition, and the expectations and demands of their students. Once technology such as virtual classrooms, high speed video conferencing and audio-streaming becomes widespread, access to educational opportunities will undoubtedly be enhanced for people from outer-metropolitan, regional and remote communities, and for people with work and family responsibilities. We expect significant gains to be made particularly quickly in the area of professional training in the health fields in rural and remote locations, where we envisage that the NBN will enhance our capacity to engage with students seamlessly from afar.

While we expect that the benefits of the NBN for students will be significant, the benefits for staff and the community more broadly, in terms of their engagement with universities, are also likely to be substantial. By providing data speeds that are 100 times faster than is currently available to most people, the NBN has the potential to revolutionise the way that individual members of staff undertake their work. Working from home or from remote locations will become much more feasible than it is currently, with benefits for employers, employees, their families and the environment. Members of the public are likely to benefit too from the improved access that the NBN will provide to the library, publication, data and other resources held by universities. As a result, Australian universities are likely speed up their efforts to follow the international trend towards facilitating open access to the outcomes of their publicly funded research.

As the Committee may be aware, the University of Sydney hosts within its Faculty of Science the Centre for Ultra bandwidth Devices for Optical Systems (CUDOS). As an Australian Research Council supported Centre of Excellence, CUDOS is an international leader in fundamental and applied research into nonlinear photonics. Its mission is to demonstrate all-optical processing applications and to develop devices for ultra-high bandwidth optical telecommunications systems. It is currently in the process of creating photonic and optical systems of the type that are widely expected to form a fundamental part of the optical-fibre based global telecommunications industry over the next 20 to 30 years. CUDOS's director, Professor Ben Eggleton, is an internationally recognised expert on optical fibre technology and its capabilities compared to other alternatives. I encourage the Committee to meet with Professor Eggleton to hear his insights about the future of the global telecommunications industry and the pros and cons of different broadband infrastructure options. Professor Eggleton can be contacted or

If the Committee would value further information about the likely impact of the NBN from an educational perspective, then our Deputy Vice-Chancellor (Education), Professor Derrick Armstrong, would be the best point of contact,

For further information from an information technology perspective, please contact our Chief Information Officer, Mr Bruce Meikle,

Yours sincerely

Michael Spence