ECONOMIC DEVELOPMENT AND INFRASTRUCTURE COMMITTEE

Inquiry into Improving Access to Victorian Public Sector Information and Data

Melbourne — 27 October 2008

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Mr A. Smart, Principal Consultant and Marketing Director, ACIL Tasman.

The CHAIR — I welcome Mr Alan Smart to our all-party parliamentary committee hearing today on the Inquiry into Improving Access to Victorian Public Sector Information and Data. You are very welcome. Evidence taken at public hearings of the Economic Development and Infrastructure Committee is protected by parliamentary privilege, so here is your opportunity to say what you wish, relevant to the inquiry, under parliamentary privilege. Comments made outside the hearing are not afforded such privilege.

Could you state your name and if you are attending in a private capacity or representing an organisation. If you are representing an organisation, please state your position within that organisation.

Mr SMART — My name is Alan Smart from Canberra. I am a Principal Consultant with ACIL Tasman economic consulting, and I am here representing ACIL Tasman in relation to an economic study we undertook last year.

The CHAIR — Your evidence, once you have okayed it, will be put on our website for the public to read. Would it be convenient now for you to make a brief presentation and we will ask questions afterwards?

Mr SMART — Sure. I made some notes which I will speak to and which I forwarded to you in the form of a presentation. They are really relating to some work that we did last year, both for the Cooperative Research Centre for Spatial Information and for the Australian Spatial Industry Business Association, and that was to do an economic assessment of the impact of the spatial information industry in 2007. There had been a number of attempts in many countries over the years to do this, but there was no real cohesive national one in Australia.

The first point that I would like to make is we had to start with a definition. The definition I have given you on slide 3, basically says:

> The spatial information industry acquires, integrates, manages, analyses, maps, distributes and uses geographic, temporal and spatial information and knowledge.

It then goes on to explain how it gets used in research and industry. That is a fairly well-accepted definition from the Association of American Geographers and the Geospatial Information and Technology Association. But when you get down to trying to measure the impact or the size of an industry, it gets a little bit more complicated. The first thing we went to was to look at what the Australian Bureau of Statistics defined as the spatial information industry, and in fact there is not a classification that goes to that. But there is a classification that covers a range of industries including things like aerial surveying, cadastral surveying down to hydrographic surveying, oceanographic surveying services et cetera. So we started there.

I can give you some up-to-date figures. When we did it last year we could not actually get the precise revenue numbers. Some numbers were done in 1998–99 for the Spatial Industry Action Agenda, and it was estimated that the revenue from the industry at that time was $926 million. Recently the ABS began reporting business revenues through the GST records, so we went back and had a look at that. We were able to get later figures which were not available last year. In 2005–06 the revenue from the industry was $2,223 million, which is approximately a growth rate of about 6.2 per cent nationally. So it is a fairly rapidly growing industry, and that is just narrowly defined to that small group of professions.

That is broadly in line with a Victorian survey done by ASIBA earlier this year which estimated the revenue from the industry to be around $425 million for Victoria, a 10 per cent increase on 2005–06. This is quite new information that confirms that the industry is somewhat larger than we estimated in our report and growing fairly significantly at around 6 per cent per year nationally. But that is not the whole story.

The footprint of the industry is much larger. The other day in the *Australian* I saw an advertisement for a spatial analyst at VicRail, and so these people are being employed in a lot of types of organisations in government and industry. Whilst we define that industry quite narrowly in terms of surveyors et cetera, really its footprint is much bigger, and I can sort of illustrate that footprint on slide 6, which looks at the spatial information supply chain. It starts out with capturing the data. Now that might be raw data, it might be cadastral information or it might be road centrelines. Bringing that together and giving people access to it and enabling it to be distributed creates the opportunities for people to add value to that data, to layer it, to put address data with it, to put sociological or economic data with it and then to integrate it together. That is where the extra value is coming, and that is where it is being integrated into business.

To give you an example, last week I was at a pipeline industry conference. WestNet Energy has introduced a traffic monitoring system using Google Earth and vehicle tracking systems. The company has reduced its accident rates by 50 per cent on the Dampier to Bunbury natural gas pipeline, and it has no fatalities. It is this sort of use of integrating these technologies into businesses, whether it is government business or private business, where the real value comes.

What we have tried to do is to look at the impact on the economy as a whole through the impact of the spatial industry on other industries. The way to do that is to use what is called a general equilibrium model of the economy which enables you to look at the overall impact of a change in one sector — say, a change in productivity in one sector — on GDP or consumption nationally, and it can be done at regional levels as well. We did 22 case studies of industries. We looked at the applications that were being made, tried to estimate how far those applications had penetrated the industry and then, by talking to people who had experience with them, estimated what the impact on their productivity of using spatial information had been. Using those two measures — levels of adoption and levels of impact — we came up with assessments for each sector.

It is best illustrated on slide 8. MillMapper is a little application of spatial technology into the maintenance of milling equipment. It does not matter what it is, but it has an impact if it improves the productivity in the precious metals industry that flows to an overall productivity improvement in mining generally, which feeds into the economy more broadly. The same thing applies to the spatial industry itself; the spatial industry also adds value, which feeds into the economy more broadly.

As shown on slide 9, we looked at 22 sectors, and I have listed them. I have grouped them there from agriculture, mining and property services through to communications, retailing, manufacturing et cetera. We found that the biggest adopters in this group were property and transport, construction and the utilities. That is where the biggest applications are applying now. But in medium-level applications we found government and mining, and also agriculture, fisheries and forestry, are quite important users of spatial information.

If I might just refer to Victoria, a recent study found the use of precision agriculture and self-steering tractors in agriculture brought productivity improvements of up to 20 per cent in broadacre agriculture. We took 10 per cent in our study, but these are real productivity improvements, real efficiency improvements, that these types of technologies are bringing to these industries.

The CHAIR — I will flag that I want to ask a question on that later.

Mr SMART — Sure. I think I will flip to slide 11, where I have the table of all the productivity shocks, as we call them. What you do is you have a model of the economy and you then change something in it; when you change a productivity level, we call it shocking the model, and that gives you a different outcome. So if you can look down there, some of the big productivity improvements in, say, business services were between 0.5 and 0.7 per cent; or in communications they were between 0.98 per cent and 1.32 per cent.

The lower levels relate to what we called a very conservative case, where we used only evidence. We wanted to find demonstrable and quantifiable evidence that there had been a productivity gain, so we wanted either a study or report or some credible research that shows there was that productivity saving; and then the larger one was where we knew there were more uses, but we had not been able to find the study or had not been able to find the exact confirmation, but we knew it was happening so we had a higher level of estimate, which we thought was more realistic.

I refer you to slide 12. When you shock a model you can have two outcomes. We have a reference case, then we put all those productivity improvements in and then we get a scenario with spatial information and we get a different economic path, and it is the difference between those paths that we are measuring in this model. The results are on slide 13. In summary, we found that the impact of the spatial information industry on gross domestic product was between $6.4 billion and $12.6 billion — that was the lower and the higher — and that is the accumulated impact of the spatial information industry on GDP. In other words, GDP was that much higher than it otherwise would have been.

The more important figures are probably the following: impact on consumption, which is $3.5 billion to $6.7 billion; higher investment, $1.7 billion to $3.4 billion; and, more importantly, a slightly positive outcome for net exports and wages, between 0.6 and 1.1 per cent higher.

So in total, taking all of those changes together, adjusting for the internal transfers within the economy and resource shifts as a result of these changes, we found that the spatial information industry had resulted in an increased GDP being somewhere between 0.6 per cent and 1.2 per cent higher than it otherwise would have been. We consider that a fairly conservative estimate.

We were then asked what was the likely impact of constraints on access to data. Again in the course of our case study we asked people the question: are there any constraints on data, and if they were removed, would you have had a better outcome? We identified a series of issues that people raised with us. The first was the availability of what we call fundamental data or, if you like, base data.

I can go into some of these in more detail later if you would like. Then we looked at the inadequacies of data infrastructure — in other words, difficulties in finding registries that would link users to resources, wherever they might be held, and in access to data in terms of its consistency, licensing arrangements et cetera. Finally we looked at pricing.

We then said to each of the people we approached in the case study, ‘How much do you think that would have affected your productivity outcome? If those constraints had been removed, how much higher would your productivity have been?’. That ranged from 2 per cent for industries like forestry to as high as 14 per cent for business services — I have summarised those in slide 15. Clearly, areas like electricity, water and transport, because they are high users of spatial data, indicated they could have had up to 10 per cent higher levels of productivity impact if the access to spatial data had been better than it was.

Then we ran the model again. The result was that if these constraints had been removed or in some ways overcome, we would have had an outcome that was around 7.5 per cent higher overall. These numbers are significant, I think, in terms of the economic impacts of the industry and the economic consequences of not having access as efficient and effective as possible.

That summarises what we did and the results we got. I would be happy to talk more about details of what is behind those numbers, but I thought this might be an appropriate point to stop.

The CHAIR — Thank you. I wanted to ask three questions, Alan, regarding some of the evidence you have just given us. Could you expand upon the following? You talked about Victorian railways advertising for a spatial analyst. I would be interested to know how much such advertisements are coming up now in the employment section. Is this fairly rare, or is it just something I have not noticed? I must admit, I do not pore over the employment section, but my

ears pricked up when you said they actually advertised for a spatial analyst. You also mentioned the Dampier pipeline example and improvements there. I would be interested in your expanding a little more on that. Also, when referring to slide 10 you made reference to a 20 per cent improvement using a self-steering tractor. I found your presentation really interesting. To allow others time to ask questions also, I will not ask more questions that I have scribbled behind various copies of your overheads.

Mr SMART — Okay.

The CHAIR — Finally, do we have your permission to put your overhead presentation on our website?

Mr SMART — Sure.

The CHAIR — It is just quite a crisp summary of what will be in the Hansard transcript.

Mr SMART — Okay.

The CHAIR — Thank you.

Mr SMART — I did not do any survey of employment, but just as a result of the work we became aware that many organisations will have GIS or spatial specialists in them now. Usually they will be in there to run something like MapInfo or ArcInfo; they will be recording information and reporting it. As we speak, I am doing a project using a spatial product called MapInfo to track oil import infrastructure, to record where it is and put economic data around it.

I can show you an example. There is an organisation in Canberra called the Australian Maritime Safety Authority. It employs a person who manages and uses GIS software. This is a very interesting application of it. This is using Google Earth Pro plus accurate global positioning, plus a ship reporting system. So it has on a very easy-to-use piece of software the location of every vessel. They have location; if they are doing search and rescue, they can locate where they thought the vessel was. They can attach modelling to that and do current modelling to try to predict where that vessel might have gone.

Putting this in this kind of format speeds up quite significantly how quickly they can make decisions and how quickly they can either implement search and rescue or implement ship management activities. They need someone to pull that together, and so they have a person who does that. I imagine that is what Victorian railways would be having. These kinds of people tend to be science trained. I know the person in AMSA came out of the architectural and engineering business. They become familiar with the software, and they are the people who pull it together.

The CHAIR — But are there many ads?

Mr SMART — Yes.

The CHAIR — There are? Okay.

Mr SMART — You see, it is a growing industry, I think.

The CHAIR — And to just expand on that a little, within our tertiary institutions are there separate subjects; is it part of academia now? How do we train people with this level of expertise, or does it not need specific training, so that if you are fantastic on computers you can just do this?

Mr SMART — No, no. This is a little bit out of my field now, but ASIBA has had a policy on education, and in Victoria there is quite a strong team in ASIBA who are working on an education and training policy for these people.

The CHAIR — All right. What about the Dampier pipeline?

Mr SMART — Okay. The pipeline business and the infrastructure business is a very interesting application. This particular application was done to manage their maintenance crew vehicles when they are out on the pipeline in remote areas. They now have on Google Earth Pro a way they can track every vehicle they have. They can, for example, monitor speed; they can help manage accidents; they can get a lot of data on where accidents are occurring; and it all comes up on one screen. This is a very, very familiar use of this.

The CHAIR — Can you run through those figures you gave us, please, on the cost savings with cutting down or eliminating accidents?

Mr SMART — They said to me they have reduced incidents, I think, by 50 per cent; they had had a fatality in the previous years, and they have eliminated all fatalities. So this is a program of managing a vehicle fleet and managing the health and safety of operations.

But more importantly, when the Tasmanian gas pipelines were built there was a fairly new application of spatial information in terms of first of all mapping the route — doing the exploration for the route — and mapping anything from biodiversity to topography. Once they had put that in and when they built it, they were then able to keep a record of where all the valves were and where all the river crossings were. They can use that with personal data and remote sensing material to have the maintenance people go out to the spot; they can put the information in. This information is kept quite centrally, so it has significantly improved the productivity of simply constructing, building and managing pipelines and keeping track of them.

There are so many applications that we came across as we went through this. The Great Southern Plantations has been using what they call terrestrial laser scanners to map the canopies of the forest. These can all be brought back into GIS systems, which can be managed centrally and can be used to send people out to specific sites to examine areas of concern or maintenance, using accurate positioning systems.

The productivity gains here are quite significant; they are very important to industry. Maybe the one we should talk about is agriculture, because precision agriculture is a fascinating application. It has applications in a couple of areas. The first is in the self-steering tractors using what they call GNSS global satellite positioning, but it is basically accurate GPS. Using digital maps controlling tractors they can get very accurate lines when they are ploughing or when they are harvesting. They can also use it for yield monitoring. They can use it for fertiliser application.

A recent study funded by Land and Water Australia showed productivity improvements of around 20 per cent in terms of broad aqua-agriculture. That was done after we did ours and found credible evidence that there were gains of between 10 to 20 per cent in agricultural productivity. Current adoption is about 10 per cent. Just imagine if that were extended, what the potential of this would be.

Mr CRISP — I am going to take the legal side for a moment and talk about Creative Commons as a licensing model and ask whether you have views on which licensing models you favour?

Mr SMART — This is out of my area of expertise so I can only make observations. My understanding is that the aim of Creative Commons is to have a simpler licence, which gives the author of the product enough control — as much control as they want — a bit like when you are downloading some software and you get prompted, 'Do you agree with this?' and you can tick it, and if you do, it is quicker.

The reason for going to look at Creative Commons was to try to get around all of the different types of licensing arrangements. In the sense that it is trying to get a common, easy-to-use standard that protects the interests of the owners of the data, I think it is a good idea. I have heard

that it is a little bit — not user unfriendly but heavy going, but I have not used it myself so I cannot comment.

Ms THOMSON — The area I am interested in is how much access to government information is already freely available, and how much more do you think is needed and required? And are there any areas of government for which access to spatial information is not available and should be available?

Mr SMART — The general reaction I get from talking to industry users is that it is patchy, that there are a couple of issues. What they are really looking for is some registries where they can get access to the resources, and those registries are not always consistent — things like data standards, fitness for purpose et cetera, are often not consistent.

We mentioned in our report that there are concerns about some areas of data not being adequate. I am sure you would be aware that the Department of Climate Change is working now on a digital elevation model of the 1:100 series national maps. There are some who felt that we should have one now. There was a lot of hope from the spatial industry action agenda many years ago that we work very quickly on this. I think it has been moving quite significantly. But from just doing this work and talking to people there was a sense that there were some gaps and the main issue was getting access to the data, the registries to get there, and then knowing that it was reliable.

The CHAIR — What about Victorian data, as opposed to national data or data from other states?

Mr SMART — Again, I am not an expert in this area. My impression was, in comparing it, that Victoria is doing pretty well in getting its data together. It has got a program of developing spatial data infrastructure. It has been doing a lot of work in getting the quality and the fitness-to-purpose right. It seems to be, from the way I look at it, going along the right track, but it is difficult for me to judge in relation to WA or Queensland or New South Wales.

The CHAIR — Have you got one good example from Victoria that you would want to highlight? You might like to think about it.

Mr SMART — I would have to go back. The traditional areas of address data and road data and property data, from what I can see or what I have been told, look good in terms of what is happening in the rest of Australia, but I am really not competent to comment on that because I do not use it myself.

Mr THORNLEY — Firstly, let me vouch for the agricultural applications. We have certainly found on our farm you can get a lot of soil chemistry just out of a high-quality satellite photo, for starters. You map that in, you map your fertiliser product, fertiliser layout and everything, then you have a GPS on the header as it comes out and you measure the yield, and you see what you did or did not do, and it is fantastic.

My particular thought is probably more related to geological and other data, but I am interested in the question of pricing. On the one hand we hear a lot of economists making reasonably compelling arguments for making the information free in the public domain to maximise its utilisation and therefore the economic value created, and hopefully somehow that trickles back through the 10 per cent of GDP that lands in our coffers to help cover the cost of the investments required.

I hear that argument, but I can also see a fairly obvious fiscal argument for the data that is highly valued in some of these applications, particularly in mining and other areas, that it would not be unreasonable to have some form of cost recovery.

The flip side, though, I would have thought, if you do have public domain and it is free, is the potential obligation for those who then use that data and potentially add value to it to then in the

same spirit share it with the rest of the industry. It seems to me they cannot have it both ways, but I am interested in whether that is true or not and whether you have any views about which ways you think are more appropriate in thinking about the economic rent and where it lands.

Mr SMART — Yes. I think the two arguments are well set out in section 4 of the discussion paper. I cannot add any more to those; they are both well-founded arguments. For me the issue comes down to what data you are talking about. And I think when people say it should be free, they mean basically that the marginal cost of supplying it is very low, and it seems to me that that gets down to what you might call administrative by-product — data that the government is collecting that it will collect anyway, which can only be collected by the government; it is the only organisation in the land that can do it, the only organisation that has the power to do it. That is probably as close to what is often termed fundamental data, which is where that argument went to; it was not talking about value-added data, it was talking about fundamental data.

I think that is where the question lies and where we have to think about: what is that data that is a public good? That is the data that I think all of that economic argument is going to. Once you are starting to add value to it in one form or another, layering it together, like that diagram I had — when you start to put it with other data, you start to improve its quality — then it is probably becoming a value-added product, where you would then be looking for a legitimate almost competitive neutrality argument, because you are starting to do something with that data that other people can do to it as well.

Governments have the natural monopoly right at the fundamental data end, and that is where I think some of the thinking has to be done about what we are doing here and the way we price it.

Mr THORNLEY — Okay, although that does seem to lead suspiciously to the place where the corporate customer gets the data for free and then does not have an obligation to pass it on. But I can understand that argument. Is there an access question though — there is a difference between saying you have added proprietary value and you should get some compensation for that but it is still public domain — —

Mr SMART — Yes, it is still public domain.

Mr THORNLEY — So if you add proprietary value to it, that is fine; you are entitled to some appropriate licence fee, but you still have got to make it available.

Mr SMART — Well, the fundamental data, that basic data, if you like: the administrative by-product data — the street centre lines and the cadastral data and property lines et cetera — the things that government collects anyway.

The CHAIR — I would not mind pursuing this a little further. That has all been paid for by the taxpayer; it is their data. If it is shared willingly — I understand exactly where Mr Thornley is going with his line of questioning. You have not convinced me that there is not a mutual obligation, you might say, to share in the spirit that the taxpayers have shared.

Mr SMART — The classic public good is defence. Defence is a public good. It is non-excludable and it is non-rival. We all consume the same amount of defence. I cannot consume it and stop you from consuming it. It is the classic public good. That is what the whole theory of public good was devised for. The problem here is that there are grey areas of whether information is a public good or not. What I am saying is — I am talking about this administrative by-product, if you like, the data that is the base level of data — that if you follow the economic argument, that should be made available at the moment of — —

Mr THORNLEY — I understand that and I am pretty okay with that, but now I am focusing on the other end where somebody has added some value to that data. Often, I suspect, or not infrequently, by the integration of other data which may be also public good, this is the way

one creates value, right? — through two or three open public domain data into some integrated outcome that has business value of its own.

Should there not be some obligation on you making that new product also available in the public domain? I can see an argument that you should receive some appropriate licence fee or compensation for it, but it is not clear to me that we should hand over all this baseload information that is in the public domain for the economic benefit that can be derived from it, and then it is allowed to go into proprietary black holes and not be available to anyone else.

Mr SMART — Perhaps I can answer that with an analogy. Roads are generally a public good. You can put a toll road in and make it private, but generally they are a public good. People use roads to transfer products and goods and services along and they take all of the economic return from doing that. They might pay a base tax for the road, but generally the road tax is paid by the general taxpayer. We do not say to the trucking company, 'You have got to make your goods and services available for nothing', but we also do not let him stop someone else using the road.

Mr THORNLEY — Let me give a slightly different analogy. Let's take a PSTN, a telephone network. That is a public good. Somebody owns it, but they have an obligation to have the interconnect for others who wish to use that, including the value-added, but there needs to be a fair economic rent. There is a lot of common use infrastructure. I guess to take the analogy, it would seem to me that if the data is a public good and it then gets transformed into some other thing that is of great value — let's say we take statistical data and spatial data and other things that have come from the public domain — is there not an argument that that ought to at least be common use infrastructure? You get the proprietary benefit of it but others can use it so long as they have an appropriate interconnect into that product.

Mr SMART — I guess it depends. You are getting into trade practices law here and whether there is market power here or not. If it is a perfectly operating market and other people can come in and do it as well, then I think that argument is strong, but if there is a natural monopoly — it is a bit like pipeline access. It depends what the market power is in that particular market. I agree with you that if there is market power — —

Mr THORNLEY — It is a fair point. And most of those common use infrastructures are natural monopolies.

The CHAIR — That is a key point for us. If after you have left here and there are items you want to reflect on and then perhaps comment to the executive officer, that would be helpful. We might do a bit of brainstorming ourselves on this and pose a couple of hypotheticals to get your expertise, if you would not mind. Would that be all right?

Mr SMART — Sure. I must say that I am really focusing on this economic study. This is quite a difficult area. I have read a lot obviously, and I must say that I thought the discussion paper encapsulated the two arguments very well, and I think that taking it to the next stage is exactly what these markets — —

The CHAIR — And that is what we are grappling with. Coming up with examples, we are looking perhaps to you in your expertise to help us with that.

Mr SMART — Sure.

The CHAIR — If you would not mind. We are running short of time, but one thing we also need to cover before you conclude is fitness for purpose. You mentioned it in your presentation and you said that that was a key barrier. Would you like to expand a little more on that and again focusing on the Victorian Government. What would you be making by way of recommendations for the mechanisms required to ensure confidence in that?

Mr SMART — Yes. This is a very difficult area. I have been looking at this from an economic point of view rather than a technical point of view, I have to say. It seems to me that you have got the basic raw data which comes in: is it right or not, what is its reliability, what is its integrity? There is a step to bring that to a consistency so that if you are going to be using and relying on it, you know it is right or you know what its potential error ranges are.

I think that is where this argument gets quite difficult, and that is where I think there is a need for a dialogue between government and industry — when I say government and industry, I mean the people who have the data and the people who use the data because a lot of government uses the data as well — to say, 'What exactly are we looking for in terms of the reliability and standards as well as the access?', and that is where there might be some value-adding happening. Whether that happens in government or the private sector is a question that is on the table for discussion.

The CHAIR — Have you got any examples in the Victorian Government of where it is going well or there could be opportunity for improvement if we set up a hypothetical and perhaps had a few people around the table to brainstorm on this?

Mr SMART — I do not, because, as I said, I did not approach it from that angle, but in talking to people in ASIBA in Victoria, they would certainly have some views.

The CHAIR — Thank you. We have finished punctually. Thank you very much, Mr Smart. We appreciate your time here. You will be provided with a transcript within about a fortnight. You are free to correct typographical errors. That was very interesting. We also thank you for the time in presenting your overheads so clearly. That was excellent.

Mr SMART — Thank you.

Witness withdrew.