

- 9 LINZ and the NZGO are responsible for overseeing the policy framework that supports the national *Geospatial Strategy* and its work programme [POL Min (06) 22/13 refers]. The Strategy is based on a collaborative government agency opt-in approach.

Issues

- 10 Location-based information forms a part of New Zealand's knowledge infrastructure. Location-based information is being coupled with new technologies, leading to innovative business solutions across a diverse range of markets. The power of location-based information lies in its ability to be combined with other information to improve decision-making. It has similar advantages to broadband with considerably less cost, and has similar potential to the internet. That is, it is an enabling technology, rather than being an end in itself.
- 11 Each year government agencies, local government and industry use significant resources to collect and maintain location-based information to carry out their core functions. A spatial data infrastructure provides opportunities to combat the following issues:
 - 11.1 while agencies have strong incentives to efficiently meet their own information needs, there is little incentive to pool resources and more cost-effectively meet the needs of groups of agencies, or for broader government or economy-wide objectives. Where agencies have combined to collect data, it has been difficult to manage and sustain
 - 11.2 similar or duplicate information is collected, maintained and stored by multiple agencies, and is not easily discoverable, accessible, or easily integrated
 - 11.3 existing government information is being re-purchased by other agencies through third party providers after they have 'cleaned' and integrated the data for a fee due to the lack of system interoperability, and
 - 11.4 response to emergencies such as the Christchurch earthquake, oil spills, or disease outbreaks can be hampered by existing barriers to quick low-cost release of relevant location-based information.

Value proposition for Government to develop a spatial data infrastructure

- 12 Government's location-based information is a proven catalyst for economic growth and improved government efficiency. Accelerating progress to better connect that information will address several policy drivers of the Government's economic objectives, namely: investment in infrastructure; better, smarter public services for less; and innovation and business assistance.

Boosting economic growth

- 13 Estimates of the value from using location-based information in New Zealand and overseas are compelling. The use of location-based information added \$1.2 billion in productivity-related benefits to the New Zealand economy in 2008. Estimates show that removing key barriers could have added a further \$481 million a year and generated an additional \$100 million in government revenue.
- 14 Improved access to government location-based information – through an effective spatial data infrastructure – was identified as the best low-cost value-for-money intervention in the short term. It would also have the highest overall benefits for

New Zealand with an estimated 5 to 1 benefit-to-cost ratio.² Details on a spatial data infrastructure are in Annex 1.

- 15 International estimates also show the enormous value of location-based information. Since the 1990s there has been worldwide exponential growth in new markets for products and services using location-based information.

Improved government efficiency

- 16 There is an opportunity to provide better and more cost-effective government services from improved coordination, collection, management and delivery of government's location-based information. This can be achieved through using a spatial data infrastructure to 'collect once, use many times'. Benefits include better informed decision-making, cost savings, reduced duplication, and capturing economies of scale.
- 17 Many agencies are embracing location-based technology to improve service and decision-making.³ There are opportunities for government location-based information to be better used to allow its latent value to be realised.
- 18 Increasing benefits will be reaped over time. Some immediate gains, such as avoiding duplication, will be possible from early work to simply identify location-based information held by agencies. Greater savings will be made over time through improvements in information acquisition, management and quality. The greatest gains will be reaped through transformative uses over a longer term.

Other benefits

- 19 Using location-based information has further broader benefits:

Environmental	Security	Community
<ul style="list-style-type: none"> • helps communities and businesses through better spatial planning, such as Auckland's Spatial Plan • optimises physical infrastructure investment, such as the broadband rollout • measures and improves the 'clean' economy. 	<ul style="list-style-type: none"> • enables multi-agency intelligence and operations • makes New Zealand more resilient to disaster, with faster recovery, minimising economic damage, and reassuring residents and investors. 	<ul style="list-style-type: none"> • more accessible, accountable government • demonstrating an understanding of community needs • supporting community planning and development.

² Spatial Information in the New Zealand Economy; Realising Productivity Gains; ACIL Tasman, July 2009. Key barriers were: problems in accessing data, inconsistency in data standards, and a general lack of skills and knowledge about modern location-based information technology.

³ Examples include the Ministry of Social Development's contract mapping, Ministry of Agriculture and Forestry's FarmsOnline project, Ministry of Fisheries' National Aquatic Biodiversity Information System (NABIS), LandCare's GIS portal, NZ Transport Agency's Enterprise GIS Plan, Animal Health Board's VectorNet system, cross agency Ocean Survey 20/20 being coordinated by LINZ, Ministry for the Environment's Land Use and Carbon Analysis System (LUCAS), and the work of the Natural Resources Sector Network which involves working alongside regional government.

- 20 Better connecting government's location-based information – through a spatial data infrastructure – therefore represents an investment in New Zealand's infrastructure and warrants inclusion in the Government's economic agenda.

Current Government initiatives

- 21 There is a range of existing cross agency initiatives to make all non-personal government data and information more freely available. These include:
- 21.1 *Directions and Priorities for Government Information and Communication Technology (ICT)*: framework to specify priorities for ICT management and investment across government. It will harness ICT as a critical lever for business innovation and increase the availability of government's non-personal information [EGI (10) 226 refers]⁴
 - 21.2 *e-Government Interoperability Framework (e-GIF)*: all public sector agencies to adopt rules and standards to allow electronic interoperability, and
 - 21.3 *New Zealand Government Open Access and Licensing framework (NZGOAL)*: an open access and licensing framework for public sector agencies to release all non-personal material to the public for re-use.
- 22 There is also a range of government initiatives considering shared resources and improvements to public service delivery. These include the Better Administrative and Support Services (BASS) Programme being coordinated by the Treasury; the Ministry of Economic Development's centralised procurement process; and Tier 1 Statistics that identifies top priority all-of-government statistics.

Location initiatives and the role of LINZ and NZGO

- 23 Location-based information is a potential flagship project within these broader information and efficiency initiatives, and is consistent with their principles.
- 24 In 2007 the *Geospatial Strategy* was released, and the NZGO was established within LINZ as the coordinating body for implementing the Strategy. The *Geospatial Strategy* remains relevant with its focus on collaboration to more effectively collect, manage, use and link government location-based information. The four strategic goals are: governance,⁵ data, access and interoperability. Through the collaborative approach where agencies choose to opt-in to the *Geospatial Strategy*, elements of a national spatial data infrastructure are emerging, but we need to accelerate progress.
- 25 LINZ has two critical roles in location-based information management:
- 25.1 championing the *Geospatial Strategy*, through the NZGO

⁴ The Chief Executive of LINZ chairs the Data and Information Re-use Chief Executives Steering Group that is focusing on Direction 2 of this policy to support open and transparent government. The work programme this group oversees includes more than twenty agency and sector initiatives concerned with making government information more freely available and re-usable.

⁵ The governance includes cross-agency and local government involvement. There is a Joint Ministerial group to set the strategic direction (Minister for Land Information and Minister for Communications and Information Technology); a Geospatial Executives Group (GEG) for oversight and implementation, and a Steering Committee to advise the GEG and develop, steer and evaluate the *Geospatial Strategy* work programme. The GEG has representatives from LINZ (Chair), Ministry of Agriculture and Forestry, NZ Transport Agency, Department of Conservation, Statistics New Zealand and Local Government New Zealand.

25.2 developing a centre of excellence as the custodian of five nationally important datasets.⁶ In this second role, LINZ is in the process of improving the discoverability of and access to its datasets. This information will form a key component of the spatial data infrastructure. The process of LINZ releasing its information may also raise issues that will be relevant for other agencies collating fundamental datasets, such as the cost of maintenance, pricing and data quality improvement.

Leadership to better manage government location-based information

- 26 Work on the *Geospatial Strategy* is moving in the right direction and elements of a spatial data infrastructure are emerging. But New Zealand lags behind international developments, particularly in the creation of a formal spatial data infrastructure, and is losing growth opportunities because of this.
- 27 International experience shows that where the mandate to progress this work is unclear, progress is slower. Clear leadership is needed to develop and implement a formal spatial data infrastructure. Greater government agency involvement in the spatial data infrastructure will help to release its latent potential.
- 28 The Joint Ministerial group envisaged under the previous Government to oversee the *Geospatial Strategy* and the development of the infrastructure is limited to technical Ministers. To advance the Strategy, I believe that the issue is better placed on the broader economic agenda and linked to improving state sector performance.
- 29 I therefore consider that the Ministerial Committee on Government ICT⁷ is a more appropriate broader economic forum to advance the Strategy, and propose that it take over the Joint Ministerial group's role.
- 30 LINZ is best placed to continue to lead the *Geospatial Strategy* and the development of a formal spatial data infrastructure, in collaboration with other significant holders of location-based information, including local government, Crown agents, academia and the private sector. LINZ requires a strengthened leadership role to ensure progress is accelerated.
- 31 I propose that LINZ and the NZGO, within governance arrangements of the *Geospatial Strategy*, provide advice to the Ministerial Committee on Government ICT by June 2011 with a proposed design and implementation plan for a national spatial data infrastructure, including any funding, resource or pricing requirements. This will involve consideration of how to phase the work and engage the wider sector. If there are funding consequences, the matter will be referred to Cabinet for decision.
- 32 I propose that the all-of-government approach led by LINZ include:
- 32.1 requiring that state sector agencies with location-based information consult the NZGO to ensure their existing datasets comply with the spatial data infrastructure framework (once developed) unless there is a compelling reason not to, and consult the NZGO for guidance on compliance. These agencies include all relevant public service departments, the New Zealand Defence

⁶ These are the property boundaries (cadastral), property titles, land survey (geodetic), topographic, and hydrographic datasets.

⁷ The Ministerial Committee on Government ICT is comprised of Ministers English (Chair), Ryall, Tolley, Joyce and Guy as Ministers of Finance and for Infrastructure (Chair), State Services, Education, Communications and Information Technology, and Internal Affairs [DOM Min (09) 1/4 refers].

Force, New Zealand Police and selected Crown agents. These are listed in Annex 2

- 32.2 agencies seeking an exemption from compliance with the spatial data infrastructure framework (once developed) for specified datasets apply to their Minister, who can grant an exemption in consultation with the Minister for Land Information
- 32.3 each agency retains the responsibility and capability to develop and maintain their own datasets to meet their core business, and that those agencies with location-based information conform, over time, with the spatial data infrastructure requirements
- 32.4 LINZ leading a process to create a shared resources model for fundamental datasets that multiple agencies have an interest in, to maximise the value for money of these datasets to New Zealand, and
- 32.5 requiring agencies intending to tender for or purchase new location-based information or services to consult the NZGO to ensure consistency with the spatial data infrastructure requirements and possible involvement of other agencies, provided that the needs of the purchasing agency will still be met.

Developing a formalised spatial data infrastructure and further work

- 33 Work is needed to complete and formalise the emerging spatial data infrastructure. New Zealand already has interoperability guidelines (e-GIF), licensing (NZGOAL) and pricing guidance, some data and metadata standards, tools, and user groups. These will form the foundation for the spatial data infrastructure. LINZ and the NZGO are able to undertake a programme of action to develop the formal spatial data infrastructure within current baselines, and are building their capability to carry it out.
- 34 This work may require a transformational change over a number of years but action can proceed immediately. A collaborative agency partnership will be needed with commitments of time and resources. It may also add complexity to agency information systems during a period of transition. The development of a focused work programme and management of the various phases of the work will ensure the programme of action is achievable. It will also assist in keeping agency costs to within baselines, although some funding may need to be moved across agencies.
- 35 The programme of action will need to focus on those areas that will deliver the greatest impact for the economy and public sector efficiency. One immediate priority will be to identify and compile fundamental datasets that are needed by government and actively manage their coordination. Fundamental location-based information is fragmented across government (central and local), Crown agents, academia and the private sector. Compiling some fundamental datasets will require information that is not held by government. Compiling the data will enable transformative uses of the unlocked information. Examples of some fundamental datasets might include: transport networks, addresses, mineral resources, agricultural and aquacultural resources, and biosecurity.
- 36 Subsequent phases of work would look at including other state services datasets that are not considered fundamental datasets. These might include datasets that are required by multiple agencies and their use enhances the effectiveness of government agencies. LINZ and the NZGO will work collaboratively with all key stakeholders.

- 37 Local government, Crown agents, academia and the private sector hold significant location-based information and expertise. Some are already involved in the *Geospatial Strategy* and are leading the way towards contributing to the spatial data infrastructure. Their voluntary involvement will be able to continue and future work will involve engagement with the wider sector. How best to involve others will be considered as part of the future work programme.
- 38 LINZ and NZGO will provide agencies with advice and support as they move towards compliance. This will make it easier for agencies to align with the infrastructure. The NZGO is also developing a tool to help agencies to measure the economic impact of releasing their information.

Risks and mitigation

- 39 The following table lists major identified risks, the level of risk and proposed mitigation.

Risk and explanation	Risk level	Proposed mitigation
<p><i>Industry reaction</i> Some companies may lose significant government revenue due to information being made more usable and available. They might also argue that government is moving into downstream processing that is best left to the market.</p> <p>The Spatial Industries Business Association (SIBA) wants government, especially LINZ, to focus on improving data quality.</p>	High	<p>Keep industry involved, consulted and part of developing the spatial data infrastructure, so they can reposition at the more innovative and higher value-add end.</p> <p>Highlight potential boost to industry from increased demand for geospatial services.</p> <p>Stress the greater benefits to users and to New Zealand as a whole.</p> <p>I am working with SIBA to discuss their priorities.</p> <p>LINZ is also undertaking a data quality improvement project in parallel.</p>
<p><i>Additional resources and system complexity from spatial data infrastructure</i> Establishing the spatial data infrastructure will take agency time and resources to transition. For a period, there will be additional system complexity</p>	Medium	<p>LINZ and NZGO will assist agencies to understand how to meet the requirements of the spatial data infrastructure.</p> <p>Deal with need for additional resources through budget Cross Agency Initiatives Process (CAIP).</p> <p>Focus on the long-term benefits of system ease and greater information use from the spatial data infrastructure, leading to greater efficiency.</p>
<p><i>LINZ/NZGO capability to handle additional responsibilities</i> Requires resources and culture change to provide appropriate guidance to agencies.</p>	Medium	<p>LINZ and NZGO have been building capability, and will continue to prioritise this work within baselines. LINZ and NZGO will consider processes to appropriately support agencies.</p>

Consultation

- 40 The following agencies were consulted in developing this paper and any comments incorporated: Archives New Zealand, Departments of Building and Housing, Conservation, Corrections, Internal Affairs, and Labour; Inland Revenue Department; Government Communications Security Bureau; Ministries of Agriculture and Forestry, Culture and Heritage, Defence, Economic Development, Education, Environment, Fisheries, Foreign Affairs and Trade, Health, Justice, Research, Science and Technology, Social Development, Transport, National Library of New Zealand, New Zealand Customs Service, Statistics New Zealand, State Services Commission, Te Puni Kōkiri, the Treasury, New Zealand Defence Force, New Zealand Police, Civil Aviation Authority of New Zealand, Electricity Commission, Housing New Zealand Corporation, Maritime New Zealand, New Zealand Fire Service Commission, New Zealand Trade and Enterprise, New Zealand Transport Agency, New Zealand Walking Access Commission, Local Government New Zealand and the Privacy Commissioner.
- 41 The Ministry of Health (MoH) is comfortable with the intent of the paper, but notes the need to work through any impacts that may arise for health information technology (IT) infrastructure and the implementation of the National Health IT Plan.
- 42 New Zealand Police have provided the following comment:
- 42.1 The paper places priority on pulling together and making available to the public current government-owned data. While Police agrees with greater sharing of government-owned data, Police considers immediate priority should be given to the pulling together of fundamental (priority) datasets, which was also given priority in the *New Zealand Geospatial Strategy*.
- 42.2 Should the focus remain on pulling together government-owned datasets, Police considers that its immediate needs and those of other emergency agencies' will not be met. Furthermore Police is concerned that the approach is likely to impose additional costs while still obliging it to purchase critical data from the private sector.
- 43 The New Zealand Fire Service Commission provided similar comments on the importance of fundamental datasets as the Police in paragraph 42.
- 44 The Department of the Prime Minister and Cabinet was informed of this paper.

Financial implications

- 45 There are no direct financial implications in this paper, although the future work programme may have financial implications that will require further consideration.
- 46 Further work to compile fundamental datasets is likely to have cross agency funding implications that may need to be considered as part of the CAIP. Agencies with responsibility to compile fundamental datasets are likely to require additional resources to undertake the extended responsibility. Some funding may be sourced from other agencies that make savings from no longer needing to duplicate this work.

Human Rights, Legislative and Gender Implications, Regulatory impact analysis, and privacy considerations

- 47 The proposals contained in this paper appear to be consistent with the New Zealand Bill of Rights Act 1990 and the Human Rights Act 1993. However, there may be search and seizure issues where location-based information is of a type for which people would have a reasonable expectation of privacy. Use of personal information by the state should not unreasonably intrude into the lives of its citizens. Officials from the Ministry of Justice and LINZ will work together on this issue to ensure consistency with the Bill of Rights Act.
- 48 There are no legislative, gender or regulatory implications from this paper.
- 49 This paper has limited privacy implications as it primarily deals with non-personal information. Where location-based information includes personal information that is publicly available though not easily accessible, agencies will need to consider the implications of the Privacy Act 1993. Where necessary, agencies may need to restrict access to or aggregate publicly available personal details to ensure compliance with the Privacy Act. Issues of privacy will be considered as the spatial data infrastructure is developed.

Publicity

- 50 Industry experts are expected to be interested in this proposal. I will work with industry to ensure that this proposal best meets their needs. LINZ and NZGO will also collaborate with and consult industry.
- 51 A communication and engagement plan will be developed by LINZ and the NZGO to ensure that this proposal is clearly communicated.
- 52 The plan includes LINZ making publicly available the contents of this paper and the related Cabinet minute.

Recommendations

- 53 The Minister for Land Information recommends that the Committee:
1. **note** better use of government's non-personal location-based information can significantly contribute to boosting the New Zealand economy and government revenue, and improve public sector efficiency;
 2. **note** that better connecting government's location-based information represents an investment in New Zealand's knowledge infrastructure, supports several policy drivers of the Government's economic objectives, and warrants inclusion in the government's economic agenda;
 3. **note** that developing an effective national spatial data infrastructure – a framework that connects providers and users of location-based information – has the potential to reap the greatest benefits for New Zealand from government's location-based information
 4. **note** that clear leadership is needed to develop a national spatial data infrastructure, and agency participation is required to realise its greatest potential;

5. **endorse** Land Information New Zealand (LINZ) as the lead agency to develop a more formalised spatial data infrastructure, in collaboration with other significant holders of location-based information, including local government, Crown agents, academia and the private sector on their involvement in a spatial data infrastructure;
6. **agree** that the Ministerial Committee on Government ICT replace the Joint Ministerial group to be responsible for approving strategy-related geospatial policy and oversee the *Geospatial Strategy* [POL Min (06) 22/13 refers];
7. **direct** LINZ and the New Zealand Geospatial Office (NZGO), within governance arrangements of the *Geospatial Strategy*, to undertake further work on the design and implementation details of a spatial data infrastructure and report back to the Ministerial Committee on Government ICT by June 2011 including on any funding or resource requirements;
8. **direct** that heads of state sector agencies listed in Annex 2 with location-based information comply with the spatial data infrastructure framework (once developed) unless there is a compelling reason not to, and consult the NZGO for guidance on compliance;
9. **agree** that agencies seeking an exemption from compliance with the spatial data infrastructure framework (once developed) for specified datasets apply to their Minister, who can grant an exemption in consultation with the Minister for Land Information;
10. **agree** that each agency retain the responsibility and capability to develop and maintain their own datasets to meet their core business, and that those agencies with location-based information conform, over time, with the spatial data infrastructure requirements;
11. **authorise** that LINZ lead a process to create a shared resources model for fundamental datasets to maximise the value for money of these datasets to New Zealand;
12. **direct** agencies intending to tender for or purchase new location-based information or services to consult the NZGO to ensure consistency with the spatial data infrastructure requirements and possible involvement of other agencies, provided that the approach meets the purchasing agency needs;
13. **invite** each Minister responsible for a Crown agent listed in Annex 2 to include an expectation that the Crown agent will comply with the new requirements for location-based information in their annual letter of expectations;
14. **agree** that LINZ make publicly available the contents of this paper and the accompanying Cabinet minute.



Hon Maurice Williamson
Minister for Land Information

28/11/2010

ELEMENTS OF A NATIONAL SPATIAL DATA INFRASTRUCTURE

- 1 A spatial data infrastructure is a framework that manages and organises location-based information in a way that helps to connect providers and potential users.⁸ It is similar to the organising framework required for the internet to be effective.
- 2 A spatial data infrastructure requires certain key elements to be effective, and these are present in New Zealand's emerging spatial data infrastructure:
 - 2.1 *greater awareness* of the power of location-based information
 - 2.2 *good governance arrangements*: oversight, direction setting, the overarching framework and legislation
 - 2.3 *compiling fundamental datasets*: a focus on those datasets with the greatest potential as a first step (some of these already exist)
 - 2.4 *standards and interoperability* (including acquisition, maintenance, access, re-use and discoverability): standards to allow the sharing of information (these already exist) and allow users to easily find it
 - 2.5 *capability development*: establish and maintain strong, independent professional standards and develop a skilled labour force to meet demand, and
 - 2.6 *research* to inform continuous improvement.

⁸ This would include implementing accepted data delivery, metadata and other agreed standards to facilitate discoverability, access and sharing of location-based information.

Agencies included in this initiative

Public Service Departments	Non-Public Service Departments	Crown Agents
Archives New Zealand	New Zealand Defence Force	Civil Aviation Authority of New Zealand
Department of Building and Housing	New Zealand Police	Electricity Commission
Department of Conservation		Housing New Zealand Corporation
Department of Corrections		Maritime New Zealand
Department of Internal Affairs		New Zealand Fire Service Commission
Department of Labour		New Zealand Trade and Enterprise
Inland Revenue Department		New Zealand Transport Agency
Land Information New Zealand		New Zealand Walking Access Commission
Ministry of Agriculture and Forestry		
Ministry for Culture and Heritage		
Ministry of Defence		
Ministry of Economic Development		
Ministry of Education		
Ministry for the Environment		
Ministry of Fisheries		
Ministry of Foreign Affairs and Trade		
Ministry of Health		
Ministry of Justice		
Ministry of Māori Development (Te Puni Kōkiri)		
Ministry of Research, Science and Technology		
Ministry of Social Development		
Ministry of Transport		
National Library of New Zealand		
New Zealand Customs Service		
Statistics New Zealand		