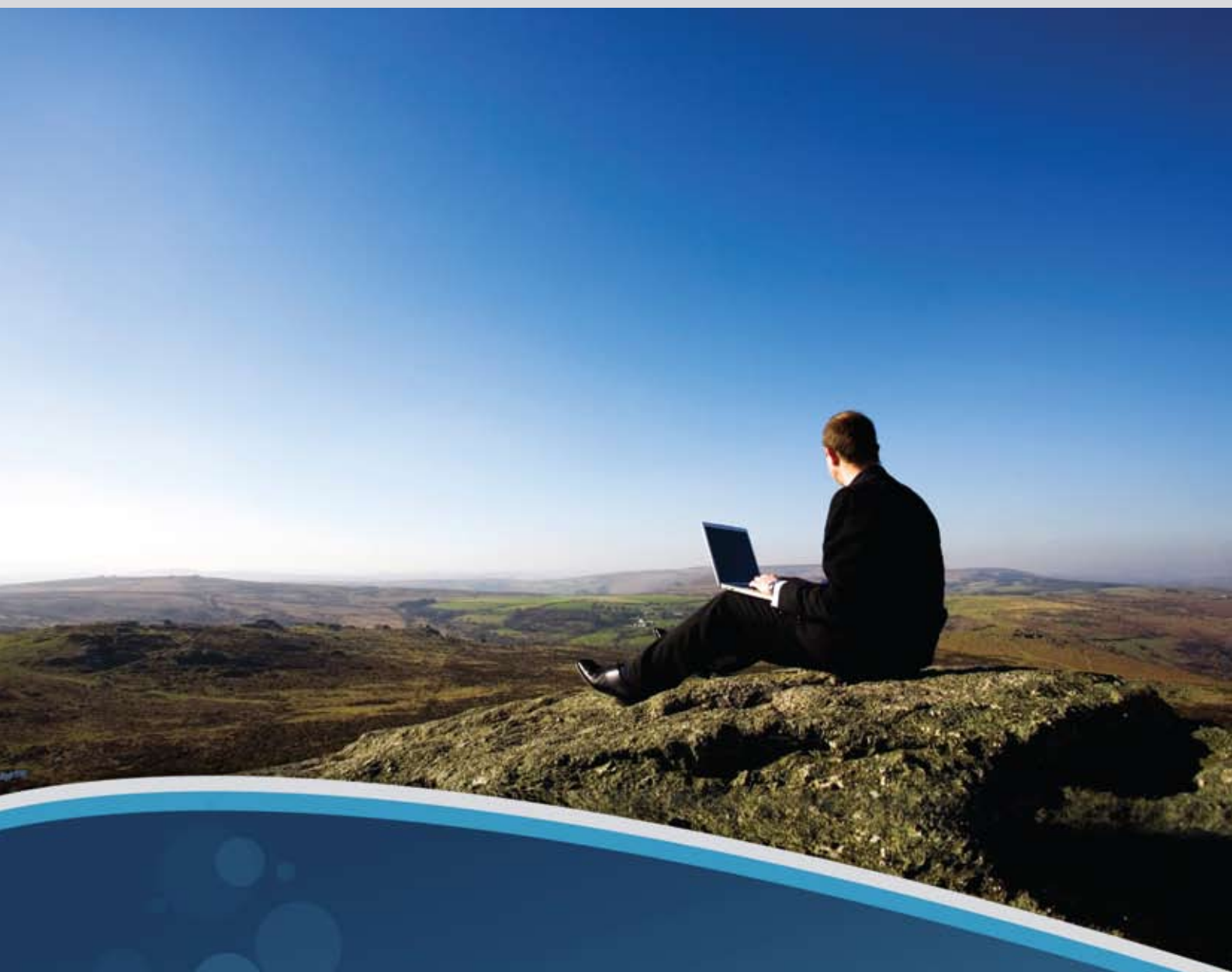




REALISING THE
Power of Location



A Location Information Strategy for Western Australia

Version 2.0, updated November 2012

Supported by;



Our vision is for location information to enhance today's decisions and drive better outcomes for tomorrow; helping to create a vibrant future for Western Australia

In this future, every Western Australian will benefit as we apply the power of location to better understand where events happen and their effect on the people and assets at those locations. Across the public and private sectors, we will use location information to better plan and manage risks and improve the strategic vision and impact of our decisions.

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Minister's Foreword

A humorist once remarked in frustration; ***"We are not lost. We are locationally challenged."***

I am proud to say that Western Australia is anything but "locationally challenged." On the contrary, the Strategy that follows demonstrates **our State stands at the cutting edge of location information delivery.**

A sense of place - its characteristics, its values and virtues, drawbacks and downsides - is essential in a modern world. **Location is a treasure house of information.** It is the basis for many of the decisions that profoundly affect our lives.



We are constantly asking "where?"

Where is the nearest medical centre?

Where should we build a new school?

Where are the communities at greatest risk of a disease outbreak?

And so on.

The **answers** all depend on accurate, timely, accessible location information. **It is in this spirit that I commend to you the Location Information Strategy for Western Australia.**

This Strategy heralds a new era. For the first time, it details the vision for a *consistent framework*, made possible by the integration of location based information from Western Australia's many excellent sources.

As a result, **the Strategy will underpin the effective delivery of key State initiatives**, including priority infrastructure programs, regional development, climate change adaptation, emergency services, crime prevention, urban planning and many more. It will enable better sharing of relevant information across the public sector, the private sector and to members of the public.

Better information will result in better decisions and better outcomes.

I commissioned this study with these benefits clearly in mind. In a powerful submission to the Economic Audit Committee in October 2009, Landgate - the State's authority for location information - argued persuasively for more coordinated and collaborative management of WA's location information assets. **This Strategy** – led by Landgate, the existing Western Australian Land Information System (WALIS) framework and assisted by public sector agencies, representatives of the private sector and academia - **is the result.**

It launches us on the road to world's best practice.

It sets out *what* needs to be done, *when* and *how*.


And it shows that it is now time for action.

The Western Australian Government is, of course, responsible for the creation and management of most of the State's location information. Therefore, it will take a lead role in delivering the outcomes of the Strategy. However, the involvement of the State's industry and academia will be essential and I look forward to their positive involvement. In order to optimise the benefits, Landgate – through the WALIS framework – will be responsible for overall coordination.

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I would like to personally thank all those who have contributed to the development of this Strategy and, in particular, Landgate and the WALIS community, including public sector agencies, the Spatial Industries Business Association, the Surveying and Spatial Sciences Institute and representatives from tertiary institutions. I commend them on their excellent work.

I am proud to endorse this groundbreaking Strategy that promises benefits to all Western Australians.



Hon Brendon Grylls MLA
Minister for Lands

Executive Summary

Location is so much more than a set of geographical co-ordinates. Location can, and should, provide critical information for better decision making: by and for Federal, State and Local governments, business and the public.

Maximising the value of location information to the State is the Key Objective of this Location Information Strategy. The Strategy provides the necessary direction, framework and impetus to fully realise the power of location.

Simply put, the more we know about where events occur and how they affect the people and assets at those places, the more competently we can plan, manage risk and use resources. This in turn will increase the success rate for initiatives, help circumvent future problems and provide tangible financial benefits. The end result is improved service delivery and superior outcomes for everyone.

Examples and applications are limitless. Whether trying to determine where to build a new school, examine the impact of rising sea levels along our coast, or plan major developments in regional areas: reliable, relevant, easily accessible, cost-effective location information is fundamental.

Western Australia is already well positioned to deliver precisely this kind of quality information through the Western Australian Land Information System (WALIS) and the Shared Land Information Platform (SLIP). **The challenge is to consistently deliver the best these systems can offer, while working towards even greater capabilities in the future.**

Accordingly, this Strategy critically examines the collection, management and use of Western Australia's location information assets. It gives specific emphasis to reducing wasteful duplication, preventing inefficient utilisation of scarce capital funding across Government,



Western Australian Land Information System (WALIS)

Established in 1981 by the Western Australian Government, WALIS is chartered with responsibility for coordinating across-government access and delivery of location (geographic) information. WALIS comprises all of the State Government Departments and the Commonwealth and Local Governments are participants via Memoranda of Understanding. The private sector and academia also participate in the governance arrangements to ensure a truly holistic approach to location information management in Western Australia is achieved.





Shared Land Information Platform (SLIP)

The development of SLIP began in 2004. The aim was to open up access to location information held by Government agencies. The initiative began with the involvement of an initial 19 agencies. There are now over 400 datasets available online. SLIP is an internationally recognised government information sharing platform, and has received numerous awards. With SLIP, shared access to land and property information is now more economical, faster and simpler.



reducing difficulties in accessing location information held by the public and private sectors, improving service delivery, and removing constraints on critical decision making. The Strategy also paints in broader strokes, offering suggestions about how to deal with some of the State's wider issues, including the need to manage population growth and maximise the benefits from infrastructure investment.

We have already made significant progress. For the past five years, the Shared Land Information Platform has led the way, greatly increasing availability and access to key location information across government. We have designed and developed tailor made tools to meet the specific needs of individual agencies. The results have been nothing short of excellent.

It is now clear we need to take the next step forward. This demands a blueprint involving, not only the whole of government, but embracing the entire community. All stand to benefit considerably, as we have already highlighted. There will be immediate benefits to Western Australian industry through improved access to greater amounts of higher quality data, as well as more efficient and quicker approval processes. And the State's existing location information industry will be enhanced by the encouragement of investment and innovation.

It has been said many times that information is the currency of the 21st Century. **With that in mind, this Strategy has four important goals:**

1. **FACILITATE** the State's growth and sustainable development through improved use of location information.
2. **ENABLE** better informed government, industry and community decision making.
3. **STREAMLINE** the capture and maintenance of government data.
4. **FOSTER** innovative thought, process and practice.

We are already actively working towards these goals. Priority initiatives in location information across the State have been identified. **These five Strategic Initiatives are:**

- » **Promoting and branding Western Australia – Location WA**
- » **Strategic capture of the State’s location information**
- » **Enhanced access to location information**
- » **Citizen engagement through location technology, and**
- » **Education and career development – embedding location intelligence**

A number of forward thinking strategies have already been developed for each initiative and a high level Program Implementation Framework has been prepared. The Strategy, Vision and implementation approach have been adopted by Government and industry. A detailed plan for overall program implementation, as well as individual plans for each strategic initiative are being developed, including project deliverables, scope, milestones and costs. The benefits, both now and in the future, promise to be exciting.

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In addition to the Strategic Initiatives outlined above - a number of shorter-term Priority Projects will be implemented to ensure early benefits from the program, making infrastructure investment and the delivery of services more timely and cost effective.

This Location Information Strategy has been *developed* by Landgate and the WALIS Office, with support from the WALIS community, industry and academia. Lead agencies will, of course, play a primary role in each priority initiative. However, we believe for this Strategy to truly fulfil its rich promise, *implementation* must be shared by the widest possible cross section of participants.

Realising the potential of location information: the public and private sectors and academia have endorsed this Strategy and associated strategic initiatives and actions. Proposed lead organisations are committed to progressing and leading the assigned strategic initiatives, and overall Program Implementation is appropriately resourced.

Our Vision is for location information to enhance today’s decisions and drive better outcomes for tomorrow; helping to create a vibrant future for Western Australia.



Introduction

How We Define Location Information

Throughout this document, reference is made to “location information”. This can be interchanged with spatial, geospatial, place and geographic information. It refers to any piece of information that has a location element, such as an address, a postcode, a building or a census area. Most information from diverse sources can be linked to a location.

This Location Information Strategy is a bold blueprint aimed at addressing some of Western Australia’s major challenges: Big Picture issues such as our growing population and adapting to climate change. The Strategy pinpoints Priority Projects of economic, social and environmental significance. And importantly, it details effective ways to maximise the value of the collection, management and use of Western Australia’s location information.

In its 2008 report for the Cooperative Research Centre for Spatial Information, ACIL Tasman conservatively estimated revenue from the spatial industry in 2006/07 at \$1.37 billion and industry gross value at around \$682 million.¹ Growth has continued to accelerate. A 2010 study estimates the spatial industry market in Australia and New Zealand is now worth \$2.1 billion.² **Clearly, location information is increasingly being highly valued and delivering economic benefits.**

Further evidence of the value and utility of location information is demonstrated by the application of precise positioning technology using real time location data in key sectors of the Australian economy including mining, construction and agriculture. In dollar terms, it is estimated that Real Time Positioning (RTP) technology using global positioning systems has the potential to generate between \$73 billion and \$134 billion net present value for the Australian economy, to 2030. Implementing a standardised national RTP network could deliver additional cumulative benefits of between \$32 billion and \$58 billion (gross), as a result of increased adoption rates and volumes.³

The take-up of mobile location based devices that use RTP GPS capability by the general community is also growing rapidly, and location is central to this. It is estimated that global revenue from consumer location based services will reach US\$8.3 billion in 2014 as more compelling and useful applications and services are developed.⁴

¹ ACIL Tasman Pty Ltd (2008). The Value of Spatial Information: The impact of modern spatial information technologies on the Australian economy. Accessed 9 August 2010 from http://www.crcsi.com.au/uploads/publications/PUBLICATION_324.pdf

² Corporate GIS Consultants (2010). The 2010 GIS Industry and Technology Survey, eighth survey to members of the Australian and New Zealand spatial information community.

³ Allen Consulting Group (2008), Report on the Economic Benefits of High Resolution Positioning Services . Accessed 18 August 2010, from www.crcsi.com.au/pages/publications.aspx .

⁴ Gartner Inc. (2010). Forecast: Consumer location-based services worldwide, 2008-2014. Accessed 12 September 2010, from http://www.gartner.com/DisplayDocument?id=1412514&ref='g_fromdoc'

This Strategy also dovetails with the Government's Public Sector Reform program.

It supports key recommendations of the Economic Audit Committee's 2009 review into the operational and financial performance of the State's Public Sector. Important areas of synergy include the need to reduce duplication and improve efficiencies. It also strengthens the evidence base for decision making by, amongst other things, ensuring access to common datasets, and facilitating more collaborative work practices.

And this Strategy is proudly holistic. It recognises the value of location information as a complete value chain: from data collection, to its management, maintenance, compilation and finally its use, through intelligent analytical tools for planning and superior decision making.

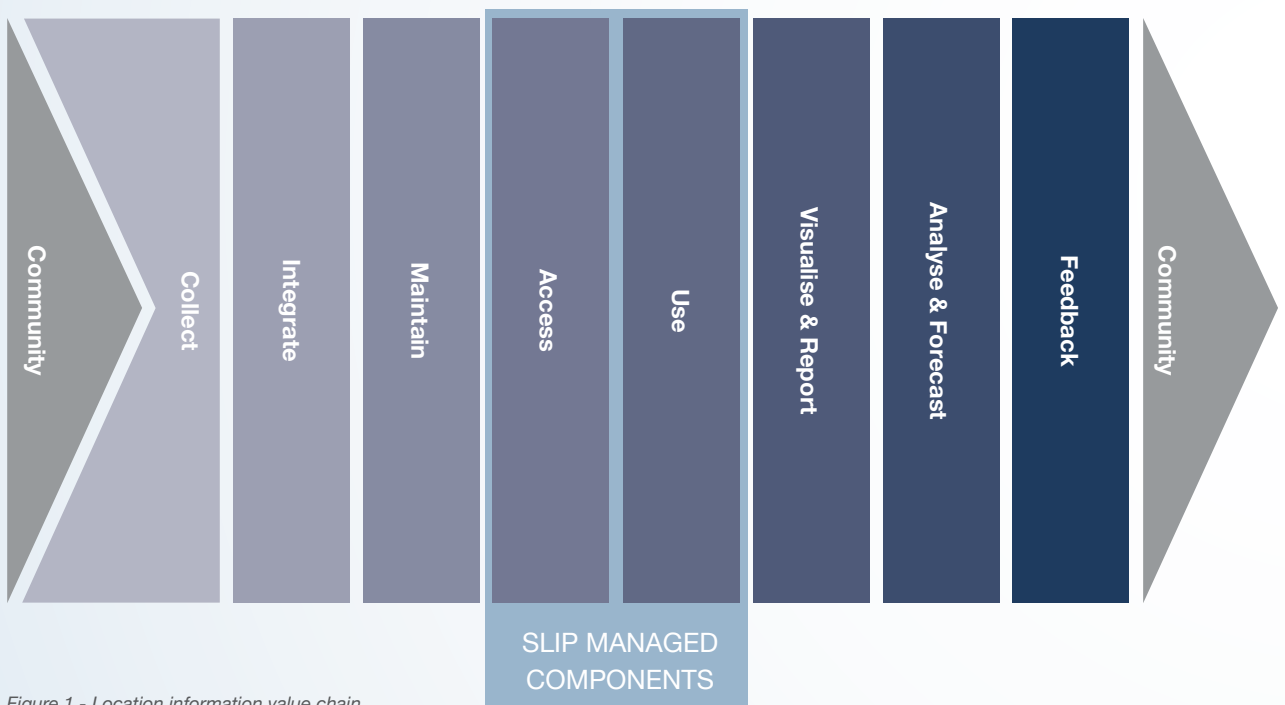


Figure 1 - Location information value chain

Objective, Goals and Benefits

The objective of this Strategy is to provide the necessary direction, framework and impetus to realise the full power of location. Once again, the Strategy is in sync with progressive initiatives both here and overseas. It is also aligned with key aspects of the national agenda, including improving access to public sector data and Government 2.0. And it echoes cutting edge international trends in location information use and management.

The Location Information Strategy recognises that location information, in itself, does not deliver a better planned future. Rather, the Strategy presents location information as the necessary foundation that is used for better decision making. With higher quality information, government, industry and the community will achieve more beneficial outcomes. And they will be reached more efficiently and effectively.

This Strategy has four goals:

1. **FACILITATE** the State's growth and sustainable development through improved use of location information.
2. **ENABLE** better informed government, industry and community decision making.
3. **STREAMLINE** the capture and maintenance of government data.
4. **FOSTER** innovative thought, process and practice.

Successful implementation of this Strategy will benefit the widest possible range of stakeholders, including government, citizens and the private sector. It will result in reduced wasteful duplication, preventing inefficient utilisation of scarce capital funding across Government; better access to location information held by the public and private sectors; improved service delivery; and less constraints on critical decision making.

⁵ Western Australian Planning Commission (2009). Directions 2031 and Beyond: Metropolitan Planning Beyond the Horizon: Accessed 6 September 2010 from <http://www.planning.wa.gov.au/Plans+and+policies/Publications/2224.aspx>

Who this Document is For

This Strategy is intended as a guide for senior members of the Western Australian Government, key stakeholder groups and spatial information businesses, as well as the wider community. It has been developed by Landgate and the WALIS Office with support from the WALIS community, the Spatial Industries Business Association (SIBA), the Surveying and Spatial Sciences Institute (SSSI), the Cooperative Research Centre for Spatial Information (CRCSI) and academic institutions.

To be *successful*, this Strategy will require the active support of all relevant government agencies, in particular the lead organisations for each of the strategic initiatives. Implementation will involve a range of staff from across government, as well as the commitment and participation of the academic and private sectors.

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Case study – Making Public Transport Trouble-free

A critical goal of the Public Transport Authority (PTA) of Western Australia is making public transport an attractive and sustainable choice for connecting people and places. To help achieve this, the Authority must meet the needs of travellers, such as where to find their nearest services and relevant timetable information.

The PTA's approach has been innovative. It provides access to a range of data related to bus routes and bus stops, and provides access to this information via its website and through an SMS service to mobile phones. Commuters can thus plan their journeys online, and access specific timetable information from anywhere.

The PTA has also set up live web services, so that other organisations are able to embed journey planners into their own websites, or for use by mobile applications. So, for example, a retailer with a chain of stores can embed a journey planner into their company website, or into an iPhone application. Customers then have a simple, convenient guide on how to get to their nearest store: a win-win situation.

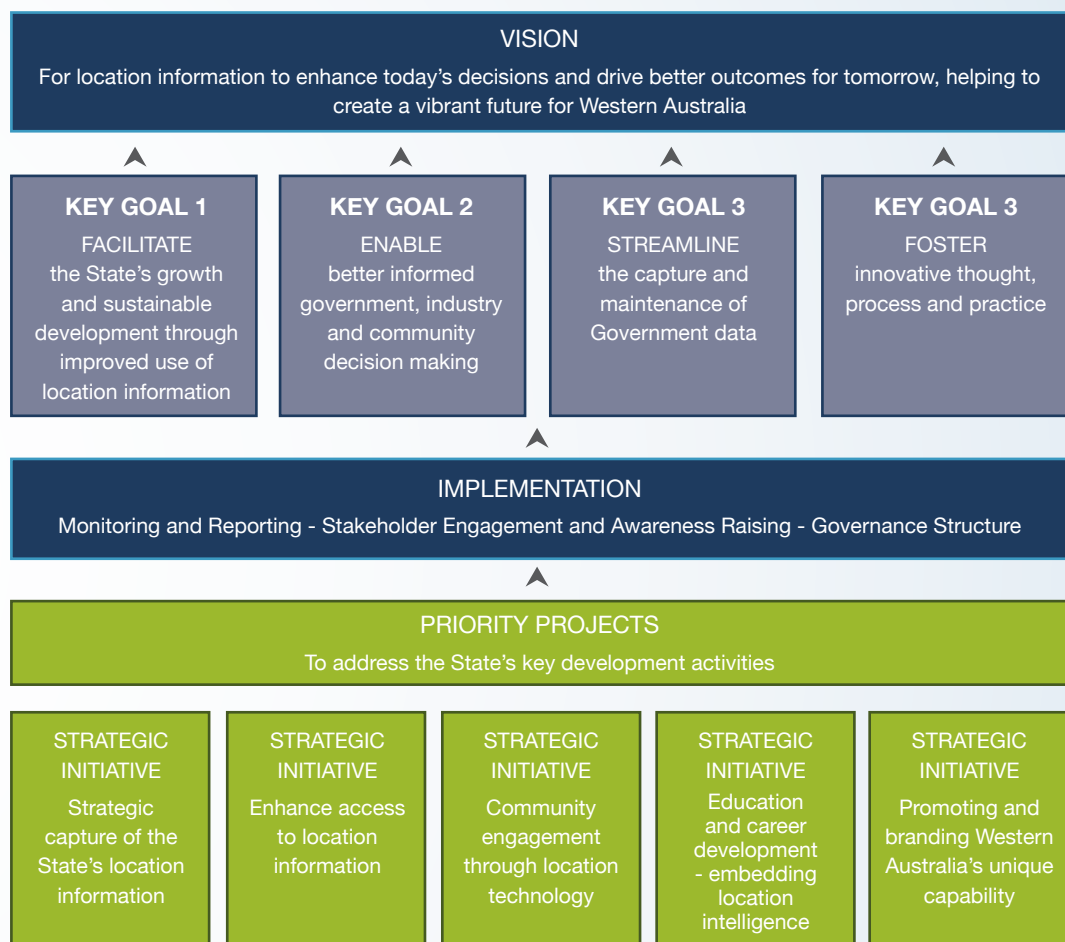
It's important to note that this is being achieved without significant impacts on PTA's existing systems, which were seeing demand for SMS information double each month (to a current monthly demand of 50,000 SMS requests and around 1.8 million website page views).

This example demonstrates how innovative thinking can deliver added value from an existing resource. By providing relevant tools and interfaces, the PTA has enabled third parties to publish its location information even more widely, and without the need for a government agency to develop significant new systems itself. This means:

- » Public transport information is available as widely as possible;
- » Travellers can access reliable information - through the government agency responsible for maintaining it - using the technology of their choice, but without the need for the agency to deploy and maintain multiple applications; and
- » Targeted information is available on demand, and to people on the move.

Location Information Strategy Framework

The following framework has been developed to deliver the Strategy;



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Figure 2 – Key goals, location based solutions and strategic initiatives.

Note - A separate document outlining the Program Implementation Framework has been developed. An overview is provided on page 28.

Why We Need a Strategy

First, the good news. Right now, Western Australia is extremely well positioned globally in terms of the management of location information. The Western Australian Land Information System (WALIS) is a dynamic partnership of government agencies working with business, education and the general community to manage and promote the State's geographic information, and making it available online. Established by the Western Australian Government in 1981, it is recognised as a world leader in whole of government process.

The Shared Land Information Platform (SLIP), enabling users to discover, view and access hundreds of datasets, anywhere, anytime, has been in operation for five years and has further enhanced the sharing of data. An overview of WALIS is provided in Appendix A and SLIP in Appendix B.

However, challenges lie ahead. Most government data is still held by agencies in varying formats, making it hard to update, access and ensure accuracy. As the State faces a more complex future, it will need to grow and upgrade its capabilities. By developing and implementing a Strategy now, the structures currently in place, - in particular WALIS and SLIP, - can be improved to maximise their value to the public, business and the Western Australian Government.



Case study – Minimising Maintenance Costs

The Department of Housing is responsible for, among other things, public and community housing, Aboriginal and regional housing, major government projects, capital works projects, and property and facilities maintenance. When the Department was approached by Landgate to utilise the SLIP Enabler Framework, staff were still tracking properties manually. This meant a combination of hard copy maps, street directories and customised printed maps. It was time consuming, labour intensive and did not allow for genuine analysis of data.

The Department recognised the value of being spatially enabled and SLIP clearly demonstrated the means to achieve this. Landgate developed a prototype, built in-house so the Department could use its own key data, along with some SLIP datasets. The prototype application, called HAGIS (Housing Assets Geospatial Information System) provided a fuller, clearer picture of property assets and released the power of location based data. For example, staff were able to calculate the distance from Department properties to shops, transport, schools and health facilities, maintain more up to date records on Department assets and undertake analysis of stock, demand and clustering of public housing.

In February 2008, Amristar Solutions won the contract to build the full application for the Department. Using data from SLIP and the Department, the application now allows staff to visualise information and create a macro view of housing stock and demand. Previously, this was not possible. For a relatively small investment, the Department has achieved a fully operational housing management environment that would have cost more than four times the amount using other sources, saving in excess of \$1.5 million on the system build alone. Critically, the Department has also minimised the ongoing maintenance costs by using SLIP and by subscribing to a data service that always has access to the most up-to-date information.

The efficient, effective sharing of location information within and across organisations requires a framework. This must include acceptance of common business processes and consistent IT infrastructures, appropriate open standards and simplified licensing arrangements. Establishing these working principles and building on existing examples of best practice will help maintain the quality, integrity and availability of data.

At the same time, there are competing demands over *how* and *what* information needs to be made available. Changing community expectations, a growing call for access to public sector information, and existing and emerging technologies are just some of these. What is required is a proactive and cooperative effort to manage expectations, backed by a greater understanding and more effective use of location information.

Western Australia *needs* a Location Information Strategy. This Strategy will establish how the many different types of location information can be shared, integrated and used more easily and effectively for making important decisions. This will grow the State's competitive advantage and innovative capacity, reduce wasteful duplication, deal with future problems head on, improve services for the community and deliver direct financial benefits.

Challenges Addressed by the Strategy

State-wide Challenges

Over the coming decade, the Western Australian Government, business and the community will face significant challenges in providing goods and services in economically, environmentally and socially sustainable ways. These challenges are:

- » **Maximising the benefits of government and industry investment** – The growth of Western Australia is largely being driven by another resources boom. Around \$180 billion worth of investment in mining is expected to flow into Western Australia and the Northern Territory between now and 2016⁶. The Western Australian State Government is also investing in priority infrastructure projects across the State including Oakajee Port (\$339 million⁷) and Pilbara Cities (\$977 million⁸). Better sharing and use of location information can help achieve significant cost savings through better planning and decision making.
- » **Managing population growth** – The State's population is growing faster than any other part of Australia. The Perth Metropolitan "...region will have a population of 2.2 million people. This represents: over half a million new residents to be housed in 328,000 new dwellings and needing 353,000 new jobs"⁹ all by the year 2031. This Strategy improves the availability of critical location information to help plan for this unprecedented growth.

⁶ CEDA. (25 March 2010). Inventing the Future: Shaping WA for 2010-2050. Concept Launch.

⁷ Department of State Development. Oakajee Industrial Estate and Port Project. Accessed 16 July 2010 from <http://www.dsd.wa.gov.au/6616.aspx>

⁸ Western Australian Government. State Budget 2010-11: Strong foundations. Working together (Pilbara). Accessed 18 August 2010 from <http://www.mediastatements.wa.gov.au/Pages/Results.aspx?ItemID=133526>

⁹ Western Australian Planning Commission (2009). Directions 2031 and Beyond: Metropolitan Planning Beyond the Horizon. Accessed 6 September 2010 from <http://www.planning.wa.gov.au/Plans+and+policies/Publications/2224.aspx>



Case study – Cutting the Cost of Infrastructure

The New Perth Bunbury Highway (NPBH) is the single largest project ever undertaken by Main Roads (WA). Funded by the State and Federal Governments, the 70.5 km project was delivered by the Southern Gateway Alliance (SGA), a partnership of three industry leaders, Leighton Contractors, WA Limestone and GHD, and the State's road agency Main Roads.

The project commenced in 2006 and construction required more than 14 million tonnes of material. Rather than apply the traditional approach of surveyors pegging the alignment and guiding construction activity on-site, the SGA took advantage of modern GPS machine guidance, real time positioning (RTP) technology, location information and two-way communication to ensure that the latest design was used to construct the road in the right location, with the correct alignment, slopes and cambers.

Live data streams were also sent to the office from the field, providing important data on machine locations, their grid position and heading, the design currently in use, whether the machine was being operated manually or automatically and whether it was moving.

This innovative construction method, using precise, up-to-date location information resulted in significant savings, allowing the project to be completed six months ahead of time and around \$18 million under budget. At least three months and \$14 million of these savings were directly attributed to using machine guidance and location intelligence.





Case study - Managing Coastal Vulnerability

The effects of climate change can be confronting. Even today, severe storms, flooding, hail and drought can have a devastating impact on lives and business. And far more profound climate change is predicted. Experts say that over the next century, sea levels will rise by around 1.1 metres¹⁰.

Consider the impact of a sea level rise in Western Australia; a State with 20,513 kilometres of coastline. There are between 18,700 and 28,900 residential buildings that may be at risk of flooding in the event of such a rise. A 2009 report by the Department of Climate Change put the replacement value of these properties at between \$4.9 billion and \$7.7 billion.¹¹

This potential threat highlights the importance of quality, timely information to support emergency planning, response and recovery. The impacts of major climatic events can be devastating and include shoreline erosion, inundation of coastal lowlands, and changes to ecosystems and the distribution of habitat. WA's coastal areas are susceptible in many ways, including:

- » Infrastructure (residential housing, ports, marinas, coastal developments)
- » Regional industries (oil and gas, tourism, fisheries, aquaculture, pearling)
- » Recreational activities (fishing, boating, diving).
- » Environment (beaches, reefs, marine protected areas, ecosystems, threatened species).

The Managing Coastal Vulnerability initiative under the LIS aims to better equip decision makers by configuring the primary coastal and marine data held by relevant State Government agencies for broader industry use, ensuring efficient shared access to this data and making the information more readily available via a single public interface.

¹⁰ Department of Climate Change (2009). Climate Change Risks to Australia's Coast: A first pass national assessment. Page 6.

¹¹ Department of Climate Change (2009). Climate Change Risks to Australia's Coast: A first pass national assessment. Page 115.

- » **Ensuring sustainable development** – The present needs of Western Australians, as well as the long-term wellbeing and prosperity of future generations, demand the careful use, conservation and enhancement of resources. Only then can the ecological processes on which society depends be maintained. This Strategy ensures consistent data so that planners can make better decisions about developments and service delivery.
- » **Adapting to climate change** – Sea level rise, storm surges, reduced rainfall and hotter, drier summers will impact significantly on Western Australia. Location information plays an integral role in identifying areas and communities at greatest risk and monitoring changes. It holds the key to developing mitigation strategies and modelling future impact as we face a radically changing climate.
- » **Fostering a strong economy** – It is vital for Western Australia to fully capitalise on the resources boom. This includes positioning itself as a strong and resilient economy while building new capabilities and competencies. This Strategy helps to attract inward investment to the State. At the same time, the Strategy emphasises Western Australia's world-leading reputation for excellence in location information delivery. This study embeds location information awareness and analytical skills as a business tool enabler. And it encourages a healthy spatial sector that benefits organisations by providing them with cost-effective business intelligence solutions.

- » **Aligning with national priorities** – Western Australia cannot afford to operate in isolation. Nor can it afford to be out of step with advancing technology. As a State, we must keep pace with, and where possible influence, the national agenda. This Strategy completely aligns with national priorities and initiatives, such as improving access to public sector information and Government 2.0. It also helps position Western Australia at the forefront of location information, particularly in respect to emerging technologies, developing policies and standards and the most valuable use of location data within and across the sectors.

Location Information Challenges

We have so far failed to maximise our use of location information to help address these challenges. Quite simply, too few datasets from across government and other sectors can be integrated and analysed with reliability and ease.

Accordingly, the Strategy aims to:

- » Enhance the coordination of location information across data providers to improve critical decision making.
- » Reduce duplication of effort, not only in the collection and capture of data but also of the resources required to manage and maintain it.
- » Improve access to data for all Western Australian citizens, including knowledge of what information exists and how and where to find it.
- » Enhance the way location information is packaged, to ensure it is fit-for-purpose and can be easily aligned, integrated and analysed.
- » Increase the knowledge of, and access to, government data held in individual organisations and agencies, to ensure the full value of our asset is being realised.
- » Upgrade the capability of organisations to adhere to standards and custodianship principles.



Case study – Finding New Value in Old Information

There is an old English expression “new money for old rope” referring to a simple way to make money. Our concern here is to generate value, but the principle is the same.

Consider this. If the majority of our investment in location information is in its capture and maintenance, with much less time spent enabling better access to it, then anything that improves access and usability will deliver a significant return on investment. We acknowledge that these benefits can be hard to quantify. But improved information access has significant potential to unlock innovative uses which haven’t even been imagined yet.

Take the remarkable case of UK postcodes. Originally, they were designed simply to help the Post Office deliver letters and parcels. These days, new uses are being found literally every day. For example, the database detailing which postcodes are to be found where, underpins countless websites, from that of National Statistics, to those of pizza delivery companies. The same set of numbers continues to generate extra value at no additional cost to the public sector¹².



¹² Department of Climate Change (2009). Climate Change Risks to Australia’s Coast: A first pass national assessment. Page 125.

State-wide Challenges	By solving the location information issues, we can...
<p>Maximising the benefits of government and industry investment</p> <ul style="list-style-type: none"> » Optimum use of infrastructure » Appropriate service delivery levels 	<ul style="list-style-type: none"> » Establish an integrated view of the State's key infrastructure assets and service delivery points and model the impact of new resource developments on these assets and services. » Develop shared models of regional development precincts. » Improve decision making by both the government and the private sector regarding infrastructure and service development.
<p>Managing population growth</p> <ul style="list-style-type: none"> » Affordable housing » Access to education » Availability of health services 	<ul style="list-style-type: none"> » Improve planning through alignment of road, rail, power and water data layers, cadastre, planning and services to ensure rapidly developing areas are appropriately planned and serviced. » Increase citizen engagement through processes where communities contribute information to ensure improved planning and services, particularly health.
<p>Ensuring sustainable development</p> <ul style="list-style-type: none"> » Access to public transport » Intelligent transport systems » Ecologically friendly cities 	<ul style="list-style-type: none"> » Undertake more efficient planning and use of public transport. » Ensure efficient energy use in a carbon neutral environment. » Ensure appropriate protection of high value ecological communities, and ongoing monitoring of these State assets.
<p>Adapting to climate change</p> <ul style="list-style-type: none"> » Environmental management » Disaster preparedness and mitigation » Natural resource management 	<ul style="list-style-type: none"> » Improve availability of relevant information for scenario planning and emergency response. » Reduce impacts of extreme weather events. » Ensure profitable farms and food security through precision farming and best management agricultural practices.
<p>Fostering a strong economy</p> <ul style="list-style-type: none"> » Build opportunities and capabilities beyond resource development 	<ul style="list-style-type: none"> » Create innovative new business enterprises developed using location information. » Ensure we have a highly skilled workforce.
<p>Aligning with national priorities</p> <ul style="list-style-type: none"> » Influence the national agenda » Provide national leadership 	<ul style="list-style-type: none"> » Promote and brand Western Australia as a leader in location information and technology – <i>Location WA</i>. » Improve representation on key bodies and contribution to national priorities.

How the Strategy will Address these Challenges

The Location Information Strategy provides a compelling vision and direction for location information in Western Australia into the future.

Strategic Initiatives

It is a bold State-wide vision that defines five fundamental strategic initiatives that need to be delivered if Western Australia is to have the capacity, information and policy framework necessary to address the identified challenges.

The initiatives are:

- » **Promoting and branding Western Australia's unique capability**
- » **Strategic capture of the State's location information**
- » **Enhancing access to location information**
- » **Citizen engagement through location technology**
- » **Education and career development – embedding location intelligence**

Specifically, the Strategy proposes the following actions and policies:

Four Key Principles

The Location Information Strategy is driven by four key principles that will deliver greater efficiencies in the management of location information in Western Australia. The principles are;

- » Location information is only collected once to avoid duplication and made readily available to support functions of Government;
- » Location information is consolidated and accessed in the most effective way through the Shared Land Information Platform (SLIP);
- » All current and planned capture proposals of location information using Government funds will be provided by public sector agencies to Landgate in order to identify and prioritise, in consultation with relevant public sector agencies, opportunities for strategic investment in the capture of this information; and
- » Benefits of government and industry research and development investment in location information and technology will be applied to create a comprehensive advantage for Western Australia and to support the State's strategic needs – maximising the value of this investment for the State.

Promoting and branding Western Australia's unique capability

- » The collective capability of the State's location intelligence will be leveraged across the private, public and research sectors to grow and develop the location industry for the benefit of all Western Australians.
- » The State's capabilities and its reputation as a leader in the use of location information will be promoted and built on – putting WA capability on the world map.
- » Local innovation will be encouraged to enhance the State's innovative capacity, competitiveness and attractiveness for investment.
- » Industry development initiatives will advocate the importance of location to other sectors, and enhance the awareness and use of location information in the State.

Strategic Capture of the State's Location Information

- » Key datasets will be identified and collected for the State, initially to support the priority development programs and effort will be focussed on aligning these datasets to a single core set of fundamental products.
- » The quality (accuracy, currency) required of each key dataset will be better defined and used to drive positional alignment across all datasets, initially to support key priority infrastructure programs within three years.
- » Western Australia will maintain a single version of key infrastructure datasets that are held at the State level.
- » Any data captured using Government funds, whether by private or Government agencies, will be made available for use by any other Government agency (with consideration for the necessary privacy and confidentiality requirements). The WALIS Office must be advised of its capture and it must be included in the "single point of access" portal.

Enhanced Access to Location Information

- » Agencies will only maintain the data that they are responsible for as leads.
- » Users will access a single point of truth for each key dataset required for business activities.
- » There will be a single access mechanism to access all Government data.

- » Government will open up access to key datasets, allowing greater opportunities to create tools, applications and services that address community and business needs with consideration for the necessary privacy and confidentiality requirements.
- » Government will develop and deliver an enhanced core business user interface to provide a foundation capability to overlay location information with business intelligence.

Community Engagement Through Location Technology

- » The capture and maintenance process will be updated to allow citizens to contribute content to datasets where appropriate to capture local knowledge and feedback on data quality.
- » Expand opportunities, through the promotion of Web 2.0 and other emerging technologies, for the business community and individuals to develop innovative and creative new business tools that will benefit the Western Australian community.

Education and Career Development - Embedding Location Intelligence

- » Work will be undertaken with Western Australian tertiary education centres to expand opportunities, beyond technical and science disciplines, for graduates and professionals to develop an understanding of the use and power of location information and technology.
- » Cross sector initiatives will develop innovative and targeted school programs (primary and secondary) to promote the use and power of location information and related technology.



Successful progression of these five strategic initiatives will require:

- » The adoption of new location information policies;
- » Additional investment in data capture;
- » Expansion of location information access mechanisms;
- » Better collaboration between government, industry and academia;
- » Strengthened governance arrangements; and
- » Commitment to the Strategy by the public, private and academic sectors.

This Strategy establishes the strategic framework within which the collection, management and use of location information will be improved in Western Australia.

It is recognised that it will take time to achieve all aspects of these strategic initiatives and their associated work programs and to fully realise the benefits from the anticipated investment. To maintain momentum, deliver early returns and build capacity, the immediate focus will be on pursuing priority development projects.

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Priority Projects

To deliver tangible benefits in the short-term, while positioning Western Australia as a leader in location information in the future, the Strategy identifies the need to select key Priority Projects that will address State wide challenges through the use of location information.

These Priority Projects will serve an important purpose. Importantly they will demonstrate, in a user focussed approach, the important and valuable role location information can play in decision making processes. By focussing on issues that matter to Western Australia, including approvals processes, regional development, managing population growth, planning schemes, as well as the delivery of public services, such as health, transport and education.

They will lay the groundwork for informed evidence based decisions, an improved approach to coordinating effort and a better return on the State's investment. The results and lessons learnt from this initial work will lay the foundation for future Stages of a Program of Work.



Supporting Regional Development

The Location Information Strategy Program of Work aligns closely with the objectives of the Royalties for Regions Program and the Action Agenda for Regional Development. The program will address key challenges affecting regional Western Australia, and establish a legacy by building and retaining capacity in regional centres. The Location Information Strategy Program will deliver the following benefits, supporting the six key priority areas as follows:

Housing and Services

- » Improved access to, and quality of, location information, to support decisions for housing and services' location and capacity.
- » More robust coastal planning to mitigate the risk to infrastructure (including industrial, commercial, services, and residential).

Employment, Infrastructure, Skills

- » Developing stronger collaboration between Government and the private sector to promote opportunities for location information to benefit other industries, including logistics and transport.

Education

- » Unlocking more career pathways for regional students in the surveying and spatial sciences fields.

Health

- » Coupling health information (including service levels and demands) with location information will provide significant advantages in the way Government manages delivery – delivering better outcomes, more efficiently.

Social and Environmental Amenity

- » Enhanced access to information supporting regional service and infrastructure planning based on a better understanding of local needs and opportunities.

Leadership and Decision-Making

- » Providing decision-makers with the location information they need, when they need it, significantly reducing delays.

The Regional Development Council has agreed to invest in the Location Information Strategy through the Royalties for Regions program. This investment will be made through a partnership with the WALIS Community in WA.

The Council recognises the long and successful history of innovation and collaboration in the management and application of location information through WALIS; a partnership that has grown over 30 years. Mr. Ian Fletcher, Executive Chair of the Regional Development Council, noted that “we believe WALIS, which brings together the skills and expertise in location information and technology, is uniquely placed to deliver the integrated view of our people, resources and infrastructure that is so critical to the Council’s approach to regional development in Western Australia.”

<http://www.rdl.wa.gov.au/aboutus/independentpartners/Pages/Regional-Development-Council.aspx>



Case study – Helping the Health of Communities

The Department of Health manages a large volume of information. As much of this data relates to individual patients, it is confidential. However, the information could be of significant use to other agencies and of interest to the community. How to balance these apparently conflicting interests presents a challenge. The Department is meeting expectations of enhanced access to medical information, at least in part, by working with location information.

The Department has recently deployed an online mapping application which displays health information. It is an important showcase for the value of location data in understanding health issues. The Department is able to summarise health information for areas - such as within a group of suburbs - while still protecting patient confidentiality. Information can be aggregated to larger areas for community access, or for smaller areas when shared with other agencies.

The critical need to share essential information was underlined during the 2009 outbreak of Swine Flu. The Department of Health tracked reported cases as the outbreak spread. However, it was unable to share this information with other agencies - such as the Department of Education and Training - because appropriate arrangements were not in place to package the data in such a way that it was useful, but did not violate patient's privacy. Similarly, there was no infrastructure in place to provide information to the public on the location of the outbreak.

In the future, the Department is committed to exploring how to make location based health information more readily available. This has significant benefits for other agencies, particularly in understanding health risks related to communities, and in planning as our population ages while continuing to grow.

Benefits of the Strategy

The benefits of this Strategy are:

- » **Direct financial savings** – through reduced duplication of data and systems, and improved capture, maintenance and sharing of information. (Refer to the *Cutting the Cost of Infrastructure* case study, page 16);
- » **Better decision making** – by ensuring the availability of accurate, reliable and relevant location information to those who need it, when they need it. (Refer to the *Managing Coastal Vulnerability* case study, page 17);
- » **Increased return on investment** – through better use, and re-use, of data and systems: i.e. collect or build once, use many times. (Refer to the *Finding New Value in Old Information* case study, page 18);
- » **Enhanced innovation and growth** – by using location information to increase the innovative potential of the State in order to solve pressing challenges and attract inward investment. (Refer to the *Helping the Health of Communities* case study, page 26);
- » **More targeted, efficient services** – via new or streamlined processes/services resulting from improved datasets and enhanced data integrity and access. (Refer to the *Minimising Maintenance Costs* case study, page 14); and
- » **Greater public participation** – by embracing innovative technology to make government services smarter and more convenient and encouraging citizen involvement. (Refer to the *Making Public Transport Trouble-free* case study, page 12).

These benefits – which will begin delivering within two years – far outweigh the cost of implementing this Strategy.

The main stakeholders of the Strategy benefits are the Western Australian community, land agencies, industry groups (eg. developers, surveyors), spatial experts and the academic sector.

Western Australian Government – This Strategy emphasises the principle “**Better information IN - Better decisions OUT**”. This has clear public benefits. The Strategy supports a number of the recommendations outlined by the 2009 Economic Audit Committee, including greater collaboration across sectors and improved access to common datasets. Further benefits include direct savings by reducing duplication of data and infrastructure and building the capacity to embed location information awareness and analytical skills across government.

Citizens and communities – Communities have a growing expectation of online service delivery and an expectation that Government information and services are available from a one stop shop. Whilst not currently possible in Western Australia this Strategy positively contributes to enabling these expectations. Members of the public will also benefit from this Strategy through such initiatives as online applications that allow them to contribute to the actual collection of information. They are more likely to become involved in the planning and decisions that affect them, by providing crucial, real time location information to their local council or government.

Spatial information industry – The Strategy boosts the continued growth, expansion and the development of new technology and ideas by encouraging investment, innovation and research in location information. This will follow from more accurate and up-to-date government-managed data, providing the spatial industry with more opportunities to develop value-added services.



Case study – Up to Code: Tracking Residual Current Devices (RCDs)

In 2009, changes to the *Electricity Act 1945* made it compulsory for all homes to have two RCDs installed, when ownership is transferred, or a new lease agreement is established. The Energy Safety Office is utilising location information to identify whether properties comply with the regulations or not. It is a potentially life-saving application of the data as RCDs ensure electrical safety in the home by preventing electrocution when the electricity supply is cut, or an imbalance in the current is detected.



Private sector – One of the main benefits for the private sector will be easy access to multiple layers of data, creating economic benefit by saving time, effort and cost. Within the new location information management framework, industry can develop value-added products and services, develop markets, promote new products, undertake research and development and manage its data with new certainty. The private sector will also benefit from improved understanding of the value of location information and will be able to take advantage of improved access to more data in more useful formats.

A critical decision is before us. The benefits for Western Australia will not be realised without the Location Information Strategy.



Governance and Leadership – Framework for Implementation

The Program Implementation Framework is a separate document providing a broad outline for implementing this Strategy and is the foundation upon which the detailed Program Implementation Plan will be developed. Simply put, it is designed to drive these important reforms.

The key objective of the implementation framework is to ensure full realisation of the benefits of the Strategy. This is very much a case of “the sum being greater than the parts”. Coordinated implementation and effective leadership will deliver benefits over and above those of providing each initiative discretely.

Landgate, through the WALIS framework, will provide overall program coordination, while the various lead organisations will be accountable for delivering individual strategic initiatives.

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Successful implementation of the Strategy will be achieved by clearly defining:

- » **Management and monitoring of the overall Program of Work to deliver the Strategy;**
- » **Roles, responsibilities and accountabilities necessary to deliver the Program of Work;**
- » **Financial, physical and human resources required and how they will be sourced; and**
- » **How focused implementation of the Program of Work will achieve the goals of the Strategy.**

The Program Implementation Framework focuses on a number of crucial areas, including:

Stakeholder Engagement and Awareness-Raising

The objectives are to engage:

- » Key decision makers - so they realise location information can increase business efficiency;
- » Significant industry groups - to raise the profile and value of location information to achieve business outcomes and to build the *Location WA* brand; and
- » End users - to ensure location information remains relevant to their changing needs.

Governance

Delivering a Work Program with contributors in government, industry and academia is complex. Coupled with the inherently dynamic nature of the location information industry itself, delivery requires flexible governance, so that changes can be made as required. The framework must evolve and remain appropriate to each sector, according to its needs. Existing structures, arrangements and committees will be utilised where possible, with the understanding that they should be altered or replaced, as appropriate.

Measuring Success

Success must be measured. In this case, a number of critical success factors, key performance indicators, and clearly defined reporting and monitoring mechanisms will be assessed as part of a comprehensive review process.

Benefits of a Coordinated Program Implementation

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Successful implementation of the Strategy requires the input and commitment of government, industry and academia.

To foster this, the implementation approach will be to:

- » Encourage innovation, collaboration and sharing of expertise to maximise value;
- » Ensure initiatives align to identify synergies, enhance benefits and avoid duplication;
- » Balance the interests of each sector to ultimately deliver benefits for the State; and
- » Promote and market the value of location information and the Strategy.

Costs

In May 2012 the Western Australian State Cabinet approved \$23 million funding to implement Stage 1 of the Location Information Strategy Program of Work between 2012 and 2015. This program will leverage existing projects, infrastructure and governance frameworks to reduce the impact on budgets and maximise the benefits from this investment. The Strategy sets-out a long-term vision for location information in Western Australia and is also intended to drive future stages of implementation to address changing priorities over time.



Appendices

Appendix A – Western Australian Land Information System (WALIS)

Established in 1981 by the Western Australian Government, WALIS is chartered with responsibility for coordinating across-government access and delivery of location (geographic) information. WALIS comprises all of the State Government Departments and the Commonwealth and Local Governments are participants via Memoranda of Understanding. The private sector and academia also participate in the governance arrangements to ensure a truly holistic approach to location information management in Western Australia is achieved. Landgate has been assigned the responsibility by Government to host the WALIS Office, which acts as a facilitator and encourages collaboration to achieve **the vision of WALIS: “Seamless access to WA spatial information; from anywhere, for any use, by anybody.”**

The WALIS concept is recognised as a world leader and significant progress has been achieved over the last 30 years in terms of data standards, enhanced access to information (SLIP) and reduced duplication of effort. As discussed previously, location information challenges still exist, and this Location Information Strategy is seen as the next logical building block required to realise the vision of WALIS.

Further details on WALIS can be obtained by visiting www.walis.wa.gov.au.

Appendix B – Shared Land Information Platform (SLIP)

The development of the Shared Land Information Platform began in 2004. The aim was to open up access to location information held by Government agencies. The initiative began with the involvement of an initial 19 agencies. There are now over 400 datasets available online.

Importantly SLIP was initially delivered through four business focus areas;

- » Emergency Management, led by DFES;
- » Natural Resource Management, led by DAFWA;
- » Electronic Land Development Process, led by the then DPI; and
- » Interest Enquiry, led by Landgate.

The technical infrastructure required to link all of the various agencies and datasets together, known as SLIP enabler, has been delivered by Landgate.

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SLIP addressed a number of important issues, including the duplication of infrastructure, inconsistent updating of data and difficult-to-access information.

The program provided smaller agencies with limited or no spatial investment with a unique opportunity; to reap the benefits of spatially enabled information, without the large cost of developing their own infrastructure. And crucially, SLIP ensured that data custodians could share their information while retaining the control and maintenance of the data.

SLIP is now an internationally recognised government information sharing platform, and has received numerous awards. With SLIP, shared access to land and property information is now more economical, faster and simpler. Government, business and the community benefit from better informed decisions that are supported by a more complete and consistent knowledge base. SLIP is an excellent example of the advantages of utilising location based information, and provides an effective foundation for further enhancements.

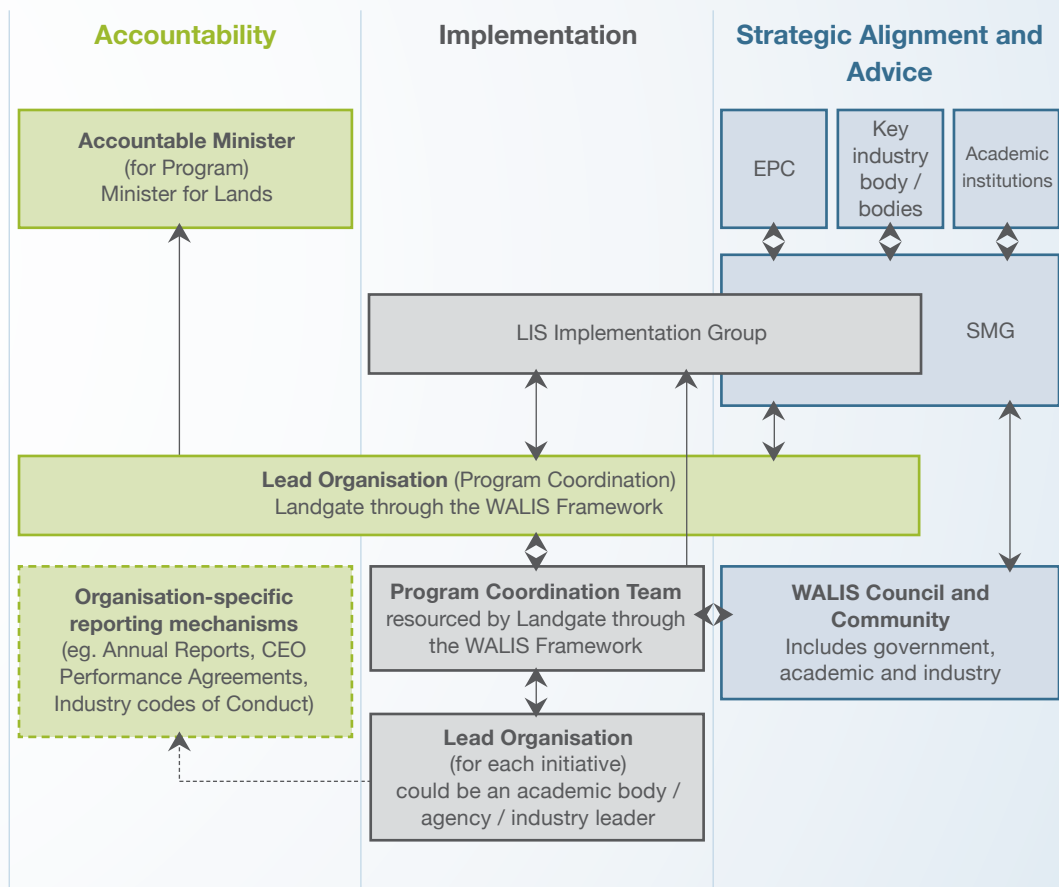
Whilst an impressive achievement, further work is required to: (1) deliver services for integrating data; (2) enable mechanisms to improve the quality of the data; and (3) provide value added decision support tools to enhance analysis and predictive modeling capabilities.

This Location Information Strategy will harness the lessons learned by the Western Australian Government, leverage the existing investment in infrastructure and build capability.

Appendix C – Governance Structure

The proposed governance model for overall coordination of the program and implementation of the Strategy builds on and expands the existing WALIS governance model.

To be effective, all parties must commit to the Strategy and work collaboratively. For Government agencies, this will involve staff in a range of activities, from data capture and management, to providing IT systems and support. Lead agencies for specific components of the Strategy must embrace their leadership role. And key partners - the Spatial Industries Business Association and the Surveying and Spatial Sciences Institute - will be required to support successful implementation through the ongoing involvement of their members.



Appendix D – Glossary of Terms

Term	Definition
CRCSI	Cooperative Research Centre for Spatial Information
EAC	Economic Audit Committee
Government 2.0	Involves a public policy shift to create a culture of openness and transparency, where government is willing to engage with and listen to citizens and make available non-sensitive public sector information
HAGIS	Housing Assets Geospatial Information System
Interoperability	Refers to the ability of different systems to share data with one another. In an online environment interoperability can be encouraged through the use of open standards to facilitate data exchange between different systems or platforms.
Location information	Any piece of information that has a location element, such as an address, a postcode, a building or a census area. Most information from diverse sources can be linked to a location. This term can be interchanged with spatial, geospatial, place and geographic information.
Real Time Positioning (RTP)	RTP technology provides improved positional accuracy across a broad range of applications where precision is vital, and as a core for navigation systems and machine guidance. RTP also enables a two-way communications stream that can be used to send a positioning signal to the user, and to receive information from the user
SIBA	Spatial Industries Business Association
Spatial	Relating to, occupying, or having the character of space
SSSI	Surveying and Spatial Sciences Institute
SLIP	Shared Land Information Platform
WALIS	Western Australian Land Information System
WALIS Community	Made up of a network of people and technology to share the power of location information and to continually improve its usefulness and accessibility. Formal membership comprises State government agencies with representation from the Commonwealth and Local Government, and an increasing number of private sector organisations, industry advisory bodies, academics and community organisations.
WALIS EPC	WALIS Executive Policy Committee is the governing body of WALIS and comprises Chief Executive Officers and Directors General of nine WALIS member agencies that have custodianship responsibilities for the majority of the Western Australian Government's spatial datasets.
WALIS SMG	WALIS Spatial Management Group is the strategic body for WALIS and will advise and be responsible to the EPC. The SMG is made up of Director-level representatives from core areas of WALIS.
Web 2.0	A term describing a broad shift towards an online environment characterised by interaction, collaboration and user-generated content. Examples of Web 2.0 sites include Facebook, Wikipedia and YouTube.

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