



ACIL Tasman

Economics Policy Strategy

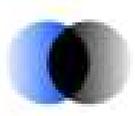
Potential of Spatial Information in Australia

Foundations of Open

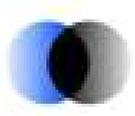
3 April 2008

CRC Spatial information report

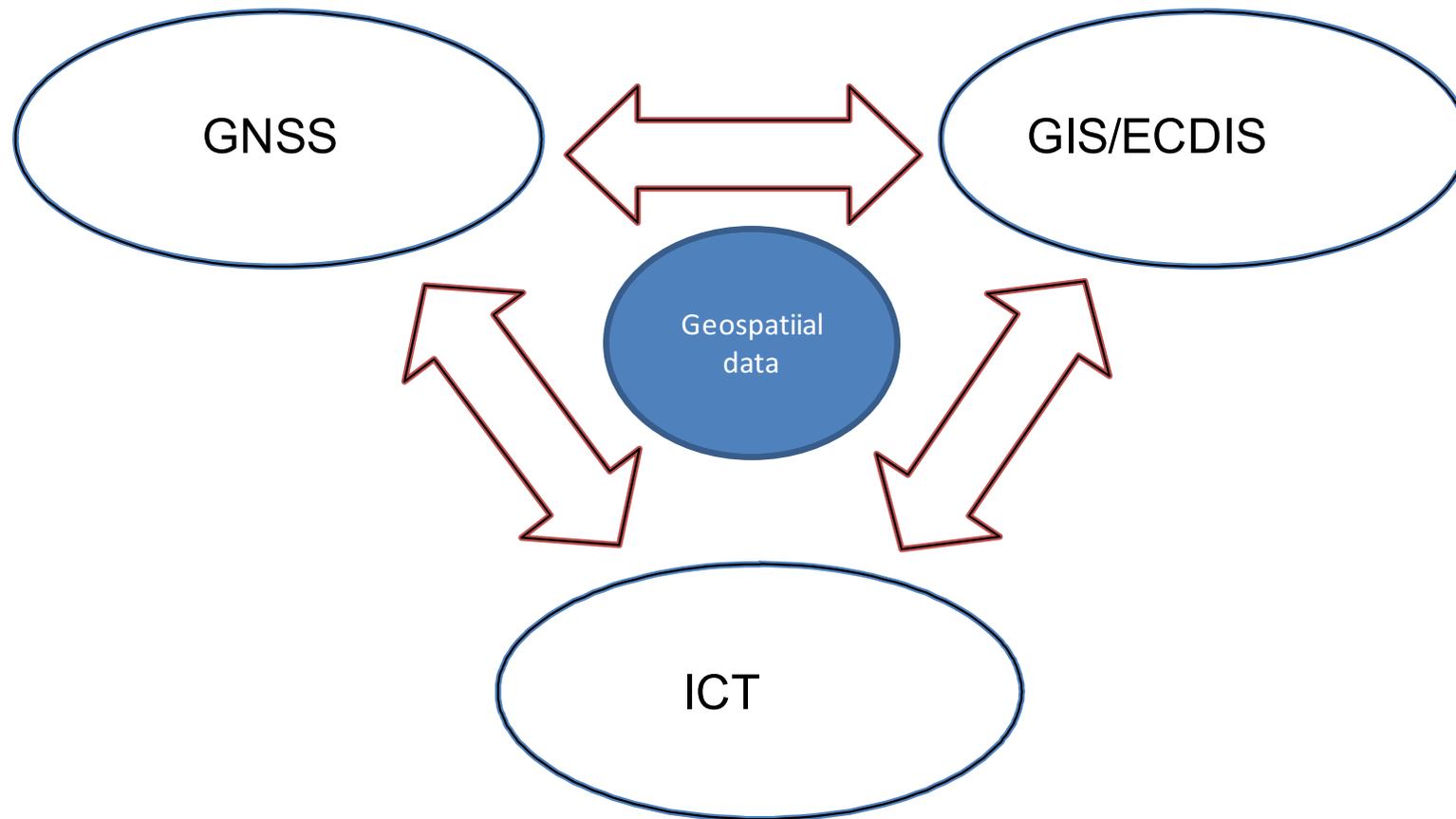
1. to establish the verified and quantified economic impact of spatial information (SI) to the Australian economy in 2006-7 year,
2. to estimate the cost of inefficient access to data and identify the factors operating to create these inefficiencies,
3. to consider the future prospects for the spatial information to contribute to Australia's economic, social and environmental development goals.



Spatial information (SI) describes the physical location of objects and the metric relationships between objects.



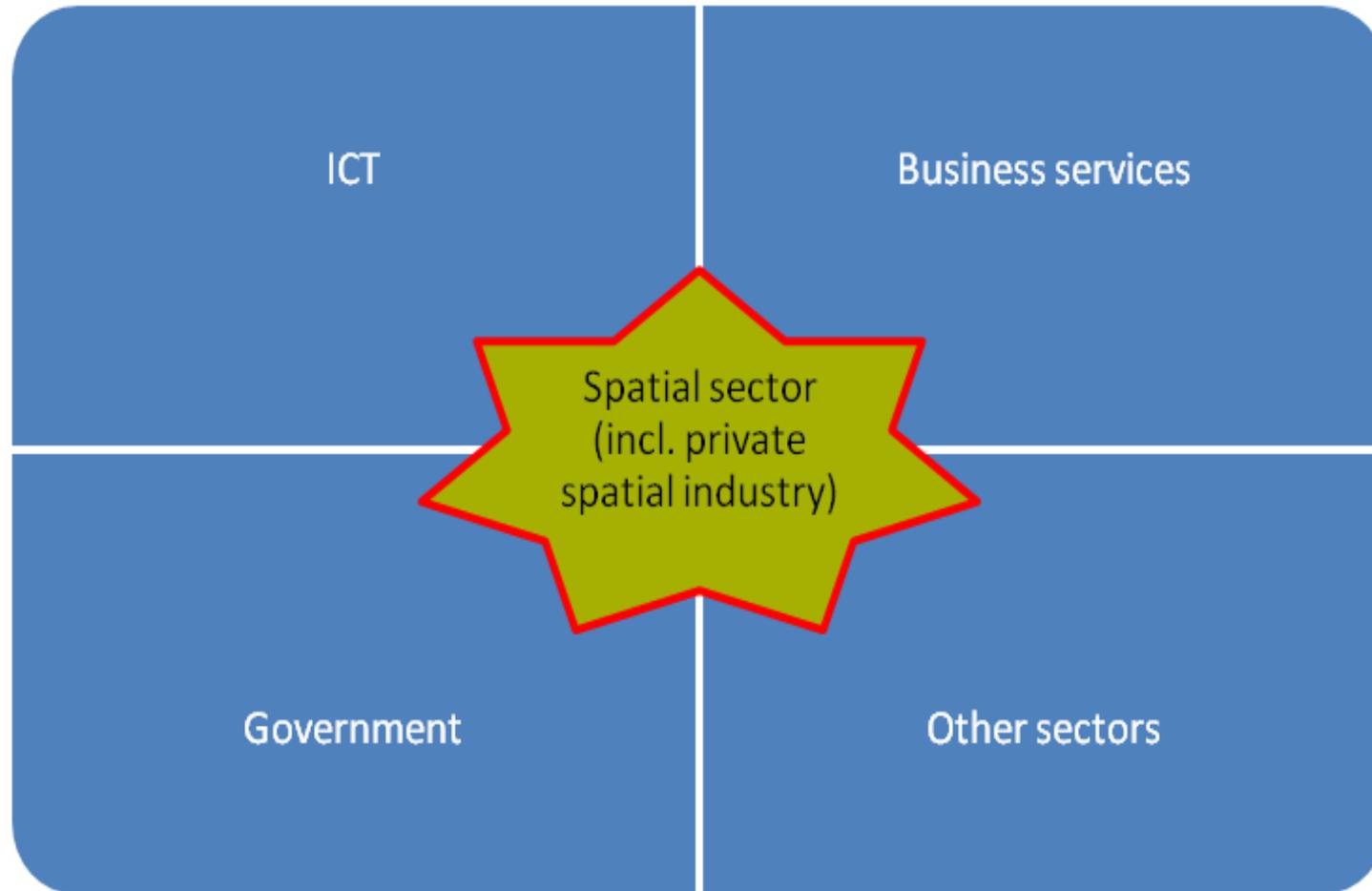
Illustrative relationship



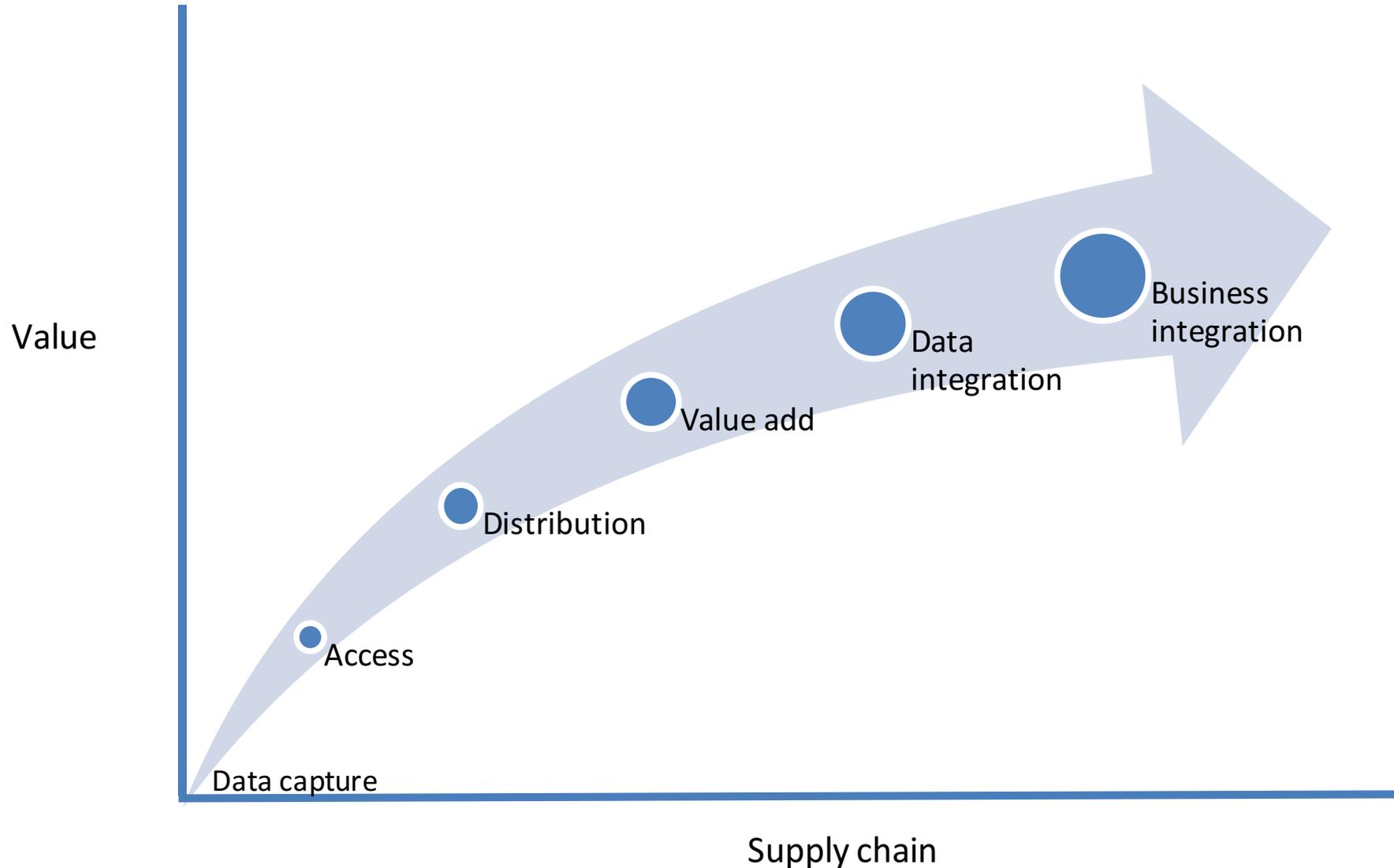


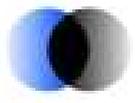
Industry Classification Surveying and Mapping

- Aerial Surveying Service
 - Cadastral Surveying Service
 - Engineering Surveying Service
 - Geodetic Surveying Service
 - Gravimetric Surveying Service
 - Hydrographic Surveying Service
 - Land Surveying Service
 - Map Preparation Service
 - Mining Surveying Service
 - Oceanographic Surveying Service
 - Photogrammetry
 - Seismic Surveying Service
- Industry gross value add in 2006-07 around \$683 million

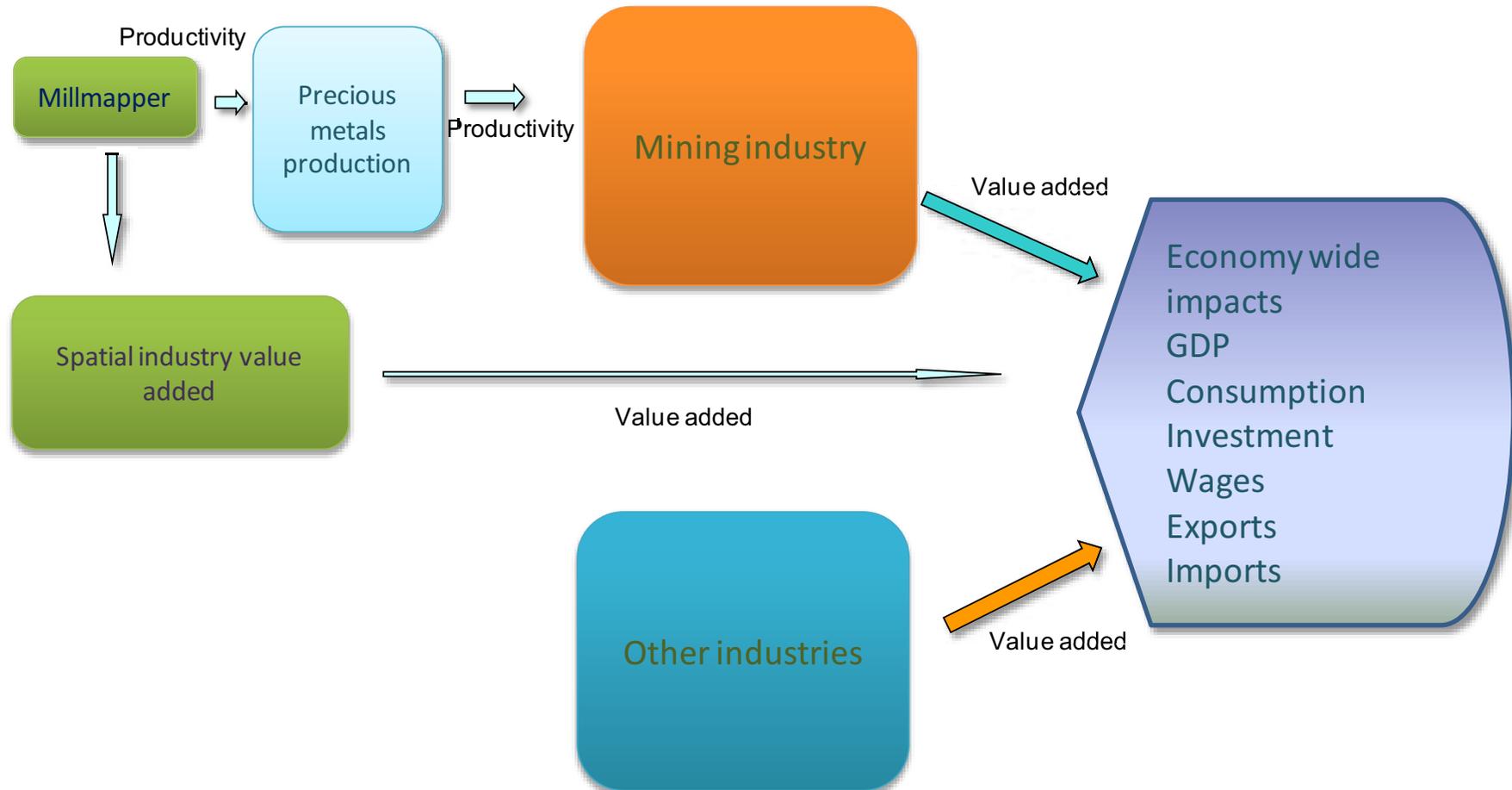


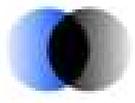
Spatial information supply chain



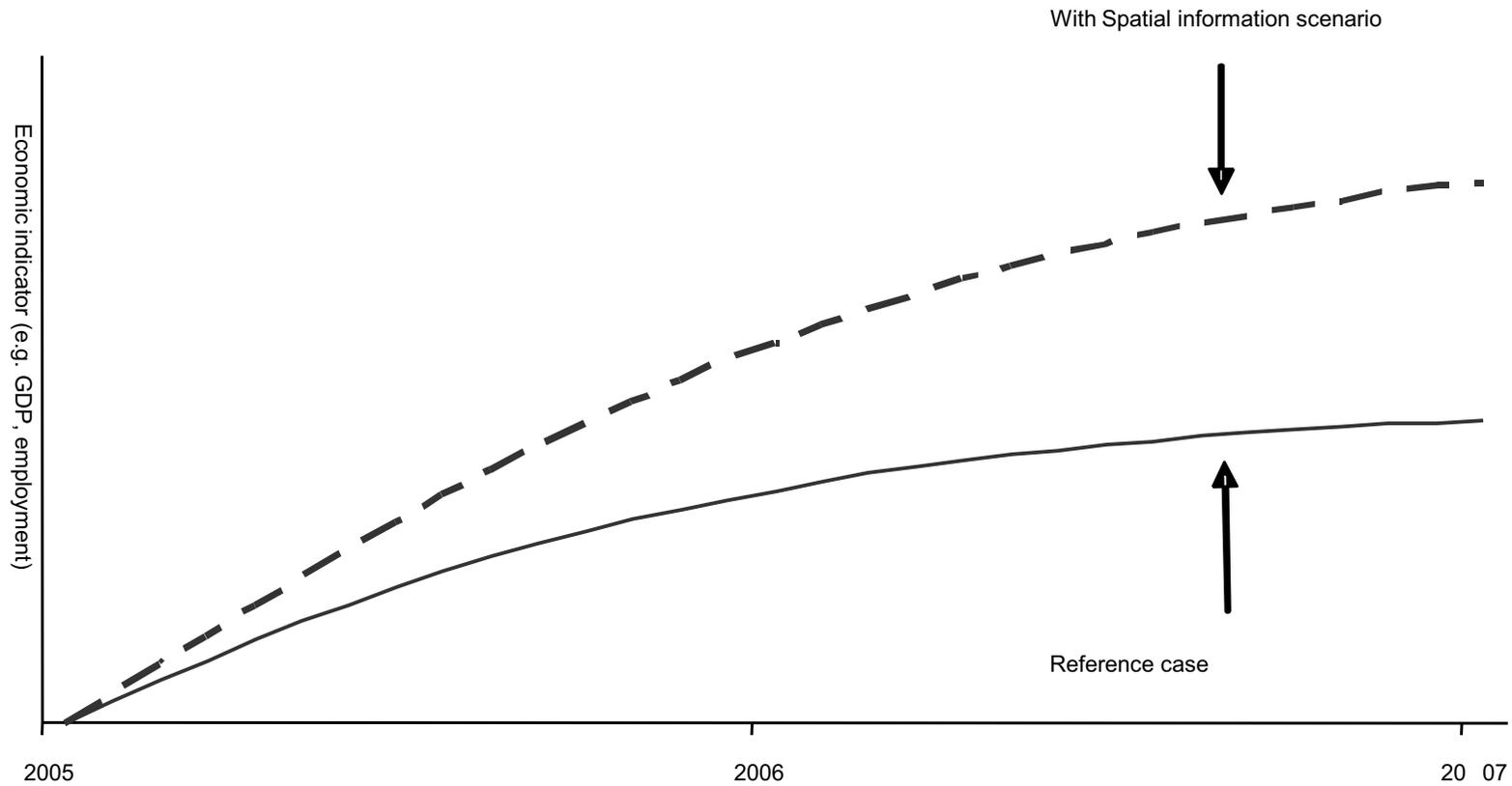


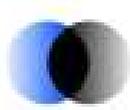
Economic benefit paths





Scenario analysis



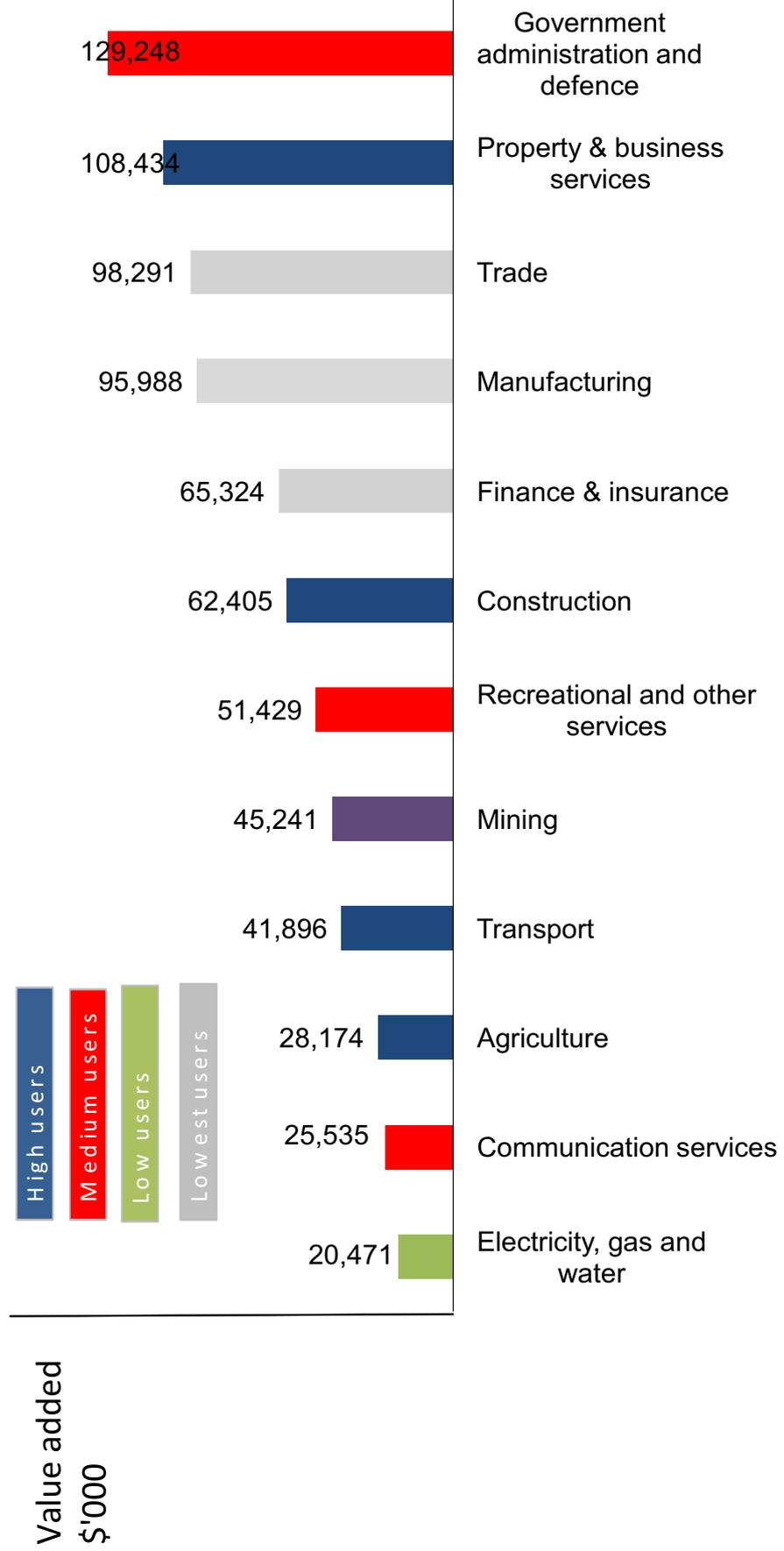


Sectors studied

- Agriculture fisheries and forestry
- Mining
- Property and services
- Construction
- Transport and storage
- Utilities
- Communications
- Health and community services
- Retail
- Manufacturing
- Tourism and recreation
- Government services including environment planning meteorology and defence



Sector size and intensity



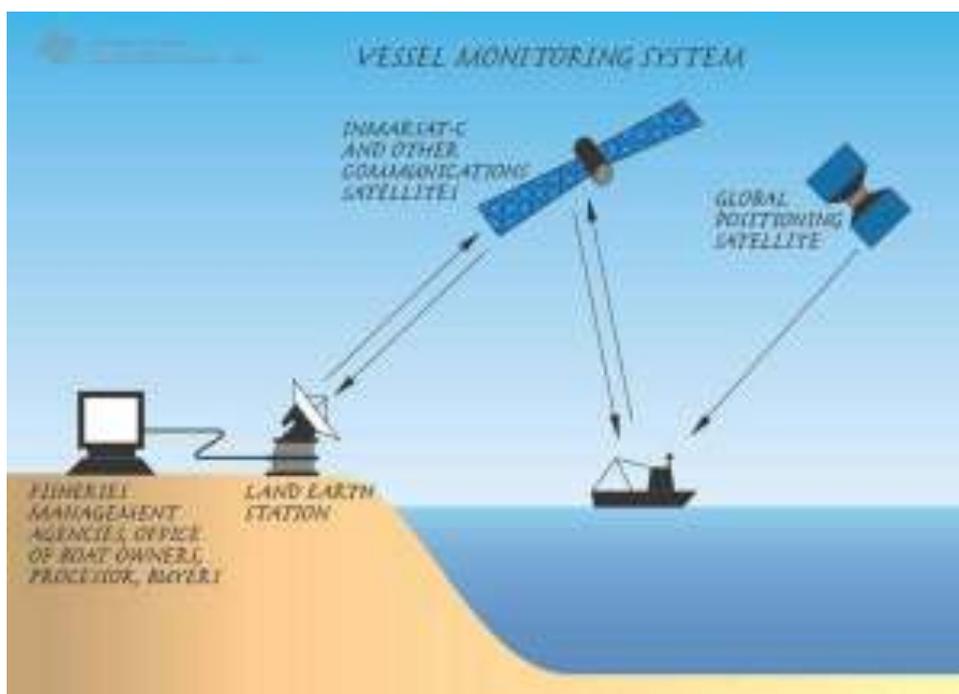
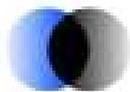


- Controlled traffic farming
- Variable rate application
- Yield monitoring
- Pests and diseases
- Whole farm planning
- Irrigated agriculture
- Natural resource management
- Salinity management

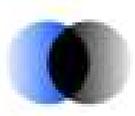




- Total forest management
 - Palm held GNSS enabled GIS for
 - yield estimates
 - forest management
 - Damage assessment
 - Environmental compliance
 - Data fed back to a centralised system (ForMS)
 - LIDAR being used for
 - Canopy health mapping
 - Resource assessment



- GNSS Plotters
- Fisheries management
 - Vessel monitoring
- Habitat mapping
- Protected marine areas



Mining and petroleum

Coal industry

- Automated loaders in long wall mining

Minerals processing

- Imaging milling machinery for maintenance improvement

Oil and gas

- Offshore operations – rig positioning/remote operations
- Pipeline planning and operations

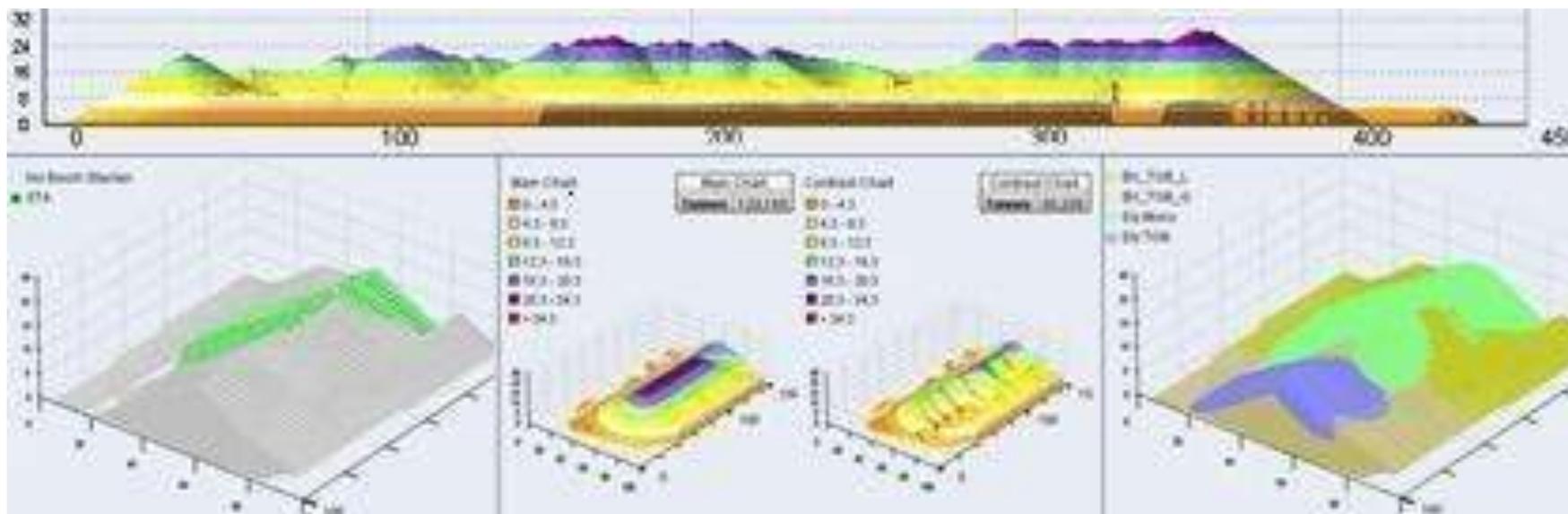
Three dimensional geophysics



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Economic Policy Strategy

Managing bulk commodity supply chain



Property and services

Land development

- 50% to 100% improvement in surveying and planning
- Faster internet based approvals

Engineering surveys

- Terrestrial laser scanners speed up 3d surveys
- Sydney Town Hall Station, Ord River development

Route and site selection

- Pacific highway upgrade

Design

- Linking CAD with spatial data (25% improvement in productivity)

Machine guidance

- Eastlink Project in Melbourne – reduced costs by around 10%

Barista – low cost photogrammetric software from high resolution satellite imagery

- Topography of the build environment
- Mapping build progress
- Monitoring height, access etc

Forbes shire council

- Combined laser scanning and GPS technologies with satellite technologies for field monitoring, surveying, planning and design.
- Savings in materials as well as labour.

Transport and storage

Delivery, route and itinerary planning

- Reported savings in fuel (4%), labour (18%) and drive time (7%)

Transport planning

- Reducing future bottlenecks

Vehicle tracking

Traffic and congestion management

- Real time data to minimize congestion and manage extreme weather conditions in air and sea transport

Rail scheduling

- Reduced fuel consumption by up to 20%

Austroads

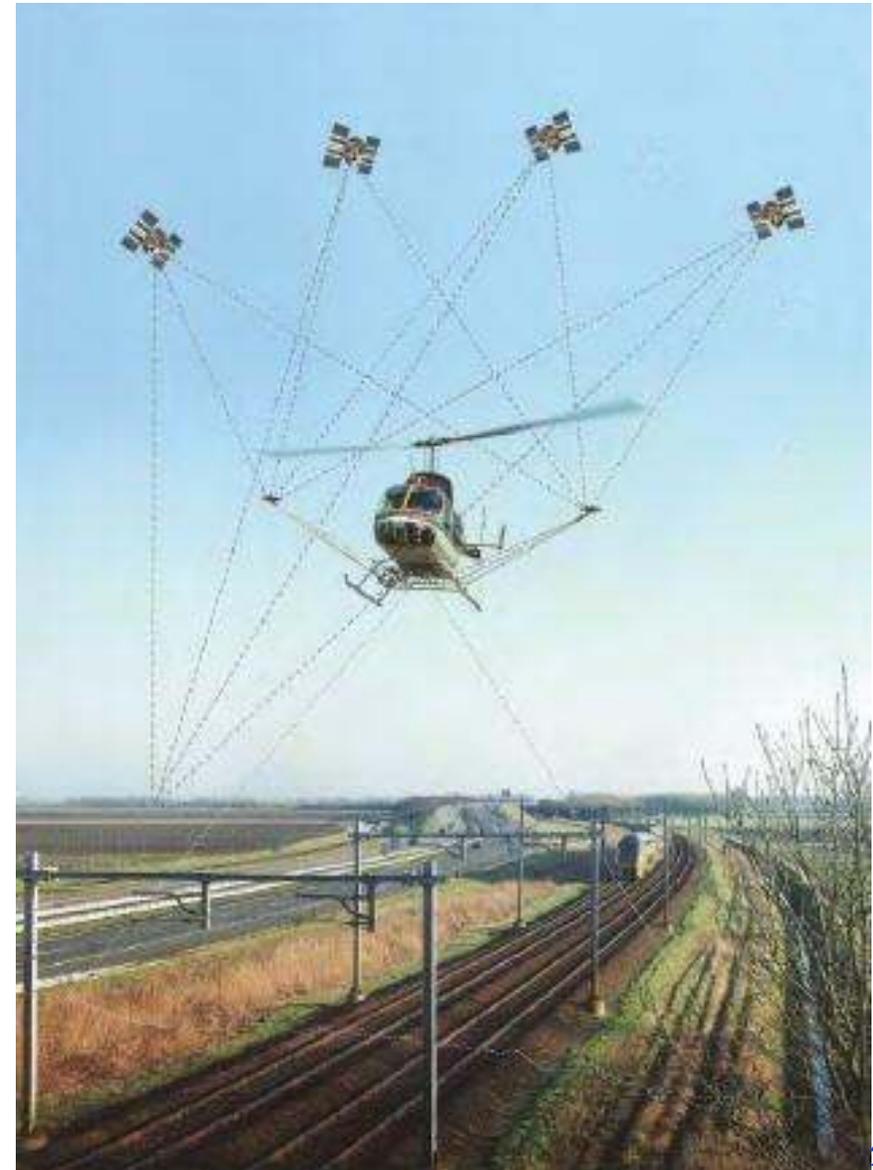
- Remote monitoring of freight vehicles for compliance with times and operating conditions
- Benefit cost ratio of around 5 to 1

Air traffic management

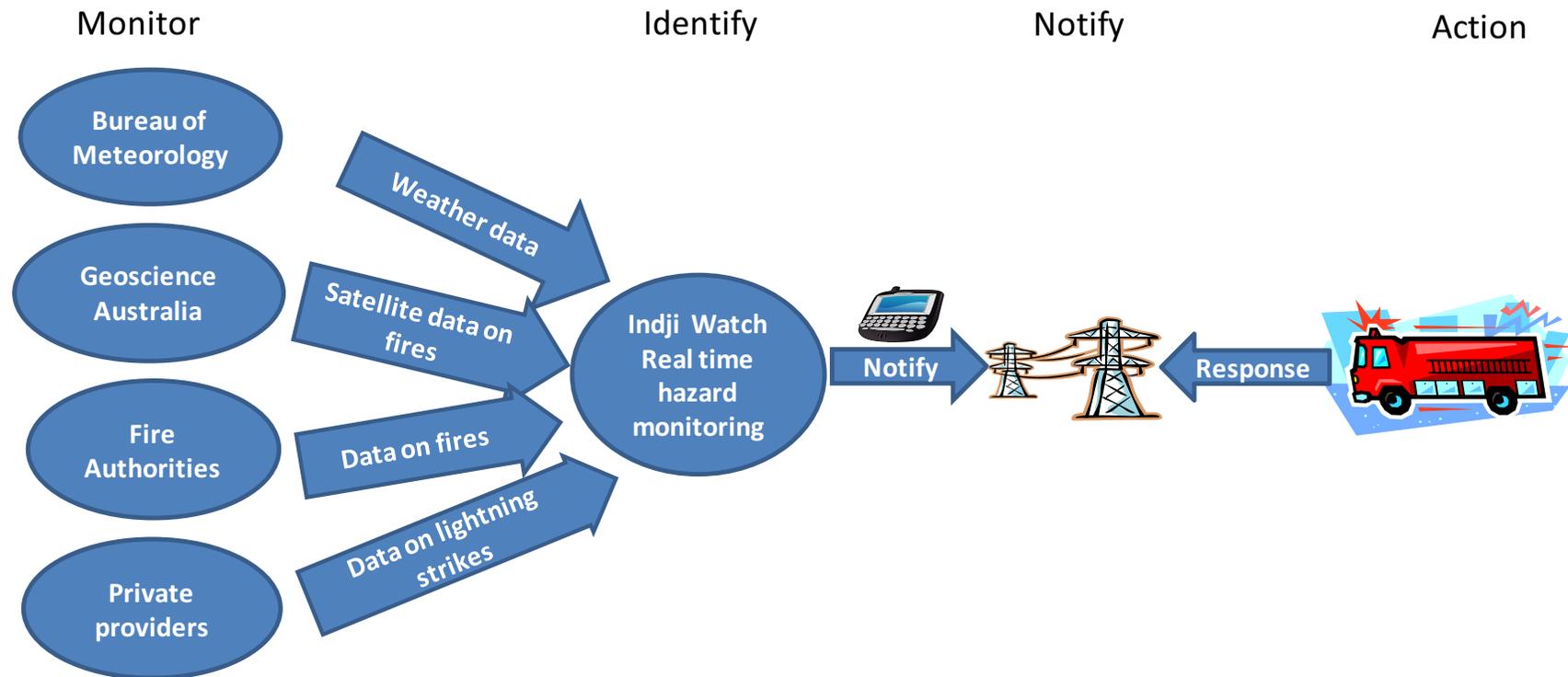
- Non precision GPS reduces fuel and operating costs (2%-3%)
- High precision landing system – Sydney airport
 - Savings on fuel, diversions, terrestrial navigation systems
 - Around 2% savings on operating costs

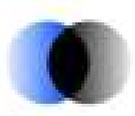


- Asset management
- Capturing corporate knowledge
- Recording location of assets and features
- Customer service
- Service order fulfilment



Hazard management





Geoscience

Bathymetry

Biosecurity

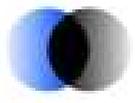
Air and sea safety

Defence and security

- Critical infrastructure

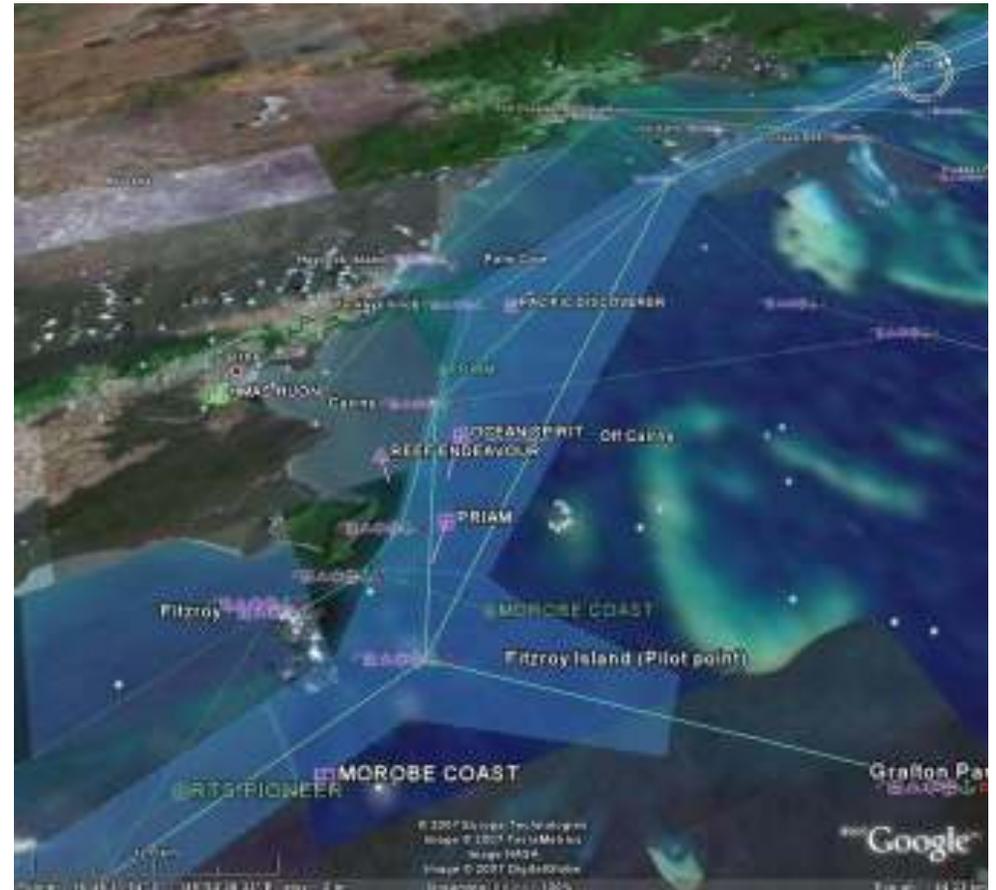
Service delivery

Development approvals



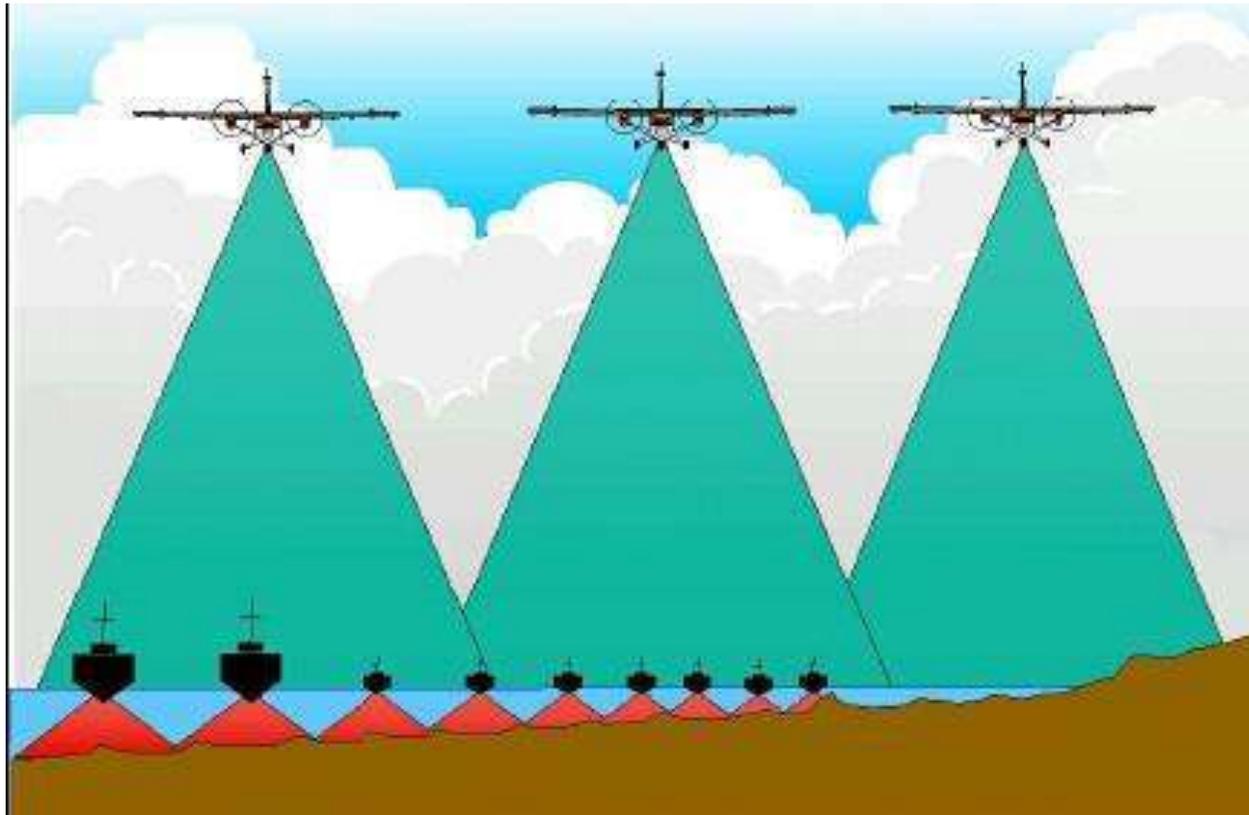
Search and rescue

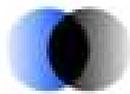
- Totally spatially enabled
- System reduces time to brief search aircraft from 3 hours to 3 minutes





Airborne Laser Bathymetry

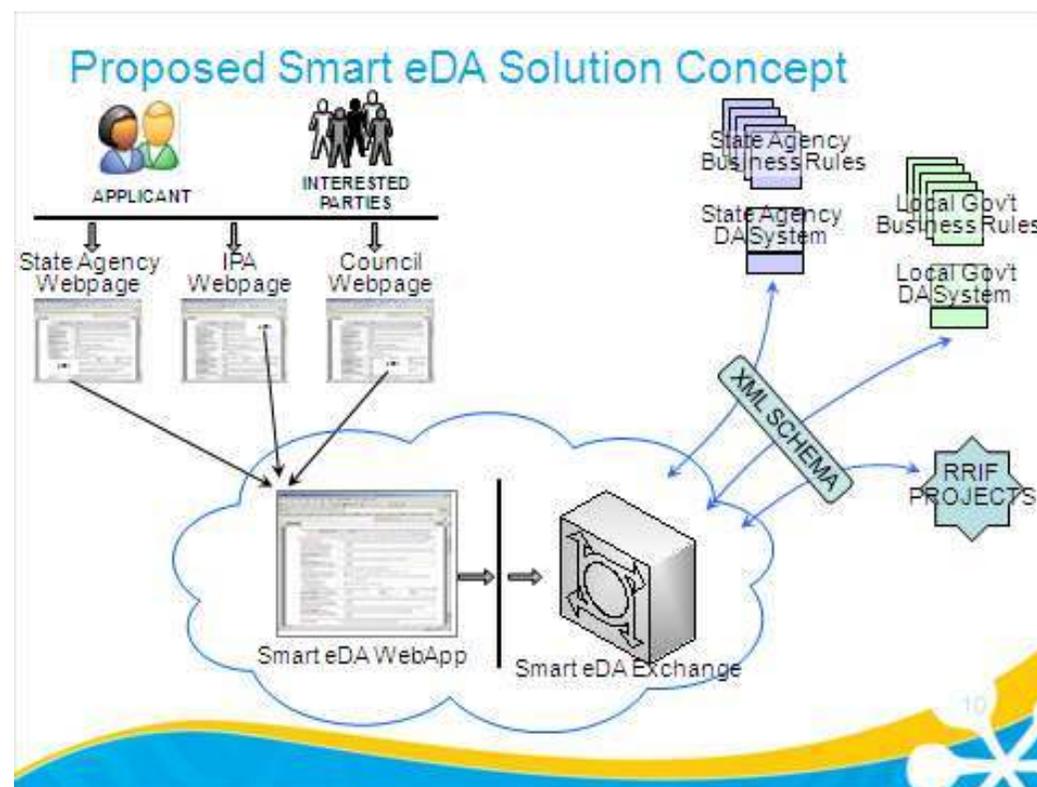


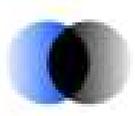


Development approvals

Development approval productivity increased by 12% in QLD

Adoption around 50% in 2006-07





Other applications

National Carbon Accounting Scheme

National Water Audit

Epidemiology

Managing programs – Medicare

	Type of shock	Quantifiable scenario	Estimated scenario
Grains (specialist growers)	Total productivity	0.93%	1.08%
Mixed (grain & sheep/cattle)	Total productivity	1.35%	1.50%
Sugar cane	Total productivity	0.11%	0.26%
Cotton	Total productivity	0.07%	0.22%
Other agriculture	Total productivity	0.00%	0.15%
Forestry	Total productivity	1.93%	1.93%
Fisheries	Total Factor Productivity	4.14%	5.14%
Construction	Total productivity	0.25%	0.50%
Business services	Labour productivity	0.50%	0.70%
Coal	Total factor productivity	0.21%	0.36%
Metal ores	Total factor productivity	0.16%	0.31%
Oil & Gas	Total factor productivity	0.15%	0.15%
Government	Labour productivity	0.34%	1.05%
Road Transport	Total productivity	1.40%	1.65%

	Type of shock	Quantifiable scenario	Estimated scenario
Rail Transport	Total productivity	0.00%	0.45%
Air Transport	Total productivity	0.80%	1.04%
Other transport	Total productivity	0.00%	0.30%
Electricity/gas/water	Total productivity	0.73%	1.25%
Communications	Total productivity	0.98%	1.32%
Trade	Total productivity	0.00%	0.08%
Manufacturing	Total productivity	0.00%	0.02%
Other	Total productivity	0.00%	0.02%
<u>Resource availability</u>			
Oil	Resource availability	3%	6%
Gas	Resource availability	5%	10%
Minerals nec	Resource availability	7%	14%
Coal	Resource availability	10%	20%



Accumulated impact

Factor	Impact	Percentage
GDP	\$6.4 bn - \$12.6 bn	0.6% - 1.2%
Consumption	\$3.6bn - \$6.9 bn	0.6% - 1.1%
Investment	\$1.7bn - \$3.7 bn	0.6% - 1.2%
Exports	\$1.3 bn - \$2.3 bn	
Imports	\$1.2 bn - \$2.2 bn	
Wages		0.6% - 1.1%



Constraining factors

- Access to data
 - Fundamental data
 - Data infrastructure
 - Access to data
 - Pricing of fundamental data
- Skills shortages
 - Education and training
- Coordinated action at all levels of government

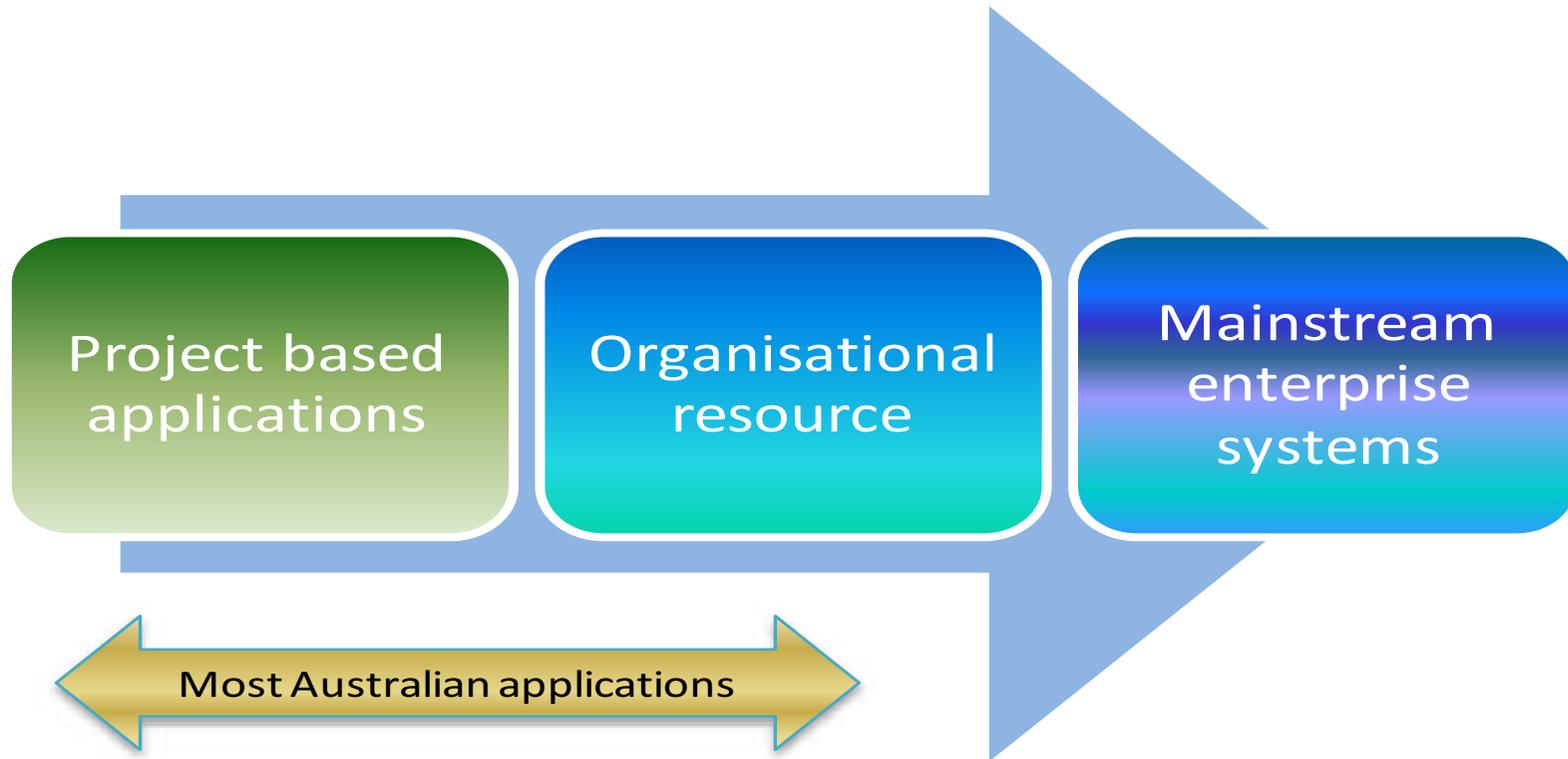


Cost of inefficient access to data

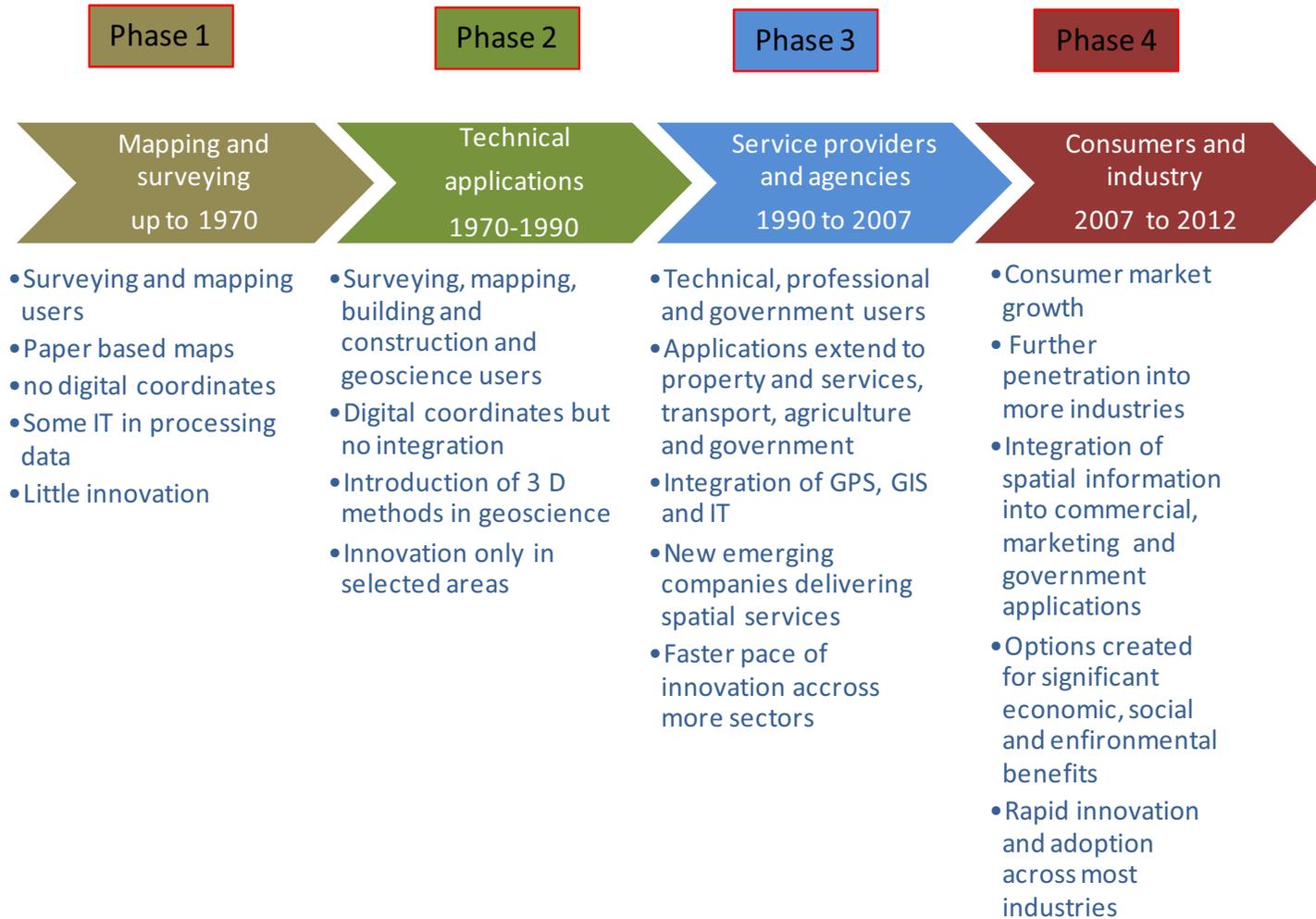
Productivity impacts in some sectors between 5% to 15% lower than they would have otherwise been

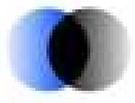
Accumulated impact on GDP around 7% lower in 2006-07 (around \$0.5 billion)

Emerging trends



Where is this going





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QUESTIONS