FRONTIER SI>

YEAR IN SUMMARY 2019-20

ACKNOWLEDGMENTS

FrontierSI would like to make the following acknowledgments:

- Australian Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land across Australia where our services are located. We also pay our respects to Elders past and present.

- Māori as tangata whenua and Treaty of Waitangi partners in Aotearoa New Zealand.

- Image contributions by the broader FrontierSI team and the spatial information research community.

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CEO'S MESSAGE

In July 2019, FrontierSI set a Strategic Plan and accompanying 3-year Business Plan with a target for growth as a self-sustaining and purpose driven organisation. I am delighted to say that the FrontierSI team and our partners have already achieved many of the goals that we had set.

The unprecedented events and global impact from the Coronavirus Pandemic (COVID-19) required a refocus of our immediate priorities, in particular to supporting our staff in working from home for the last four months of the financial year, responding to the changes in our partner priorities, and changes in our approach to partner engagement.

FrontierSI ensured the continuous delivery of critical business services in a way which prioritised the ongoing welfare of our staff and maintenance of our valuable partnerships. Annual Engagement plans have been maintained with all Core and Support Partners of FrontierSI and regular contact with key stakeholders has, and will, continue to be sustained into 2021. Our inaugural partner roundtable meeting in May 2020 was well supported and provided an opportunity to share challenges and experiences amongst our partner base, and we look forward to running similar events in future.

We have:

✅ **Solidified our partner base and formed new strategic alliances.** We have strengthened our partner base with government agencies, universities and industry partners; 29 partners in total. We also became a Core Partner with the newly formed SmartSat CRC, signed a Statement of Strategic Intent with the Australian Space Agency and re-signed our memorandum of understanding with the Open Geospatial Consortium. We look forward to working with these organisations to leverage opportunities with, and for, our partners.

✅ **Provided support and flexibility for our staff in a smooth transition to working from home arrangements.** Our staff moved to exclusively working from home in mid-March and we implemented a variety of support mechanisms and worked through flexible work arrangements to facilitate this change in a time of uncertainty. It was pleasing that our approach was validated through our recent staff engagement survey in which over 90% of staff agreed they had been provided with the appropriate level of support during the pandemic.

✅ **Defined our values and further cultivated an inclusive culture of committed and capable staff.** During 2019, FrontierSI adopted a bottom-up approach to collectively define the behaviours, values and culture of our organisation. Our ability to live these values: 'collaboration, future focus, agility, integrity, and communication' will be critical to achieving our objectives.

✅ **Initiated, progressed and delivered high impact projects contributing to cross jurisdictional priorities and national initiatives.** We have made significant progress in longer term programs of work such as the Australia New Zealand Satellite based positioning testbed (SBAS) which wrapped its trial phase in July 2020 following the release of the economic benefits analysis in July 2019. The next phase will see an operational system designed and developed following a competitive tender released by Geoscience Australia and Land Information New Zealand. We are also contributing to the progress of Geoscience Australias Positioning Australia initiative,

> *While the full extent of COVID-19s impact is yet to play out, FrontierSI finished its second year of operations in a sound position and we have chartered a course in which we will continue to provide value for our partners in the development of new initiatives and delivery of impactful solutions to complex spatial problems with a focus on public good outcomes. We are extremely proud of our progress and achievements in 2019-20.*

and commenced the commercialisation of the Value Australia program, which is creating digital valuation models and tools for land and property across Australia.

FrontierSI continues to deliver value to projects such as Groundwater Dependent Vegetation (GDV) and Australia Geospatial Intelligence Organisation (AGO) Labs with follow-on programs which build on foundational capabilities from the initial scope and demonstrate our ability as a connection point for industry and government. 2020-21 will see FrontierSI collaborate with partners in machine learning and commencing three digital twins pilot projects..

✅ **Consolidated Board governance structures and focused on near term business priorities while progressing longer term strategic initiatives.** The Board consolidated its governance framework in 2019-20 supported by a four Board Committee structure implemented in August 2019. With the onset of COVID-19, the Board focussed on near term business stability and staff welfare, and monthly Board meetings were held to monitor these issues from March 2020. At the same time, longer-term strategic initiatives have been progressed at a pace commensurate with business and key stakeholder priorities.

✅ **Exceeded our prior year income ($8.0M v $6.9M) and maintained research and innovation expenditure at > 75% of total spend for 2019-20.** FrontierSI aims to be the people of choice to lead transformational spatial research and innovation in Australia and New Zealand; this means providing the connection point, trusted collaborative model and expertise to deliver high impact solutions to complex, multi stakeholder challenges. It means creating and maintaining successful partnerships. These happen when teams across disciplinary, organizational, cultural and international boundaries work together with common goals and agreed expectations.

FrontierSI and its partners are ideally positioned to profoundly influence and facilitate the transformation towards a more spatially enabled society. As we focus our attention on the future and progress through the next decade, FrontierSI and its partner network remain well placed to realise the full benefits of spatial technologies. Precise positioning will facilitate broader use of autonomous vehicles be they robots, cars, trucks, tractors, trains, drones or ships. More accurate positioning technology combined with 5G telecommunications and machine learning will assist remote workforces and vastly improve pandemic contract tracing. It will be common practice for buildings and precinct infrastructures to be designed, modelled, built, and managed in a virtual world alongside their physical twins. New sensor technologies in the form of micro and mini satellites will provide near real-time Earth observation data to consumer and industry based applications to allow us to monitor our natural environment in a much more integrated way. The growing use of spatial data will vastly improve our decisions, provide better services, keep us safe, and raise our quality of life, all through the application of location based data.

Our ongoing ability to pursue our objectives would not have been possible without the support of our long-standing partners and we are particularly grateful for this continued support in these challenging times. Strong engagement, open dialogue, commitment to service excellence and continual learning remain critical to addressing the shared challenges we face.

Graeme Kernich, Chief Executive Officer

VISION, MISSION & PURPOSE

Vision

We will be the spatial organisation of choice to lead, formulate, broker and deliver collaborative solutions with government, industry and universities.

Mission

Through our partnerships and collaborative model, our spatial expertise will accelerate industry and economic growth, provide better government services and lead to improved environmental and social well-being.

Our mantra is to make our partners better at what they do.

Our value lies in our ability to harness the spatial expertise of our university and industry partners to solve complex problems.

Values

We value **collaboration**, **future focus**, **agility**, **integrity**, and **communication**.

We are solutions driven, and achieve high quality outcomes through collaboration, being open minded and embracing inclusion, working together as a team internally, and with our partners and clients.

We are **future-focused**, looking at "what's next": from tapping into the most promising technologies, to new application areas to ensure we deliver.

We respond to our partner needs with **agility**, being flexible and deploying teams and effort as needed, to adapt to our rapidly changing environment.

We work with **integrity**, we do what we say, we are professional and respectful of others.

We **communicate** and share information effectively, we listen first, seek to understand other perspectives and simplify complex concepts into understandable stories.

STRATEGIC PLAN UPDATE 2020–2023

In 2018-19 the FrontierSI Board set a strategic framework for FrontierSI to grow and consolidate as a self-sustaining organisation, while at the same time generating surpluses for reinvestment in research and innovation.

In 2019-20, while the underlying objectives remain consistent, in consultation with our staff, partner base and Board, we refreshed the strategy to better articulate our purpose and the key elements which will drive business sustainability in a COVID impacted world, much changed from 12 months prior.

To review the FrontierSI Strategy 2020-2023, visit http://bit.ly/FrontierSI_2020-2023_Strategy

Progress against strategic objectives

Below is a summary of progress made against each strategic objective in 2019-20.

STRATEGIC OBJECTIVE	High Impact	Drive Outcomes	Sustainable Future	Collaboration & Innovation
GOAL	**Broker High Impact Spatial Solutions to complex problems**	**Drive the adoption of spatial outcomes by and for our partners**	**Ensure a sustainable partner base through a strong reputation of identifying and solving complex spatial challenges**	**Multi-sectorial problem-solving with a creative and collaborative approach**
PROGRESS AGAINST PRIORITIES TO JUNE 2020	**Positioning & Geodesy** In collaboration with Geoscience Australia and other partners, research and innovation outcomes were achieved in Integrity Monitoring, Analysis Centre Software development, Ground Deformation and Geodetic Standards projects. **Spatial infrastructures & data analytics** We have maintained a strong research focussed data analytics portfolio aimed at improving data workflows in collaboration with multiple partners across several applications. Outcomes have included improved estimation of River Lines, Quality Assurance of LiDAR, Machine Learning based feature extraction, improved cadastral accuracy and the use of distributed ledger technology in planning workflows. We have assisted in the uptake of the objectives of the Digital Earth Australia (DEA) industry strategy and commenced a new project in automated valuations (Value Australia). **Connecting Space & Spatial** We have solidified our relationship with key organisations, signing as a core partner and commencing two collaborative projects with the SmartSat CRC and signing a statement of Strategic Intent with the Australian Space Agency. **Foster Development of the Digital Twin for 2020 focus** Aligned with the new ANZLIC Strategy, we have worked with partners to develop 3 new Digital Twin themed collaborative projects for commencement in 2020-21. FrontierSI released a Spatially Enabled Digital Twins Capability Statement including partner case exemplars and detailing core competencies.	**Facilitate awareness and uptake of SBAS** We continued to test commercially based projects on the SBAS testbed, including the release of a comprehensive economics benefits analysis of SBAS Economic benefits study covering 10 industry sectors across Australia-New Zealand. **Explore scale up of adoption of 'internet of things' (IOT)** We explored the use of IoT technology with spatial technologies by being project lead in a new SmartSat CRC project – SigWater and completion of an IoT project in QLD which is now in use by the QLD government. **Accelerate the adoption of EO & Mapping Solutions** 2019-20 saw the successful completion of a Digital Earth Australia (DEA) Industry Labs Program and Australian Geospatial Organisation (AGO) Labs pilot program. The ABC science week in August 2019 featured our QUT-DNRME Virtual Reef Diver project. **Group on Earth Observations Conference 2019.** In collaboration with Geoscience Australia, the Australian Space Agency and CSIRO, FrontierSI initiated Industry focussed events at the conference. This was the first time this had been carried out and the initiative was considered highly successful. An Industry Track was added for the GEO 2020 event as a result (although event deferred due to COVID).	**Maintain Partner base** The retention of all core and support partners indicates a very pleasing level of partner satisfaction in the work done by FrontierSI. **Ensure people systems and processes to effectively manage partners and clients** Partner Engagement plans were maintained with all Core and Support Partners, regular meetings held with key stakeholders and completion of an annual review. We implemented the CRM, HubSpot, with a view to improving communication and engagement with our partners. **Foster Partnerships for new business opportunities** As well as exploring new strategic partnership opportunities with organisations such as the Australian Space Agency with whom FrontierSI signed a Statement of Strategic Intent in August 2019, we also expanded our project partner base in existing areas of expertise and new ones. As an example, the Phase II GDV Monitoring Project brings in additional mining companies Rio Tinto, Fortesque and Atlas Iron. **Establish a presence in the space agenda** We maintained involvement in the 2026Agenda, linkages with ICSM and the Australia New Zealand Land Information Council. In addition, we have taken an active role in the 2030 Space and Spatial Roadmap development.	**Strengthen congruence between strategy, capability and culture** We embrace an ongoing commitment to diversity and inclusion and implemented and or trialled several initiatives from within the 2026 Agenda Diversity and Inclusion Action Plan in 2019-20 including adoption of more flexible work practices, trialling an anonymous CV assessment process and completion of a pay equity audit. Ensuring cultural and values alignment was a priority criterion in recruitment of new staff. A focus on empowering staff to develop new project ideas led to two new funded projects in 2019-20. **Ensure staff and partners embrace the Strategy** Maintaining excellence in partner delivery and staff welfare and engagement have been top priorities in 2019-20. Inclusive 'bottom up' processes in the development of organisational values and a strategy refresh have been rewarded with a high staff retention rate (>80%), attraction of some new, really talented people and a vibrant team culture with highly engaged staff. Positive partner feedback was received in relation to our emphasis on partner engagement and remaining committed to aligned priorities and service excellence. **Ensure alignment of structure, resourcing and strategy** The Board consolidated its governance framework supported by a four Board Committee structure which met regularly during 2019-20. The organisational structure and related processes such as committee terms of reference and operating policies were reviewed to ensure optimal alignment.

RESEARCH & INNOVATION APPROACH
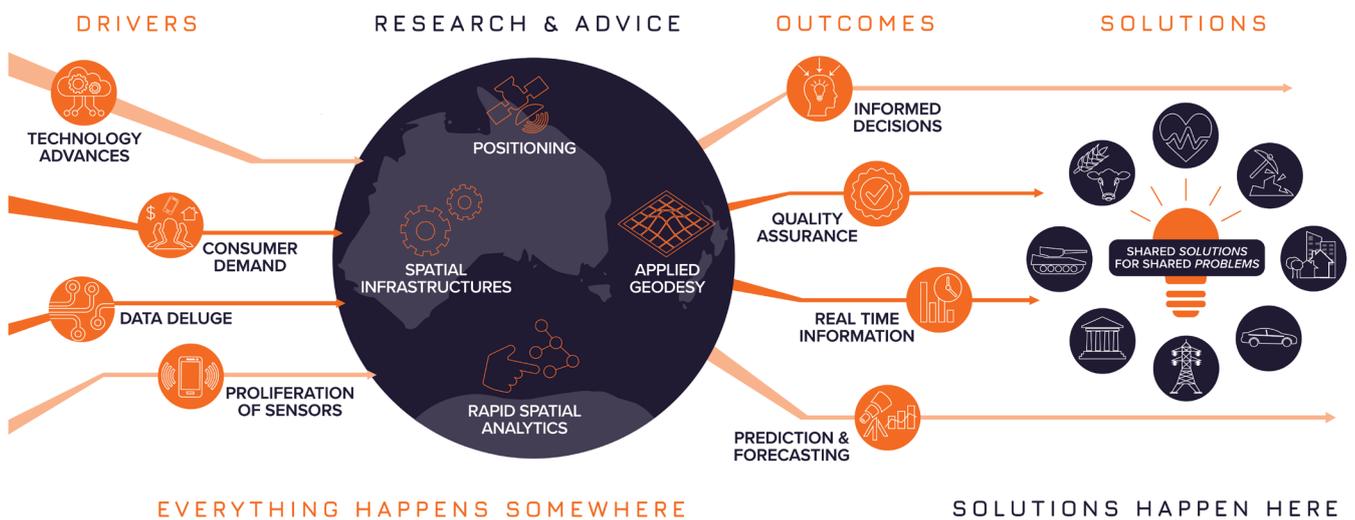
We work in three core areas:

Positioning and Applied Geodesy – with the aim of improving location;

Spatial Infrastructures – focussing on increasing data accessibility and improving service delivery;

Rapid Spatial Analytics – with the goal of generating answers through automation, and delivering applied solutions across a range of industries, often with improvement to government services as a focus.

DRIVERS · RESEARCH & ADVICE · OUTCOMES · SOLUTIONS

TECHNOLOGY ADVANCES

CONSUMER DEMAND

DATA DELUGE

PROLIFERATION OF SENSORS

POSITIONING

SPATIAL INFRASTRUCTURES

APPLIED GEODESY

RAPID SPATIAL ANALYTICS

INFORMED DECISIONS

QUALITY ASSURANCE

REAL TIME INFORMATION

PREDICTION & FORECASTING

SHARED *SOLUTIONS* FOR SHARED *PROBLEMS*

EVERYTHING HAPPENS SOMEWHERE

SOLUTIONS HAPPEN HERE

FrontierSI provides the connection point and collaborative model for our partners to access, develop and apply spatial research development and innovation project outcomes into impactful solutions.

We provide our partners with the research services, expertise and technology to improve operations and implement innovative solutions.

Our services and capabilities include:

Project Facilitation: Responsively facilitating the formulation and delivery of complex projects which require collaboration between organisations. This draws upon our ability to connect drivers and insights from different organisations, extensive networks internationally and our expertise in delivering multi sectoral and multi-partner projects.

This includes our ability to create, manage and monitor quality outsourcing and subcontracting services which enhance solution delivery. Through our outsourcing capabilities, FrontierSI offers efficient and effective access to a highly specialised and expert resource base. The scalability through our networks vastly enhances our ability to deliver the required solutions and business outcomes.

Collaborative Applied Research: We have 17 years' experience in creating and managing collaborative teams of academic, private sector and government professionals to solve challenging innovation and R&D spatial problems of varying scales. We help to break down organisational, jurisdictional, and technology silos to deliver results and realise value for all project stakeholders. We have staff accredited in a variety of project management approaches to ensure that the right approach is used for each problem.

Often these are large scale, complex, multi-jurisdictional initiatives. Our projects range from deep technical research through to proof-of-concepts and demonstrators.

Advisory Services: Through our inhouse expertise as well as industry and university partnerships, we provide independent and trusted expert advice in spatial industry strategy, business strategy, data and spatial infrastructures strategy, innovation programs, technology due diligence, industry and technology trends, new markets assessment and economic analysis. We offer software development capabilities and technical Geographic Information System (GIS) services.

Industry Engagement and Outreach: We conduct workshops, reviews and industry consultations across both technology and end user markets to uncover new strategic insights and directions for our partners. We have co-organised national and international business networking events and business exchanges.

These extensive outreach efforts raise awareness of new technologies and their potential benefits, leading to the funding of new large-scale initiatives. Our global linkages and networks beyond ANZ connect our partners to leading global research and innovation.

Technology Development: We bring ideas to life, straddle the divide between cutting edge research and commercially scalable software to bring our partners ideas to market. We help our industry and government partners navigate the constantly changing digital environment by rapidly prototyping new ideas to explore feasibility and strategic fit. We join forces with our partners to provide an innovative, competitive edge in project bids. We play at the leading edge of technology, providing expertise in design, development, prototyping, and testing.

Professional Training: We provide training, capacity building, up-skilling and professional development courses directly and through our partners. Through our research we deliver postgraduate and postdoctoral education and training.

SIGNIFICANT OUTCOMES

Asia-Pacific Spatial Excellence Awards (APSEA)

We were very pleased with the awards our partners received in 2019-20 in recognition of their collaborative impact over recent years. Our collective contribution in advancing the use of spatial information in society throughout 2019-20 was far reaching - as reflected in the sample of awards received at an individual, state and national level.

The APSEAs are a long-standing premier event in the spatial industry's calendar and previous years have seen an excellent standard of competition across individuals, and private, public and academic sector organisations vying for the prestigious recognition. We congratulate all nominees and winners.

Virtual Reef Diver

Award: People & Community Award

Virtual Reef Diver enables coral cover data from a diverse array of monitoring programs and citizen science groups to be combined and used to support data-enabled management decisions. The Virtual Reef Diver team included FrontierSI, QUT, DNMRE, Reef Check, UQ and ABC Science.

Digital Earth Australia

Award: People & Community Award (NSW/ACT)

A collaboration between Geoscience Australia and FrontierSI, **Digital Earth Australia** (DEA) Industry Strategy, including DEA Labs and Sandbox, was awarded the People & Community Award (NSW/ACT).

Digital Earth Australia is a platform that uses spatial data and images recorded by satellites orbiting our planet to detect physical changes across Australia in unprecedented detail. DEA prepares these vast volumes of Earth observation data and makes it available to governments and industry for easy use.

DELWP, University of Melbourne & FrontierSI

Award: Technical Excellence (Vic)

DynAdjust is an open source, cross-platform, high-performance least squares adjustment application that elegantly and effortlessly produces 3D coordinates and uncertainties for both small and extremely large geodetic networks. DynAdjust provides a ground-breaking solution to a longstanding problem faced by geodesists in Australia and throughout the world — the requirement to efficiently produce and maintain geodetic reference frames based on continental-sized geodetic networks subject to ongoing change.

Cancer Atlas

Award: Spatial Enablement and the JK Barrie Award for Overall Excellence

The **Australian Cancer Atlas** is a joint research project between Cancer Council Queensland, QUT (Queensland University of Technology), and FrontierSI. The digital cancer atlas shows national patterns in cancer incidence and survival rates based on where people live for 20 of the most common cancers in Australia. The Atlas was been endorsed by the Australasian Association of Cancer Registries and Cancer Council Australia.

Women in STEM

Award: Highly Commended Women's Leadership Award and President's Award

Roshni Sharma

We celebrated the women who continue to push boundaries and lead innovation and ground-breaking research, having made significant contributions to spatial and science.

Congratulations to FrontierSI's Eva Rodriguez Rodriguez and Roshni Sharma.

Eva Rodriguez Rodriguez at GEO Week 2019

Vision 2030

Award: Export

Spatial Vision, the General Commission of Surveys Kingdom of Saudi Arabia, and FrontierSI were awarded the Export Award for our work in providing high quality geospatial information to support location-based decision-making in priority growth areas of the Saudi Arabian economy.

We also acknowledge a number of state based awards which were finalists at APSEA.

Cliniface

Award: People & Community, WA

WA Department of Health, Curtin University, Roy Hill Community Foundation, Perth Children's Hosptial Foundation and FrontierSI were recognised for their work on Cliniface - a 3D facial visualisation and analysis software that enables collaboration between clinicians and researchers to advance understanding of facial characteristics and their relationship with rare diseases and other conditions.

OUR IMPACT

Group on Earth Observations (GEO) Week Industry Track

L to R: Senator the Hon Matthew Canavan, James Johnson (CEO, Geoscience Australia), Eva Rodriguez Rodriguez (FrontierSI), and Graeme Kernich (CEO, FrontierSI)

In 2019 GEO Week brought together ministers from GEO's members comprised of 111 UN Member States.

In collaboration with Geoscience Australia, the Australian Space Agency and CSIRO, FrontierSI was integral in leading an Industry Track of events to involve local and international industry and provide companies with a range of activities and events to promote their capabilities, network with participants and ministers from GEO members, engage with international agencies, forge new partnerships, meet new customers and potential users, and announce new initiatives.

FrontierSI was also responsible for facilitating several workshops, panel discussions and presentations, and ensured that a wide range of Earth Observation (EO) innovators from around the world were successful in showcasing the latest in EO data and technology.

This included various Side Event programs involving a diverse and extensive collection of EO discussions which created a great opportunity to gain a more detailed understanding on key issues and activities influencing the development of the global EO sector. FrontierSI also helped facilitate the EO Industry Platform which allowed additional opportunities for participants to hear presentations organised on a thematic basis which highlighted new ideas and capabilities, provided updates about cutting edge technology and their applications, and raised topical issues for discussion.

AGO Labs

In 2019, the Australian Geospatial Intelligence Organisation (AGO) partnered with FrontierSI to pilot a new industry innovation program, the AGO Analytics Labs program, which aimed to provide AGO with exposure to a wider pool of organisations and their associated capabilities from which to draw upon for technology support in automated geospatial intelligence.

The pilot program attracted significant interest, receiving 26 proposals for initially three available projects, with an additional project being added later, and activities conducted with Ozius, Urbis and AIML, Maxar, and Microsoft.

The program was rapidly implemented, with the first companies initiating project work within two months of the program launching the call for proposals. Key learnings from the pilot program included a much more comprehensive understanding of industry capability in Artificial Intelligence/Machine Learning (AI/ML), a proven mechanism of industry engagement and internal problem definition, improved AGO staff awareness of AI/ML capability in industry, and an improved AGO ability to work with small business who are unfamiliar with the objectives and processes of defence and intelligence organisations.

With the pilot program deemed a success, FrontierSI looks forward to collaborating with AGO in 2020-21 in an expanded program (AGO Labs 2020).

Identifying and Monitoring Groundwater Dependent Vegetation (GDV) Using Earth Observation

Mine dewatering is the removal of unwanted groundwater from a mine to allow rock and mineral extraction from beneath the water table.

This can affect the health of groundwater dependent vegetation (GDV) in the vicinity, which rely on a stable water-table for water requirements. Monitoring the potential impact of mining operations on GDV is an important compliance requirement for mining companies. However, the location of actual GDV species and selecting the best monitoring sites requires comprehensive knowledge and extensive time to set up.

Narrowing the search space to determine locations of GDV species is the first step towards establishing a time saving, cost efficient, and comprehensive monitoring program to monitor and manage dewatering activities. However, to date there is no standard tool to simplify this process. To address this need Curtin University researchers in consultation with mining companies, Roy Hill Iron Ore and BHP, recently developed GDV likelihood models using weighted seasonal imagery from Digital Earth Australia's (DEA) Open Data Cube to map GDV at the press of a button.

This sees the team achieve the first milestone towards developing an expanded monitoring project, which will fully exploit the DEA Data Cube to reconstruct the past as well as combine higher resolution imagery such as Sentinel-2 for future applications.

FrontierSI in collaboration with partners Curtin University, in consultation with mining partners BHP, Roy Hill, Rio Tinto, Fortescue and Atlas Iron and with guidance from the Department of Water and Environmental Regulation, the Department of Biodiversity, Conservation and Attractions and the Western Australian Biodiversity and Science Institute, have commenced stage 2 which will further extend the models developed to assist the prioritisation of ground-based responses by including a suite of remotely sensed derivatives. It will also include near real time detection of GDV health decline and develop and deploy a user-friendly interface using an agile and consultative approach.

The aims of this project have been derived from the research priorities identified by mining companies operating in the Pilbara region, regulatory departments and consulting bodies.

SBAS

The Satellite-Based Augmentation System (SBAS) Test-bed Project was led by Geoscience Australia (GA) in partnership with Land Information New Zealand (LINZ) over the past 3 years.

FrontierSI managed the industry-based projects that evaluated the SBAS Test-bed. The teams engaged broadly with industry, academia, and government to test the operational capabilities of SBAS for the Australasian region.

In an economic benefits report released in July 2019, the Test-bed assessed the economic, social and environmental benefits of improved positioning technologies and demonstrated tangible benefits across a range of industry sectors in both countries.

Accurate and reliable positioning information has significant economic benefits with an expected value of $7.6b over 30 years for Australia and New Zealand. Benefits of an operational SBAS include wider coverage, enhanced accuracy, signal integrity and reduced commercial costs and infrastructure investment.

"SBAS delivers positioning information via satellite broadcast, and hence can overcome the current gaps in mobile and radio communications to deliver accurate and precise positioning information anytime, and anywhere within Australia and New Zealand, at no additional cost to the user."

Three new satellite positioning technologies were deployed across the region: single frequency legacy SBAS, the world's first Dual Frequency Multi Constellation (DFMC) SBAS, and Precise Point Positioning (PPP) and trials continued throughout 2019-20 testing the services across Australia- New Zealand.
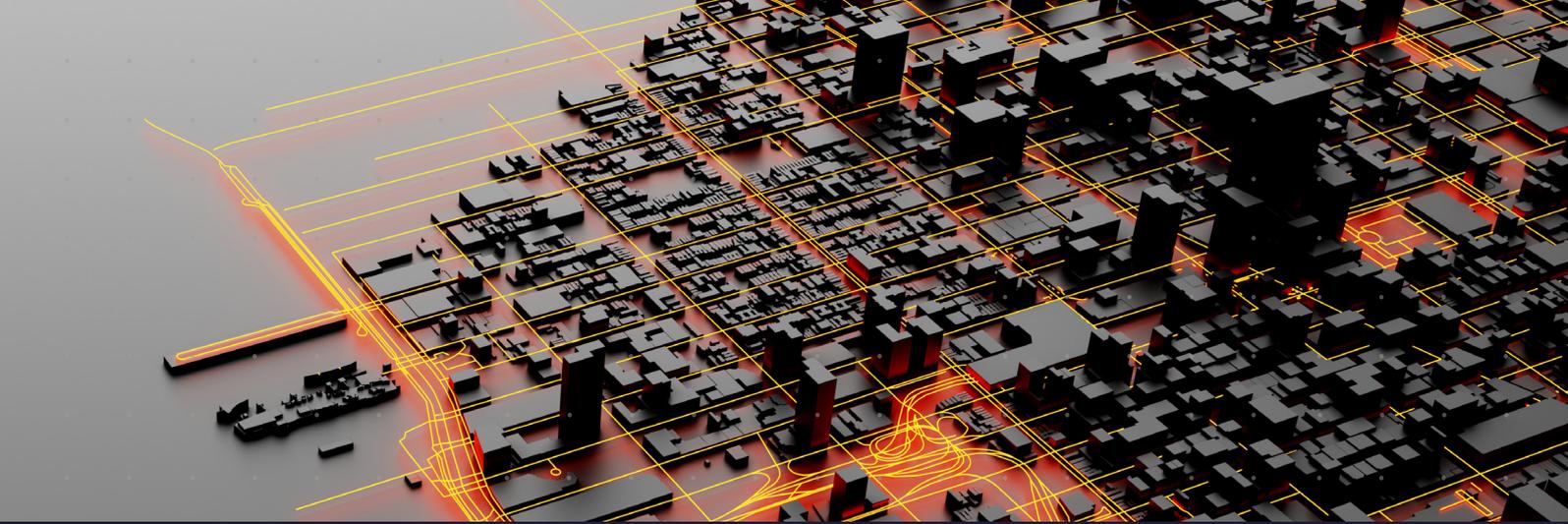
Value Australia

Land and property is the nation's single largest asset class. The valuation of these assets is used to collect land tax, inform infrastructure investment and lending for homes, along with modelling insurance risk and investment returns.

Property tax currently contributes $50 billion p.a. across Australia, supported by an estimated $300 million p.a. of costs to government. Services for banking and finance are delivered by the property valuation industry, costing over $350 million, of which more than 75% is wages.

The current labour-intensive approach to land and property value assessment results in expensive, subjective, slow and often out of date valuations for property, particularly for urban fringe (peri-urban) and regional land. These shortcomings coupled with the emerging cyber threats to the underpinning valuation data infrastructure, require a collaborative approach between industry, government and researchers to develop secure, scalable, and commercially viable solutions.

The $8.5M Value Australia project, which commenced in early 2019-20, will run over three years and includes funding via an Australian Government CRC-P grant. Value Australia brings together a collaborative mix of organisational expertise from research (FrontierSI, UNSW), Industry (Commonwealth Bank of Australia, Omnilink), State Government (Office of the NSW Valuer General) and local council (Liverpool City Council). The project team will integrate research, significant data assets and state-of-the-art analytics and artificial intelligence to deliver secure digital valuation models and tools covering a broad range of land and property types across Australia and overseas.

Value Australia builds on two years of pilot work across metropolitan Sydney and Brisbane through the award-winning RAISE project which developed a range of Automated Valuations Models (AVMs) and will expand on this base to produce a national suite of data and software products which are scalable, efficient, secure, and accurate.

Industry Leadership

Digital Twins

A number of industry sectors have been building use cases for Digital Twins and we're now witnessing the collective outcomes from many organisations entering this exciting and ground-breaking field.
We welcome the emergence of new research, technological advances in 3D data acquisition and analytics, the growth in education and advisory, and the growing range of partnerships between government and industry organisations that continue to advance the developing ecosystem of digital twins. FrontierSI in collaboration with our partner network are already contributing to Digital Twins through improving standards and interoperability of data supply chains,

providing better location information for property and related data sets, and developing and interlinking cross-jurisdictional and cross-sectorial partnerships.

Digital Twins have the potential to transform the design, management and performance of the built and natural environment. While a variety of digital twins support exploration, visualization and analysis of multi-dimensional data, use cases which demonstrate the analytical power of digital twins and specifically 3D and real-time data streams within an integrated analytical treatment for situational awareness, are still lacking.

Following an EOI seeking partner proposals which significantly advance the creation of digital twin products and services in support of our government partners' priorities, FrontierSI is co-investing in three DT pilot projects commencing in 2020-21.

FrontierSI is collaborating with partners on piloting the **Australian Environmental Health** (AusEnHealth) Digital Twin: a national digital environmental health decision support platform to access, visualise and analyse environmental health data, reports and models, and provide tools to support adaptation planning, vulnerability assessment and decision making. The collaboration comprises FrontierSI with partners Queensland University of Technology, Qld Department of Natural Resources, Mines and Energy, Curtin University, Geoscience Australia, WA Department of Health, and NGIS, as well as stakeholders Australian University Research Infrastructure Network (AURIN), Victorian Environmental Protection Authority and Terrestrial Ecosystem Research Network and National Environmental Prediction System (TERN).

"Currently there is no national digital representation of environmental and health indicators at a local level, to enable policy makers, health managers and researchers to identify vulnerable populations, predict future disease burden and plan for a changing climate in a coordinated, timely manner."

FrontierSI is also involved in a new digital twin initiative, Liveable City Digital Twin Pilot, which is piloting a precinct level analytics-aided and standards-based 3D/4D Digital Twin in Western Sydney. The collaboration comprises FrontierSI with partners UNSW, NSW Spatial Services, and QLD Department of Natural Resources, Mines and Energy, along with stakeholders AURIN, Data61, and Astrolabe.

"FrontierSI is determined to build the spatial capabilities across government, industry and universities to enable the delivery of an ecosystem of integrated digital twins. Purpose built use cases which are developed on common frameworks and are open standards driven will contribute to the wider use of digital twins."

In a third project, working with our New Zealand partners University of Canterbury and Land Information New Zealand, as well as the New Zealand National Institute of Water and Atmospheric Research, we will be looking at using technology in the creation of efficiencies in flood risk management, which in New Zealand is an activity which is devolved to regional councils and, as a consequence, highly variable. Historically, the computational modelling and scenario assessment required for flood risk management and mitigation requires substantial amounts of spatial data related to infrastructure and the environment, making it challenging and expensive.

This is particularly a problem for smaller regions or communities where the costs of such analysis may be prohibitive. In this project, a "flood resilience digital twin" will be developed and tested comprising of three-waters, flood mitigation and other infrastructure, high-resolution topography and land cover, in order to facilitate these assessments to be completed more rapidly and at lower cost. This project will develop and test the specifications needed for a New Zealand flood resilience digital twin and implement it for selected urban areas.

Showcasing Diversity and Inclusion in the Spatial Sector

The co-conveners of the Spatial and Surveying Diversity Leadership Network and Portfolio, FrontierSI's Eva Rodriguez Rodriguez and Amelia Davies (Director Land Information & Spatial Services at DELWP) issued a call to the spatial sector to showcase leaders in our sector who were investing in opening doors, challenging bias, and creating workplace cultures that foster a sense of belonging and inclusion.

The aim was to hear and learn about those success stories which demonstrated practical ways to improve diversity and inclusion in the workplace. As individuals and organisations, we know the importance of increasing diversity and inclusion, however it is often difficult knowing where to start. Reaching out to the community to seek inspiration and sharing our own stories is a wonderful first step.

Several organisations and individuals in the spatial and surveying sector stepped forward to share their stories to inspire action and spark our imaginations. FrontierSI, ANZLIC, ISV, Karen Joyce and SSSI Mentoring Program have taken steps to improve diversity and inclusion in their work.

As a result, there have been several case studies and stories collated from organisations and individuals in the spatial sector to inspire, think and act. We acknowledge the incredible work by everyone involved in driving this initiative in the spatial sector and progressing this effort forward.

PEOPLE & CULTURE

As a service-based organisation our staff remain our biggest asset, and the onset of COVID-19 led to a heightened and ongoing focus on staff health and welfare as a top priority. With FrontierSI's staff having a pre-existing capability to deliver all business functions and project services while working remotely, by March 2020 all staff had smoothly transitioned to working from home.

Several initiatives were implemented to ensure staff working remain fully supported in a working from home environment. Initiatives included:

- Extended support to the Employee Assistance Program;

- Flexible working conditions;

- Allowance to cover extra working from home costs and setup;

- Additional communications and check-ins at an individual, team and organisation level using tools such as Zoom, Microsoft Teams, Skype and Slack.

- Team based activities to promote social connection and health (eg: walking app challenges and online quiz nights).

Pleasingly, in the first of what will become an annual staff engagement survey, satisfaction levels for Management's handling and support for staff during the pandemic rated 94%.

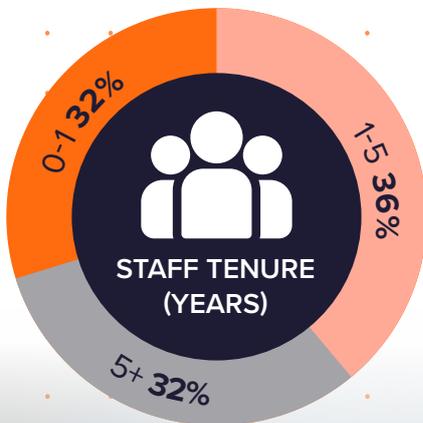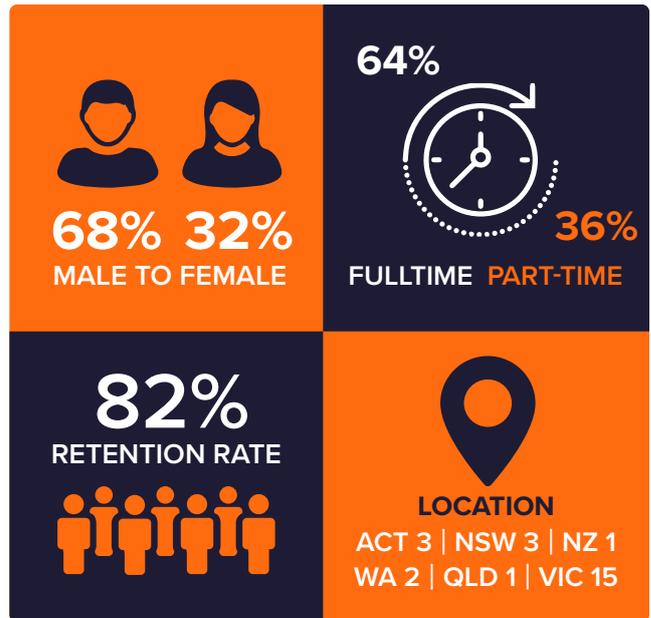**FrontierSI formally operates within a functional structure divided into three key areas:**

- Operations (finance, governance, communications, administration)

- Business Development/Partner Relations

- Research and Innovation

With a core employee base of 25 staff who broker, manage and deliver projects in collaboration with a much greater partner resource base, success is dependent on ensuring maintenance of a diverse and inclusive culture which encourages cross functional collaboration while maintaining a strong partner focus. The executive team are supported by a management team with a broad range of technical skills and experience pertinent to and commensurate with the roles they fulfill.

In acknowledging flexible work practices as one of the most important factors in attracting and retaining a diverse workforce, we have placed particular emphasis in this area with 36% of staff who work part time, and others who work varied hours, to allow management of outside personal and professional commitments. Acting on feedback from our staff, we will also include greater flexibility and expanded opportunities within our Performance Development Planning framework from 2020-21, ensuring the development offerings cater to the varying needs and aspirations of our staff and benefit the individual and our organisation.

We are pleased to confirm the appointment of Kate Williams in the role of Chief Business Officer joining the Executive team of (left to right) **Graeme Kernich** (Chief Executive Officer), **Melanie Plumb** (Chief Operating Officer) and **Phil Delaney** (Chief Innovation & Delivery Officer).

68% 32%
MALE TO FEMALE

64%
36%
FULLTIME PART-TIME

82%
RETENTION RATE

LOCATION
ACT 3 | NSW 3 | NZ 1
WA 2 | QLD 1 | VIC 15

0-1 **32%**

1-5 **36%**

STAFF TENURE
(YEARS)

5+ **32%**

FrontierSI has embraced an ongoing commitment to diversity and inclusion and has implemented or trialled several initiatives from within the 2026 Agenda Diversity and Inclusion Action Plan in 2019-20 including the adoption of more flexible work practices, trialling of an anonymous CV assessment process and completion of a pay equity audit.

PROJECT DELIVERY

In 2019-20, FrontierSI led, formulated, brokered and delivered solutions with government, industry and university partners within a portfolio of 53 projects. 24 Projects were completed, 26 new projects commenced and FrontierSI began 2020-21 with an active project portfolio of 29 projects with a cumulative funding value in excess of $17M.

FrontierSI exists to solve partner challenges and our portfolio reflects the deep level of engagement we have with each organisation within our partner network. Our projects engaged 140 project partners across 72 organisations, with each of our university and government partners involved in multiple initiatives. Maintaining alignment with partner and stakeholder strategies and initiatives across our project portfolio is an ongoing priority, both in assessing the activities to pursue and in determining how we deliver.

POSITIONING & APPLIED GEODESY PORTFOLIO

Project Title	Key Sectors	Status	Collaborators
Calibration of Signal Power, and their utilisation from ground tracking networks for constellation monitoring.	Government	Commenced	Geoscience Australia
Developing a practical and comprehensive approach to crustal deformation modelling in support of Australia's time-dependent reference frame	Government	Commenced	DELWP Vic, Spatial Services NSW, Geoscience Australia, LINZ Position ++, Curtin University
Ionospheric modelling for the ACS and NPI	Government	Commenced	Geoscience Australia, RMIT
Positioning Australia – Accelerating Industry Adoption	Whole of Economy	Commenced	Geoscience Australia,
Precise GNSS positioning with Smartphones	Government	Commenced	Geoscience Australia, RMIT, Otago University
Prototyping of satellite laser ranging (SLR) capabilities into the ACS	Government	Commenced	Geoscience Australia
Improving access to precise positioning information – review of existing research	Government	Commenced & Completed	Geoscience Australia, Positioning Insights
Improving access to precise positioning information by utilising modern data transmission protocols – Part 1 – Scoping Study	Government	Commenced & Completed	Geoscience Australia, QUT
Ensuring access to precise position by improving geodetic data interchange standards – Scoping Study	Government	Completed	Geoscience Australia, Curtin University, DELWP Vic
Establishment of a Regional Satellite Based Augmentation System Testbed	Whole of Economy	Ongoing	Geoscience Australia, LINZ, RMIT, Buildvation, AMSA, Pilbara Ports Authority, GMV NSL, Aurizon, Rio Tinto, Chevron, Napier Port, ThingC Robotics, Scion Research, and University of Adelaide.
Integrity Monitoring for the Multi-GNSS Analysis Centre Software	Government	Ongoing	Geoscience Australia, UNSW, RMIT, LINZ
Ongoing Development of the Multi GNSS Analysis Centre Software.	Government	Ongoing	Geoscience Australia
Provision of SBAS Specialist Research & Technical Capability	Whole of Economy	Ongoing	Geoscience Australia, LINZ

DATA ANALYTICS (INCLUDING EARTH OBSERVATION)

Project Title	Primary Sector	Progress	Partners
Aligning the Vicmap Statewide DEM to Hydro and Contours	Government	Commenced	DELWP Vic
AusSeaBed Data Hub Component Development	Government, Agriculture & Natural Resources	Commenced	Geoscience Australia
Develop Methods for Automated Data Extraction into a Machine-Readable Database for Subsequent Data Query and Reporting.	Resources	Commenced	DNRME Qld, QUT
Digital Earth Africa Notebook Uplift	Government	Commenced	Geoscience Australia, Digital Earth Africa
NSW Riverlines Toolkit Modification & Training	Agriculture & Natural Resources	Commenced	Spatial Services NSW, Spatial Vision
Prioritising GDV inspection using ensemble models and near real-time monitoring	Resources	Commenced	Geoscience Australia, Curtin University, Roy Hill, BHP, Dept of Water & Environment Regulation WA Biodiversity Science Institute, Rio Tinto, Fortescue, Atlas Iron.
Provision of Market Research for continuation of DEA Industry Strategy	Whole of Economy	Commenced	Geoscience Australia
Rare Diseases empowered - Multi-dimensional digital diagnosis and monitoring of rare diseases	Health	Commenced	Sanofi, Curtin University, Telethon Kids Institute
SmartSat CRC Project: Earth Observation Analytics Solutions: Know the Market to Grow the Market	Agriculture & Natural Resources	Commenced	SmartSatCRC, Geoscience Australia
Validation of 3D imagery for rare diseases for assurance for international database development and integration with platforms including Patient Archive [Cliniface IV]	Health	Commenced	Curtin University, Perth's Children's Hospital
Vicmap Machine Learning Feature Extraction Phase 2	Government	Commenced	DELWP Vic, Orbica
Defining an Agriculture Property Data Model for Australia	Agriculture & Natural Resources	Commenced & Completed	Meat and Livestock Australia, Geoscape
Developing a Spatial Data Services Roadmap	Government	Commenced & Completed	DELWP Vic
Exploring the Economic Value of Westlink	Built Environment	Commenced & Completed	Wyndham City Council
GEO Industry Track Support [Earth Observations]	Whole of Economy	Commenced & Completed	Geoscience Australia
Using AI to Automatically Detect Vegetation from UAV Imagery.	Agriculture & Natural Resources	Commenced & Completed	Melbourne Water
AusSeabed Quality Assurance Tool	Government	Completed	Geoscience Australia
Australian Geoscience Data Cube (AGDC) Industry Engagement	Government	Completed	Geoscience Australia, Data Farming, NGIS, Cibolabs
Blockchain for Property Development	Built Environment	Completed	Spatial Services NSW, Business Aspect

Project Title	Primary Sector	Progress	Partners
Cadastre of Known Accuracy	Government	Completed	Spatial Services NSW, Symbolix
Change Detection System from High Resolution Satellite Images (CDS)	Government	Completed	DNRME QLD, Dept of Environment and Science QLD, QUT, University of Queensland
Copernicus Data Hub Training Materials	Government	Completed	Geoscience Australia
Enhancing NSW Building Footprints Using Machine Learning	Government	Completed	Spatial Services NSW, RMIT
Foster an Open Source Community for the Open Data Cube	Government	Completed	Geoscience Australia, AMA, Symbios
Integrated city planning using the RAISE toolkit	Built Environment	Completed	QUT, UNSW, Omnilink, NSW Valuer General, Blacktown City Council, Parramatta City Council, Brisbane City Council, Landcom, Australian Property Monitors.
Measuring and Monitoring Vegetation Health Impact through Earth Observation	Resources	Completed	Geoscience Australia, Curtin University, Roy Hill, BHP, NGIS, GHD, Department of Water and Environment Regulation, Western Australia Biodiversity Science Institute
Provision of Spatial Cancer Models for New Zealand.	Health	Completed	NZ Ministry of Health, QUT, Cancer Council Queensland
Smart Information Services for Land Use Planning	Built Environment	Completed	Spatial Services NSW
Utilisation of Earth Observation data to determine smoke exposure during prescribed burns and correlation of these exposed areas to health outcomes	Health	Completed	Curtin University, NGIS, WA Department of Health, Bureau of Meteorology, WA Department of Biodiversity, Conservation and Attractions
VicMap Machine Learning Phase 1	Government	Completed	DELWP Vic
Australian Geospatial-Intelligence Organisation Analytics Lab	Government	Ongoing	AGO, Maxar, Digital Globe, Ozius, Urbis, AIML, Microsoft
Cliniface Stage 3 – Integrating, Enhancing and Scaling 3D-FAST for local and international impact	Health	Ongoing	Curtin University, WA DOH, University of Sydney, Linear Clinical Research, Perth Children's Hospital
Learning Predictive Models for Urban Artificial Intelligence	Built Environment	Ongoing	UNSW, Urban Development Institute of Australia
QA4UAV Tool	Government	Ongoing	Spatial Services NSW, DELWP Vic, Minerals Research Institute of Western Australia,
Maintenance of the Bushfire and Natural Hazards CRC's Online Project Management System	Emergency Management	Ongoing	Bushfire and Natural Hazards CRC
Towards the Cadastre QLD. Transformation Program Through a Digital 3D Cadastre Demonstrator.	Government	Ongoing	DNRME Qld
Value Australia	Built Environment	Ongoing	UNSW, Omnilink, Commonwealth Bank of Australia, Liverpool City Council, NSW Valuer Generals Office

SPATIAL INFRASTRUCTURES

Project Title	Primary Sector	Progress	Partners
Improving the user experience and usability for users of the NSW government spatial hosting portal.	Government	Commenced & Completed	Spatial Services NSW, designit
Preliminary activities to establish a web-based platform based on the existing Vanuatu Coastal Risk portal	Agriculture and Natural Resources	Commenced & Completed	CSIRO, NGIS
University of Canterbury Professor Position	Government	Ongoing	University of Canterbury, LINZ

UTILISATION & COMMERCIALISATION

The effective management and utilisation of IP is fundamental to achieving the objectives set out in FrontierSI's Strategic Plan.

The management of IP is guided by the following practices:

- Facilitation of rapid uptake (and capability) by end-user participants and stakeholders for national benefit.

- Innovative use of IP including all FrontierSI Core Partners having a licence to use IP for internal research purposes.

- Endeavouring to make prior decisions about the commercial potential of investments in IP from research. Where an impact maximising an outcome of public good is sought or where there was no commercial uptake (and no national security or privacy issues) then the IP will be placed into the public domain.

- Operating an end-user uptake pathway with an emphasis on partnering SMEs and government organisations, supported by research providers. Appropriate consideration is also given to the needs of corporate participants.

Property Development Transaction Platform

The Property Development Transaction Platform (PDT) initiative has its origins in an FrontierSI R&D project to build a Block Chain based transaction platform for the property industry.

Partner organisations Spatial Services NSW and Business Aspect, as well as Civic Ledger, collaborated to build the Block Chain capability.

The rationale for PDT was that there are many transactions in the property development pipeline that can benefit from a Block Chain approach which provides benefits such as:

- Secure open access, not just for governments and proponents, but for secondary markets, particularly the finance and insurance industries

- Real time access. Significant costs and delays are incurred in the property development pipeline by processes running sequentially rather than in parallel, and starting later than possible due to lack of access to decision points and documents

- Immutable records. Certificates, plans and documents stored using Block Chain cannot be altered without disclosure, while full version control is provided.

Cancer Atlas

The Australian Cancer Atlas, initially released in September 2018, was developed through a collaboration between FrontierSI, with research partners Cancer Council Queensland, Queensland University of Technology, and the Australian Institute of Health and Welfare.

It shows national patterns in cancer incidence and survival rates based on where people live for 20 of the most common cancers in Australia – such as lung, breast and bowel cancer. It lets us make sense of complex data more easily. In turn, this helps health agencies, policy makers and researchers digest the data to understand and see previously indistinguishable patterns. It will provide a better understanding of geographic disparities and health requirements.

Since the original release, the project team has continued to pursue opportunities to implement the atlas in other contexts and jurisdictions. One such opportunity is a project with the New Zealand Ministry of Health which was completed in 2019-20, which utilised the methodology and expertise developed under the Australian Cancer Atlas, for application in a New Zealand setting. In addition, the Cancer Atlas team have been successful in an ARC Linkages bid which will enable further expansion and additional functionality to be added to the Atlas including time series analysis and additional cancer types.

PARTNERSHIPS & KEY STAKEHOLDERS

FrontierSI would not exist without its partners. Our model for ongoing sustainability is predicated on solving partner challenges by drawing on the expertise of our university and industry partners. Our fundamental role is in providing the brokering and coordination function ensuring the best teams come together to deliver impactful and sustainable outcomes.

Through this model we view our partner base as either partners that utilise our research and innovation services (predominantly government) or partners that provide those services (predominantly university and industry). As a collaborative organisation we believe in growing the skills and capabilities of our university and industry partners, which contributes to the growth of specialist spatial skills for use by the economies of ANZ.

We are proud and grateful to have maintained a solid partner base in 2019-20, retaining all Core and Support Partners from prior year and a stable industry partner group.

Key relationships have also been forged with all of Australia's leading spatial peak bodies; ANZLIC (Australia New Zealand Land Information Council) representing the government interests, SIBA/GITA (Spatial Industries Business Association and Geospatial Information Technology Association) representing the private sector interests and SSSI (Surveying and Spatial Sciences Institute) representing the spatial profession. Formal connections are also maintained with associated industry bodies and organisations, both domestically and internationally, where there is strategic alignment and benefit to be derived for FrontierSI and our partners, including The ANZ Smart Cities Council, The Australian Space Agency, Open Geospatial Consortium (OGC), European Association of Remote Sensing Companies (EARSC) or the Space Industry Association of Australia.

Core Partners

Support Partners

Industry Support Partners

FrontierSI also became a Core Partner in the newly formed SmartSatCRC. The 100+ partner CRC, which commenced operations in early 2020, has strong strategic alignment with FrontierSI's objectives in Earth Observation and connecting space and spatial. With two projects commenced and others in proposal stage we will look to further leverage opportunities for our partner base through this relationship into 2020-21.

PARTNER ENGAGEMENT & COMMUNICATION

Partner engagement and communication is critical to ensuring a thriving research and innovation ecosystem. The FrontierSI Partner Engagement model was introduced in 2019-20 and involves a four-step process for engaging with partners which includes:

1. Prepare

We consult with our Government and University partners to understand their expectation of us and the key priorities each partner would like the partnership to focus on. This information is captured in a Partner Engagement Planning Tool, a living document updated at each partner meeting to ensure activities and focus remains current and relevant.

2. Implement

Led by the Partner Engagement Manager, FrontierSI then implements key activities identified through the consultation process.

3. Review

FrontierSI undertakes an annual review with the key contacts at each partner to gain feedback on the partnership specifically addressing the identified expectations.

4. Improve

Feedback from partners is presented to FrontierSI staff and Board and recommendations for improvement are considered to ensure continuous improvement.

The process is a dynamic and ongoing cycle, which supports a comprehensive approach to engagement and will, over time, build an evidence-based platform for continuous improvement. Each FrontierSI partner has a FrontierSI staff member assigned as their partner engagement manager who meets regularly with the prime contact at their partner. The engagement process is overseen by Head of Partner Engagement. A light version of this four step process is also applied with each of our industry partners.

In 2019-20 it was apparent that the impacts from the Australian east coast bushfire crisis, followed by the global COVID-19 pandemic would result in deep longer-term implications for our key partners. Like FrontierSI, our partners have experienced rapid change in priorities and working arrangements, and we have amplified our engagement mechanisms, at a project and organisation level, both formally and informally, in response. Our aims: to consistently work in alignment with our partner's needs; to demonstrate our value proposition; and to assist where we can during an unprecedented period. Our approach was welcomed.

In June 2020, through our annual review for our Core and Support partners to ascertain a) level of satisfaction b) partner expectations, and c) future priorities for partners, FrontierSI achieved an overall partnership satisfaction level of >75% satisfied partners (83%) as measured by review of engagement plans or expectations with its core Government and University partners.

Communications

The Communication Purpose

The purpose of our communication is to:

1. Convey an accurate sense of what FrontierSI is doing and by whom to our partners and stakeholders.

2. Promote FrontierSI, our partners, our outputs and our benefits to the wider community building a sense of the novel and foundation spatial research we conduct that leads to improved social and economic wellbeing across Australia and New Zealand.

3. Reinforce a sense of pride and achievement in the work we do. The content focus of our communication is based on three core areas:

- Project impacts, outcomes, applications and adoption of new technologies

- Conveying opportunities for our partners to participate in research and innovation activities across our program areas

- Celebrating the achievements of our collaborative partnerships.

We aim to tell our stories in a practical impactful way to the private sector, government and our partners. Our conversations beyond the immediate spatial community will seek to grow the spatial value chain by substantially increasing the impact of our activities and those of our partners.

Our communications strategy is to vary the content of key messages to suit our target audience: by technical complexity, industry application and use cases to be most relevant to partners, end users and the wider community.

Profile Raising

Critical to FrontierSI's success is articulating our value to our partner base and an ever expanding user community. The challenge will be in determining how best to reach new users, seeking them out, and communicating to their differentiated needs. The requirement for connection and stronger engagement has never been more acute. In applying our efforts to the right actvities, in the right proportion, we will broaden our community and ultimately increase the impact of our work for the benefit of Australia and New Zealand.

2019-20 Snapshot

2019-20 saw the development and implementation of a new external FrontierSI content marketing approach which delivered growth through robust industry engagement. Throughout this period, we disseminated communications across several platforms around several industry initiatives and workshops. We established and tracked metrics to monitor the status of several activities, which ultimately drove project effectiveness. We provided effective analyses of all our communications projects and adjusted plans based on our deep-dive data-driven insights and taking into consideration the impact COVID-19 made on our industry and partners.

Our approach ensured that industry and partner-facing communications remained consistent across our business strategies, product messaging and corporate brand standards. This has strengthened FrontierSI's role as key thought leaders in the spatial information and allied industries.

12 INDUSTRY NEWSLETTERS

129K IMPRESSIONS **1.3K** FOLLOWERS
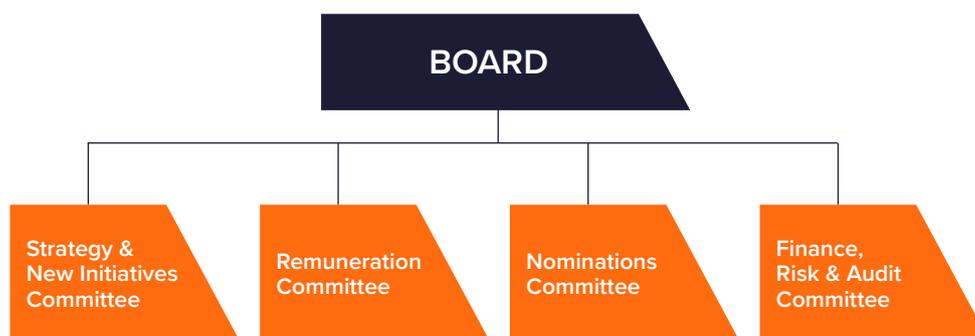
4K PAGE VIEW **1.5K** FOLLOWERS

GOVERNANCE & MANAGEMENT

Spatial Information Systems Research Limited (SISR), trading as FrontierSI is an unlisted public company limited by guarantee. SISR has status as a not-for-profit charitable organisation under Subdivision 50-B of the Income Tax Assessment Act 1998 and section 123E of the Fringe Benefits Tax Assessment Act 1986.

FrontierSI's partners contribute to organisational governance through participation in a nomination and appointment process of the skills-based Board who is responsible for governance and operations of FrontierSI. The Board is comprised of a mix of independent and representative members including an independent Chair and a Managing Director in the CEO, with Executive support for Board and Committees provided by the COO who is the appointed Company Secretary. Beginning 2019-20 with an eight-member

composition, the Board reverted to a seven-member composition with the retirement of Abigail Goldberg in February 2020 and determined this as the optimal composition and structure to lead FrontierSI.

The Board consolidated its governance framework in 2019-20 supported by a four Board Committee structure implemented in August 2019. With the onset of COVID-19 Board focus turned to near term business stability and the welfare of FrontierSI staff. An interim COVID-19 Business Plan was approved for the April to September 2020 period, and monthly Board meetings were held between March and September 2020 to closely monitor these issues. Concurrently, the Board focussed on progression of longer-term strategic initiatives at a pace commensurate with business and key stakeholder priorities.

BOARD

- Strategy & New Initiatives Committee
- Remuneration Committee
- Nominations Committee
- Finance, Risk & Audit Committee

	Board		Finance, Risk and Audit Committee		Strategy & New Initiatives Committee		Remuneration Committee		Nominations Committee	
2019-20 BOARD & COMMITTEE MEETINGS	Eligible	Attended	Eligible	Attended	Eligible	Attended	Eligible	Attended	Eligible	Attended
Abigail Goldberg*	4	4								
Bruce Thompson	11	11			9	8	2	0		
Chris Thomas	11	9	4	4	9	8			1	1
Gillian Sparkes	11	9			9	9	2	2	1	1
Graeme Kernich	11	11			9	9				
Michelle McLean	10	10	4	4			2	2	1	1
Paul Farrell	11	10			9	9				
Wendy Lawson	11	10								
Wayne Poole**			4	4						
Melanie Plumb***	11	11	4	4	9	9	2	2	1	1

Notes:
* Abigail Goldberg resigned from the Board on 19 February 2020
** Wayne Poole, Deputy Director Business Advisory @ Core Partner RMIT, is an appointee to the FRAC
*** Company Secretary

Board of Directors

GILLIAN SPARKES
CHAIR
(Independent)
linkedin.com/in/gillian-sparkes

CHRIS THOMAS
DEPUTY CHAIR
(Independent)
linkedin.com/in/chrisfthomas

MICHELLE MCLEAN
(Independent)
linkedin.com/in/mcleanmichelle

WENDY LAWSON
(University Partner
Representative)
linkedin.com/in/wendy-
lawson-00bb233b

PAUL FARRELL
(Industry Partner
Representative)
linkedin.com/in/paulfarrell2

BRUCE THOMPSON
(Government Partner
Representative)
linkedin.com/in/brthompson1

GRAEME KERNICH
CEO & Managing Director
linkedin.com/in/graemekernich

FINANCE SUMMARY

FrontierSI remains in a sound financial position and delivered a favourable result to budget in 2019-20, ending the year with an operating deficit of $0.2M against a budget deficit of $2.2M.

This favourable variance was driven by expenditure savings in research with delays experienced in appointment of research positions, lower than anticipated expenditure on new projects and initiatives and also through savings in operating costs.

FrontierSI was fortunate to qualify for Australian Government COVID-19 stimulus scheme payments, with $0.2M received.

2019-20 Financial Year Highlights:

✓ **Growth from previous year income of 16% ($8.0M is 2019-20 vs $6.9M in 2018-2019)**

✓ **Maintained operational expenditure at < 25% of total spend for 2019-20**

✓ **Finished 2019-20 with Net Equity of $6.9M including $4.9M of funds in reserve**

2019-20 Income

Research Project Income	$5.9M
Subscription Income	$1.7M
Other Income	$0.4M
Total Income	**$8.0M**
Budget	*$8.7M*

Pie chart: 74% Research Project Income, 21% Subscription Income, 5% Other Income

- Research Project Income
- Subscription Income
- Other Income
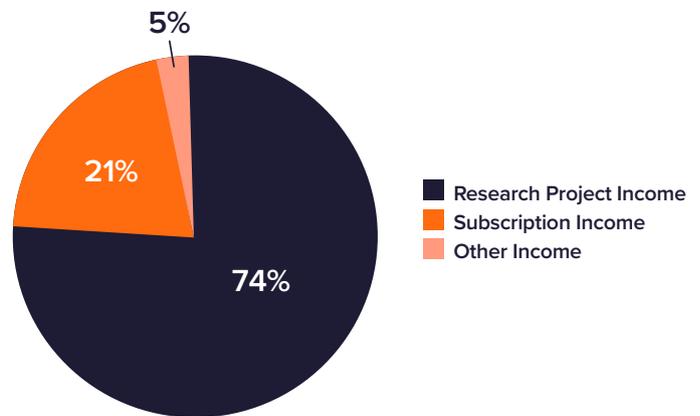
2019-20 Expenditure

Research Projects	$6.3M
Operating Costs	$1.7M
Other Expenditure	$0.2M
Total Expenditure	**$8.2M**
Budget	*$10.9M*

Pie chart: 76% Research Projects, 21% Operating Costs, 3% Other Expenditure

- Research Projects
- Operating Costs
- Other Expenditure
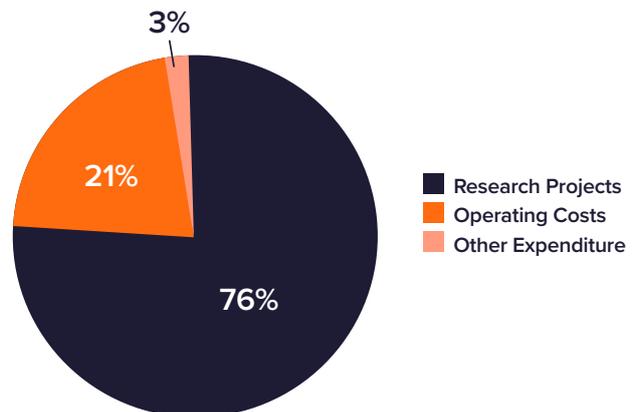
2019-20 Program Allocation

Earth Observation & Analytics	$4.2M
Positioning & Geodesy	$1.3M
Spatial Infrastructures	$0.8M
Total Expenditure	**$6.3M**

Pie chart: 67% Earth Observation & Analytics, 21% Positioning & Geology, 12% Spatial Infrastructures

- Earth Observation & Analytics
- Positioning & Geology
- Spatial Infrastructures
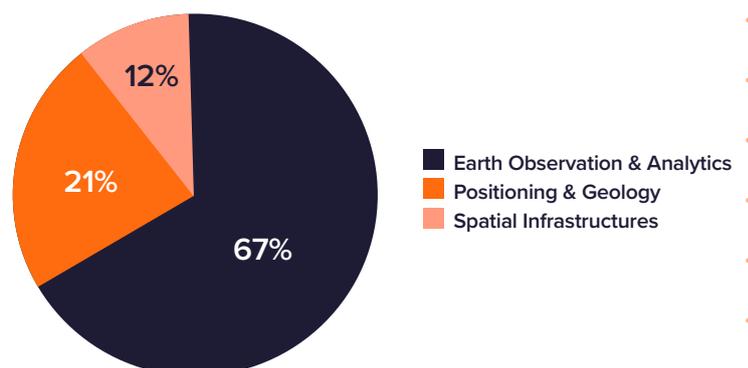
GLOSSARY & ACRONYMS

ACS	Analysis Centre Software
AGDC	Australian Geoscience Data Cube
AGO	Australian Geospatial Intelligence Organisation
AI/ML	Artificial Intelligence/Machine Learning
AMA	Australian Medical Association
ANZ	Australia and New Zealand
ANZLIC	ANZLIC – the Spatial Information Council formerly known as the Australia and New Zealand Land Information Council
APMPF	Australian Property Monitors
APSEA	Asia Pacific Spatial Excellence Awards
AURIN	Australian Urban Research Infrastructure Network
AusEnHealth	Australian Environmental Health
CEO	Chief Executive Officer
CRCSI	Australia and New Zealand Cooperative Research Centre for Spatial Information
COVID-19	Coronavirus Pandemic
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CURTIN	Curtin University
DEA	Digital Earth Australia
DEM	Digital Elevation Model
DELWP Vic	Department of Environment, Land, Water & Planning, Victoria
DNRME	Department of Natural Resources, Mines and Energy, Queensland
DT	Digital Twin
EARSC	European Association of Remote Sensing Companies
EOI	Expression of Interest
FAST	Facial Analysis Streamlining for Clinical Translation
FTE	Full Time Equivalent
GA	Geoscience Australia
GDV	Groundwater Dependent Vegetation
GEO Week	Group on Earth Observations Intergovernmental Summit
GIS	Geographic Information Systems
GITA	Geospatial Information and Technology Association

GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
IoT	Internet of Things
IP	Intellectual Property
ICSM	Intergovernmental Committee on Mapping and Surveying
ISV	Institute of Surveyors Victoria
KSA	Kingdom of Saudi Arabia
LINZ	Land Information New Zealand
MLA	Meat and Livestock Australia
MOU	Memorandum of Understanding
NPI	National Positioning Infrastructure
OGC	Open Geospatial Consortium
PTP	Property Transaction Platform
QA	Quality Assurance
QUT	Queensland University of Technology
RAISE	Rapid Analytics Interactive Scenario Explorer
RT	Real time
RMIT	RMIT University
SBAS	Satellite-Based Augmentation System
SIBA	Spatial Industries Business Association
SISR	Spatial Information Systems Research Ltd
SME	Small to Medium [sized] Enterprises
SSNSW	Spatial Services, Department of Customer Service, NSW
SSSI	Surveying & Spatial Sciences Institute
STEM	Science, Technology, Engineering, Mathematics
TERN	Terrestrial Ecosystem Research Network
UDIA	Urban Development Institute of Australia
UN	United Nations
UN-GGIM-AP	United Nations Committee on Global Geospatial Information Management – Asia Pacific
UNSW	University of New South Wales
WA-DoH	Western Australian Department of Health

FRONTIER S I >

We know where.

frontiersi.com.au