

Australian Livestock Spatial Innovation Program



EXECUTIVE SUMMARY

Support and co-investment is being sought to create a nationally-funded program to deliver spatial innovations through the red meat value chains across Australia and internationally.

The Australian Livestock Spatial Innovation Program (ALSIP) is designed to meet the strategic objectives of the Australian Red Meat industry and contribute to the National Innovation and Science Agenda by delivering industry led research, technology and innovation through the commercial red meat value chains. This program will deliver real world outcomes to improve the value of existing red meat products, decrease the costs required to produce these products, and increase production volume across the value chain.

By directly aligning spatial technologies with the strategic investment imperatives set through the Meat Industry Strategic Plan (MISP), investment in this program has the potential to deliver a 3.5 benefit cost ratio with a total benefit of over \$140 million by 2021. In addition, investing in spatial innovation which improves adoption of quality and grading standards will deliver an additional \$40 million of benefit along the value chain for each 1% increase in the adoption of MSA grading from the current Australian herd rate of 35%. Over and above these benefits, integration of spatial information and technology in to the decision making process is estimated to deliver up to a further 15% of productivity gains for producers.

This prospectus will guide co-investment in an industry-led Research, Development and Extension Program in spatial science and location-based technologies across the red meat (beef cattle, sheep and goat) industries in Australia and into export markets.

By systematically harnessing and integrating innovation in spatial technology and services, the research program will achieve outcomes aligned with MISP imperatives:

- **Increased compliance with quality market specifications**
- **Increased traceability and feedback, behind the farm gate and through to domestic and international consumers**
- **Increased productivity and efficiency through the entire value chain**
- **Increased communication and connectivity technology for producers**
- **Decision support along the value chain**
- **Improve social license to operate**
- **Coordinated spatial technology research across the country that increases the return on investment and develops powerful industry partnerships.**

These improvements will be clearly demonstrated at a whole-of-industry and individual enterprise level. Partners in this program will have the first opportunity to access the benefits of the technology and services delivered through this program, as well as the potential to build these in to new products and services.

Spatial technologies including precision satellite positioning, high resolution satellite imaging autonomous and robotic vehicles, unmanned aerial vehicles and advanced databases are some of the fastest growing technologies areas globally. However spatial technology is significantly under-developed in Australia's agriculture value chain. There is a significant opportunity to create a **technology launch-pad** to drive new, Australian-developed spatial innovations into the large international livestock industry. Spatial technologies have a key role to play in improving the livestock value chain, and a coordinated, industry-wide program of spatial innovation is the best way to deliver these improvements.

The red meat industry in Australia is valued at \$15.8 billion per annum, with around 120,000 properties carrying beef, sheep and goats across all states and territories. These industries have significant growth opportunities, particularly through new and emerging Asian markets where the human population is expected to grow significantly through to 2050 and beyond, and where consumers with greater disposable incomes are now demanding significantly higher access to animal protein.

This market opportunity provides challenges for the Australian industry with high production costs, increasing demand for consumer feedback and transparency, and more challenging environmental situation.



Environmental challenges are, expected to increase with the impact of climate change and an increasingly variable climate.

Australian red meat livestock (hereafter referred to as livestock) production faces some unique challenges because of the scale and diversity of grazing systems. Information alone (e.g. sensor data on pasture biomass, animal behaviour data or carcass yield) represents just a part of the story. Linking this information to current or historical spatial data (i.e. where these animals and animal products are or have been) provides critical information to improve decision-making throughout the value chain.

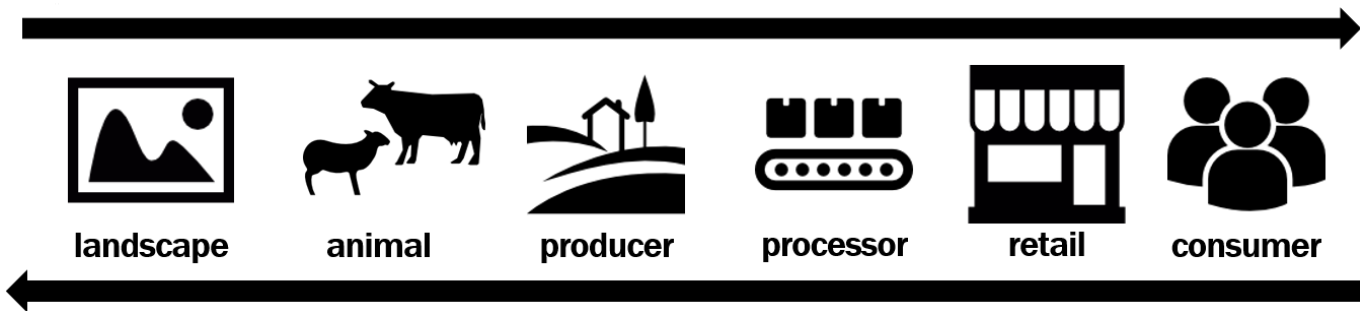
The 2015 release of the National Innovation and Science Agenda (NISA), the Northern Australian White Paper and the Meat Industry Strategic Plan 2015-2020 (MISP) illustrates an improving national appetite for research and innovation. Spatial technology is a notable gap in the detail of each of these initiatives (apart from some isolated initiatives). As such, benefits delivered through these initiatives are not complete, and research into spatially-based technology across the country is not coordinated.

Spatial technologies are developing at unprecedented rates. Over the next five years we will see hundreds of new and higher-resolution imaging satellites and a near-doubling of the global and regional navigation satellite systems. The move towards being able to effectively store and analyse 'Big Data', including location information, will allow a new level of insight across the entire value chain. New, more energy-efficient global satellite and terrestrial positioning systems mean that real-time tracking of assets such as animals and their products are becoming a reality. The impact of these core spatial technologies will be significantly increased and value-added by other developments including the National Broadband Network (NBN) and other terrestrial and satellite based communication systems, mobile technologies and applications (apps), autonomous aircraft and vehicles, a proliferation of sensor systems and so much more.

This document summarises the benefits that will be delivered across both the livestock and spatial industries from investment in a coordinated, industry-wide program of spatial innovation, targeted to deliver value across the major Australian and export livestock value chains.

This Program will complement and improve the value delivered through existing investment by Cooperative Research Centres, Rural Development Agencies, industry and government.

SUMMARY OF PROGRAM



The Australian Livestock Spatial Innovation Program (ALSIP) focuses on technology which can provide major value and efficiency gains to be realised **across the key value chains in the domestic and international markets**. These gains will focus on priority areas identified through industry, Meat and Livestock Australia (MLA) and the MISP 2015-2020. Working from the priorities and return-on-investment information from the MISP, and information gained during workshops with key industry participants, the program focuses on delivering benefits through the following broad research and development activities:

- **Improved Quality and Grading Compliance:** Adherence to key company quality specifications and Australian meat grading standards significantly increases the financial return on each animal across the value chain. For example, delivering beef products to Meat Standards Australia (MSA) specifications is worth on over \$0.30 per kg more to the producer, and \$1.92 increase to the processor. Implementing sensor, monitoring and decision making-technologies to increase the number of livestock grown to MSA specifications will significantly improve financial returns across the entire value chain.

Uplifting MSA alignment alone would represent \$40 million per year increase along the value chain for each 1% increase in adoption. Spatial technologies are the key to making this happen.

- **Value Chain Information Systems:** This will focus on two main feedback loops:
 - Processor to Animal – On-farm livestock tracking allows meat quality feedback from processors to extend further than the farm gate allowing producers to understand the movements, interactions and behaviours of animals, and how this relates to quality and price specifications as assessed in the abattoir.
 - Consumer to Animal – Extending animal tracking on individual cuts through to packaging and consumption allows real-time validation of MSA grading through crowdsourced feedback applications. To optimise their operations and practices, farmers need access to consumer metrics regarding the specific quality of their products.

By way of example, a Trip Advisor style rating app for meat consumers would drastically increase and improve feedback on consumer satisfaction with meat products, build brand recognition and loyalty locally and internationally, and create a competitive application for users to become community 'experts' on red meat products.

- **Social License to Operate:** Consumers and the community have increasing expectations about the information available and transparency within the livestock industry. The MISP identified that in the absence of reliable information flow and availability, and continually-improving animal welfare and environmental management practices, the *demand for red meat products could decrease by at least 6% by 2030*. Progressive and proactive action in this area will minimise the risk to sales and consumption contraction, and strengthen brand loyalty and social goodwill, thereby increasing both demand and price. Farmers are the custodians of social licence at the first and most important step in the value chain. The proposed solutions will generate the data flows necessary to support credible social licence information as part of advanced paddock to plate marketing.
- **Rural Connectivity:** This activity will investigate and optimise communication infrastructure to allow better transfer of information both on-and off-farm. Consistent, high speed connectivity is critical for the success of technology solutions from the livestock industries. On farm connectivity will also explore and



harness the role of Internet of Things (IoT) and telemetry systems through both land and satellite based solutions.

- **Decision Support On- and Off-Farm:** This activity will strategically invest in existing technologies to scale up, integrate and provide training and extension activities tailored to intensive and extensive production systems in both northern and southern Australia.

MISP modelling shows a potential for productivity gains of more than 15% for beef producers and close to 10% and 8% for sheep and goat producers respectively by improving decision support capabilities.

Integrating livestock production systems with transport, processing, wholesaling and retailing systems will minimise transaction costs and allow for modelling of future product market specifications to be achieved based on current conditions.

- **Feed Base Efficiency and Landscape Health:** Effective management and improvement of both the feed base and feed conversion efficiency to improve animal growth rates has been identified as having the greatest potential to improve on-farm productivity. In addition, modelling and managing the spread of weeds across the feed base would significantly increase production. Spatial information provides the fundamental base for measuring, modelling and predicting pasture biomass availability, efficiency and use over time, as well as weed distribution and change. Linking this information to animal behaviour and movement, and climate, soil and land type data significantly reduces fertiliser costs, increases production and positively impacts environmental grazing systems.

The MISP has reported that investment in technologies which increase the growth and productivity of the feed base will decrease production costs almost 4% for the Northern Beef, over 8% for Southern Beef and over 9% for Sheep.

These improvements will be delivered through key spatial technologies including satellite-based positioning and imaging sensors, integrated data analysis, application development, communication technology, animal sensors, unmanned aerial vehicles (UAVs,) and cloud-based big data modelling.

Already there is considerable existing work in these areas, and increasing levels of adoption of these technologies in the more intensive agricultural industries.

Investment in this Program will focus on scaling up, educating and testing production and prototype technology where it is already available. Where the technology is not available, the investment will focus on bringing existing research ideas through to on-ground applications and measuring the effect across key value chains during the process. **The Program will focus on providing coordination and direction to existing spatial research across many institutions and industry, and look to grow the potential benefits and industry partnerships available to Program participants.**

This initiative has already been validated through workshops and interviews with a number key value chains organisations, innovative producers and industry research bodies. The ideas and opportunities identified through this engagement forms the basis for this Program of work.

The following section provides a brief summary of the key sectors of applied spatial research that are likely to deliver the greatest productivity gains across the entire livestock value chain. These technologies are linked to individual application areas in the subsequent section.



Fundamental Datasets

Improve the quality, detail and resolution of fundamental datasets required by producers to make effective decisions including **soil, land types/systems, elevation, and climate and weather** data.



Earth Observation Systems

There are over 300 active Earth Observation Satellites in Space, many of which can provide valuable information for the livestock industry. Information from these sensors can be used for **infrastructure, biomass, soil moisture and climate**.



Positioning (Animals & Assets)

Australia is in a unique position to use positioning systems from many other nations, with devices for animal and asset locations expected to achieve around **2cm positioning over the next few years**.



Animal Analytics

The combination of location, health, remote weight gain monitoring and identification sensors allows analysis of the impacts of animal location, behaviour, genotype and the environment on **health, growth and genetics**.



Location Analytics

Modelling of interaction between elements inside or along the supply chain. Data such as soils, animal movement and weather prediction can be combined to allow **active decisions** to be made. This also allows **new data** to be created to support the other key decisions and systems.



National Livestock Information System (NLIS)

Spatially enabling the NLIS will allow automatic tracking and traceability, and provide a wealth of information about efficiency, movement and value both on-farm and across value chains.



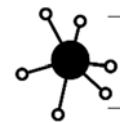
Remote & Automated Monitoring

Affordable remote monitoring using **UAVs and telemetry** allows automated collection of data about **animals** (weight, health) and **assets**, both on-farm and during processing and export. There are significant labour efficiencies to be gained.



On-Farm Data Integration

Dynamic, smart integration of on-farm data to assess the effectiveness of management decisions, predict future change, use and growth, and optimise planning of new infrastructure.



Supply Chain Data Integration

Improved information modelling and feedback up and down the supply chain. Allows better **supply and demand prediction** to optimise turn-off **decision making**, improve product **traceability**, and **improve efficiency** from slaughter to delivery. Improved information leads to accurate **forward contracting of meat to consumer specifications**.



Communication Systems

Internet connectivity is essential for smart, connected livestock decision-making systems, and in rural Australia is mostly facilitated via satellite links. **Improving on- and off-farm connectivity** will drastically increase the **products, services and decision-making** capability of producers across Australia.



KEY PROGRAM ACTIVITIES

Rural Connectivity



Activity Description

This activity will investigate and optimise communication infrastructure to ensure better transfer of information both on- and off-farm. Connectivity solutions cover not just property to internet connectivity; communications within property boundaries are just as important; between people, equipment, assets and animals.

As the communications market is already a well-established technical discipline, the focus of this activity is not on creating new technology solutions, but in optimising current solutions, and investing in prototype systems to help bridge the current gap in communication requirements. Projects like Google Loon, Sigfox and Myriota provide great examples of innovative solutions to provide stable internet over vast areas.

Key spatial technologies



Communications | Earth Observation | Location Analytics

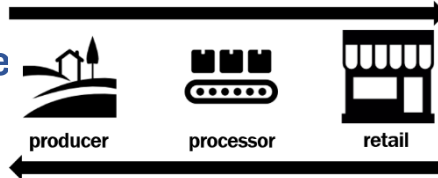
Industry Benefits





As the communication sector is large and diverse, it is hard to model specific returns on investments. However, as identified in the January 2015 Northern Australia Audit, even with the NBN Co broadband rollout, the north and particularly the more remote parts, will lag behind. More creative solutions are needed with cooperation across all levels of government and industry.

New investments in optimising communications across livestock, particularly in rural Australia, will deliver clear benefits across the sector.



Improved Quality and Grading Compliance

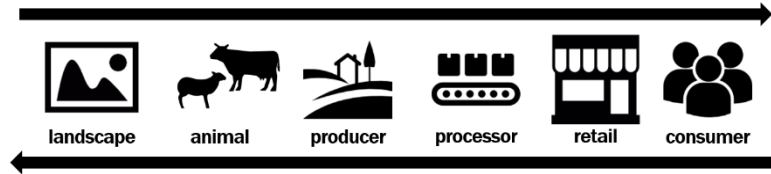







<p>Activity Description</p>	<p>Adherence to Australian quality assurance standards and grading specifications significantly increases the financial return on each animal across the value chain, adding significant value per kilogram to all sectors of the value chain.</p> <p>This work will look to compliment other work occurring in quality compliance and feedback within the red meat market, including initiatives funded by Rural Research and Development for Profit projects.</p> <p>Some processors have developed additional meat quality specifications, for example the JBS Farm Assurance Program has delivered approximately an additional \$0.67 per kilo back to producers. Grading initiatives like MSA and assurance programs such as Farm Assurance are key to Australia maintaining a premium, clean image in its international markets.</p> <p>The identification and tracking of animals that meet compliance standards is generally not feasible, particularly for producers operating extensive production systems. As such, applied research into cost effective systems to automatically track, report on and identify location and health of animals that are predicted to meet QA standards will both reduce labour costs and increase financial returns per animal.</p> <p>Currently, 35% of Australian beef cattle and 5% of sheep are graded for MSA. Lifting these assurance rates by 1% would have a large financial impact across the entire value chain.</p>
<p>Key spatial technologies</p>	<div style="display: flex; justify-content: space-around; align-items: center;">     </div> <p style="text-align: center;">Animal Analytics Positioning Remote Monitoring Next Gen NLIS</p>
<p>Industry Benefits</p>	<p>Approximately \$7.2 million for beef producers and over \$40 million across the value chain <u>per year</u> for every 1% increase in beef MSA compliance¹</p> <p>Sheep and Goats – To be determined in program activities</p> <p>This activity would also influence the \$100 per head benefits from enhanced value chain information.²</p>

¹ Assuming 1% of 800,000 yearly slaughters, average of 275kg carcass weight, and benefits of \$0.33 per kilo for producer and \$1.92 per kilo across value chain



Value Chain Feedback



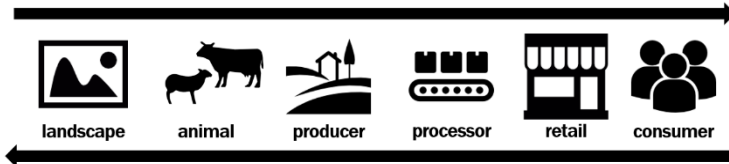
<p>Activity Description</p>	<p>The MISP identified that significant value could be created across the value chain by better integration and communication of customer requirements and feedback along the chain. This activity will focus on delivering through feedback loops:</p> <ul style="list-style-type: none"> ▪ Processor to Animal – MSA feedback from processors to producers, linking to cattle movement, health and other relevant datasets ▪ Consumer to Animal – Crowdsourcing validation of MSA standards to improve quality and accuracy of rating <p>This work will build on and compliment other initiatives in the area of compliance and feedback, such as the Advanced Measurement Feedback Project. By way of example, a Trip Advisor style rating app for meat consumers would drastically increase and improve feedback on consumer satisfaction with meat products, build Australian brand recognition and loyalty.</p> <p>This project provides a positive opportunity to engage and strongly coordinate collaboration across the value chain and across research activities already underway in this area to deliver value for producers, processors, wholesalers, retailers and red meat consumers in our domestic and export markets. This will require significant change in collaborative working arrangements across the sector and will be trialled through the larger value chains across Australia. This activity has already engaged with some key value chains who have indicated willingness to participate in this collaboration to realise benefits.</p>
<p>Key spatial technologies</p>	<div style="display: flex; justify-content: space-around; align-items: center;">      </div> <p>Animal Analytics Positioning Supply Chain Next Gen NLIS Spatial Analytics</p>
<p>Industry Benefits</p>	<p>According to the MISP there would be a \$100 per head benefit from supply chain efficiencies derived from better specification of steers and heifers², in addition to other benefits described in this document. This will be from a combination of reduced dark cutting³ and increased delivery to specification.</p> <p>Significant marketing and brand loyalty can be gained from a closer link between consumers in the international market and the product source. This will help quality brands to maintain or increase business, and grow the size of the market. Data can be used from customer locations to unlock location and demographic trends to inform future marketing strategies.</p>

² MISP Imperative 4.1.1: Improving quality and compliance via enhanced supply chain information

³ Dark cutting is when beef does not brighten when cut and exposed to air. Studies have shown consumers prefer bright pink coloured meat at the retail level. Dark coloured meat is largely due to animal stress before slaughter.



Social License to Operate



<p>Activity Description</p>	<p>Consumers and the community have increasing expectations on the way livestock and the production environments are managed in order to deliver safe and high quality food that meets consumer specifications. This activity will link across all other activities though two main drivers:</p> <ul style="list-style-type: none"> ▪ Better engagement with consumers ▪ Increased availability and quality of animal and environmental data <p>This activity will include opportunities to engage with complex spatial technologies which can both help producers make more informed decisions about the use of their land and feed base and provide robust, evidence based sustainability and landscape health measures. Progressive and pro-active action in this area will reduce market contraction, and strengthen brand loyalty and social goodwill, thereby increasing both demand and price.</p> <p>Quantifying animal welfare through the development of spatial and behavioural monitoring systems will provide an increase in production benefits (as producers develop targeted early interventions) and increase social confidence in the industry.</p>
<p>Key spatial technologies</p>	<div style="text-align: center;"> </div> <p style="text-align: center;">Analytics Monitoring Earth Obs Supply Chain Data Next Gen NLIS</p>
<p>Industry Benefits</p>	<p>The MISP identifies that without active improvement of environmental and animal welfare data and reporting, the demand for red meat could contract as much as 6% by 2030.⁴</p> <p>Increasing data and action in this area has the potential to counteract reduction in demand improve health and environmental factors helps to increase the quantity and quality of supply. As such, the MISP identified:</p> <ul style="list-style-type: none"> ▪ 10:1 return on investment at 2020 for investments in animal welfare ▪ 5:1 return on investment at 2020 for minimise impact on environment⁵ <p>Similar to other activities, significant marketing potential, brand loyalty and integrity can be gained from a closer link between consumers and the product source, flowing to an increase price and demand.</p>


⁴ MISP Imperative 1.1.1: Continuous improvement of animal welfare and MISP Imperative 1.2.1: Minimising industry impact on the environment

⁵ MISP Executive Summary 4: Benefit Cost ratios by Pillar, Priority and Imperative for MISP 2020



Decision Support On- and Off-Farm

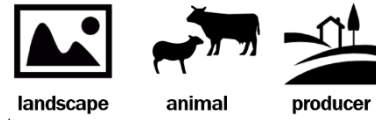


<p>Activity Description</p>	<p>The aim of this activity is to strategically invest in existing technologies to scale up and provide training and extension activities tailored to the Northern and Southern markets.</p> <p>Integrating livestock production systems with transport, processing, wholesaling and retailing systems will minimise transaction costs and allow for modelling of future product market specifications to be achieved based on current conditions.</p> <p>This forward modelling will be a significant change from current practices, shifting the focus of these systems from those that just provide diagnostic or strategic information to ones that provide support for predictive and tactical decisions. Significant work is required to allow producers and processors to understand the risks associated with the information outputs from these systems.</p> <p>The fundamental data which underpins these tools require appropriate “paddock scale” resolution, consistency and accuracy across the country. Datasets such as weather and climate, soil type and moisture, land types and vegetation, elevation, biodiversity and property and regional infrastructure, require significant work to be suitable for decision making across both the extensive and intensive grazing systems.</p> <p>The integration of existing decision support tools (e.g. feed budgeting) with developing data streams such as animal location and behaviour monitoring will provide significant improvements to model outputs and increase the reliability of existing tools.</p>
<p>Key spatial technologies</p>	 <p>Supply Chain Decision Data Position Earth Obs Loc Analytics Monitoring</p>
<p>Industry Benefits</p>	<p>MISP modelling shows that decision support investment will increased productivity gains by 15% for producers across the beef sector, 10% gains in the sheep sector and 8% in goats.⁶</p>

⁶ MISP Imperative 2.1.1: Decision support for farming businesses



Feed Base Efficiency & Landscape Health



<p>Activity Description</p>	<p>Effective management and improvement of both the feed base and feed conversion efficiency to improve animal growth rates has been identified as having the greatest potential to improve on-farm productivity. Modelling and managing the spread of weeds across the feed base would significantly increase production.</p> <p>This activity would focus on the integrated use of satellite based and remotely operated sensors (UAVs), and handheld sensors to understand available pasture biomass, pasture quality and feed utilisation, and assess the effect of different management decisions on pasture productivity, utilisation and live weight gain.</p> <p>These same technologies can be used to automatically map the extent and change of weeds, and the impacts of pests. According to data reported in the MISP, weeds currently cost the industry \$2,358 million per year, equivalent to around 30% of the gross value. Feral animals were cited as the reason for losses for the livestock industries totalling \$285 million⁷. Spatial technology will be key to understanding the effect of any new management activities for both pest and weed management.</p> <p>Improved nutrient use efficiency has been identified as a key issue for southern grazing systems. Integrating the spatial tools available with existing precision agriculture technologies developed in the cropping industry will lead to significant cost reductions and increased productivity. This will also allow producers to optimise property infrastructure, stocking rates, paddock rotations to maximise cattle production.</p>
<p>Key spatial technologies</p>	<div style="text-align: center;"> <p>Analytics Monitoring Decisions Data Monitoring Loc Analytics</p> </div>
<p>Industry Benefits</p>	<p>The MISP has reported that investment in technologies which increase the growth and productivity of the feed base will decrease production costs almost 4% for the Northern Beef, over 8% for Southern Beef and over 9% for Sheep.⁸</p> <p>A “do nothing approach” to pest and weed management would result in 2% productivity decrease across the red meat sector, while investment in management of these issues would see a 4.9% increase in productivity by 2030⁷.</p> <p>The development of variable rate fertiliser strategies for the grazing industry has been reported to have the potential to increase farm gross margins by \$85 per hectare for sheep enterprises⁹</p>

⁷ MISP Imperative 1.2.2: Sustainable management of the natural resource base

⁸ MISP Imperative 2.1.2: Increasing livestock productivity through new research, table on R&D initiatives to improve livestock productivity — growth rates

⁹ MLA Report B.GSM.0004, Potential for information technologies to improve decision making for the southern livestock industries

CO-INVESTMENT AND PARTNERSHIP OPPORTUNITY

The Australian Livestock Spatial Innovation Program (ALSIP) is seeking co-investment from livestock industry and research partners to support a bid to the federal government to fund a five-to-seven- year program. Partners will have the first opportunity to access the benefits of the technology and services delivered through this program, as well as the potential to build these in to new products and services.

This industry-led research, development and extension Program in spatial/location-based technologies will operate across the red meat (beef cattle, sheep and goat) industries in Australia and into export markets. The Program will coordinate and drive new innovation through Australia's key red meat industry value chains.

The aim of this Program is to provide coordination, investment and strategic direction over the somewhat scattered spatial technology and red meat research industries. This will ensure research is targeted and linked directly to industry needs, and focus on the benefits that can be driven across multiple value chains.

This Program will grow the size of the spatial research market, target investment in key existing and upcoming research, development and extension activities, and deliver new products and services both locally and internationally.

ALSIP seeks expressions of interest to co-invest (both cash and in kind) and partner in this initiative.

Initially the Program is seeking letters of support and indicative levels of co-investment from three key stakeholder groups:

- **Key value chain organisations across the red meat sector;**
- **Spatial and livestock research, technology and policy organisations focused on the red meat sector;**
- **Industry bodies and peak councils.**

ALSIP will look to match cash co-investment through Meat and Livestock Australia's Donor Company. This co-investment figure will form the basis of a request for federal funding, backed by return-on-investment modelling from the Meat Industry Strategic Plan 2015-2020.

After initial consultation with some industry and research partners, the current plan is to form a not-for-profit company to manage this initiative. This company will be governed by an industry board and directly aligned with the CRC for Spatial Information to allow current industry led research to be leveraged into this applied research program.

ALSIP represents a clear, coordinated effort to invest in spatial technology that can improve information capture and flow between value chain participants and drive financial benefits along full value chain.

The call for partners in this Program is now open, and will be receiving feedback, letters of support and indicative co-investment until **Thursday 24 March 2016**.

For more information, please visit www.crcsi.com.au/redmeat

Please direct responses to, or questions about, this prospectus to:

Phil Delaney

CRC for Spatial Information

pdelaney@crcsi.com.au

03 9035 9936

Sam Gill

Meat and Livestock Australia

sgill@mla.com.au

02 8055 1819

Heather Burrow

University of New England

hburrow2@une.edu.au

02 6773 3512



CRC for Spatial Information
Level 5, 204 Lygon Street
Carlton, Victoria, 3053
Australia
+61 3 8344 9200
info@crsi.com.au



une
University of
New England



crc • si



mla
MEAT & LIVESTOCK AUSTRALIA