DRONES STRATEGY

2018-2023

FRASER COAST REGIONAL COUNCIL

Fraser Coast

AVIATION PROJECTS

AEC

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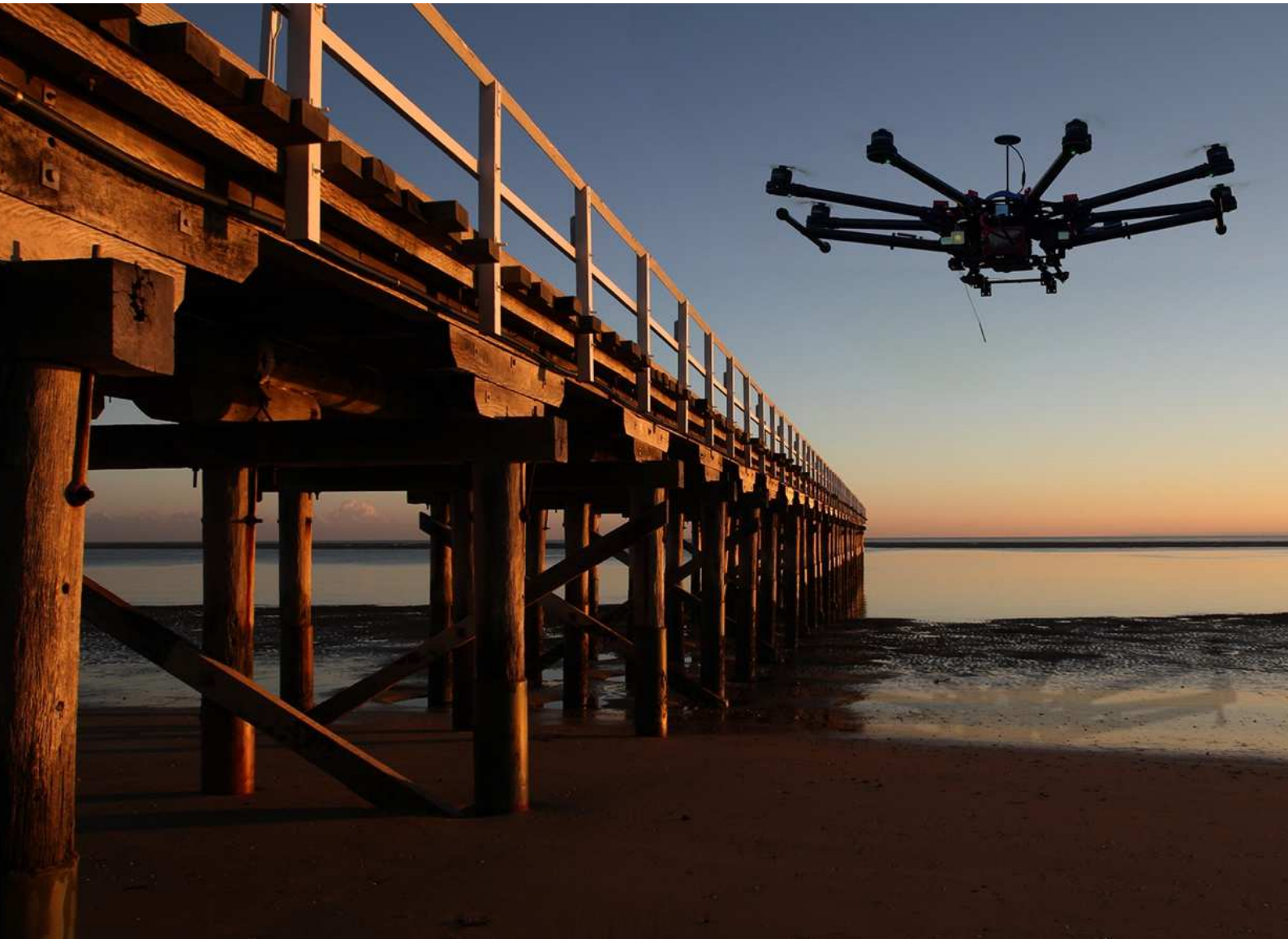

EXECUTIVE SUMMARY

Drone technology and use is one of the fastest growing sectors in the global economy. Sales of recreational and commercial drones are expected to grow from a base of $8.5 billion in 2016 to $12 billion by 2021 (41%). Drone-related industries are also expected to grow at similar rates.

The Fraser Coast as a local government area has endorsed drones as a key strategic direction and is at the forefront of developing its vision and objectives to maximise the economic and social benefits of the growth in the industry.

The Fraser Coast Region is one of only three local government areas actively planning for specific drone business and investment attraction, including the identification of specific public locations where recreational drones can be launched and flown, the planning and construction of a Drones Innovation Hub and an Investment Attraction Strategy.

The Fraser Coast Region has a number of competitive advantages to attract drone-related business including political and organisational commitment to the development of the Region as a Drones Innovation Hub; its location as an ideal destination with outstanding natural environments; well-developed tourism assets, accessibility by land and air, greenfield space and existing aviation hubs; and an available and motivated workforce and supporting services to accommodate expansion and growth in drone-related activity.

Investments and skill developments are expected in the education sector, to educate and train a new cohort of future employees to provide an increased capacity to support drone-related business operations and research and development activities.

The Fraser Coast Region has significant support and goodwill from the business, education and community sectors for the development of the Region as a Drones Innovation Hub

The region has existing and established drone businesses with knowledge and skills in the industry to mentor and grow other aspects of the supply chain.

A detailed and pragmatic investment attraction and sector development program will deliver real and tangible outcomes for the local area. Key focus areas will include:

- Consistent and Constructive Policy Alignment
- Increased Community Awareness of the Fraser Coast Drone Strategy
- Infrastructure Needed to Drive Industry Growth
- Incentivisation, Grants and Promotion Programs
- A Collaboration and Advocacy Strategy.

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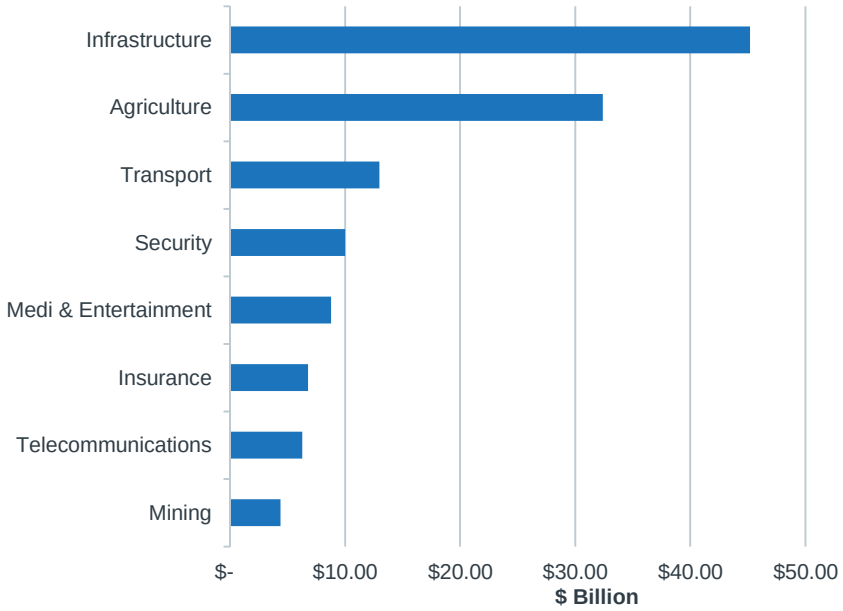
1. DRONES: AN OVERVIEW

1.1 GLOBAL OVERVIEW

The global drones industry is a rapidly emerging sector that has the potential to generate significant economic and social benefits. Drone Technology is proliferating at an extraordinary rate, with capability and performance doubling every 18 months, and prices continuing to plummet. (McKinsey & Company, 2017)

Business Insiders BI Intelligence defines drones as *aerial vehicles that can fly autonomously or be piloted by a remote individual* known as Unmanned Aerial Vehicles (UAV). Under that criterion, BI Intelligence expects global sales of drones to surpass $12 billion in 2021, which is up by a compound annual growth rate (CAGR) of 7.6% from $8.5 billion in 2016.

Figure 1-1: Predicted value of drones by industry



Source: PwC (2017)

In this rapidly developing industry, entrepreneurs, governments and, more broadly, communities who endeavour to quickly embrace and adapt to this disruptive technology can place themselves at the forefront of reaping significant benefits, and have the potential to transform the economic and social bases of their communities.

It is expected that growth in the drones industry will occur across three main segments:

- Recreational drones will reach 29 million, a CAGR of 31.3% by 2021.
- The number of commercial use of drones will reach 805,000 in 2021, a CAGR of 51%.
- Government enabling activities and their increasing operational use of drones are anticipated to continue driving the advancement of drone technology and uses.

These three segments will necessarily be dependent on further separate components of related development and growth including:

- Manufacturing
- Coding and programming
- Videography and mapping technology
- Training
- Trialing and testing services
- Commercial, professional and operational operator services
- Maintenance and repair services.

Table 1-1: Start-up business activity across the Unmanned Aerial Service (UAS) value chain

Description	Description	What's Included
Components	Components used on a UAS platform	• Batteries • Gimbals • Payloads • Sensors • Motors
Original equipment manufacture	Full UAS platform manufacture or integration	• Consumer UAS • Commercial UAS
Physical Infrastructure	Physical infrastructure for UAS take-off, landing, recharging	• Landing pads • UAS stations • Verti-ports • Chargers
Navigation, traffic, unmanned traffic management (UTM)	Systems designed to navigate airspace	• Artificial intelligence software • Route planning • GPS devices • UTM
Operators	Professional operators of UAS	• Photography • Mapping • Inspections
UAV navigation	Threat prevention and mitigation	• UAS guns • Shields
Support services	Support services for UAS	• Pilot market places • UAS regulation • Insurance • Retail and distribution • Consulting • Training
Data management	Software and analytics to digitize information collected by the UAS	• UAS mapping software • Image processing software

Source: McKinsey & Company (Cohn, 2017)

1.2 QUEENSLAND OVERVIEW

The Queensland Government launched a Drones Consultation Paper in 2017, seeking feedback on ways in which to support the drones industry in Queensland and to seek ideas to capture the economic and social benefits associated with its development.

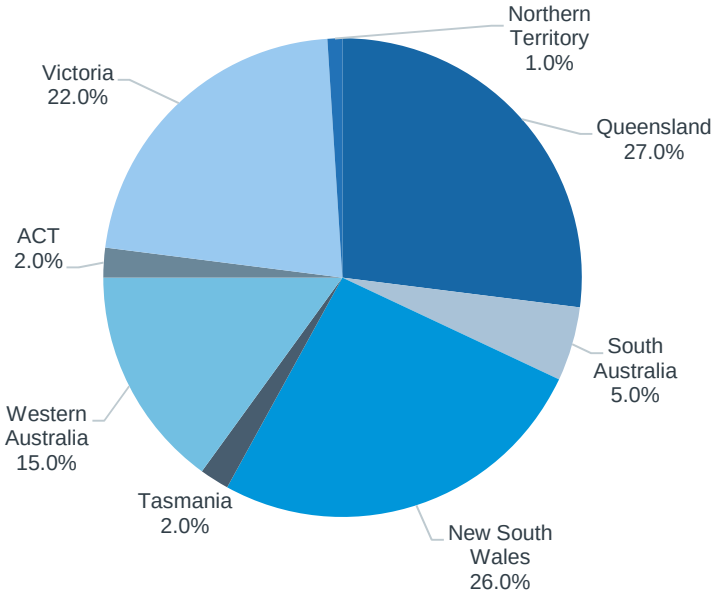
This signals a positive commitment by the State government to supporting the establishment and development of drone related businesses and uses in Queensland, with potential future funding becoming available to support local governments, businesses and communities in doing so.

The Fraser Coast Regional Council (Council) responded to the Consultation signaling its own vision (See section 3.1) to become a hub for the drone industry in Queensland, and ways in which it saw the Fraser Coast Region being able to positively contribute to the regional and broader State economies.

There are still relatively few businesses and individuals in Australia in this emerging industry. For example, there are currently only 296 registered Unmanned Aerial Service (UAS) Operator Certificate Holders in Australia, with 72 (27%) registered across Queensland. The number of certificates per million population for Queensland is 16.48 compared to 9.94 and 10.54 for NSW and Victoria respectively.

This represents a one-off opportunity for Council to become one of the first local governments to target the relocation and/or establishment of drone-related businesses, and to put in place practical actions to support the development of a Drones Innovation Hub in the Fraser Coast Region.

Figure 1-2: Share of UAS Certificates by State/Territory



Source: Advance Queensland (2015)

The Regional Queensland 2015 Startup Ecosystem Report (Advance Queensland July 2017) recognised that many digital companies are now being created to provide value primarily around digital technologies to support drone usage. Across Regional Queensland, advances in drones are helping regional entrepreneurs establish innovative new companies.

A growing number of Regional Queensland drone operators are also catering to a long list of clients in agriculture, land management, energy, and construction. Commercial drones have leapt far ahead of regulators and are already entrenched in many industries. Many operators are small private companies and startups – although some larger companies are seeing the opportunities and beginning to invest in drone technology.

1.3 LOCAL OVERVIEW

During the stakeholder engagement phase for the development of this Strategy, it became evident that there is a groundswell of support in the Region to become the 'place to be' for the development and expansion of drone-related activities. This support was articulated by existing businesses, Chambers of Commerce, local education providers, community groups and Council staff.

There is support for a centralised location specifically for training organisations, with purpose-built facilities and environment to support pilot training and other drone related activities. This could see the Region become a place of choice for such providers and operators in the future.

To be at the forefront of the development in the drones industry, Council will need to act quickly to:

- Develop and implement its vision and policy basis
- Provide a framework and environment in which drone usage is welcomed and well-managed
- Raise awareness of its commitment to the industry locally, regionally, nationally and internationally
- Build and/or facilitate the development and construction of key infrastructure

- Develop an investment attraction strategy and a programme of incentives to attract business, for example:
  - Non-financial Incentives:
    - Dedicated Drone Industry Development Officer to act as a single point of contact
    - Fast tracked development applications with guaranteed turnaround times
    - Site selection assistance & familiarisation tours
    - Business Case assistance for project analysis and viability studies
  - Financial Incentives such as:
    - Infrastructure/rates relief to businesses engaged in drone-related activity to encourage 'clustering'
    - Waiving of Development Application Fees/Charges
    - Offer of peppercorn or free rent to start-ups in a Drone Incubator Facility housed within the precinct – or other premises (Council owned?) prior to precinct development
  - Other initiatives could include:
    - Commit funds to attract drone industry focused event/forum/conference e.g. World Drone Congress was held at BCEC in Jan 2017
    - Notwithstanding the fact that this industry is already a key focus of Federal & State programs, the opportunity to link to current funding opportunities via streams such as Advance QLD
- To actively advocate and build relationships with government and private organisations to facilitate the long-term investment required to make the Fraser Coast Region Drones Innovation Hub become a reality.

Active and participative community leadership will be essential to the success of this Drones Strategy, and providing a single point of contact for businesses, the community and other stakeholders will be a prerequisite to demonstrate commitment to the Strategy.

1.4 THE REGULATORY FRAMEWORK

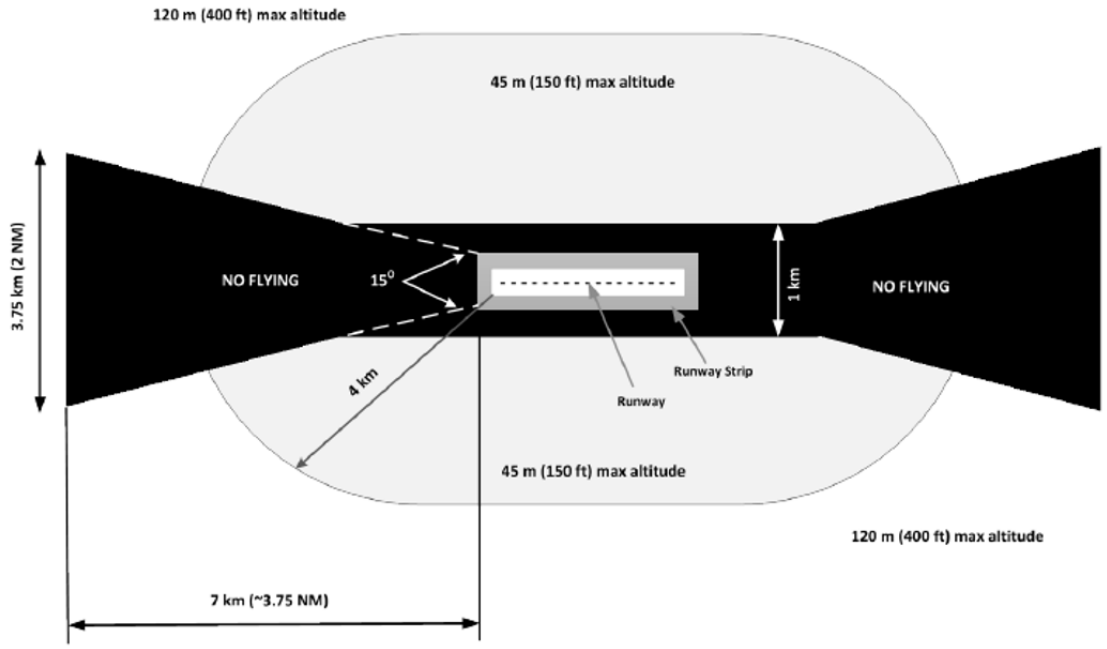
The Civil Aviation Safety Regulations Part 101 consolidates the rules for unmanned aeronautical activities, including for remotely piloted aircraft.

Drones or remotely piloted aircraft systems can conflict with the safe operation of airports and aircraft landing areas (ALA), therefore the Civil Aviation Safety Authority generally prohibits the operation of remotely piloted aircraft (RPA) within areas of airspace where civil aircraft operate. RPAs are not allowed to operate within 3 nautical miles (5.5 km) of a controlled aerodrome (i.e. with an operating control tower).

For non-controlled aerodromes, including aircraft landing areas, CASA excludes RPA operations from on or above runways or taxiways or in the approach and departure paths of the aerodrome.

The excluded areas are illustrated below:

Figure 1-3: RPA exclusion areas around non-controlled aerodromes



Source: CASA (2017);

CASA has produced an 'app' that shows no-fly zones, and fly with caution zones, for drones operated in the under 2 kg commercial category. The app can also be used as a guide for recreational flyers, identifying no-fly zones around airports, the flight paths of small airports, helicopter landing areas, and restricted and military airspace. Drones over 2 kg require a remote pilot license and a remotely piloted aircraft (RPA) operator's certificate.

Drone operations that require permissions, area approvals or approval regulations is provided on CASA's website: www.casa.gov.au/aircraft/standard-page/commercial-unmanned-flight-gaining-your-remotely-piloted-aircraft-pilot

To successfully promote the Fraser Coast Region as a Drones Innovation Hub, it will be necessary for Council to proactively liaise with CASA during the initial stages of the execution of this Strategy, to ensure that any drone activity is properly managed in accordance with current guidelines. At the same time, this will provide an opportunity to provide feedback and input into what will be a significant period of regulation development whilst regulations mature and catch up with the capabilities and needs for the safe, effective and efficient use of drones in public and private airspace. This advocacy will need to be undertaken with both State and Federal Governments.

1.5 DRONE BUSINESSES AND USES

There currently exists a long list of uses for which drones are currently being used, with this list continuing to grow and develop at an incredible pace. The following industry uses are based on research into the drones industry as it stands today, further detail can be found in Appendix A.

These uses will need to be considered by Council in terms of their industrial and operational application and value to the regional economy to determine a prioritisation for the type, scale and location of the businesses it hopes to attract to the Fraser Coast Region.

This exercise will form part of the development of an Investment Attraction Strategy and will need to be undertaken in consultation and in collaboration with the State and Federal governments, local, regional, national and international businesses and the Fraser Coast community.

TELECOMMUNICATIONS AND UTILITIES

Companies save time and significant operational costs when inspecting communication towers and power poles with UAV's. UAV Drone services include:

- Line of sight surveys for transmission
- RF External interference detection
- Structure upgrade, design, as-built and maintenance inspections, including 3D modelling and asset management
- Thermal imagery inspections.

MAINTENANCE

Maintenance of infrastructure management can be a slow and costly process and, in most cases, requires rope access, scaffolding and elevated work platforms. UAV Drone services include:

- Structure routine maintenance inspections
- Building physical, environmental and energy efficiency inspections
- Weather event insurance analysis
- Pipeline and pumping equipment inspections
- Dam wall inspections
- Wind turbine inspections
- Lighting pole maintenance inspections
- Power line and HV tower inspections
- Road and bridge inspections.

Case Study 1: Brisbane City Council

Unmanned aerial vehicles or drones have been a source of concern for local governments and regulatory authorities. While there are restrictions on the use of drones in public spaces for recreation, councils have a strong business case on the benefits of using drones to maintain and manage public amenities and physical assets.

Drone technologies work with Enterprise Asset Management (EAM) software to deliver insights that go beyond basic maintenance and security activities. As local councils face tighter budgets, the biggest challenge is to have a hold of how facilities and assets that are spread over land, sea or in distant or awkward locations are performing. The synergy between drones and EAM helps improve the inspection process and allows councils to document asset conditions from public spaces such as parklands to building, facilities and infrastructure in an automated and more strategic manner.

Brisbane City Council has demonstrated how drone images have been used to conduct inspections on council buildings, monitor wildlife populations in parks and to evaluate the potential for turf and event management. The use of drones will allow councils to assess if their public spaces will need pest or weed control in addition to regular maintenance work.

Councils operating in regional or remote locations are often challenged with managing assets in places that may be difficult or dangerous to reach. At other times, these areas could be difficult to access such as the

rooftop of building structures where machinery is situated. Instead of scaffolding and manually inspecting equipment on tall buildings, images from drones can provide technicians with valuable viewpoints and details about critical assets without having to physically attend to a site.

Expanding the lifecycle of facilities and infrastructure requires monitoring performance and conducting preventative maintenance of each council asset. This is particularly important for critical infrastructure that cannot fall over such as security systems, drainage systems or public roads.

With drones, the ability to deliver high-resolution imagery helps maintenance crews determine where to focus their attention and resources. Going beyond photographic images, drone technology can even supply infrared and x-ray images to detect structural issues or dangerous leaks in an environment that may be potentially unsafe for humans.

These advancements ensure drones have an embedded role in facility management, fleet management and asset management by expanding the capabilities of field crews. Over time, physical inspections can be replaced with drones capturing historical images for real-time assessments. With the widespread adoption of rooftop solar photovoltaic systems in local council buildings, a drone with infrared thermal-imaging features can survey solar panels to identify damaged panels for maintenance.

The use of drones alone only solves one part of the challenge faced by today's asset managers. To achieve the most of this technology, data and imagery must be paired with a sophisticated asset management system that incorporates historical records, maintenance standards and other sensor information to assess conditions and determine maintenance requirements. This includes the identification of corrosion, detecting hairline cracks, spillages or leaks, to perform dilapidation assessments or land surveys.

Data collected from each of these areas must be assessed and captured in real-time by a receiving asset management program. Asset managers would be able to cross-reference the condition of assets today in real time against the condition of assets from previous images or sensor readings. Through this process, they can determine the next course of action in the asset management lifecycle by comparing this data against manufacturing or industry standards.

A comprehensive asset management strategy that includes drones for inspections provides a meaningful alternative strategy to traditional asset management. Such solutions can shift operations and maintenance processes from a reactive to proactive mode. Bringing drones, sensors and comprehensive asset management solutions together can help councils extend the useful life of their critical assets. As budgets and resources become increasingly scarce in local governments, drones could be the solution for councils looking to proactively manage their critical and valuable assets.

https://www.governmentnews.com.au/2017/09/getting-local-councils-board-drones/

CONSTRUCTION

Drones are being used as an effective solution for digitising and optimising operations for a construction site. Drone flights can capture high-quality aerial data, analyse it and create a detailed 3D survey of the site. UAV Drone services include:

- Project construction time-lapse photography of construction projects to increase productivity
- Detect break-lines and check stockpile volumes of building supplies
- Compare plans to as-built.

(Source: URL www.insightus.com.au, UAV Drone Services)

FIRE MANAGEMENT

- Search large areas to detect fires,
- Map fire fronts on real-time information,
- Coordinate and guide in firefighters in an out of crucial areas

- Fire fighters can see a live stream from the drone
- Pinpoint fire prone areas from collection of high resolution imagery to detect dry and/or overgrown areas that represent fire risks.

SEARCH AND RESCUE

- Guide a rescue team straight to target
- Rescue team can also see live stream from the drone to gain additional perspective
- Thermal camera systems can detect humans
- Unmanned aerial system can be in the sky and searching within minutes

EMERGENCY RESPONSE

- Command view provided by drones providing the big picture to manage operations and make informed decisions,
- Natural disasters such as floods and earthquakes, drones provide versatile maps and make informed decision and facilitate an effective response to the problem,
- Improved infrastructure by using drones to learn from emergencies by visualizing problem areas and facilitating the improvement of structures and systems, reducing the risk of future emergencies.

(Source: Ninox Robotics, URL https://ninox-robotics.com/services/emergency

Case Study 2: QFES

As part of its commitment to embracing technology, QFES is conducting trials across the state to investigate the use and value of Remote Piloted Aerial Systems (RPAS) (drones) to assist in a range of activities our department undertakes.

There are many scenarios when an aerial view is advantageous. Deploying RPAS over a river can be faster than getting boats on the water, they can determine the size and spread of bushfires quickly and at low cost, and RPAS can search for people missing in inaccessible bushland with speed and accuracy using thermal imaging cameras.

RPAS are being trialed to assess their possible use supporting firefighting and search and rescue operations. RPAS can be equipped with high resolution video cameras and infrared equipment useful in search and rescue. In some circumstances, RPAS may provide a low-cost, low-risk alternative to traditional air and land searches.

On 2 September Exercise Flight was held on the Brisbane River using RPAS technology in a simulated boat incident. Urban and rural firefighters, SES volunteers and personnel from the Queensland Police Service (QPS) participated in the exercise aimed at demonstrating the benefit of RPAS capabilities.

Exercise Flight successfully demonstrated the benefit and enhancement to field operations that RPAS bring. The aircraft provided a non-intrusive overview of the search area that allowed both the search coordinator and the searcher to quickly gain situational awareness and locate objects in the water. The exercise also demonstrated a successful joint emergency services operation and highlighted systems compatibility between QPS and QFES.

Firmly focused on the future, QFES will continue investigating other technologies that may improve the efficiency and effectiveness of firefighting and search and rescue operations.

https://www.qfes.qld.gov.au/about/Documents/Response%20Mag/RESPONSE-Mag-Edition-15.pdf

Figure 1-4: Technology advances in firefighting and search and rescue operations

AGRICULTURE

The Fraser Coast region possesses rich soils, with agriculture remaining an important economic feature of the region. UAV Drone services include:

Animal Detection

- Interactive distribution maps of animal populations represent detailed information in a clear usable format
- Baiting plan can utilise a distribution map of pests to form a targeted baiting plan and as result reduce cost
- Coordinated hunting using drones to coordinate hunters on the ground to deal with target pests by seeing a live stream from the drone.

Plant Analysis and Vegetation Crop Mapping

- Crop health by using drones to visualise the health and predicted yield of crops
- Discover weed outbreaks before they get out of control
- Gain insight into soil quality to help predict and mitigate future problems.

(Source: Ninox Robotics)

Aerial Weed Spraying

- Accessing difficult to access areas to control weeds
- Precise spot spraying and targeted control
- Accurate spray record using GPS tracking and mapping
- Minimise disturbance with discrete and quiet drones: For example, valuable ecological areas can be difficult and dangerous to access on foot for weed control and can be accessed with drone capability.

(Source: Flightworks, URL www.flightworks.nz/aerial-spraying-drone-perfect

Case Study 3: Agriculture & Pest Control

Mid-Field Weed Identification: Using Normalised Difference Vegetation Index (NDVI) sensor data and post-flight image processing to create a weed map, growers and their agronomists can easily differentiate areas of high-intensity weed proliferation from the healthy crops growing right alongside them. Drones can detect and map the presence and extent of weeds, invasive plants, crop diseases and damage by feral animals.

Historically, many growers had not realised how pronounced their weed problem was until harvest time.

Drones are a lot faster and far more economical to operate than 4WDs, tractors or motorbikes.

Drone photography can provide up to the minute aerial photography at a resolution and cost not possible by other means. Image source: (Geoff Trowbridge, FDI Associate).

- Figure 1-5: Aerial view of orange orchard and grape vines at Griffith, NSW

- http://www.futuredirections.org.au/publication/drone-revolution-australian-agriculture-part-two-case-studies-practical-benefits/

ENVIRONMENTAL DRONE RESEARCH AND AERIAL DRONE PHOTOGRAPHY

The Great Sandy Biosphere area and the Great Sandy Strait are recognised internationally for its unique environmental value by UNESCO and geological distinctiveness. The decision gives world-wide (World Heritage) recognition to the Fraser Coast region (Fraser Island and coastal waters). Marine Drones and Aerial Drones are valuable in research and aerial photography to ensure the protection of this natural resource, for example

- Wildlife surveillance; and
- Habitat monitoring including major breeding sites for endangered marine turtles, species of fauna and flora, the declared Dugong sanctuary, RAMSAR wetlands and migratory birds, whale sanctuary and major transitory point for humpback wales on their annual southern migration past the Queensland Coast, as well as monitoring changes in the oldest and largest unconsolidated sand mass in the world.

(Source: Fraser Coast Information Centre)

www.visitfrasercoast.com/destinations/great-sandy-strait/attractions/great-sandy-biosphere

TOURISM, MEDIA AND MARKETING

- Tourism marketing and advertising using aerial photography and video

EVENTS - RECREATION (DRONE RACING – WWW.FPVR.ORG)

Case Study 4: Drone Racing/Recreation

Several parks across Brisbane have been chosen to include designated areas for flying drones and other remotely piloted aircraft. These locations will be monitored as part of a six-month trial and reviewed regularly.

You can fly your aircraft in the designated areas if the following conditions are met:

- you are flying for recreational purposes; and
- your aircraft weighs no more than 2 kg; and
- your aircraft is electric; and
- your aircraft has propeller guards (drones only); and
- you are flying in a manner that does not endanger, interfere with or cause nuisance to the park, park users or adjoining properties; and
- you follow Civil Aviation Safety Authority's (CASA) safety rules for flying drones and other remotely piloted aircraft recreationally.

The flying of drones and other remotely piloted aircraft in Australia is regulated by the Civil Aviation Safety Authority (CASA) through the Civil Aviation Safety Regulations Part 101. The CASA rules for flying drones are detailed on the CASA website.

Civil Aviation Safety Authority (CASA) regulates the flying of drones and other remotely piloted aircraft when they are in the air. Brisbane City Council regulates the flying of these aircraft when they are being launched from and landed in Council land.

1.6 STAKEHOLDER ENGAGEMENT

Key internal and external stakeholders were invited to be engaged and consulted as part of this project.

Four facilitated workshops were held with the following groups:

1 Fraser Coast Regional Council staff

2 Agriculture and Aviation stakeholders

3 Business and Government stakeholders

4 Education Sector stakeholders

Where key stakeholders were unable to attend the facilitated workshops, they were approached to provide verbal and/or written feedback.

These groups considered the following questions and provided feedback which has been incorporated into this report as follows:

Q1: How can the Fraser Coast region promote itself as the place to be for drone-related industries?

Q2 – What do you currently use/sell drones for and what opportunities are there for their use/sale in other parts of your operations?

Q3 – What do you think are the challenges/obstacles that prevent the growth of drone-related activity in the Fraser Coast region and what can be done to remove these challenges/obstacles?

Q4 – What are the types of programs/ initiatives you would like to see introduced to support/attract drone-related activity to support the economic growth of the region?

2. FRASER COAST: THE DRONES INNOVATION HUB

Why the Fraser Coast?

To maximise the opportunities that will arise in this emerging drone industry, it will be important to clearly articulate the reasons why businesses should seek to invest in the Fraser Coast Region and to practically and proactively demonstrate that Council is open for drones business.

Perhaps the most compelling competitive advantage for the Fraser Coast is the established commitment the region has via pollical and organisational support for the delivery of a Drones Innovation Hub in the region. Other considerable regional comparative advantages as a location for drone manufacture, for training, for trialling and testing and for operational uses are primarily centred around:

- Location – ideal destination and natural environments
- Physical assets – tourism assets, accessibility, greenfield space, aviation
- Workforce – availability and supporting services.

2.1 COMPETITIVE ADVANTAGES

The Fraser coast offers highly suitable natural environments and urban areas and it is also a region that has a clearly articulated vision to become the place to be for drone activity in Queensland.

This Fraser Coast Drone Strategy is a response to the Queensland Drones Strategy Consultation Paper, released by the Queensland Government in September 2017, in seeking feedback on how to grow the State's drone industry. The State Government's vision is for Queensland to become:

> *'a world leader in both drone technology and application, creating a space where the technology can "complement and enhance" the lives of local communities'*.

In response, Fraser Coast Council has adopted a vision which states that Council wishes:

> *To be at the forefront of developing and capitalising on drone technology and applications to deliver long term, sustainable economic and community benefits.*
>
> *This will be achieved through collaboration and innovation encompassing all levels of government, industry and the broader community and contribute to Building Better Communities.*

2.1.1 Location

Ideal destination

Fraser Coast's continual population growth is a result of the Region's appeal in providing a lifestyle and investment destination. From an investment perspective, the Fraser Coast regional population is set to grow dramatically with a projected population of 134,9973 in 2036 (Qld Govt Statistician's Office).

To support emerging drone markets, Council will need to promote the Fraser Coast as an ideal destination for Queensland's Drones Innovation Hub for drone operators, training and research development.

Ideal Climate

The Fraser Coast offers a warm sub-tropical climate with most of days providing ideal conditions for drone operations.

According to Bureau of Meteorology climate data:

- the highest monthly mean maximum temperature is 30.8°, experienced in the month January;
- the highest 9am mean wind speed is 15.2 km/h, and the highest 3pm mean wind speed is 21.3 km/h, both experienced in the month of January; and
- the months of June-October each recorded, on average, fewer than six days in which rainfall was equal to or greater than 1 mm.

Varied Natural Environments

With the World Heritage listed Fraser Island (K'gari) and the Great Sandy Biosphere, pristine marine environments, and vast swathes of agricultural and open land, the Fraser Coast also offers a variety of environments that are suitable for different drone usages.

Planning Scheme

To promote a 'drone-friendly' region, with the aim of attracting public and private investment, Council's planning scheme should be reviewed to identify and remedy any existing policies that may be restrictive and to consider any potential changes that can support drone activity. Appropriate zoning, including provision for drone testing and trialling sites can provide incentives for investment attraction.

2.1.2 Physical Assets

Globally Recognised Tourism Assets

The Fraser Coast boasts some of the world's most recognised tourism assets, anchored by Fraser Island, and pristine beaches. Sea wildlife such as whales, dolphins, dugongs, turtles, manta rays and numerous species of fish can be seen while cruising the Fraser Coast waters. The coastal attractions are supported by a range of land-based activities at key destinations, including urban attractions, sea-based tourism and national parks. Access to world recognised coastal areas is ideal for both aerial and marine drone technology advancement.

Accessibility

The Fraser Coast can be easily accessed by land, sea or air, with the Bruce Highway and Fraser Coast airport providing easy and quick access to Brisbane and other metropolitan areas in South East Queensland. The Fraser Coast is also only 30 minutes from Brisbane and only 90 minutes by air from Sydney.

The Fraser Coast as a Drones Innovation Hub, where aerial and marine drone operation and technology research is encouraged, has the potential to attract people from a wide catchment including Queensland, Australia and internationally, including south-east Asia. The Queensland Drone Strategy recognised Queensland's proximity to growth markets, and therefore Fraser Coast is:

> *'… is ideally located to access and connect with the high growth markets in the Asia Pacific region. Asia's expertise in electronic manufacturing and technology development provide opportunities for collaborations for industry and research and development, as well as exports. '*
>
> *Queensland Government, Queensland Drones Strategy (2017)*

Accessible space

The Queensland Drone Strategy identified facilities restrictions as a challenge and stated:

> *'Queensland does not currently have commercial facilities capable of supporting certain types of drone testing. To position Queensland as a hub for drone testing and development, upgrading existing facilities or developing greenfield sites will be required to accommodate large scale drones.'*
>
> *Queensland Government, Queensland Drones Strategy (2017)*

The Fraser Coast Region has greenfield space available that could be developed into:

- A commercial facility for accommodating large scale drones,
- Space for a training site for drone pilots,
- Space for drone parks
- Drone flying space outside operational airspace
- A Drones Innovation Hub to encourage the emerging drone industry as a valuable tool for business.

These drone initiatives have the potential to make the Fraser Coast a Drones Innovation Hub and accommodate many drone applications and provide opportunities for employment and regional economy growth.

Suitable site selection criteria for an appropriate site would include:

- Physical infrastructure
    - Landing site
    - Runway
    - Hangar/building/workshop
    - Control centre
    - Observation tower
    - Working space
    - Hazardous goods storage
    - Security
    - Workshop/maintenance shed and storage
- Services
    - Electricity
    - Water
    - Sewer/waste treatment
    - Internet
- Environmental factors
    - Wind
    - Humidity
    - Cloud cover
    - Rain
    - Length of day
- Telecommunications network coverage
- Electromagnetic spectrum considerations
- Obstacle environment
- Airspace
- Other aircraft operations
- Land transport access

BOX: Drones Innovation Hub: High-Level Feasibility Study

To successfully attract new businesses and to support the expansion of existing businesses and uses of drones, the construction of a centralised, built for purpose, modern facility would provide a practical and marketable opportunity for attracting new businesses.

The following Table provides a high-level feasibility to establish such a facility in the Fraser Coast Region, acknowledging that further detailed work will be required including decisions on location, scale and potential financial and non-financial benefits. It is considered likely that such a facility would attract Federal and/or State government support in the form of grant funding provided a detailed business case is able to be developed.

Criteria	Details
Description	• A cluster of manufacture, research and development, operator, training and maintenance businesses co-located to facilitate collaboration and support activities • Sufficient outdoor and secure space for trialing and testing drones • Access to high speed internet • Training and education facilities • Meeting, conference and exhibition space • Public viewing areas
Context	• In 2016, PwC valued the global market for commercial drone activity at over $127 billion, with an expected addressable market for drones of $157 billion by 2025 (PwC, 2016; ABC News, 2017). Sales of drones are expected to surpass $12 billion by 2021, according to Business Insider Intelligence. • With a growing sector, the Fraser Coast Region has the potential to carve into the sector, particularly in the areas of photography & video, manufacturing, programming, training, events planning, operations & maintenance and trialing and testing. • The Fraser Coast has easy access to Brisbane and other South-East Queensland Metropolitan areas as well as high growth markets in the Asia Pacific Region. • The Fraser Coast Drones Innovation Hub would be one of the first for the Asia Pacific region.
Areas Impacted	• Fraser Coast and overall Wide Bay/Burnett Region
Capital	• Between $8.5 million (4,000sqm) and $12.5 million (6,000sqm), (Rawlinsons)
Operational	• Indicative operational costs of $250,000 including depreciation • Possible subsidies and incentives for businesses • Lease revenue
Critical Enablers	• Development of Greenfield or Brownfield space (location to be determined) • Training of the workforce to gain appropriate skills to support the businesses within the hub • Ensure there is consistency of advice, actions and resource allocation to attract and foster new and emerging drone businesses • Review Council's planning scheme to identify and remedy any existing policies that may be restrictive and to consider any potential changes that can support drone activity • Work with the Civil Aviation Safety Authority to ensure drone usage does not conflict with safe operations of airports • High speed internet functionality • Collaboration with all levels of government and the public to address public concerns over safety, security and privacy
Benefits	• Provide business incubator opportunities • Employment opportunities, particularly for the technologically-savvy youth in the region • New types of careers • Establishment of new start-up businesses and expansion of existing businesses into new areas • Increased productivity through co-location • Increase visitation and tourism opportunities • Support to the manufacturing, engineering, education and construction industries
Policy Alignment	• Queensland Drone Strategy • Wide Bay/Burnett Regional Plan
Funding Sources	• Fraser Coast Regional Council • Potential grant opportunities from both Federal & State governments • Private development of identified areas • Possible Joint Venture opportunities
Governance Arrangements	• Potential governance options include: o Establishment of a Council Advisory Committee o Establishment of Drone Industry Reference Group including internal and external stakeholders

Existing Links to Aviation

The Fraser Coast is well supported by the aviation industry with two operational airports located at Maryborough Airport and Hervey Bay Airport.

The Fraser Coast offers the possibility to construct a Drones Innovation Hub located in a strategic position outside the operational airspace of Maryborough Airport, Hervey Bay Airport, and a number of existing aircraft landing areas. The airports would provide the necessary capacity to attract drone businesses to support the creation of new markets at the Drones Innovation Hub from Queensland, Australia and globally.

Drone operations can be successfully integrated with other aircraft operations, but only with very strict supervision and operational oversight.

Integration of drones at Hervey Bay Airport, given the wide scope of regular public transport/charter and general aviation activities is not recommended.

Integration of drones at Maryborough Airport could be feasible, subject to limitations to the operation and future development of other aircraft operations. Further planning and stakeholder engagement would need to be undertaken to determine an appropriate future direction.

2.1.3 Workforce Availability and Supporting Services

Engaged Workforce

The Fraser Coast Region is well placed to collaborate and encourage locally based educational organisations to establish training and education to develop a suitably skilled and incentivised workforce to support the emerging drones industry to develop drone specific opportunities.

Council is currently working with the engaged workforce and local education providers to develop increased understanding on how drones can support completive market needs. Drones provide a competitive advantage for business creativity in innovating new opportunities to use drones to optimise processes and create new products for consumer markets.

A Drones Innovation Hub will provide business incubator opportunities and increase productivity for the Regional economy by encouraging new employment opportunities, new careers, establishing new start-up businesses and expansion of existing businesses into new areas.

Developing the skills of the workforce into emerging drone businesses, will put the workforce at the forefront of discovering future industries and jobs.

A History of Skilled Workforces

The Fraser Coast Region has a strong history of industry built on engineering and manufacturing. More recently the economy has evolved to provide tourism, health and wellness, education and construction activities, all of which are suitable for innovative drone usages. In addition to this, there is potential to include the skills development aspect required for the Drones Industry in the Fraser Coast Workforce Development Plan which is currently under development by Jobs Queensland in collaboration with Council.

2.1.4 Safe and Stable Environment

The Fraser Coast (and more broadly Queensland and Australia) has a stable and well established political environment in comparison to many other countries and precincts competing for international drone industry investment attraction. The local council is also proactively encouraging the regions development as a Drones Innovation Hub.

2.2 COMPETITIVE CHALLENGES

The Fraser Coast faces a number of competitive challenges in attracting drone industry activity. These challenges have been classified across the following key areas:

- Policy
- Physical infrastructure
- Public perception.

2.2.1 Policy

Consistency of Advice

The Fraser Coast Regional Council policy stance is to proactively support existing drone enterprises and to attract new drone businesses to the area.

In developing solid strategies and policies, Council will need to recognise that there is a critical need to ensure there is consistency of advice, actions and resource allocation to attract and foster new and emerging drone businesses.

To address this challenge and to facilitate consistency of advice to respond quickly to enquiries from potential investors and other drone stakeholders, it may be necessary to provide a centrally located and easily identifiable team or staff member in Council. This team or individual, ideally based in the Economic Development Team, would need to be tasked with the responsibility and authority to provide consistent and informed advice to support the vision and corporate objectives of the Drones Strategy.

Internal Policies and Guidance

Guidance for staff on the appropriate use of, and procurement processes for, drones for use in Council activities is currently not available. Leading by example will be an important aspect of promoting and supporting the drone industry and to encourage innovation in the use of drones.

The challenge for the planning scheme is to address drone technology applications and zone locations for commercial facilities and open space to support drone testing.

Guidance for staff on the appropriate use of, and procurement processes for, drones for use in Council activities will also need to be developed.

2.2.2 Conflicts Between Drone Usage & Airfields

Drones or remotely piloted aircraft systems conflict with the safe operation of airports and aircraft landing areas (ALA). The Civil Aviation Safety Authority generally prohibits the operation of remotely piloted aircraft (RPA) within areas of airspace where civil aircraft operate.

2.2.3 Physical Infrastructure

High Speed Internet

Access to high speed internet will be a prerequisite to support investment attraction. The following figures provide an overview on the current rollout of the National Broadband Network (NBN) in the Fraser Coast Region.

The purple shading indicates areas where an NBN service is currently available, brown shading indicates where the build has commenced, and the remaining white areas indicate no NBN availability.

Current providers of NBN services in the Fraser Coast Region include:

- Amaysim
- Dodo
- iPrimus
- TPG.

Figure 2-1: NBN Availability – Hervey Bay and Surrounding Area

Figure 2-2: NBN Availability - Maryborough

2.2.4 Public Perception

There are substantial public perception concerns regarding drones, including differing levels of awareness of safety, security and privacy issues and these concerns need to be addressed as part of the implementation of Council's Drones Strategy. This will require a partnership approach in collaboration with all levels of government and the public to address public concerns.

A key objective of the Fraser Coast Drone Strategy will be to increase public awareness of the 'do's and don'ts' of drone activity. To support this objective, Council will need to develop and deliver a public education program regarding security of drone operations, protecting privacy and the rapidly growing drone technology and the economic benefits from providing commercial opportunities. As public knowledge increases about the benefits of drone applications, Council expects public perception and awareness is likely to positively change.

2.3 OTHER COMPETING REGIONS

2.3.1 New Drone Hub in Victoria

Announced in July 2017, a 'Centre of Drone Excellence' has been established in Victoria and is a first for the Asia-Pacific region. The centre is based near Warragul, at Larder Park, and will focus on drone technology training and development. In the announcement, the Centre's Executive Director, stated:

> *'The addressable market for drones by 2025 as defined by PwC [PricewaterhouseCoopers] will be $157 billion…The Centre of Drone Excellence will hopefully will act as an incubator or hub for drone operators, practitioners, training, and research development.*
>
> *Ultimately, we see the local community connection, the state-wide and national use of the site as part of our target audience for the next 6 – 12 months. But ultimately, it's Asia-Pacific, if you look at Singapore, Korea, most of south-east Asia they're congested, and they also have limited opportunity to develop and shape how drones will play out in their region.'*

2.3.2 Brisbane City Council Drone Parks

Brisbane City Council has launched a six-month drone flying trail in 10 local parks, within regulations. A media release dated December 2017, stated:

> *'While pilots can fly drones and other remotely piloted aircraft from any Council park without consent if it's a children's toy or weights less than 0.5 kilograms, the trial means they will now be able to fly drones and other remotely piloted aircraft weighing up to two kilograms from the selected parks.*
>
> *However, under the trial they must be flying for recreational purposes, the aircraft must be electric, the aircraft must have propeller guards, and they must fly in a safe manner, following the rules set by the Civil Aviation Safety Authority (CASA) for flying drones recreationally.*
>
> *CASA regulates the flying of drones and other remotely piloted aircraft while they're in the air, the council regulates their flying when they're being launched from and landed in council land.*
>
> *Among the parks selected to take part in the trial are The Common Park in Coorparoo, Preston Road Park in Carina, Voyager Drive Park in Kuraby, and Cliveden Park in Fig Tree Pocket.*
>
> *With drones growing in popularity, CASA has been working to educate consumers about safe flying through initiatives such as its 'Can I fly there?' app, released earlier this year.*
>
> *Developed in conjunction with Drone Complier, the app lists areas for flying as well as no-drone zones such as airports, and areas where emergency services such as firefighters may be operating.'*

3. STRATEGIC OUTCOMES

3.1 VISION

"… To be at the forefront of developing and capitalising on drone technology and applications to deliver long term, sustainable economic and community benefits. This will be achieved through collaboration and innovation encompassing all levels of government, industry and the broader community; and contribute to Building Better Communities."

3.2 ACTION AREAS

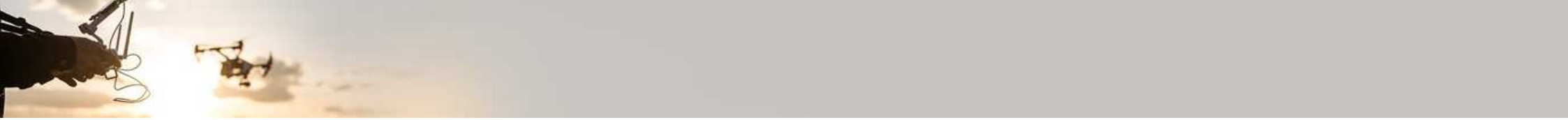
The key factors that will determine the success of a Drones Strategy for the Fraser Coast Region can be broken down into five main 'action areas', each of which will need to be addressed to facilitate effective outcomes for the strategy:

- **Action Area 1: Consistent and Constructive Policy Alignment**
  - It will be important to establish a solid policy platform to clearly articulate and facilitate the expected outcomes to be achieved by implementing the Drones Strategy. This will require action across the full suite of Council policies and guidelines to ensure an integrated and consistent approach to policy understanding and application.
- **Action Area 2: Increased Community Awareness of the Fraser Coast Drone Strategy**
  - Once the policy platform has been established, this will then need to be communicated effectively to key stakeholders and the broader community to enable a better understanding of the key objectives and priorities of the Drones Strategy. Articulating the key economic and social benefits to be gained from the Drones Strategy and the resources to be expended on it will facilitate greater acceptance and support for the required actions.
- **Action Area 3: Infrastructure Needed to Drive Industry Growth**
  - Investment in, and facilitation of, the development of key infrastructure to support drone-related activity will be required. Council will need to determine the extent of this investment and the availability of co-funding opportunities from other levels of government and industry
- **Action Area 4: Incentivisation, Grants and Promotion Programs**
  - Alongside the development of key infrastructure, an effective investment attraction strategy will identify key businesses to relocate or start-up in the Region. Appropriate existing businesses should also be encouraged to expand and invest in the development of their services.
- **Action Area 5: A Collaboration and Advocacy Strategy**
  - An effective collaboration and advocacy strategy will need to be developed to ensure ongoing support for key stakeholders, the Federal and State governments and aviation regulation authorities.

The following roadmap of recommended individual actions has been developed in line with learnings from the research into the drones industry and the 5 key Action Areas outlined above. Key activities have been categorised into the following key timeframes:

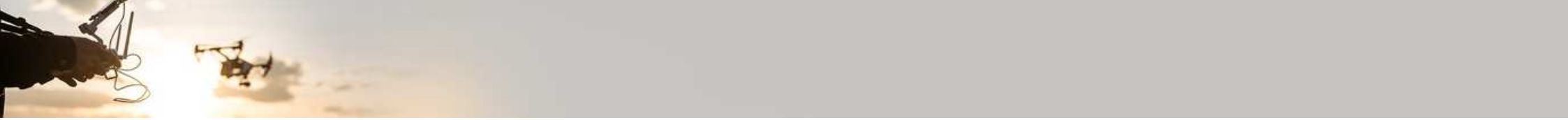
- Actions to be completed within 12 months
- Actions to be completed within 2-3 years
- Actions to be completed within 3-5 years.

Due to the fast-moving nature of the industry, most of activities have been identified to be completed within the first 12 months of this Strategy. It is acknowledged that this has resourcing implications for Council and it will be necessary to consider the capacity of the organisation to deliver and fund the Action Areas within the recommended timeframes.

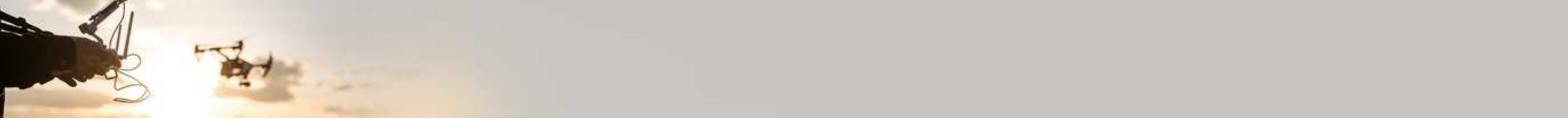


3.3 ACTION AREA 1: CONSISTENT AND CONSTRUCTIVE POLICY ALIGNMENT

#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
1.1	To provide a 'one stop shop' for all drone related activities and enquiries in Council	Appoint a person with the responsibility and authority to implement the Drone Strategy. The intention of the role is to also provide a single point of contact for all drone related enquiries from external and internal stakeholders. Implement Year 1 Actions. *Ideally the appointment process would allow for commencement on 1 July 2018*	Implement Year 1-2 Actions	Implement Year 3-5 Actions	Estimated $150,000 per annum	Person commences work on 1 July 2018	Economic Development to allocate staff resource and training to the initiative. Specific resource will not be appointed.
1.2	To integrate the objectives of the Drone Strategy into all corporate planning documents	Review and update Council's Plans to ensure integration with the objectives and key priorities of the Drone Strategy. Including: • Corporate Plan • Operational Plan • Economic Development Plan • Tourism Plan • Open Spaces Plan	Annual review of planning documentation to ensure ongoing consistency.	Annual review of planning documentation to ensure ongoing consistency.	No additional resources	Annual review is completed	Internal engagement to progress Drones Strategy to also be integrated into the Smart Communities Plan
1.3	To ensure that the Planning Scheme supports the Drone Industry	Commence Planning Scheme Amendment Process to allow for the identification and appropriate zoning of space(s) to support the Drones Strategy objectives.	Include additional statement that 'drone facilities are supported' in the Strategic Framework (3.4.2.1 – Economic Resources and Development) Undertake further review of the Strategic Framework to identify potential drone uses and how to align these with the Scheme.		Specialist advice may be required FCRC Strategic Land Use Planner	Planning Scheme Amendment Approval	Internal engagement to progress and action

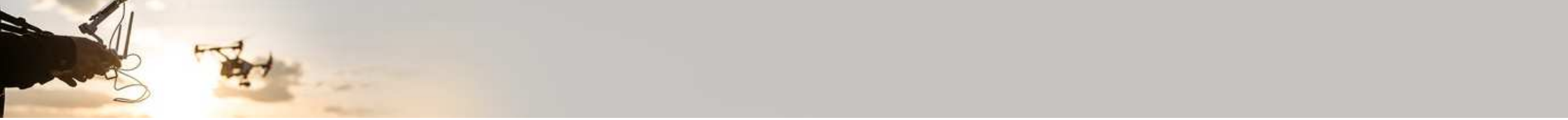


#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
1.4	To ensure that internal Council policies support drone operations	Develop policies to manage businesses applying to launch drones from Council land.	Once Council policies are developed advocate for similar policies for State owned and Commonwealth land.		No additional resources	Policies developed and adopted	Internal engagement to progress and action
		Develop policies to ensure compliance with security and privacy issues when operating drones in Fraser Coast.			No additional resources	Policies developed and adopted	Internal and external engagement to progress and action
		Develop robust and usable internal procurement policies and advice to determine when it is appropriate to procure and operate drones or sub-contract to a drone service provider.			No additional resources	Policies developed and adopted Spend on commissioning drone services increasing	Internal engagement to progress and action
1.5	To ensure that risks are identified and mitigated for drone activity	Undertake a risk assessment to identify risks and control measures for drone operations on Council land. Note: Each time a risk is identified it should be added to a risk register	Undertake annual risk review and amend Drones Strategy as necessary.	Undertake annual risk review and amend Drones Strategy as necessary.	No additional resources	Risk Register.	Internal engagement to progress and action
		Work in partnership with Airport Managers and CASA to identify no fly zones for drones around Hervey Bay Airport, Maryborough Airport and aircraft landing areas, including existing and planned residential airparks. Identify flight paths and heights and classification of airspace as Class G airspace as areas suitable for opportunities for drone research and development.	Include reference to any CASA requirements and potential impacts (noise, privacy, times of operation etc.) in the Planning Scheme		No additional resources	Partnerships established	Internal and external engagement to progress and action



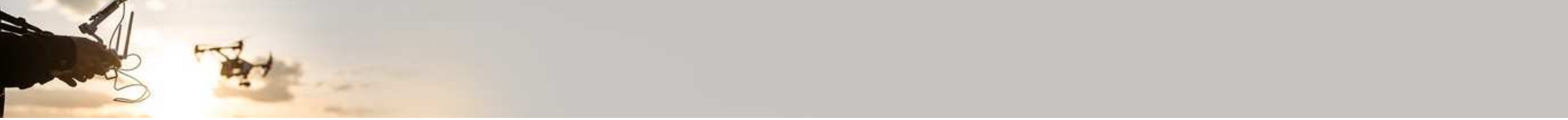
3.4 ACTION AREA 2: INCREASED COMMUNITY AWARENESS OF THE FRASER COAST DRONES STRATEGY

#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
2.1	To increase public awareness of the Drone Strategy	Develop and deliver a communications plan identifying safe recreational drone operation.	Revisit and recommunicate.	Revisit and recommunicate.	No additional resources	Communications Plan in place and implemented	Internal engagement to progress and action
		Develop and deliver a public education program regarding the security and privacy requirements of drone operations, and the economic benefits from providing commercial, educational and recreation opportunities	Revisit and recommunicate.	Revisit and recommunicate.	No additional resources	Communications Plan in place and implemented	Internal and external engagement to progress and action
2.2	To increase awareness of the ‘do’s and don’ts’ when commissioning drone services	Develop and deliver a communications plan for effective due diligence when anyone is commissioning drone services from a drone operator.	Revisit and recommunicate.	Revisit and recommunicate.	No additional resources	Communications Plan in place and implemented	Internal and external engagement to progress and action
2.3	To increase drone operators’ awareness of the ‘do’s and don’ts” of drone activity	Develop and deliver a communications plan for drone operators to comply with local airspace restrictions, including CASA rules and regulations, for example ‘Can I fly there? Drone safety app’, to help drone operators fly safety and responsibly	Revisit and recommunicate.	Revisit and recommunicate.	No additional resources	Communications Plan in place and implemented	Internal and external engagement to progress and action
2.4	To increase Council staff awareness of the Drone Strategy	Develop and deliver a communications plan for Council staff to increase awareness and to better understand the operational capabilities and limitations of drones, and the planning/approval requirements and timelines to maximise potential benefits.	Revisit and recommunicate.	Revisit and recommunicate.	No additional resources	Communications Plan in place and implemented	Internal engagement to progress and action

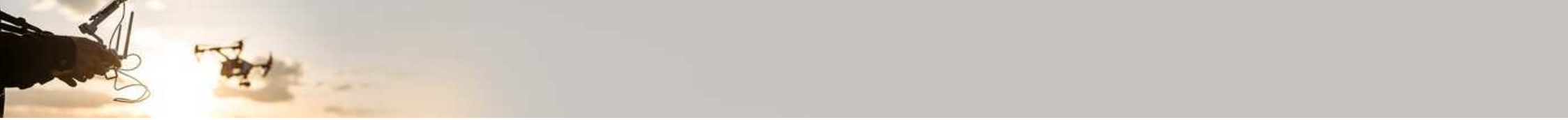


3.5 ACTION AREA 3: INFRASTRUCTURE TO DRIVE INDUSTRY GROWTH

#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
3.1	To ensure that, where appropriate, Council infrastructure supports drone activity	Map restricted airspace and then identify suitable location(s) to potentially create a 'drone park' (similar to a skate park/BMX park) where drones can be safely flown. CASA regulates the use of drones. This action item proposes to identify various places that have appropriate infrastructure where drones can be flown without impacting the amenity of surrounding land uses (refer to Brisbane City Council Case Study)	Consider expansion of 'drone parks' to other locations.	Consider expansion of 'drone parks' to other locations.	Specialist advice may be required FCRC Strategic Land User Planner	No of drone parks established	Internal and external engagement to progress and action
			Consider the provision of free WiFi locations to support drone flying. (Note: This would be required for live streaming of video footage		Subject to resource availability Opportunities to partner with private sector providers	WiFi zones established	Internal and external engagement to progress and action (Smart Communities Plan)
3.2	To ensure that Council usage of drones for operational services is maximised	Identify where Council operational services could utilise drones in day to day operations, how data can be collected and co-ordinate drone activities across Council operations.	Ongoing.	Ongoing.	Budget allocated	Spend on drone activity	Internal engagement to progress and action
		Engage with and support the Local Disaster Co-ordination Centre (LDCC) to consider using drones during disaster recovery and relief operations	Liaise with Local and Regional Disaster Management Groups (which includes all key EM stakeholders) in seeking to establish a drone emergency response team within Fraser Coast available for deployment to emergency situations in Australia and around the world.	Ongoing	Costs of commissioning drones during disaster events (may be recoverable through NDRRA)	Drones deployed	Internal and external engagement to progress and action

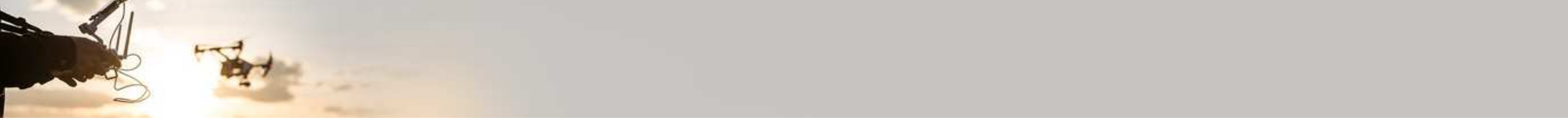


#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
3.3	To ensure that there are sufficient training facilities in the region		Promote opportunities for development applications for new businesses to provide services in training drone pilots	Ongoing	Reduced revenue from rebates on development applications	No of development applications Training facilities established	Internal and external engagement to progress and action
3.4	To ensure that there are repair/maintenance facilities for drones located in the Fraser Coast region.	Identify supply chain opportunities in Fraser Coast required to establish drone repair/maintenance service Note: Drone businesses repair/maintenance is currently primarily through Brisbane and other places including Sydney/Melbourne or overseas resulting in more time the drone is out of action.	Promote opportunities for development applications for drone repair/maintenance businesses.	Ongoing	Reduced revenue from rebates on development applications	No of development applications Repair/maintenance facilities established	Internal and external engagement to progress and action
3.5	To establish a Drones Innovation Hub in the Fraser Coast Region	Building on the High-Level Feasibility Study in Section 2.1.2, prepare a detailed Business Case for a Drones Innovation Hub including location, scale, targeted business opportunities and grant funding opportunities. Prepare grant applications.	Subject to a successful Business Case and grant application(s), commence construction of the Drones Innovation Hub. Implement Investment Attraction Strategy	Implement Investment Attraction Strategy	Order of magnitude costs $8.5m to $12.5m depending on size of facility Further detail to be developed as part of detailed Business Case	Drones Innovation Hub constructed Number of targeted businesses established	Longer term aspiration.

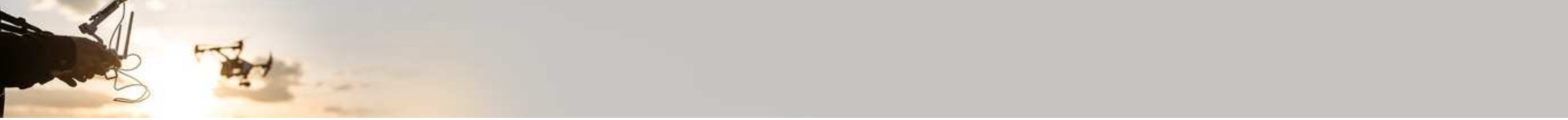


3.6 ACTION AREA 4: AN INCENTIVISATION AND PROMOTION PROGRAM

#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
4.1	To encourage development applications for new drone related businesses and the expansion of existing businesses	Develop and deliver an investment attraction brochure for distribution to potential drone industry investors. This to consider manufacturing, programming, research & development, pilot training, trialing and testing and maintenance/repair service opportunities. Appendices B and C provide details of businesses that may be targeted to establish or relocate drone services in the Fraser Coast Region.	Recruit businesses into the Drones Innovation Hub.	Ongoing	Cost of incentives and reduced lease revenue	Number of businesses leasing space $ invested in Fraser Coast Region	Internal and external engagement to progress and action
		Develop and resource a development application incentives program for businesses wanting to start-up drone services businesses. May include: Reducing infrastructure charges Reducing development application fees Fast-tracking processes	Ongoing.	Ongoing.	Reduced revenue	Number of successful development applications Number of established businesses	Internal and external engagement to progress and action
4.2	To deliver a Drones Grants Program.	Develop and deliver a grants program to encourage events, innovation and research and development activities. (option for part of a broader economic innovation fund including scholarships)	Annual grants program	Annual grants program	Budget for grants program (Council to determine amount)	Number of grant applications Number and value of grants provided Recorded outcomes and economic benefit	Internal and external engagement to progress and action (Grants Review)
4.3	To promote and market the Fraser Coast Region as the place to be for drone activity	Review and update all marketing and promotional media to ensure that the objectives and key priorities of the Drone Strategy are included. May include • Web-site • Video Case Studies • Use of Social Media	Ongoing	Ongoing	Cost of video production	Increased economic benefit to the Region	Internal and external engagement to progress and action

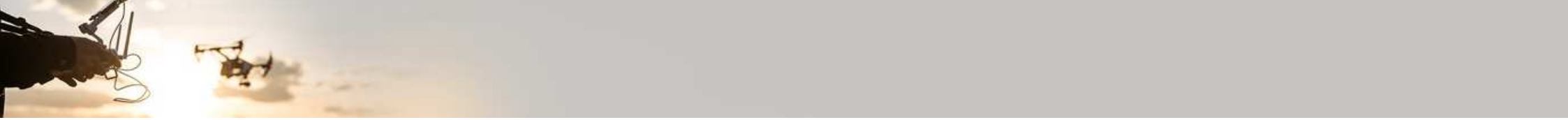


#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
		• Marketing Plans • Media Opportunities					
4.4	To lead by example and demonstrate commitment to a drone friendly Fraser Coast	Council to lead drone advancement by hosting a Drone conference or expo (drone racing) and/or other events to encourage new ideas in drone use and attract drone investment.	Annual event	Annual event.	Cost of event	Number of attendees Economic benefit to the Fraser Region from hosting event	Internal and external engagement to progress and action



3.7 ACTION AREA 5: A COLLABORATION AND ADVOCACY STRATEGY (SUSTAINABILITY)

#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
5.1	To maintain effective communication with local drone businesses and operators	Conduct an annual survey with local drone operators to obtain feedback, and to identify opportunities to support drone services and business expansion.	Ongoing.	Ongoing.	Staff time in undertaking survey	Satisfaction levels	Internal and external engagement to progress and action
		Work with drone businesses and local chamber of commerce stakeholders to encourage innovative drone service opportunities to diversify the region's economic base.	Ongoing	Ongoing	Staff time	Meetings held Increasing economic benefit to the Fraser Coast Region	Internal and external engagement to progress and action
		Facilitate partnerships between Council and the drone industry sector to better understand the needs of drone businesses.	Ongoing	Ongoing	Staff time	Meetings held Increasing economic benefit to the Fraser Coast Region	Internal and external engagement to progress and action
5.2	To develop an ongoing relationship with CASA	Support drone research and development to encourage technology to advance drone capability and safe operations in consultation with CASA. For example, CASA to host a Drone Safety Seminar.	Ongoing	Ongoing	Staff time	MoU in place with CASA	Internal and external engagement to progress and action
		Identify a nominated person in CASA to enable swift resolution of regulatory issues.	Ongoing	Ongoing	Staff time	MoU in place with CASA	Internal and external engagement to progress and action



#	Objective	July 2018 to June 2019	July 2019 to June 2021	July 2021 to June 2024	Resources	Measure of Success	Council Actions/Response
5.3	To establish and develop a close partnership with local educators	Establish partnerships with schools and TAFE Queensland, USC, to set up education and training, for example: • Integrating drone operations in training digital media students; • Highlight difference in perspective from the traditional perception a region to the new and future perspective of a region viewed through drones to the technically savvy youth; • Encourage drone businesses to provide internships and work-related learning for students	Ongoing	Ongoing	Staff time	MoUs in place with education providers	Internal and external engagement to progress and action
5.4	Ensure the inclusion of Drones Industry skills requirements is included in the Fraser Coast Workforce Development Plan	Work with Jobs Queensland to understand and plan for drones industry skills in the education supply chain	Inclusion in the Workforce Plan	Ongoing	Ongoing	Availability of suitably trained and experienced drones industry employees	Internal and external engagement to progress and action

Council Response:

- Council will develop a stakeholder engagement plan to implement and communicate the recommended actions
- Council will establish a project working group to implement the recommended actions and to develop an ongoing monitoring, reporting and evaluation framework

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APPENDIX A: GLOBAL INVESTMENT ATTRACTION TARGETS

DJI (DAJIANG) INNOVATIONS (PRIVATELY HELD)

With its headquarters in Shenzhen, China, and offices in the U.S., Germany, the Netherlands, Japan, South Korea, Beijing, Shanghai, and Hong Kong, DJI Innovations is the current leading name in manufacturing civilian drones by capturing an approximately 70% share of the drone market.

AEROVIRONMENT (NASDAQ:AVAV)

AeroVironment is a world leader in the military drone space. It builds drones for video surveillance, as well as for tactical purposes. The company is now venturing into the commercial market with the announcement in 2016 that it would bring a new UAV called the Quantix to the market. The company is designing this drone for commercial applications in areas such as agriculture and the energy industry.

AMBARELLA (NASDAQ:AMBA)

Ambarella is best known as the manufacturer of the chips in GoPro's action cameras, but the company also produces video-processing chips for other drone-makers. The company is a key supplier for DJI.

BOEING (NYSE:BA)

Through its subsidiary Insitu Pacific (which is based in Alderley, QLD), Boeing is a major player in the medium-sized drone space industry. Although most of its drone are targeted towards the military market, Boeing recently ventured into the ocean drone space with its acquisition of Liquid Robotics last year.

GOPRO (NASDAQ:GPRO)

GoPro went public in early 2014 and sold approximately $427 million worth of stock, making it the biggest consumer-electronics IPO since battery company Duracell International Inc.'s 1991 debut.

GoPro's Karma Drone series has been the most popular product line they have ever introduced.

LOCKHEED MARTIN LMT (NYSE: LMT)

One of the biggest aerospace and defence giants today, Lockheed Martin is behind many of the drones used by the U.S. military and continues to put its drone business front and centre. Lockheed is venturing into manufacturing armed drones.

3D ROBOTICS (PRIVATELY HELD)

Based out of Berkeley, California, 3D Robotics focuses mostly on autonomous drones (like its drone SOLO) with GPS point planning, otherwise known as a smart drone. The company focuses on products for everyday exploration and business applications, as well as aerial photography.

PARROT SA (EPA: PARRO)

Parrot, headquartered in Paris, is a new entrant into the UAV/quadcopter market. In a short amount of time, Parrot has seized a large part of the commercial and civil UAV/quadcopter market with the AR Drone and its successor the AR.Drone 2.0, a mid- range hobby drone with integrated FPV system controlled by a smartphone app.

YUNEEC (PRIVATELY HELD)

Headquartered in Kunshan Jiangsu, China, Yuneec is the world leader in electric aviation. With offices in North America, Europe, and Asia, Yuneec manufactures more than one million units per year sold under its OEM and ODM brands.

In 2014, Yuneec introduced the world's first ready-to-fly, out-of-the-box drone: The Typhoon Q500 quadcopter, This made the company and its products very popular amongst professionals and hobbyists.

DJI Innovations and Yuneec collectively are known as the Apple and Samsung of the drone world, and have been in a few public tech battles and legal proceedings.

NORTHROP GRUMMAN CORPORATION (NYSE: NOC)

Northrop Grumman is a legacy aerospace company that has long been a key drone player in the industry. Its Global Hawk UAV was used in U.S. military operations shortly after 9/11 and became a regular part of procedures after that.

Global list of UAV Manufacturers, filtered by country:

http://www.uavglobal.com/list-of-manufacturers/

APPENDIX B: QLD INVESTMENT ATTRACTION TARGETS

As of 30 November 2017, there were approximately 285 registered UAS Operator Certificate Holders across Queensland.

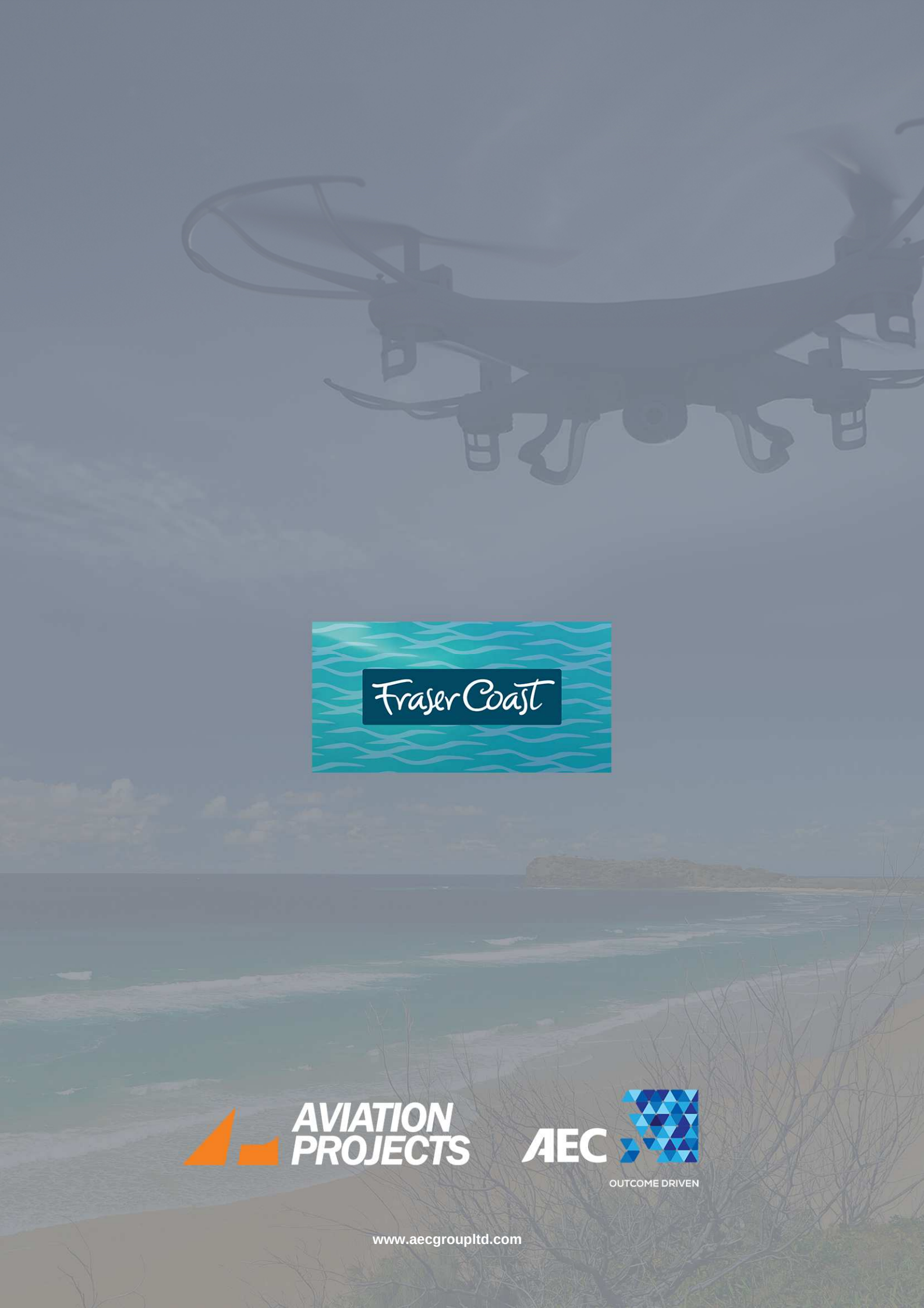
For the purpose of developing the Drone Business Strategy a radius of approximately 150km from Fraser Coast Regional Council area was applied as potentially attracting drone businesses to Fraser Coast Region Drone Those UAS Operator Certificate Holders located within the Wide Bay/Burnett region are listed below (Source: www.casa.gov.au/rpa-operator-certificate-holders).

Holder name	Town/City	Operations
JOSEPH RENDAL CANNING T/A ABOVE AGRICULTURE AND IMAGERY	Urraween, Fraser Coast Regional Council area	Aerial work
XY MAPPING	Hervey Bay	Aerial Mapping
HERVEY BAY DRONE SERVICE	Hervey Bay	Aerial Photography
WEDGETAIL DRONE SOLUTIONS	Burrum Heads	Aerial Mapping Crop Inspections Aerial Photography
STEWART NIGEL RIDDELL	Kawungan, Fraser Coast Regional Council area	Aerial work
OSPREY IMAGERY	Howard	Aerial work Aerial surveying Aerial photography Aerial spotting
PERSAL & CO. CONSTRUCTION PTY. LTD. T/A HANDY HIRE	Hervey Bay	Aerial work
VIVIEN MONA PITT T/A MAP DRONES	Bundaberg	Aerial work
CHRISTOPHER NEIL PECKHAM T/A SOURCE MEDIA	Boreen Point	Aerial work
MIRO DANNY MITROVICH T/A MDM MEDIA	Burnside	Aerial work
D.J BRITZ & W.D BRITZ	Buderim	Aerial photography Aerial spotting Aerial surveying
AEROBUGS PTY LTD	Coochin Creek	Aerial photography Aerial spotting Aerial surveying
CORNISH GEOSPATIAL PTY. LTD.	Cooroy Mountain	Aerial work
COTTRELL CAMERON & STEEN SURVEYS PTY. LTD.	Dalby	Aerial photography Aerial spotting Aerial surveying
JULIAN SIMEON GEORGE T/A FREE SAIL	Diddillibah	Aerial photography
PETER JOHN SYSON	Eumundi	Aerial photography Aerial spotting Aerial surveying
ROBINSON ENGINEERING SURVEYS PTY LTD	Gladstone	Aerial work
VANCE CHRISTOPHER KRAHENBRING T/A DASH AVIATION	Kin Kora	Aerial work

Holder name	Town/City	Operations
AVTECH UAV PTY LTD	Glan Devon	Agricultural mapping, and videography services, with additional activities including real estate showcasing, environmental monitoring, mosquito control and banner advertising
MARIO CLANCY NARITJARRUWA NGURRUMI FAGGION T/A VIDOPS	Moore Park Beach,	Aerial work
LANCE CHRISTOPHER HARRIS T/A LNK AERIALTOGRAHPY	Mountain Creek	Aerial work
TAFE QUEENSLAND	Mountain Creek	Aerial work
STICKYBEEK AUSTRALIA PTY LTD T/A AERIALFOOTAGE.COM.AU	Noosaville	Aerial photography Aerial spotting Aerial surveying
TIME LAPSE AND STOP MOTION AUSTRALIA PTY LTD	Noosaville	Aerial work
QUEENSLAND AERIAL PTY. LTD. T/A QUEENSLAND AERIAL	Tannum Sands	Aerial work
MINSTAFF SURVEY PTY. LIMITED	Toowoomba	Aerial photography Aerial spotting Aerial surveying
SHAYNE LYOL CANTLY	Toowoomba	Aerial work
THE STATE OF QUEENSLAND	Toowoomba	Aerial work
HUMMINGBIRD DRONE SOLUTIONS PTY LTD	Toowoomba	Aerial photography Aerial spotting Aerial surveying
DAVE'S DRONES PTY LTD	Verrierdale	Aerial work Aerial spotting

APPENDIX C: KEY STAKEHOLDERS

Name	Organisation
Mayor Chris Loft	Fraser Coast Regional Council
Cr Paul Truscott	Fraser Coast Regional Council
Davendra Naidu	Fraser Coast Regional Council
John McLennan	Fraser Coast Regional Council
Brendan Guy	Fraser Coast Regional Council
Ian Munro	Fraser Coast Regional Council
Craig Hutton	Fraser Coast Regional Council
Kevin Corcoran	Fraser Coast Regional Council
Nigel Greenup	Fraser Coast Regional Council
Janet Campbell	Fraser Coast Regional Council
Karen Strange	Fraser Coast Regional Council
Thea Griffin	Fraser Coast Regional Council
James Cockburn	Fraser Coast Regional Council
Col Zemek	Fraser Coast Regional Council
Chris Coutts-Smith	MSF Sugar
Rob	Urangan Fisheries
Shelia Charlesworth and Lance Stone	Burnett Mary Regional Group
Joe Minnegal	Helloworld Travel
Graeme Nagal and Heath Adams	Osprey Imagery
Brad Tallis	Tallisman Custom Training
Francois van Teijingen	Astro Aero
David Breese	Nova Systems
	Tiaro Chamber of Commerce
Faye Wiffin	Howard Community Centre
Scott Rowe	RDA Wide Bay Burnett
Kane Macready	Engineers Plus
Fiona Bowden	QLD Department of State Development
Simon Prebble	Hyne Timber
Martin Simons	Fraser Coast Tourism & Events
Dean Sherwell and Angela Lisle	TAFE
Simon Done	Education Queensland
Scott Barker	Education Queensland
Robyn Rayner	Education Queensland
Javier Leon	USC
Gillian Adams	USC
Graham Young	USC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