WHITSUNDAY REGIONAL COUNCIL

Stormwater Management Strategy

JULY 2025

STRATEGY VISION

WHITSUNDAY REGIONAL COUNCIL WILL PROACTIVELY PLAN AND MANAGE FLOODING AND STORMWATER RISKS TO GUIDE SUSTAINABLE INVESTMENT IN ASSET MANAGEMENT WHILST IMPROVING THE OVERALL WELLBEING OF THE COMMUNITY, THE ENVIRONMENT AND THE ECONOMY.

ACKNOWLEDGEMENT OF COUNTRY

COUNCIL ACKNOWLEDGES THE TRADITIONAL OWNERS AND CUSTODIANS OF THE LANDS IN OUR REGION

We pay respect to Elders past, present and emerging and acknowledge their ongoing relationship and connection to Country.

To acknowledge and show respect for our traditional owner groups' history, culture and our shared future, the Welcome to Country is conducted at all significant events.

Whitsunday Regional Council endorses the vision of a nation which values Aboriginal and Torres Strait islander heritage, cultures and peoples and recognises their distinct position as the original custodians of Australia.

Council's Mission is to make a sustainable future possible by building stronger relationships, mutual respect and encouraging cultural practices that strengthen and support harmony between Aboriginal and Torres Strait
Islander peoples and the broader community within the Whitsunday Region. Council values input and active participation from Aboriginal and Torres Strait Islander peoples into decision-making.

This Stormwater Management Strategy is a subordinate strategy of Council's Corporate Plan. All operations, services, functions and decisions undertaken must be consistent with and aimed at achieving Council's Vision, Mission and Corporate Values

01 INTRODUCTION

02 UNDERSTANDING THE RISKS

03 THE STRATEGY

04 DELIVERING FOR THE REGION

01 INTRODUCTION

The Whitsunday Regional Council (WRC) Local Government Area (LGA) is situated on the central/northern Queensland coast approximately 1,100km north of Brisbane and covers an area of more than 23,800 square kilometres. The urban areas of the Whitsunday region see communities increasingly exposed to localised stormwater drainage issues from legacy development, while the proximity to the Great Barrier Reef World Heritage Area, presents an imperative to ensure sustainable stormwater management practices.

Stormwater drainage infrastructure and overland flow paths used to reduce the impact of stormwater drainage, may pose a risk to the safety of people and property due to existing condition and levels of service. To move towards proactive risk management and investment, Council initiated the Stormwater Management Strategy which enables Council to respond to the challenge of servicing future growth while making provision for the maintenance and augmentation of existing stormwater infrastructure. This strategy provides:

- Thought leadership and strategic thinking regarding stormwater management.
- Defendable outcomes based on quantified information (versus qualitative), wherever possible.
- Clarity of logic.
- High degree of proficiency in risk communication.
- Outcomes that can be continuously improved and realigned as Council's vision changes over time (adaptable).

The Strategy sets Council's future direction with actions that will manage localised stormwater drainage issues to minimise the consequences to life, assets, community wellbeing, the environment and the economy. It also addresses the need to ensure that Council spends money on stormwater infrastructure in the most appropriate areas to demonstrate that Council is actively managing localised stormwater drainage issues proactively, on a risk basis.

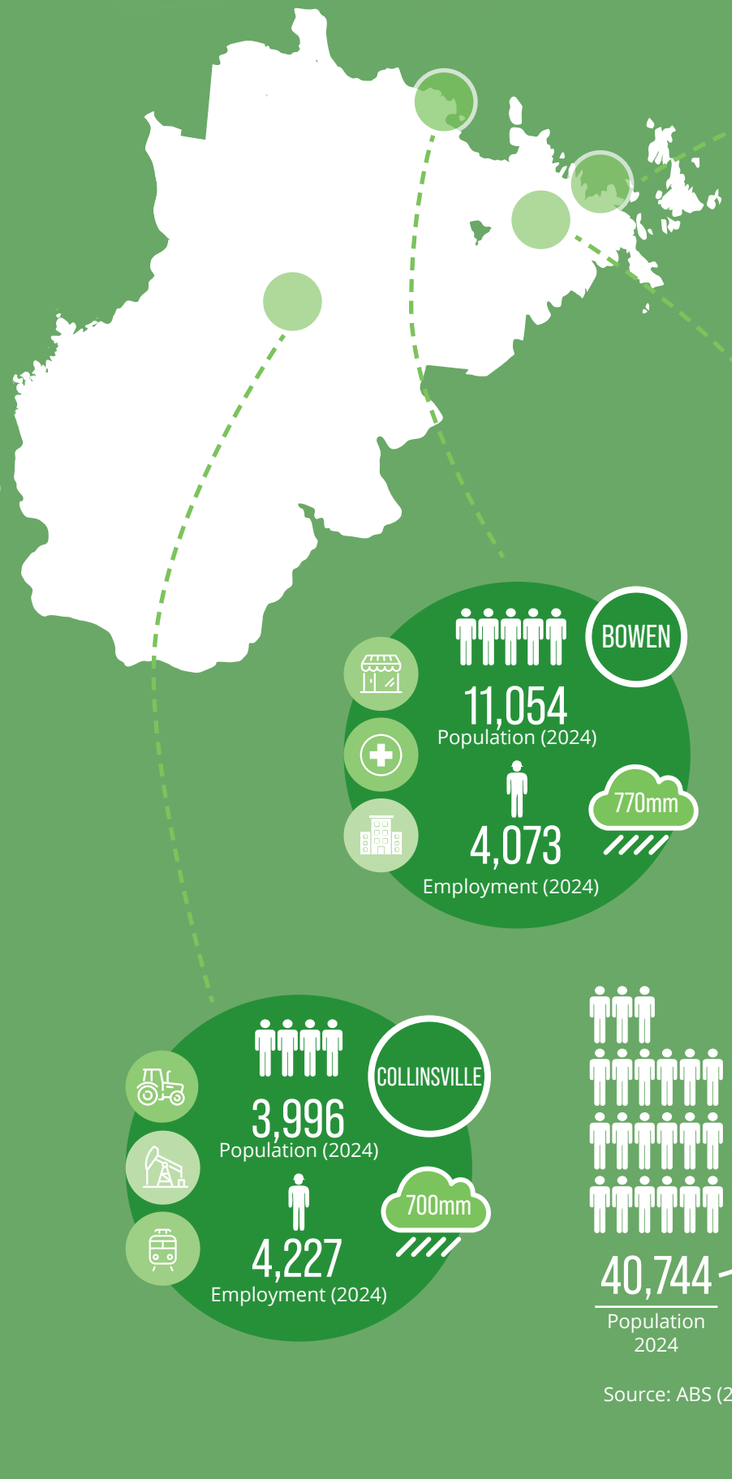
The Strategy also makes provision for the environmental health of waterways, social amenity, pollution control, affordability and impacts of a changing climate and aligns with Council's overarching Corporate Plan vision to be a sustainable and progressive region, for the benefit of the diverse community, visitors and the environment.

INTRODUCTION

ABOUT THE WHITSUNDAY REGION

The Whitsunday Region is situated in the heart of the Great Barrier Reef, boasting a strong and diverse economy driven by the agriculture (horticulture and sugar), mining, and tourism; the region is well-connected with the right mix of opportunity and liveability.

The population of around 41,000 is spread across the four areas of Bowen, Collinsville, Proserpine and Airlie Beach - Cannonvale and is projected to grow to 50,000 people over the next two decades. The population is also very fluid, with a high number of visitors and seasonal workers moving into and out of the region. On an annual basis, these movements see the population change by up to 5,000 people (14% of the population) throughout any given year. The Whitsunday LGA straddles the Don, Gregory, Proserpine, O'Connell and Burdekin River Basins, covering the Brigalow Belt, Einasleigh Uplands and Central Queensland Coast bioregions.



Source: ABS (2021;NIEIR (2025)

CURRENT SITUATION

Through the development of this strategy and feedback from the Technical Reference Group (TRG), Council's current situation has been defined and can generally be characterised by the following:

LGIP

Council's LGIP does not presently identify any Plans for Trunk Infrastructure nor schedule charges for stormwater infrastructure. Consequently, Council has little to no developer funding to contribute to enabling infrastructure for development

ASSET DATA

Current practice is to review and enter the information from more recent land development into the various databases. Council have also recently completed CCTV assessment of stormwater assets across the LGA.

SERVICE OUTCOMES

The currently adopted level of service for stormwater management is an aspirational target. The overall cost of achieving these aspirational Risk reduction targets and their acceptability by the community is relatively unknown.

OPERATION MAINTENANCE / RENEWAL PLANNING

Currently the maintenance budget is based on historical budgets, and individual / corporate knowledge of the current state of the infrastructure. Operational maintenance planning is reactive, and, at times, crisis driven

STORMWATER QUALITY

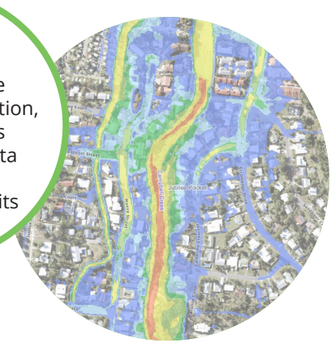
Council have undertaken little planning for stormwater quality. Council requires a vision to move towards an Integrated Water Sensitive region and the formal vision required to move towards this in the future.

CAPITAL WORKS

Current practice for capital works budgeting for stormwater infrastructure is either: driven by development demand, responsive to flooding complaints (large volumes during wet seasons), targeting renewal works as advised by operations staff or guided by political and/or community factors.

DATA

A key challenge for Council is the cost-effective collection, storage, analysis and sharing of data throughout the organisation and its stakeholders.



WHAT IS STORMWATER MANAGEMENT?

Stormwater management is the term used for planning and implementing actions that manage urban stormwater runoff and overland flows from areas such as roofs, roads, pavements and green space.

Flooding can result from multiple sources including rivers, creeks, coastal storm surge and overland flows. The management of overland flooding and stormwater is the subject of this strategy. Overland flooding occurs when urban stormwater runoff and overland flows exceed the capacity of the drainage system and usually occurs with little or no warning. When this occurs, water begins to flow over the surface of the land along natural flow paths or valleys towards the nearest creek or river. This type of flooding may be hazardous and presents a risk to the community.

There is a distinction between flood hazard and flood risk. Flooding only presents as a hazard where it exceeds the coping capacity of the environment or community. Flood risk refers to (and is a measure of) the likelihood and consequence of the hazard eventuating.

Stormwater risk management is about identifying means of reducing the likelihood and consequence of flooding.

THE NEED FOR A STRATEGY

Extreme rainfall and flooding is a natural event in the Australian environment and an inevitable occurrence within the Whitsunday Region. Climate change is predicted to increase flood risk, frequency & intensity. Whilst we cannot stop flooding from happening all together, we can reduce the consequences of flooding, manage the risk and plan for the future.

This strategy enables us to deliver a service that caters for future growth whilst maintaining and improving existing stormwater infrastructure. This strategy delivers:

- An overarching vision for the long-term management of stormwater
- A consistent and transparent approach to identifying and prioritising future expenditure
- A commitment to progressively reducing risk and improving community resilience with clear actions and accountabilities

The strategy sets Council's future direction for managing stormwater with a priority placed on minimising the consequences to human life, assets, community wellbeing, the environment and the economy. It also demonstrates how projects are prioritised based on a number of factors, the most important being protection of human life and property. The strategy makes provision for the environmental health of waterways, social amenity, affordability and impacts of a changing climate. It also aligns with Council's overarching Corporate Plan.

02 UNDERSTANDING THE RISKS

WHAT IS FLOODING?

Flooding generally relates to the inundation of usually dry areas of land and can refer to a variety of flood mechanisms, which may occur in isolation or concurrently with other mechanisms. These include:

- Urban local catchment flooding during rainfall events.
- River and creek flooding as a result of excess runoff overtopping the banks of the river or creek.
- Coastal inundation as a result of sea water inundation due to high tides or storm surge

Most flooding in the Whitsunday region is caused by rainfall, either in the form of local catchment or riverine flooding. Other possible flooding mechanisms include coastal tidal flooding from storm surge and tropical cyclone activity.

LIKELIHOOD OF FLOODING

Rainfall events, storm surge and the floods that result from them are categorised by the frequency at which events of a given size are likely to occur. Annual Exceedance Probability (AEP) is the statistical likelihood of the occurrence of a flood of a given size or larger in any one year, usually expressed as a percentage. For example, floods with a discharge equal to the 1% AEP event has a 1% probability of occurring each year.

Average Recurrence Interval (ARI) is a statistical estimate of the average period in years between the occurrences of a flood of a given size or larger. For example, floods with a discharge as large as the 100 year ARI flood event will occur on average once every 100 years. The ARI of an event gives no indication of when a flood of that size will occur next. The 1% AEP event is equivalent to the 100 year ARI event.

Small events generally occur frequently (e.g. 39% AEP or 2 year ARI) and large events quite rarely (1% AEP or 100 year ARI).

The 1% AEP flood, is the generally accepted event on which current guidelines and standards are based to protect new development.

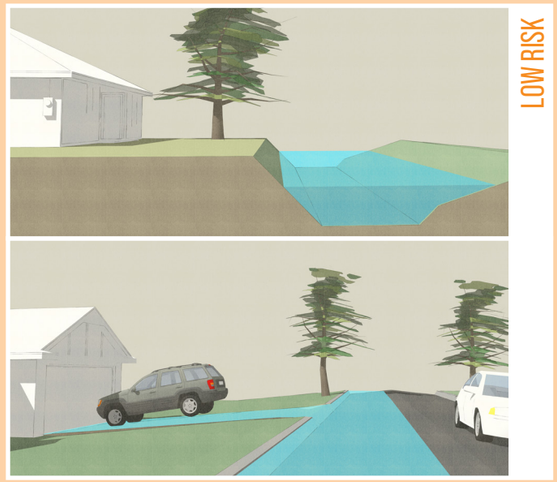
MINOR FLOODING

Minor (gentle) rainfall events can still cause flooding to areas such as road corridors, backyards, channels and creeks. However, minor and more frequent rain is less likely to pose a risk to life and property.

During minor flooding, the community may see or experience:

- Ponded or slow-moving water in backyards or open areas (such as parks or fields).
- Water flowing along overland flow paths.
- Water passing along kerb and channel.
- Water flowing through channels and creeks.

Minor flooding may result in low-risk flooding of minor structures (such as garden sheds, carports etc.) or under high-set houses.



CHALLENGES FACED WHEN MANAGING STORMWATER

Managing stormwater and associated infrastructure is a complex challenge. Effective action must consider a range of values and the cumulative effects of change at a catchment and region wide scale.

1
GROWTH
enabling development whilst minimising future risk and nourishing the environment.

2
AGEING INFRASTRUCTURE
identifying critical assets and prioritising proactive maintenance and renewal efforts.

3
FLOOD RISK
effectively managing and minimising flood hazards to public safety, property and assets.

4
LIVEABILITY
delivering social and environmental values.

MAJOR FLOODING

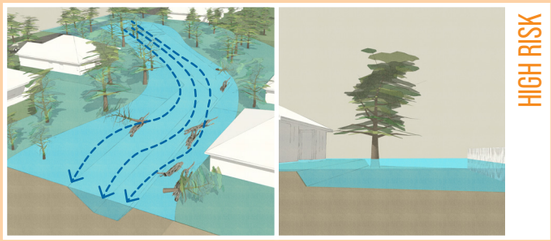
Very intense rainfall which can cause major flooding is less likely to occur than minor flooding. When it does occur, large amounts of runoff can rapidly accumulate and overwhelm urban drainage systems (like pits and pipes) or cause channels and creeks to break their banks.

This type of flooding can be very fast moving and reach areas which may have not previously flooded. Major flooding can pose significant risk to life and property where development and associated stormwater infrastructure was designed to older standards and methods.

During major flooding, the community may see or experience:

- Flooded buildings.
- Very fast-moving water along overland flow paths, towards creeks.
- Water flowing within the full road corridor.
- Water rapidly flowing in channels and creeks.
- Water breaking out of channels and creeks.

Major flooding may result in high-risk flooding of buildings (sheds and houses), parked cars and highly hazardous flow (deep, fast moving water) in channels and creeks.



1

GROWTH

Council's current Planning Scheme anticipates over 25% growth in population over the coming decade. This is coupled with an increasing demand for parks and community facilities, which are often integrated with natural waterways. The majority of this demand is projected to originate from the Whitsunday growth Corridor (Crofton to Jubilee Pocket), where waterways are largely confined through urban encroachment. As urban environments become more intensely developed, impervious surface area is expected to increase, which will result in more runoff. To successfully meet projected growth, Council aspire to provide infrastructure ahead of, or in parallel with, new development. Failure to meet this increasing demand in a sustainable, adaptable manner may result in significant flooding, pollution, deterioration of urban amenity and increased burden on stakeholders.

To facilitate growth sustainably, Council requires:

- a forward-looking, risk-based pipeline of infrastructure
- effective use of technology to guide infrastructure requirements
- integration with natural assets to minimise maintenance, flood risk and preserve a wide range of community values.

2

AGEING INFRASTRUCTURE

Council manages more than $186M of stormwater infrastructure assets that provide a level of flood protection across the region and reduce nuisance flooding incidences in some areas during local catchment events. As a result of Whitsunday's long history and continued growth, these assets vary in age with some up to 70 years old.

Recent decades have seen significant growth in Council's assets which accentuates the need to proactively plan and manage infrastructure in a sustainable, adaptable manner. Assets age with time and require timely maintenance and timely renewal to enable the continued service.

The Strategy provides an essential framework for best practice asset management decision-making and informs the organisation on the requirements to meet a certain level of service for the community.

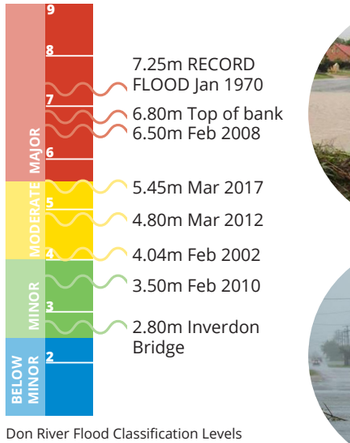
3

FLOOD RISK

The management of overland flooding / stormwater is the subject of this Strategy.

Flood risk also changes in response to the effects of climate change, such as higher intensity rainfall. This can increase the frequency and hazard associated with rainfall and must be managed in advance through careful planning and adaptable infrastructure.

The Whitsunday Region has a long history of historical flooding with significant flooding occurring after Tropical Cyclone Debbie in 2017 (pictured). Notable Don River flood events are also shown below.



Don River Flood Classification Levels & Historical Flooding
(Bowen Pump Station #033264)

4

LIVEABILITY

Liveable communitie must identify and nurture the social and environmental values associated with their catchments. Recognising these values amongst managing growth, ageing infrastructure and flood risk ensures Whitsunday's future includes important aspects that the community values.

Traditional approaches to stormwater management have often seen catchments densely developed and degraded as a result. Well-integrated stormwater corridors and creeks add significant value to communities by:

- Providing natural passage for floodwaters and 'slowing the flood wave'.
- Connected, open spaces which provide social benefits, climate cooling and lush native vegetation.
- Opportunities for wildlife ecosystems.
- Increasing value and reducing maintenance over time, if planned correctly.

These aspects (and more) make up the social and environmental values which must be protected, maintained and enhanced now for the future Whitsunday Region to thrive as a liveable regional community.

03 THE STRATEGY

Whitsunday Regional Council will proactively plan and manage flooding and stormwater risks to guide sustainable investment in asset management whilst improving the overall wellbeing of the community, the environment and the economy.

STRATEGY VISION

Whitsunday Regional Council's vision for the future was developed collaboratively with the Technical Reference Group and was informed by Council's planning documents and key themes.

As an organisation, Whitsunday's vision for the future is to:

- Create and foster safe, liveable and resilient communities supported by well-planned and maintained infrastructure.
- Encourage holistic risk management to improve public safety, the environment and the community.

CURRENT APPROACH	FUTURE STRATEGY
BACKWARD LOOKING Budget based on last year	FORWARD LOOKING Budget on asset risk scores and cost
REACTIVE Project identified as problems arise	PROACTIVE High risk assets and project benefits prioritised
BUDGET CONSTRAINED Do what you can afford each year	RISK CONSTRAINED Budget based on agreed risk targets
RISKS NOT ADDRESSED Money is spent but overall risks remain	MANAGED RISK Highest risks addressed first

OBJECTIVES OF THE STRATEGY

The objectives of the Stormwater Management Strategy are as follows:

- Manage stormwater infrastructure in an integrated, sustainable way which prioritises public safety
- Demonstrate consistent, long-term risk mitigation and value for money
- Incorporate social, cultural and environmental values in financial investment
- Manage demands for growth in line with the Vision
- Raise community awareness regarding stormwater management and potential risk
- Continuously improve methods and practices

BENEFITS OF THE STRATEGY

Effective management of Council's stormwater network requires identification and prioritisation of areas most at risk, exploring levels of service and developing integrated, risk mitigations which offer a range of benefits. This Stormwater Management Strategy will enable Council to be proactive, forward looking and risk orientated.

The benefits of a Stormwater Management Strategy include:

01 An overarching stormwater vision, identified for the long-term management of drainage infrastructure.

02 A consistent and transparent approach to identify and prioritise future expenditure. This will ensure a defendable and balanced approach to progressively reduce risk affecting the community (such as asset failure or flood risk).

03 Consensus at all levels within Council through active participation in the strategy development process.

04 Commitment to progressively reduce risk with clear actions the community and stakeholders can understand.

05 Collation of existing data (asset and condition assessments) offering Council a reliable GIS (Geographic Information System) database.

06 Governance provisions and accountabilities clearly outlined to ensure the overarching vision is maintained.

07 Tools to forecast and prioritise budget expenditure based on agreed service criteria and risk targets, providing more certainty and ensuring high risk assets are targeted first, reducing overall risk over time.

08 Outputs that ensure that the strategy is adaptable and can be continuously improved / realigned as time progresses.

STRATEGIC OUTCOMES

Council's Stormwater Management Strategy focuses on seven key themes, which are presented below. Strategic outcomes have been established based on each of these focus areas. These form a framework aimed at supporting each departmental owner in implementing the strategy, enabling continued prioritisation of future investment on a risk basis.

01 ASSET MANAGEMENT

a. Manage renewal using a risk-based approach.
b. Employ best-practice principles aimed at reducing maintenance and increasing sustainability.
c. Increased communication and feedback between Council departments and relevant external parties (e.g. river trusts).

02 CATCHMENT MANAGEMENT

a. Employ holistic principles to catchment management.
b. Establish and regulate region-specific Water Sensitive Urban Design (WSUD) guidance.
c. Invest developer contributions to prioritised improvement.

03 COMMUNITY SERVICES, ENGAGEMENT & EDUCATION

a. Clearly defined levels of service to generate reasonable community expectations.
b. Current, accessible flood risk information to promote better flood awareness to inform development, construction, design and disaster response.
c. Targeted community education coinciding with modelling.

04 DATA MANAGEMENT, SHARING AND SYSTEMS

a. Establish data & model management practices.
b. Continue infrastructure data capture including field data capture, condition assessment and feedback.
c. Provide means for ready access to regularly used data tailored for the end user to easily interpret.

05 FLOOD RISK MANAGEMENT

a. Implement flood risk reduction projects and initiatives to address existing flood risk.
b. Existing flood risk used to inform infrastructure planning, development growth, emergency planning and floodplain management.
c. Realise long-term flood risk reduction in the catchment, through adaptable mitigation measures and providing appropriate design and model assets to support development

06 GOVERNANCE AND LEADERSHIP

a. Proactively manage and support quality development outcomes.
b. Clearly defined roles, responsibilities and asset ownership.
c. Quantitatively assess and evaluate stormwater projects.

07 LEVELS OF SERVICE

a. Develop cost-effective management strategies for the long-term ensuring sustainable use of physical resources.
b. Provide a defined level of service and monitoring performance.
c. Meet the demands of growth through demand management and infrastructure investment.

DELIVERING FOR THE REGION STORMWATER MANAGEMENT STRATEGY 2025

04 DELIVERING FOR THE REGION

HOW WE WILL DELIVER THE STRATEGY

The Strategy articulates how we intend to manage stormwater into the future. This supports Council in developing a mature stormwater infrastructure pipeline which delivers value to the community.

In order to achieve the Strategic Outcomes, Council will implement a series of actions which will provide more information for critical decision making and prepare the way for proactive management of stormwater assets. These actions will be implemented though a Stormwater Technical Reference Group and include the following focuses:

- Ongoing asset condition assessments
- Data collection for key assets and flood events
- Detailed flood modelling
- Risk analysis
- Development of a proactive maintenance schedule
- Emergency management
- Raising awareness through community engagement

HOW WE WILL PRIORITISE STORMWATER PROJECTS

Throughout the strategy development process, more than 74 operational initiatives and 45 potential capital projects were identified.

In order to prioritise these based on risk and value, a multi-criteria assessment (MCA) tool has been developed. This tool considers how a given project aligns with and delivers on the values identified by stakeholders. The MCA framework criteria is displayed to the right, with the highest priority values being public health & safety.

The Strategy MCA frameworks aims to capture the benefits, deficits and costs associated with each process through a simple scoring system. This score is then summarised and ranked to support decisions regarding future stormwater investment.

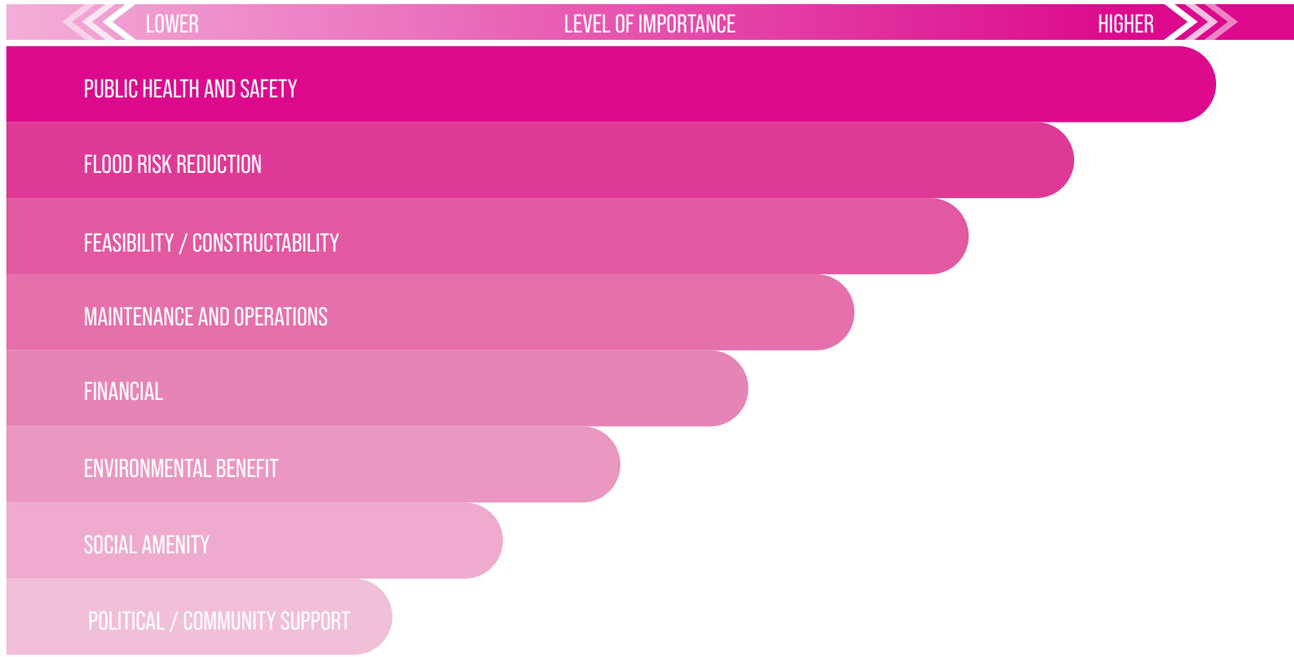
MULTI CRITERIA ASSESSMENT

A robust ranking and prioritisation method was seen as an essential part of the Strategy to ensure that projects (both structural and non-structural) were appropriately prioritised and that the decision-making process is transparent.

The Multi Criteria Analysis (MCA) process has been used to capture various benefits, deficits and costs associated with each individual mitigation project, whilst taking into account other qualitative variables determined by the project team. Assessment frameworks have been developed to support a scoring and ranking process undertaken collaboratively by AECOM and Council.

Assessment of the projects was carried out based on the following principles:

- Benchmark the performance of the options against the objectives of the study
- Where possible, utilise quantitative measures of performance.
- Recognise the complexity of the assessment and rely upon a number of measures rather than a single answer (the simplicity of which would compromise the assessment).
- Use consistent measures to enable a strong comparative assessment of options because the aim of the assessment is to derive a prioritised list of projects. Hence, direct comparisons are important and absolute scoring is less important.



COMMITMENT TO MANAGING STORMWATER ASSETS

Understanding the current condition of stormwater assets and associated risks is a significant driver to determining a sustainable operational and renewal program, capital works program and long-term, sustainable investment.

To this end, Council is adopting a new annual initiative of proactively inspecting assets (such as underground pipes and concrete channels) and identifying opportunities for renewal before issues arrive. This will ensure that critical assets can be managed based on risk and factored into stormwater infrastructure investment ahead of time.

MAINTENANCE ON EXISTING STORMWATER CHANNEL

NEW STORMWATER PIPE CONSTRUCTION

LEVELS OF SERVICE

As an organisation, Council provides services to its community, some of which are facilitated by infrastructure assets. The goal in managing infrastructure assets is to meet the defined Levels of Service in a risk-based, cost-effective manner today and into the future. Levels of Service also guide the investment in technical resources and initiatives required to deliver projects and services in line with stakeholder expectations.

To this end, Council have developed a Levels of Service Framework for stormwater assets based on community values and current practice within the industry.

FINANCIAL SUSTAINABILITY

- Improve Council's asset management planning maturity and develop long term financial plans for all asset classes which are financially affordable over the long term
- Maximise the organisation's financial performance, achieving a high level of customer service, productivity and efficiency through strategic direction

COMMUNITY INVOLVEMENT

- Ensure WRC openly communicates with and promotes the communities of the Whitsunday Region
- Foster community participation in stormwater management
- Increase community awareness on stormwater issues

NETWORK PERFORMANCE & UTILISATION

- Protect life and property
- Provide safe access for emergency services
- Provide safe access to private property
- Preserve the alignment and capacity of major drainage corridors and overland flow paths

RESPONSIVENESS

- Maintain a high level of preparedness, capability, and responsiveness to respond to, and recovery from, natural disasters that impact on our local communities and infrastructure.
- High community satisfaction with customer service and council's overall performance

FUNCTIONALITY

- Deliver a plan for the development industry and community around trunk infrastructure provision
- Delivery of network infrastructure maintenance to meet council's approved plans and standards and maintain function of the stormwater drainage system

HEALTH, SAFETY & ENVIRONMENT

- Maintain, protect and enhance natural waterways and their ecological health
- Adopt and promote water sensitive urban design principles
- Integrate stormwater systems (natural environment) with the built environment
- Optimise the use of stormwater as a sustainable resource
- Minimise health nuisance reports related to stormwater (e.g. mosquito's, septic function)

Whitsunday
Regional Council