



# CITY OF GREATER GEELONG

## Catchment Management Strategy

Central Geelong CMU

VC2044\_002-REP-001-A

13 MARCH 2026



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# 1. INTRODUCTION

## 1.1 Purpose

The Central Geelong Catchment Management Strategy (CMS) outlines the key outcomes from the investigation completed for the Central Geelong Catchment Management Units (CMU) as an integral component of the delivery of the City's Stormwater Services Strategy 2020-30. The Stormwater Services Strategy also integrates with the broader *Greater Geelong: A Clever and Creative Future* vision. The Central Geelong CMU is a *Medium* priority area that has a service objective of having the CMS completed by 2030. This area has also been flagged as a strategic integrated water management opportunity region.

The overall Stormwater Service Strategy 2020-30 has a mission to:

*Lead the adaptation and integration of stormwater services to support the city's growth, health and liveability.*

Four (4) goals achieve the strategy's mission:

*Goal 1: Foster healthy and resilient communities*

*Goal 2: Support innovative and sustainable growth*

*Goal 3: Enhance the natural and built environments*

*Goal 4: Create positive community experiences*

The Central Geelong CMS is primarily linked to **Goal 1: Foster healthy and resilient communities** for the Stormwater Services Strategy – 2020 to 2030 which has a target to develop catchment management strategies for all CMUs by 2030, however it does overlap with Goals 2, 3 and 4 of the strategy. The goals are further supported by 15 best-practice objectives, targets and measures to guide the strategy's delivery to 2030. The goals are developed to focus on the key challenges the City of Greater Geelong (Council) ranging from ongoing growth and urban change, climate change, managing ageing assets and limited funding opportunities.

The developed strategies aim to focus on the opportunities for Central Geelong CMU with regards to promoting a Water Sensitive City through a strong community focus. Then to explore potential funding mechanisms for the implementation of the strategies. Overall, there is a need for accelerating strategic planning and to develop strong and resilient communities. This study fits into Phase 3 – Strategy Development through investigation.

## 1.2 Catchment Overview

The Central Geelong CMU is located within the central area the City's service area and generally includes the suburbs of Geelong and parts of Newtown and Geelong West. The Central Geelong CMU boundary is shown in Figure 1-1 with the key challenges shown for the area in Table 1-1. The highest priority for the CMU is the flood risk within Newtown, primarily near the Gertrude Street area where historical flooding impacts properties between Shannon Avenue and Pakington Street.

The Central Geelong area also has medium risk around urban growth pressure (largely subdivisions rather than new allotments) and opportunities for improved water interception and management through integrated water management. The Central Geelong Stormwater Management Strategy project has engaged with the community to develop a calibrated flood model to understand the flood risk and explored potential mitigation and integrated water management options for the ongoing strategy.

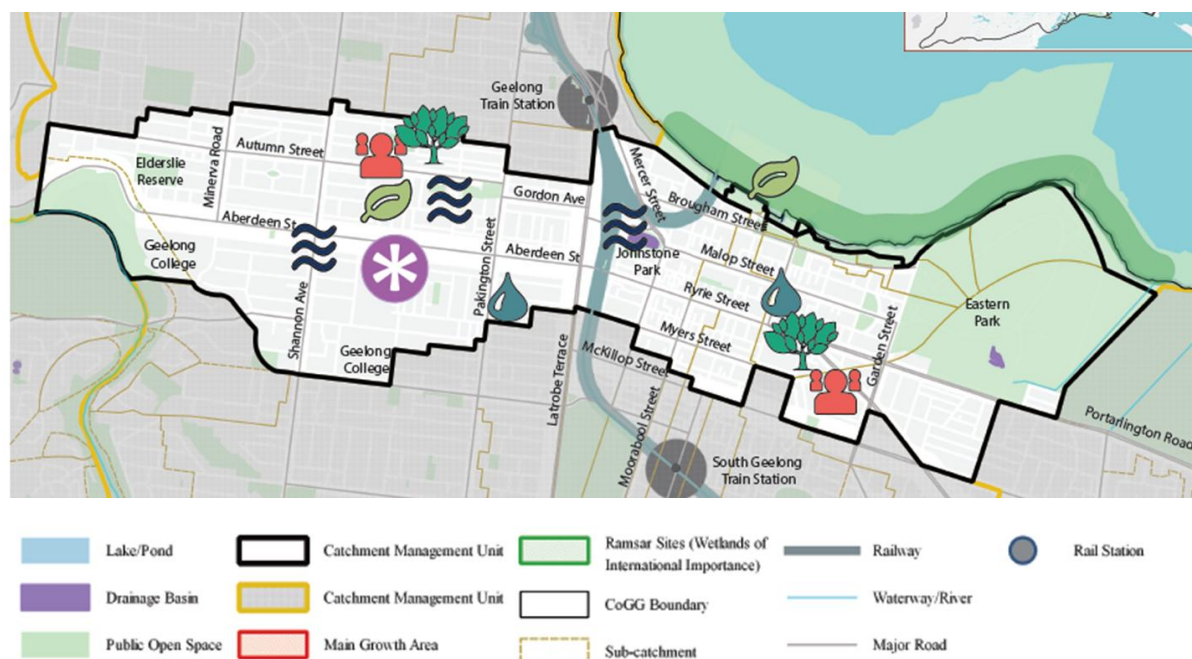


**Figure 1-1: Central Geelong CМУ – Boundary and focus areas**

**Table 1-1: Central Geelong CМУ – Current status**

| Icon                                                                                | Objective                                                                      | Priority | Commentary                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Reduce the impacts of dangerous stormwater flooding.                           | High     | High number of historical flooding events in a densely populated area, due in large part to the high impervious area of the catchment, and older infrastructure not designed to current standards |
|  | Support urban greening through integrated water management.                    | Medium   | Medium level of tree canopy coverage, less than the City's objective                                                                                                                              |
|  | Integrate stormwater systems to enhance the use of community spaces.           | Low      | Numerous existing open spaces that are irrigated. Opportunities do exist to further integrate stormwater management into these areas                                                              |
|  | Protect the health of receiving waterways, maximising their value and amenity. | Medium   | Medium priority for water quality based on the nature / extent of development and the value of receiving environments                                                                             |
|  | Implement catchment wide practices that guide growth.                          | Medium   | The suburbs of Geelong, Geelong West and Newtown are already densely populated. This trend is expected to intensify, creating changes to stormwater management in the area                        |
|  | Develop partnerships to plan and deliver stormwater solutions.                 | Low      | No current partnership projects identified                                                                                                                                                        |
|  | Implement stormwater systems that can adapt to future needs.                   | Low      | Formal knowledge of catchment (flood risk) is high                                                                                                                                                |

## 2. FLOODING ISSUES

### 2.1 Existing Drainage System

The Central Geelong CMU drainage system was modelled using information on the network supplied by Council. The Newtown portion of the catchment is collected by local drainage networks before concentrating in the low section between Autumn and Gerturde Streets. The main trunk drainage network continues through to the Geelong CBD via Gordon Avenue through to Johnstone Park Retarding Basin. Flows from the basin discharge to Corio Bay via Gheringhap Street.

Council has a target for supplying 20% Annual Exceedance Probability (AEP) reliability for the drainage network. This means that under a 20% AEP design event the drainage system should capture and convey the full event below ground. It is understood that there are sections of Council's stormwater drainage that does not meet this target, but this is not unusual as some areas have concentrated flooding that is difficult or not possible to fully convey underground. The target is set to assist in assessing the performance of the current drainage network and to identify priority areas for future drainage upgrades or mitigation.

Geelong East collects via local drainage network before discharging to Corio Bay via the open channel adjacent to Limeburners Road. The modelled pipe networks are shown in Figure 2-1 showing their utilisation under a design 20% AEP event.

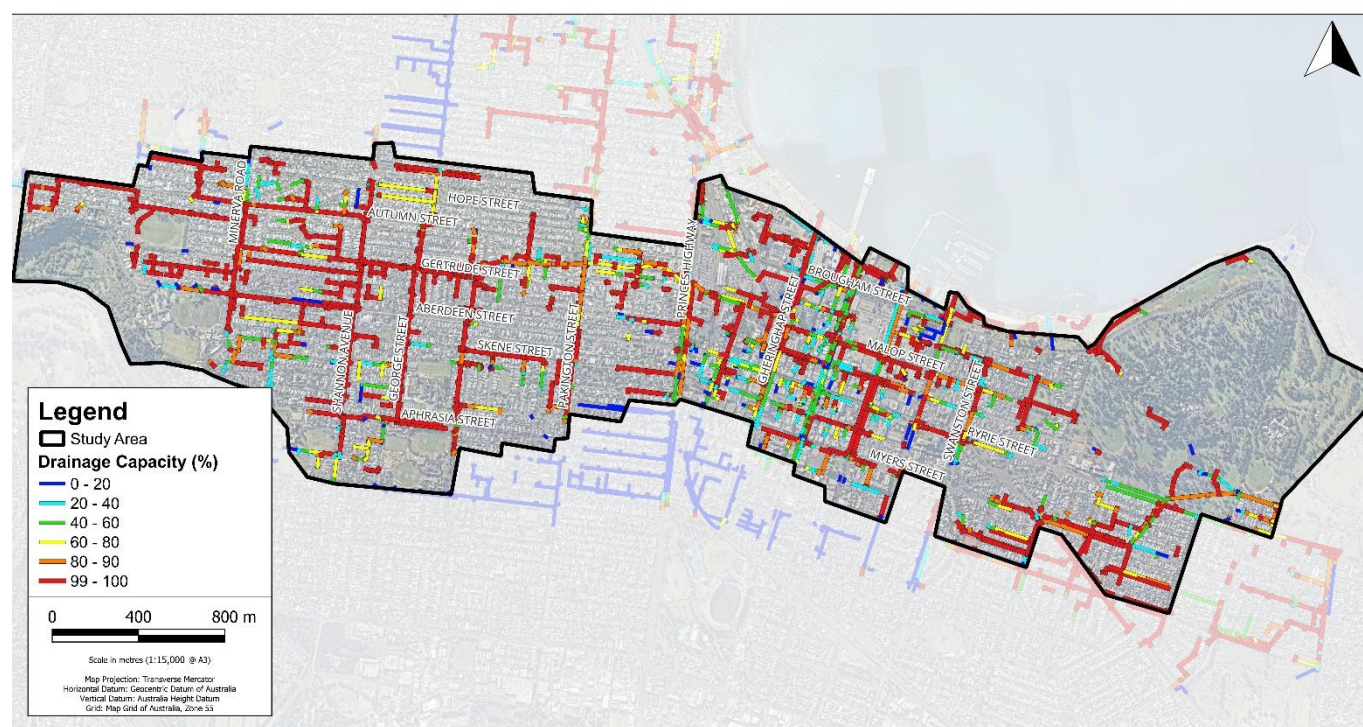


**Figure 2-1: Central Geelong CMU pipe network**

### 2.2 Flood Model Overview

Flood modelling has been used as a key tool to develop an understanding of flood behaviour relating to the Central Geelong CMU) and to guide the development of the working drainage strategy. The flood modelling allows for representation of existing drainage infrastructure, topography and proposed drainage assets and provides a range of flooding outputs based on the simulation of storm events.

The flood modelling is based on a RORB hydrological model and a TUFLOW hydraulic model. The assessment of design events has been completed using Australian Rainfall and Runoff Version 4.1 and aligns with best practice guidelines for flood modelling. The TUFLOW model includes key assets for Council including drainage pipes and pits, retarding basins and associated hydraulic control structures.

The TUFLOW model covers the full Central Geelong CMU. Key technical details and assumptions relating to the flood model are documented in the associated project reports. Flood modelling has been validated using three (3) recent events using surveyed flood markers, community supplied information and images and via community engagement of their experience during the historic events. These events allowed the model design parameters to be aligned with the catchment conditions.

The details of the model development are summarised the following documents associated with the SWMS:

- VC2044\_002-REP-002-2-CentralGeelongSWMS-HydrologyandHydraulicsReport (Engeny, February 2026)
- VC2044\_002-REP-003-1-CentralGeelongSWMS Mitigation Report (Engeny, February 2026)
- VC2044\_002-REP-001-0 Final Investigation Report (Engeny, February 2026).

## 2.3 Design Rainfall Event

The design rainfall event refers to the storm event for which development must meet appropriate flood protection standards. Based on Guidelines for Development in Flood Prone Areas (The State of Victoria Department of Environment, Land, Water and Planning, 2019) the 1% annual exceedance probability (AEP) flood, also known as the 1 in 100 year flood, is the current flood protection standard, which is used in providing flood level advice, in delineating land affected by flooding and setting requirements for most developments.

Flooding in lower magnitude storm events than the 1% AEP event is also important. City of Greater Geelong target level of service for the operation of its drainage system is the 20% AEP event (1 in 5 AEP). This report includes a review of flooding for the 20% AEP event with the current drainage system, as well as identification of drainage works to achieve a 20% cent AEP level of service.

## 2.4 Relevant Guidelines and Conditions

The Central Geelong Planning Scheme currently includes a Special Building Overlay (SBO) covering the Central Geelong CMU. This study has updated the SBO to extend east past Shannon Avenue and west past Moorabool Street.

Guidelines for Development in Flood Prone Areas (The State of Victoria Department of Environment, Land, Water and Planning, 2019) provides advice on planning of properties, buildings and structures so that they are safe from flooding from the outset without compromising the safety of other properties. Engeny has discussed with City of Greater Geelong how the conditions from these guidelines will be applied in Geelong, which can be summarised by the following:

- 0.30 metres freeboard above 1% AEP flood level is required for habitable building floor levels where buildings are impacted by overland flow paths (SBO).
- City of Greater Geelong is seeking to achieve a 20% AEP level of service, in which the underground drainage system will convey flows to Corio Bay with limited overland flow or ponding in streets and no flooding of private property.
- Properties within the SBO require a review by Council.
- Development of a Local Floodplain Development Plan.

## 2.5 Key Impacts of Flooding

In broad terms, the results show that flooding above 50 mm outside of public green space is uncommon in the 20% AEP event. Flooding above 50 mm on the road reserve and through private properties occurs in the 10% AEP and rarer events. Most of this is focussed between Shannon Avenue and Pakington Street in the 10% and 20% AEP events. These small events are generally of minor consequence in terms of impact to the study area, with the main impact being flooding from the 2% AEP event and rarer events.

The existing conditions modelling results identified several flooding hotspots within the Central Geelong CMU (Figure 2-2) including:

- 1) The overland flow path heading north down George Street (towards Gertrude Street), flooding properties where it overtops the kerb, caused by the insufficient capacity of the drainage network.

- 2) The flooding through private properties located along Gertrude Street, Laira Street, Thomas Street, Arnott Street and George Street due to the large amount of upstream flow as well as overland flow converging at the Gertrude Street and George Street intersection.
- 3) Large overland flow path, originating from Gertrude Street, heading east down Gordon Avenue, overtopping the kerb in some locations and flooding private properties.
- 4) Trapped overland flow on Transit Place and Brougham Street railway underpass caused by the low-lying terrain and made worse by the limitations in drainage capacity in the area.
- 5) Pooling of overland flow at the Gordon Avenue railway underpass caused by low-lying terrain and the insufficient amount of drainage pits to collect runoff in this location.
- 6) Trapped overland flow on Transit Place caused by the low-lying terrain and made worse by the lack of drainage network.
- 7) Ponding of overland flow in the Laneway between Winter Street and Myers Street as the current drainage network is not located in the low-point.

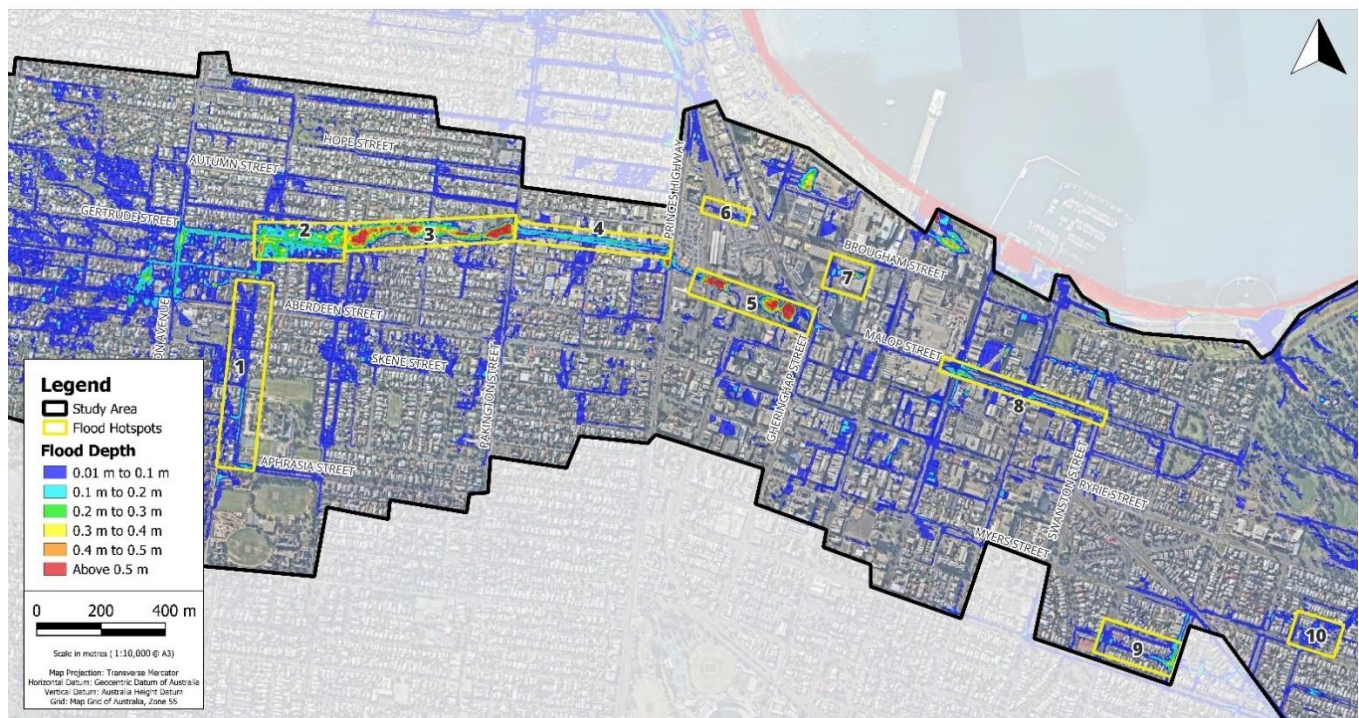


**Figure 2-2: Key Flood Hotspots – 1% AEP Event**

The number of properties experiencing above flooding is a key metric to assess and quantify the impact of design events on properties. The assessment was completed using survey of floor levels across the Central Geelong CMU to improve accuracy. Three levels of impact were assessed which are summarised in

**Table 2-1: Impacts of flooding to the Central Geelong CMU**

| Flooding Impact                                                                                               | Expected Outcome                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Property expected to have a depth of >100mm over the property (more than 1% of property impacted, up to 100%) | Minor disruption to property owner<br>Cleanup costs following the event<br>Minor property damage                                        |
| Flooding within property interacts with the building but is expected to remain below floor level.             | Damages as per above<br>Potential building damage<br>Potential isolation risk                                                           |
| Flood levels are expected to reach higher than the building floor level.                                      | All damages as per above<br>Significant rebuild costs / repair works<br>Displacement of resident<br>Emergency isolation and impact risk |

For the Central Geelong CMU the number of properties within each impacted category is summarised in Table 2-2. The highest risk properties are expected to be impacted frequently with overfloor flooding in the 20% AEP event. This Catchment management Strategy aims to outline the response to managing the flood risk within the Central Geelong CMU in context to the broader Greater Geelong strategies.

**TABLE 2-2: NUMBER OF PROPERTIES AND BUILDINGS IMPACTED IN DIFFERENT EVENTS**

| AEP Event | Properties impacted<br>(> 100 mm on property, > 1% of site inundated) | Flooding against building<br>(below floor but flood level within 300mm of floor level) | Above floor Flooding<br>(flooding overtopping surveyed floor level) |
|-----------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 20%       | 58                                                                    | 12                                                                                     | 2                                                                   |
| 10%       | 120                                                                   | 27                                                                                     | 6                                                                   |
| 5%        | 189                                                                   | 43                                                                                     | 14                                                                  |
| 2%        | 365                                                                   | 78                                                                                     | 49                                                                  |
| 1%        | 605                                                                   | 143                                                                                    | 92                                                                  |
| 0.5%      | 913                                                                   | 214                                                                                    | 151                                                                 |

### 3. DRAINAGE STRATEGY

The Stormwater Services Strategy 2020-2030 outlines the broader objectives for Geelong as well as specific strategic programs relating to the Central Geelong CMU. The Central Geelong CMU falls within the flagship Waterproofing Urban Geelong Project within this plan. This project notes that the densely urbanised sections of Geelong do not meet contemporary standards which has resulted in some areas being significantly flood prone.

This Catchment Management Strategy outlines the drainage strategy recommended following the catchment flood assessment. As outlined within the project outcomes, there are a range of actions that can be applied to the Central Geelong CMU to manage the flood risk.

#### Waterproofing Urban Geelong Project

The inner urban suburbs of Geelong such as Central Geelong, Geelong West and Rippleside often do not meet contemporary standards for urban design and stormwater management. This has created areas that are significantly flood-prone.

By implementing new drainage assets, flood warning systems, targeted drainage maintenance and planning controls, this situation can be greatly improved. These solutions can also bring further benefits to the community by delivering improved green/blue infrastructure.

Flood risk within Central Geelong CMU is expected to increase over time due to a wide range of pressures on the catchment:

- Infill development (including property densification, multi-storey apartments, office buildings, new developments and subdivisions)
- Ageing assets – assets degrade over time and performance reduces. A suitable renewal program is required.
- Historic drainage development not aligning with development – resulting in assets in locations that can limit or prohibit upgrade in the future.
- Climate change is expected to increase the frequency and severity of storms over time, putting more pressure on ageing assets.

The Stormwater Management Strategy has investigated the flood risks for the Central Geelong CMU with the purpose of identifying options that can achieve the objectives for the CMU and to align with the Waterproofing Urban Geelong Project. Details of the full mitigation assessment process are presented in the Central Geelong Mitigation Report (VC2044\_002-REP-003-1-CentralGeelongSWMS Mitigation Report, Engeny 2026). This strategy presents the outcomes from this assessment to form the strategy for the Central Geelong CMU going forward for the next 5-10 years until the strategy is re-assessed.

Broadly the management options considered fall into the following categories and following Community consultation options were assessed and modelled in detail within the Mitigation Report. The outcomes of this investigation

**Table 3-1: Management options for the Central Geelong CMU**

| Approach               | Included strategies                                                                                                                                                                                                                                      | Target objectives                                                                     |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Non-structural options | Update Municipal Emergency Response Plan (MFEP)<br>Planning controls – SBO, Floodplain Development Plan<br>Public education and engagement<br>Insurance – inform flood risk more accurately                                                              |  |
| Structural Options     | Interception options - underground storage, enlarged pipes, integrated Water Management (IWM)<br>Infrastructure upgrades – pumps and pipe capacity upgrades<br>Property specific – Voluntary Property Buyback, resilient homes program, storage at site. |  |

## 3.1 Non-Structural Options

In conjunction with the VicSES, the Stormwater Management Strategy update the Municipal Emergency Management Plan (MFEP) for the Central Geelong CMU. This updated the flood mapping and risks across the catchment with the aim for improved community resilience (via the Local Flood Guide). It is recommended that this is updated following the renewal of the flood modelling in 5-10 years' time.

The local planning controls were reviewed and the Special Building Overlay (SBO) was updated to extent over the full Central Geelong CMU. This overlay is in place to ensure that any development is aware of the flood risk and can plan appropriately to manage this risk with their design. The SBO provides an extent that identifies areas of flood risk for the 1% AEP design event against properties so that Council can review the development proposal. The [primary objective is to facilitate a process that manages flood risk for the developer and for the broader community and Central Geelong CMU as a whole.

To supplement the updated SBO, a Floodplain Development Manual was recommended to be included. The purpose of this document is to provide a document that is clear and transparent on the broader objectives of Council for developers when they are preparing a planning submission. This aims to align planning submissions with the needs and objectives of the Central Geelong CMU. The Floodplain Development Manual is embedded within the scheme under Clause 44.05-4. Planning applications must be consistent with this plan.

Community engagement by Council has been undertaken throughout the project at key stages to inform, engage and to seek feedback from the broader community. The community engagement for this project aims to raise awareness of the Central Geelong CMU current risks and the associated ongoing challenges to managing these risks via planning and structural approaches.

The flood results from this study aim to provide clarification of the flood risk across the catchment. Improved flood risk understanding allows for the community quantify the flood risk to their property and then to manage this risk via appropriate insurance. The aim of the sharing the study information is to ensure that residents are informed, prepared and can act when flood risk is present.

## 3.2 Structural Options

The Stormwater Management Strategy considered a broad array of structural options (long list of 11). The 'long list' of potential mitigation options which could be implemented to address the known flooding hotspots was assessed at a high level. Preferred mitigation options were selected from this list following discussions with Council and the community. Prior to this selection, high-level mitigation modelling was undertaken on selected mitigation works for the 20% and 1% AEP events and the resultant flood level differences were compared to the existing conditions.

Table 3.2 summarises the eleven mitigation options. It assesses the options based on four (4) primary variables:

- Benefit
  - Scale: **Low** | **Medium** | **High**
  - Considerations included: Does the option remove most above-floor flooding in the 20% AEP?; How many properties does the option remove from the flood extent / decrease the flood levels on?
- Cost
  - Scale: **Low** ( $\leq \$5m$ ) | **Medium** (between \$5m and \$20m) | **High** ( $\geq \$20m$ )
- Time to implement mitigation option
  - Scale: **Short-term** ( $\leq 1$  year) | **Medium-term** (1 to 5 years) | **Long-term** ( $\geq 5$  years)
- Can the option be implemented in stages, with each stage providing additional flood benefit?
  - **Yes** | **No**

**TABLE 3.2: SUMMARY OF STRUCTURAL MITIGATION OPTIONS**

| Mitigation Option                          | Benefit (Low, Medium, High) | Cost (Low, Medium, High) | Implementation Time Frame (Short-term, medium, long-term) | Can the option be staged? (Yes / No) |
|--------------------------------------------|-----------------------------|--------------------------|-----------------------------------------------------------|--------------------------------------|
| Voluntary Property Purchase                | High                        | Medium                   | Medium                                                    | Yes                                  |
| Voluntary House Raising                    | Medium                      | Low                      | Medium                                                    | Yes                                  |
| Raising kerbs / nature strips / roads      | Medium                      | Low                      | Short-term                                                | Yes                                  |
| Speed Humps                                | Low                         | Low                      | Short-term                                                | No                                   |
| Integrated Water Management                | Medium                      | Medium                   | Medium                                                    | Yes                                  |
| On-site Detention                          | Low                         | Medium                   | Medium                                                    | Yes                                  |
| Newtown Primary School Underground Storage | High                        | Medium                   | Medium                                                    | No                                   |
| Gertrude Street Underground Storage        | High                        | High                     | Long-term                                                 | Yes                                  |
| Gertrude Street Pipe                       | High                        | High                     | Long-term                                                 | No                                   |
| Autumn Street Pipe                         | High                        | High                     | Long-term                                                 | No                                   |
| Eastern Geelong Pipe Upgrades              | Medium                      | Low                      | Medium                                                    | Yes                                  |

The selected mitigation options from the Council and community engagement were then assessed in greater detail. Three (3) detailed large structural options were assessed using the hydraulic model to test the broader mitigation options for fixing the flood problems within the CMU. The options are discussed in Table 3-1.

**Table 3-3: Structural management options for the Central Geelong CMU**

| Approach                                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Target objectives                                                                                                                                                              | Recommended Action                                                                                                                                                     |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gertrude Street Diversion Pipeline (Mitigation Option 1) | <p>Can be staged:</p> <ul style="list-style-type: none"> <li>– Stage 1 – pipeline between Princes Hwy and Gheringhap St.</li> <li>– Stage 2 – pipeline from Pakington Street and Princes Hwy.</li> <li>– Stage 3 – pipeline between George Street and Pakington St.</li> </ul> <p>Approximate cost \$38.7m over the three stages. Benefit to Cost ratio of 0.1 (costs exceed benefits). Main benefit is in larger events where overfloor flooding is reduced in the 1% AEP from 92 (existing) to 54 properties.</p> <p>Some impacts to Johnston Park flood levels and downstream of this location.</p> | <br> | <p>Mitigation option not possible under current mitigation funding. State funding would be required to implement.</p> <p><b>Not recommended for implementation</b></p> |

|                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                       |                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Gertrude Street Pipe and Storage<br/>(Mitigation Option 2)</p>                                    | <p><b>Can be staged:</b></p> <ul style="list-style-type: none"> <li>– Stage 1 – 1200mm pipe along Gertrude Street, with 750mm pipe down Pakington Street.</li> <li>– Stage 2 – 2400mm pipe storage on Gertrude Street.</li> <li>– Stage 3 – 1800mm pipe storage on Gertrude Street.</li> </ul> <p>Approximate cost \$8.4m over the three stages. Benefit to Cost ratio of 0.29 (costs exceeds benefits). More localised benefits as compared with Mitigation Option 1. Stage 3 is optional to save costs.</p> <p>Limited impact on Johnston Street and downstream to Corio Bay.</p> <p>This option can be linked to IWM along Gertrude Street including pervious paving, raingardens, tree storage pits and green transport options like a bikeway.</p>                                                                                                                                                                     |    | <p>Mitigation exceeds annual budget however staging makes the option more feasible. Likely to require additional funding sources.</p> <p><b>Not recommended to be implemented at this stage</b></p>                                                                                                                 |
| <p>Underground Storage at Churchill Reserve and Newtown Primary School<br/>(Mitigation Option 2)</p> | <p><b>Can be staged (or either or constructed)</b></p> <ul style="list-style-type: none"> <li>– Churchill Reserve</li> <li>– Newton Primary School</li> </ul> <p>Approximate cost \$8.5m for both storages. Benefit to Cost ratio is 0.30 (costs exceed benefits). Benefits are more widespread due to upstream locations. Benefits mainly for events up to the 5% AEP event. Larger events exceed the tank capacity. The 20% AEP impacted property is removed in this mitigation scenario.</p> <p>Some localised impacts around the tank sites, however these are limited. Additional maintenance requirements for Council.</p> <p>Option to integrate IWM into the design for some capture and reuse and on street IWM to supplement the systems. Option to enhance Churchill Park and Newtown Primary School oval.</p>                                                                                                   |   | <p>Tanks can be build separately however are likely to exceed mitigation funding budgets. Will require additional funding sources.</p> <p><b>Not recommended to be implemented at this stage unless alternative funding is found</b></p>                                                                            |
| <p>IWM Options – Tree pits, rain gardens, permeable paving</p>                                       | <p>IWM options across the Central Geelong CMU were limited due to the density of the catchment and level of development. Opportunity was identified for progressive use of IWL to achieve incremental water interception and to improve the green footprint for the CMU.</p> <p>Suggested programs are to develop IWM deployment via:</p> <ul style="list-style-type: none"> <li>– Tree pits (underground storage, used to water tree over time)</li> <li>– Rain gardens (water quality improvement and some temporary detention)</li> <li>– Permeable pavement (improve infiltration)</li> </ul> <p>These programs are recommended to be integrated into new developments and coupled with projects like asset renewal. They do introduce additional maintenance requirements but one enough of these are present within the catchment there can be an impact on frequent floods and improved water quality and reuse.</p> |  | <p>Limited flood benefit to IWM options, hence not modelled for flood benefit. Aligns with objectives of improve green cover across the CMU, water quality and interception goals.</p> <p><b>This option is recommended for adoption by Council via the Floodplain Development Manual and internal programs</b></p> |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                          |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Lot scale onsite detention</p> | <p>Lot scale detention aims at intercepting runoff within the lot and is would be deployed with new development applications (new builds, subdivisions, offices and high-rise apartments). The objective is to reduce the flows from the site to current levels or beyond using rainwater tanks, storage pipes, leaky tanks and smart tanks.</p> <p>Applied primarily to new development but has potential to align with Precinct Structure Plans (PSP) for improved outcomes and could be used to retrospectively fit to older homes.</p> <p>Integrate these options within the Floodplain development Manual for inclusion in planning outcomes.</p> | <br><br> | <p>Limited flood benefit but protects against development increases in runoff.</p> <p><b>Recommended to encourage the use of these strategies in new development and PSPs vis Planning Controls.</b></p> |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3.3 Planning Scheme Controls

As the structural mitigation options are limited within the CMU, to manage flood risk it is recommended to use planning controls to enhance future safe development. The Geelong SWMS has developed and updated the planning controls for the Central Geelong CMU. A summary of the updated and recommended planning controls is summarised in Table 3-4.

**Table 3-4: Planning management options for the Central Geelong CMU**

| Approach                                      | Description                                                                                                                                                                                                                                                                                       | Target objectives                                                                                                                                                              | Recommended Action                                                                                       |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <p>Updated Special Building Overlay (SBO)</p> | <p>The SBO was updated to reflect current modelling for the 1% AEP event. The modelling has been validated to three (3) historical events and multiple recorded flood marks.</p> <p>The SBO should be exhibited for feedback from the Community before adoption within the Planning Controls.</p> | <br> | <p>The SBO is recommended to be developed and applied to the Central Geelong CMU.</p>                    |
| <p>Local Floodplain Development Manual</p>    | <p>The Local Floodplain Development Manual provides planning controls specific to the Central Geelong CMU. This is in addition to the Victorian Planning Provisions.</p>                                                                                                                          | <br> | <p>The Local Floodplain Development Manual is recommended to be adopted within the planning updates.</p> |

## 4. WORKING DRAINAGE STRATEGY

### 4.1 Strategy Overview

The Working Drainage Strategy for the Central Geelong Catchment Management Unit (CMU) has been developed based on the outcomes of the catchment flood assessment, option evaluation, community engagement, and alignment with the City of Greater Geelong Stormwater Services Strategy 2020–2030.

The strategy recognises that the Central Geelong CMU is a highly constrained, densely urbanised catchment with significant flood risk driven by historic infrastructure limitations, ongoing infill development, and increasing climate pressures. While several large-scale structural mitigation options were assessed, none were found to be cost-effective or deliverable within current funding constraints.

Accordingly, the adopted Working Drainage Strategy focuses on:

- Immediate risk reduction through planning and non-structural measures
- Incremental and opportunistic structural improvements
- Protection against future increases in flood risk
- Maintaining flexibility to deliver major infrastructure should funding opportunities arise
- Periodic review as flood modelling and policy settings are updated.

The strategy is structured across short-term, medium-term, and long-term horizons, with a commitment to review and adapt over time. It is expected that a review of the flood mapping should be conducted within 5 years to ensure the flood guidance remains consistent with best practice guidelines and captures development within the Central Geelong CMU.

### 4.2 Short-Term Actions (0–5 Years)

The short-term focus is on strengthening planning controls, improving preparedness and resilience, and embedding flood risk management into everyday decision-making and minor capital works.

Key actions include:

- Adoption of updated planning controls
- Exhibit and formally adopt the updated Special Building Overlay (SBO) based on the validated 1% AEP flood modelling.
- Apply the SBO consistently across all development and subdivision applications within the CMU.
- Introduce a Floodplain Development Manual to provide clear, site-specific guidance for developers, designers, and planners.
- Embed requirements for finished floor levels, safe access, on-site detention, and integrated water management within planning decision-making.
- Emergency management and community resilience
- Update the Municipal Flood Emergency Plan (MFEP) using the revised flood extents and risk information.
- Continue community engagement to improve awareness of flood risks, response actions, and preparedness.
- Incremental mitigation works
- Deliver low-cost, localised works such as raising kerbs, adjusting nature strips, minor pit and pipe upgrades where practical.
- Integrate these works into routine asset renewal and maintenance programs.
- On-site detention and IWM in new development
- Control lot-scale on-site detention, rainwater tanks, and smart storage systems in new developments and significant redevelopments.

- Ensure no net increase in peak runoff from redevelopment sites.
- Integrated Water Management
- Develop further IWM goals and strategies for staged implementation of urban greening and infiltration projects.

## 4.3 Medium-Term Actions (5–10 Years)

The medium-term strategy aims to progressively improve catchment performance through coordinated investment, renewal, and opportunistic infrastructure upgrades.

Key actions include:

- Asset renewal and targeted capacity upgrades
- Prioritise pipe renewals and capacity upgrades in known flood hotspots when assets reach the end of service life.
- Focus upgrades on improving conveyance for frequent storm events (up to the 20% AEP level of service) as identified in the SWMS.
- Expansion of Integrated Water Management (IWM) programs
- Roll out catchment IWM measures such as:
  - Tree pits with underground storage, Rain gardens and biofiltration systems and permeable pavements
  - Integrate IWM delivery with streetscape upgrades, open space works, and transport projects.
- Ensure IWM is included within Master planning documents and large-scale developments.
- Investigation of alternative funding pathways
- Actively pursue state and federal grant funding for flood mitigation infrastructure.
- Explore partnership opportunities with education facilities, sports reserves, and other public landowners for multi-purpose storage outcomes.
- Detailed business case development
- Reassess selected large-scale structural options (such as underground storage) should external funding or strategic opportunities arise. Take these options further along the design path to reduce delivery risk.
- Refine cost estimates, staging approaches, and benefit-cost ratios based on updated modelling.

## 4.4 Long-Term Actions (>10 Years)

The long-term strategy maintains readiness for transformational mitigation while ensuring the system can adapt to future conditions.

Key actions include:

- Major infrastructure delivery if funding becomes available
- Implement large-scale structural measures (e.g. underground storage or trunk drainage upgrades) only where external funding or strategic alignment supports delivery.
- Stage delivery to maximise benefit while managing disruption and cost.
- Catchment-wide performance review
- Update flood modelling approximately every five (5) years to reflect climate change guidance, land-use change, and completed mitigation works.
- Reassess flood risk, levels of service, and mitigation priorities.
- Policy and planning adaptation
- Update planning controls, design standards, and development guidance as required based on revised risk profiles.
- Continue the shift towards a Water Sensitive City through increased greening, interception, and reuse.

## NOW

### What Council is doing now

#### (0–5 years)

- Clear planning rules for high flood risk areas
- Improved flood emergency planning and local flood guides
- Continued community engagement
- Scoping large scale mitigation options
- Forward planning for strategic growth in the Geelong CMU
- Develop IWM Strategy for incremental water quality and detention over time

## NEXT

### What happens next

#### (5–10 years)

- Strategic asset renewal to improve system reliability and resilience
- Increased IWM, more street trees, rain gardens and water-sensitive design
- Linking drainage upgrades with road and open-space projects
- Seeking State and Federal funding for larger mitigation projects
- Review and update flood mapping and strategy

## FUTURE

### Long term plans

#### (10+ years)

- Major drainage upgrades if funding becomes available
- Regular review of flood maps as the city grows and changes
- Updating planning rules as flood risk and climate change evolve
- Ensure SWMS aligns with broader policy, IWM strategy and community expectations

## 5. SUMMARY

The Working Drainage Strategy for the Central Geelong CMU deliberately adopts a risk-based and adaptive approach, acknowledging both the severity of existing flood risks and the limitations of a developed urbanised catchment. Given the developed state of the CMU there are ongoing difficulties in developing flood mitigation projects.

Hence, rather than relying on a single major infrastructure solution, the strategy:

- Prioritises protecting people and properties via passive means (planning controls, engagement, education of flood risk).
- Prevents further deterioration of flood risk from new development (managing risk to the drainage system through increased urban runoff).
- Delivers incremental improvements over time via opportunistic upgrades (i.e. to align with development or asset renewal).
- Positions Council to respond decisively if funding or policy settings change (for major mitigation strategies).

This approach aligns with the objectives of the Stormwater Services Strategy 2020–2030 and supports the long-term vision of a healthier, more resilient, and more liveable Central Geelong.

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