

## Objective 4: Enhanced community education, flood awareness and preparedness

Understanding the extent and full impacts of flooding is essential for planning for potential future pressures on the drainage system arising from climate change and infill urban development.

Equally important is the capacity to share this information and engage with other stakeholders and the community.

Melbourne Water and councils have made flood information available to property purchasers and developers by including information in municipal planning schemes and updating property information statements.

Once flooding information is shown on planning scheme maps, it is also made available on planning certificates issued as part of any transfer of land documentation.

Melbourne Water and councils have individually notified approximately 120,000 affected landowners and occupiers as part of the planning scheme amendment process.

However, there is still a significant gap between community and agency flood awareness and knowledge.

The risks associated with flooding, and urban flash flooding in particular, are poorly understood in the community.

Apart from general flood awareness and preparation information available on a small number of local government and agency web sites, there is little specific information available on flash flooding from extreme weather events.

In addition, there is little or no information on flash flooding relating to specific areas.

Few community education flooding awareness and preparedness campaigns have been developed or implemented on a regional basis.

This lack of understanding limits the effectiveness of flood warning systems and the community's ability to prepare and respond to emergencies.

More community education and awareness programs would assist in raising levels of preparedness, aid response and recovery activities, and reduce the impacts and trauma associated with flooding.

The community education strategies adopted by Victoria's fire response organisations (Country Fire Authority, Department of Sustainability and Environment, and the Metropolitan Fire Brigade) provide examples of the success of such awareness programs.

These strategies reinforce the benefits of improved broad community awareness in enabling appropriate management actions to be undertaken by the community and individuals before, during and after an emergency situation.





Melbourne Water fact sheet

**Challenges**

Floods are a natural event and although we will develop a program to reduce intolerable flood risk over time, flooding will continue to occur across the region.

There is a need to increase the degree of flood awareness and preparation across all levels of the community.

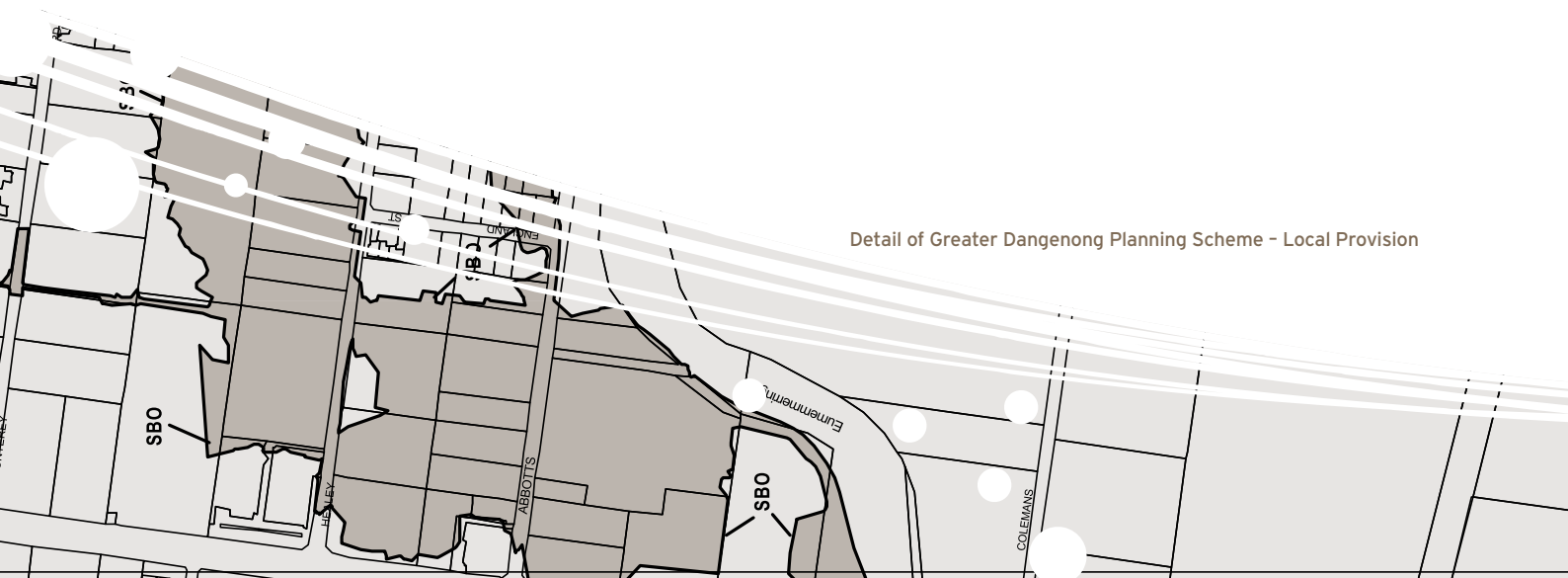
Further effort is also required in the development of warning systems for urban catchments affected by overland flooding.

Work to be undertaken to understand the relative vulnerability of communities will assist in the development of these programs. However, historically there has been no single Victorian agency with clear responsibility for the development and implementation of community awareness, engagement and education programs focused on urban flooding.

The Victoria State Emergency Service is currently exploring options for the development of an enhanced total flood warning system including community education in flood risk for the State.

**Action**

- 4.1 A community flood education, awareness and preparedness program, including flood warning, will be developed and implemented for the Port Phillip and Westernport region in partnership with Victoria State Emergency Service, and other key stakeholders.



## Objective 5: Agreed responsibilities and improved collaboration between flood management agencies

Historically, Melbourne Water has responded to flood events by undertaking engineering works to improve flood protection. However it is not practical to build infrastructure capable of alleviating all flooding.

While intolerable risk areas will continue to be identified and addressed, there are many other flood management tools that can be used in combination to reduce and manage the overall risks posed by flooding.

These tools include planning controls, flood warning systems, and programs of education, response and recovery.

The broad parameters defining and governing drainage and flood management mean that no single agency can undertake all necessary activities on its own.

Collaboration between flood management agencies is essential for developing co-ordinated and integrated flood management programs and activities.

Such collaboration must recognise that key agencies involved in flood management may differ in mandate.

Some agencies such as councils deliver a spectrum of community services. Other agencies such as the Victoria State Emergency Service and Department of Human Services have a more specialised focus and are uniquely positioned to provide specific skills and resources where needed.

Melbourne Water, councils and flood management stakeholders have recognised the need for an integrated and sustainable approach where responsibility for activities is assigned on the capability of the agency to deliver.

Examples of the key agencies providing specialised flood management skills and services include:

- The **Department of Sustainability and Environment** has the primary responsibility for the development of strategies and policy in relation to flood and stormwater management at a State-wide level.
- The **Victoria State Emergency Service** are responsible for flood response as well as assisting councils with their Municipal Emergency Management Planning, and can assist councils with education, awareness, warning systems and emergency management planning.
- The **Department of Human Services** impart expertise in emergency recovery management, and can assist with the development of Municipal Emergency Management Plans and public health sub plans.
- Councils undertake Municipal Emergency Management Planning, (Flood sub plans), provide community support, damage cleanup, and are responsible for administration of planning and building controls.
- **Melbourne Water** has primary responsibility for identification of flood extents, providing flood warning advice for major waterways, controlling development in floodplains, providing advice on flooding to local councils and the community, developing plans, and undertaking actions to minimise flooding and flood damage in the Port Phillip and Westernport region.

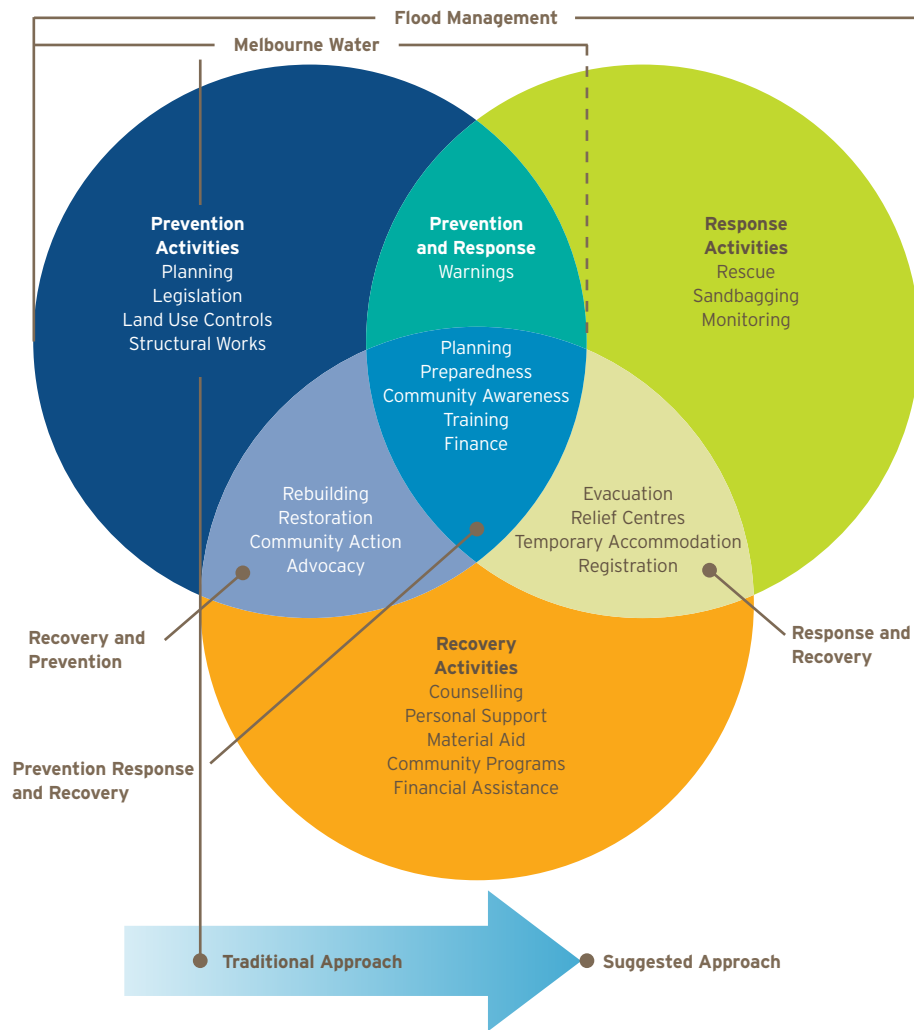


Figure 9. Engendering a more collaborative approach. Under this model Melbourne Water would become more involved in response and recovery activities.

## Challenge

Flood management agencies in the region are effective in dealing with immediate responsibilities, and much has been achieved in reducing flood risks.

However recent reviews identify opportunities to strengthen regional flood management arrangements through greater collaboration and more efficient resource use.

Reviews that support this view include the Flood Warning Service Development Plan for Victoria, Victorian Flood Warning Consultative Committee (2005), and Managing Stormwater Flooding Risks in Melbourne, Victorian Auditor-General's Office (2005).

It is a challenge to co-ordinate the activities of the numerous flood management agencies that operate under different mandates and legislation, and have different priorities, resources and capabilities.

There is currently no clear process or planning framework for flood management which brings together relevant agencies and groups and allows for community input to the development of integrated flood management activities at the State, regional, catchment or municipal level.

It is anticipated that such a framework will coordinate and consolidate the various flood management initiatives identified by this strategy.

## Action

- 5.1 Melbourne Water will work with the State Flood Policy Committee, Office of the Emergency Services Commissioner and other stakeholders to develop and implement an integrated flood management planning framework for the region.
- 5.2 Melbourne Water will provide technical and financial assistance to councils that have identified flood risk for the preparation and review of flood management plans.



# GLOSSARY

## **Annual Exceedance Probability (AEP)**

The likelihood of occurrence of a flood of a given size or larger in any one year; usually expressed as a percentage. For example, if a peak flood discharge of 500m<sup>3</sup>/s has an AEP of 5%, it means that there is a 5% risk (i.e. probability of 0.05 or a likelihood of 1 in 20) of a peak flood discharge of 500m<sup>3</sup>/s or larger occurring in any one year.

## **Average Annual Damage (AAD)**

The total damage caused by all floods over a period of time divided by the number of years in that period. If the damage associated with various annual events, (the consequences) is plotted against their probability of occurrence, the AAD is equal to the area under the consequence-probability curve.

## **Average Recurrence Interval (ARI)**

A statistical estimate of the average period in years between the occurrence of a flood of a given size or larger (e.g. floods as big or larger than the 100 year ARI flood event will occur on average once every 100 years). The ARI of a flood event gives no indication of when a flood of that size will occur next.

## **Catchment**

The area of land draining to a particular site. It always relates to a specific location and includes the catchments of tributary streams as well as the main stream.

## **Development**

The erection of a building or the carrying out of work, including the placement of fill, the use of land or a building or work, or the subdivision of land.

## **Infill development**

The development, within an existing subdivision, or vacant blocks of land that are generally surrounded by developed properties; conditions may be imposed on infill development (e.g. minimum floor levels).

## **Redevelopment**

Rebuilding an area under the current or a similar land use zoning - as urban areas age, it may become necessary to demolish and reconstruct buildings.

## **Flash flooding**

Sudden and unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding.

## **Flood awareness**

An appreciation of the likely effects of flooding and knowledge of the relevant flood warning, response and evacuation procedures. Flood awareness allows landholders to defend themselves, their property and their community from flood threats and to effectively evacuate themselves and their possessions when necessary. In communities with a high degree of flood awareness, the response to flood warnings is prompt and effective. In communities with a low degree of flood awareness, flood warnings are liable to be ignored or misunderstood, and residents are often confused about what they should do, when to evacuate, what to take with them and where it should be taken. The principal driver determining the degree of flood awareness of a community is usually the frequency of moderate to large floods in the recent history of the area.

## **Flood damage**

The tangible (direct and indirect) and intangible costs (financial, opportunity costs, clean-up) of flooding. Tangible costs are quantified in monetary terms e.g. damage to goods and possessions, loss of income or services in the flood aftermath. Intangible damage is difficult to quantify in monetary terms and include the increased levels of physical, emotional and psychological health problems suffered by flood affected people and attributed to a flooding episode.

## **Flood emergency plan**

An agreed set of roles, responsibilities, functions, actions and management arrangements to deal with flood events of all sizes. Such plans describe flood warning, defence, evacuation, clean-up and recovery arrangements. A local flood emergency plan forms an essential component of a floodplain management plan.

## **Floodplain**

Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation by the probable maximum flood.

**Flood prone land**

Land subject to inundation by the probable maximum flood. Floodplain management plans should encompass all flood prone land, rather than being restricted to land subject to defined flood events.

**Flood storage areas**

Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity.

**Hydraulic analysis**

The study of the flow of water in waterways. In particular, the evaluation of flow parameters such as water level, extent and velocity.

**Hydrologic analysis**

The study of water and its constituents as they move through the natural processes that constitute the hydrological cycle i.e. rainfall, runoff, evaporation, and infiltration.

**Overland flooding**

Inundation by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local runoff exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage systems to overflow.

**Probable Maximum Flood (PMF)**

The largest flood that could conceivably occur at a particular location. The PMF defines the extent of flood prone land. It is difficult to define a meaningful annual exceedance probability for the PMF event. It is commonly assumed to be in the order of 1 in 10,000 to 1 in 1,000,000.

**Residual flood risk**

The remaining level of flood risk that a community is exposed to after floodplain management measures to reduce risk have been implemented i.e. "untreated" flood risk. Residual risk varies with flood severity and may be substantial for flood events that are larger than the defined flood event adopted for planning purposes or for the design of structural works.

**Risk**

Risk is defined (Standards Australia/Standards New Zealand, 2004) as the chance of something happening that will have an impact on objectives. It is derived from a combination of consequences and likelihood (or probability).

**Risk analysis**

A systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences, in order to establish the level of risk. This is normally undertaken as part of a flood study.

**Risk assessment**

The process used to determine risk management priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels or other criteria.

**Risk identification**

The process of determining what can happen, why and how.

**Risk management**

The systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk.

**Risk treatment**

Selection and implementation of appropriate options for dealing with risk.

**Runoff**

The amount of rainfall that enters the stormwater drainage system, (underground pipes, overland flow paths, floodway, and waterways) after losses such as infiltration have been taken into account.



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