



**TOOWOOMBA
REGION**

TOOWOOMBA OVERLAND FLOW PATH STUDY

Know your overland flow risk

September 2026



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Prepared in collaboration with



AECOM

Remember: Even shallow water can be dangerous. As little as 15 cm of fast-moving water can make it difficult to remain standing, and 30 cm of flowing water can move many vehicles. If you encounter flowing water, turn around.

THE JOURNEY SO FAR

Since the devastating floods of 2011 and the subsequent Qld Floods Commission of Inquiry, Council has been working to build a better understanding of flood and overland flow risk across our region. As part of this work, Toowoomba Regional Council engaged AECOM to undertake detailed studies and update flood and overland flow mapping to help the community understand where flooding may occur and what their overland flow risks are. Significant mitigation works have also been constructed since this time. This includes detention basins and culvert upgrades on East and West Creek and stormwater network improvements in the Toowoomba City area.

Council's new Toowoomba Overland Flow Path Study is the next step in this journey. It identifies the paths where heavy rainfall collects and travels toward the creeks.



WHAT IS OVERLAND FLOW?

Water naturally follows the lowest path across a surface. Overland flow is rainwater that flows across the ground, travelling downhill through streets, parks, backyards, easements and other low-lying areas before eventually reaching a drain, gully, creek or river.

Overland flow can be dangerous as it often develops very quickly and can occur in areas where people do not expect water flow to occur. It can occur within minutes of heavy rainfall and there is often little warning time. As large areas of Toowoomba are quite steep, this water can also be fast moving. Even when relatively shallow, fast-moving water can be dangerous.

Overland flow is different from creek flooding

In simple terms, overland flow is rainwater that travels downhill across the land towards a creek, river or other waterway. Creek flooding occurs when creek, river or waterway fills up and spills over its banks, inundating the surrounding floodplain. Overland flow and creek flooding can occur separately or at the same time, so they are often assessed and mapped separately to help clarify where each type of risk may occur.



Overland Flow



Creek Flooding

Caused by intense local rainfall

Caused by rivers or creeks overflowing

Can occur anywhere

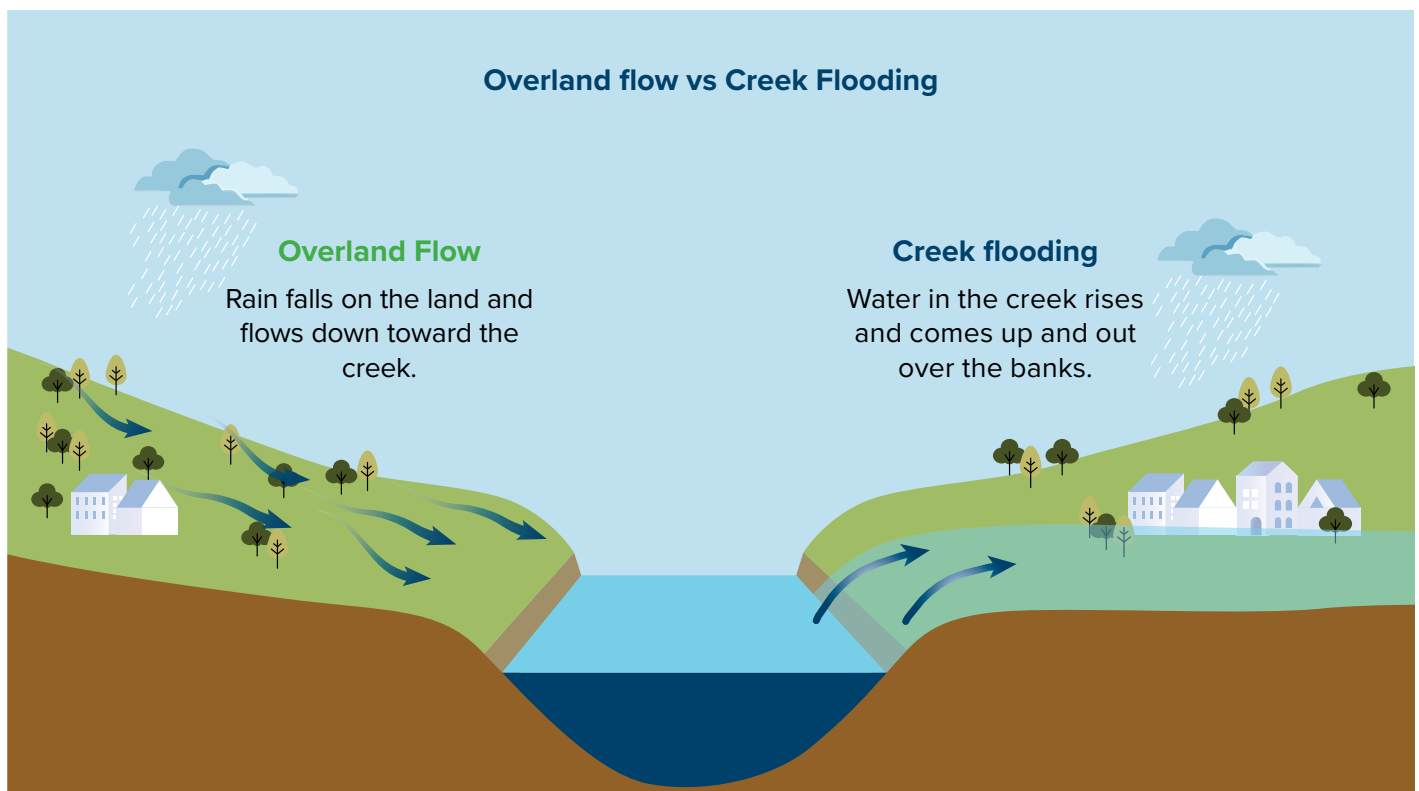
Usually affects floodplains near waterways

Often develops quickly

Usually develops over several hours or days

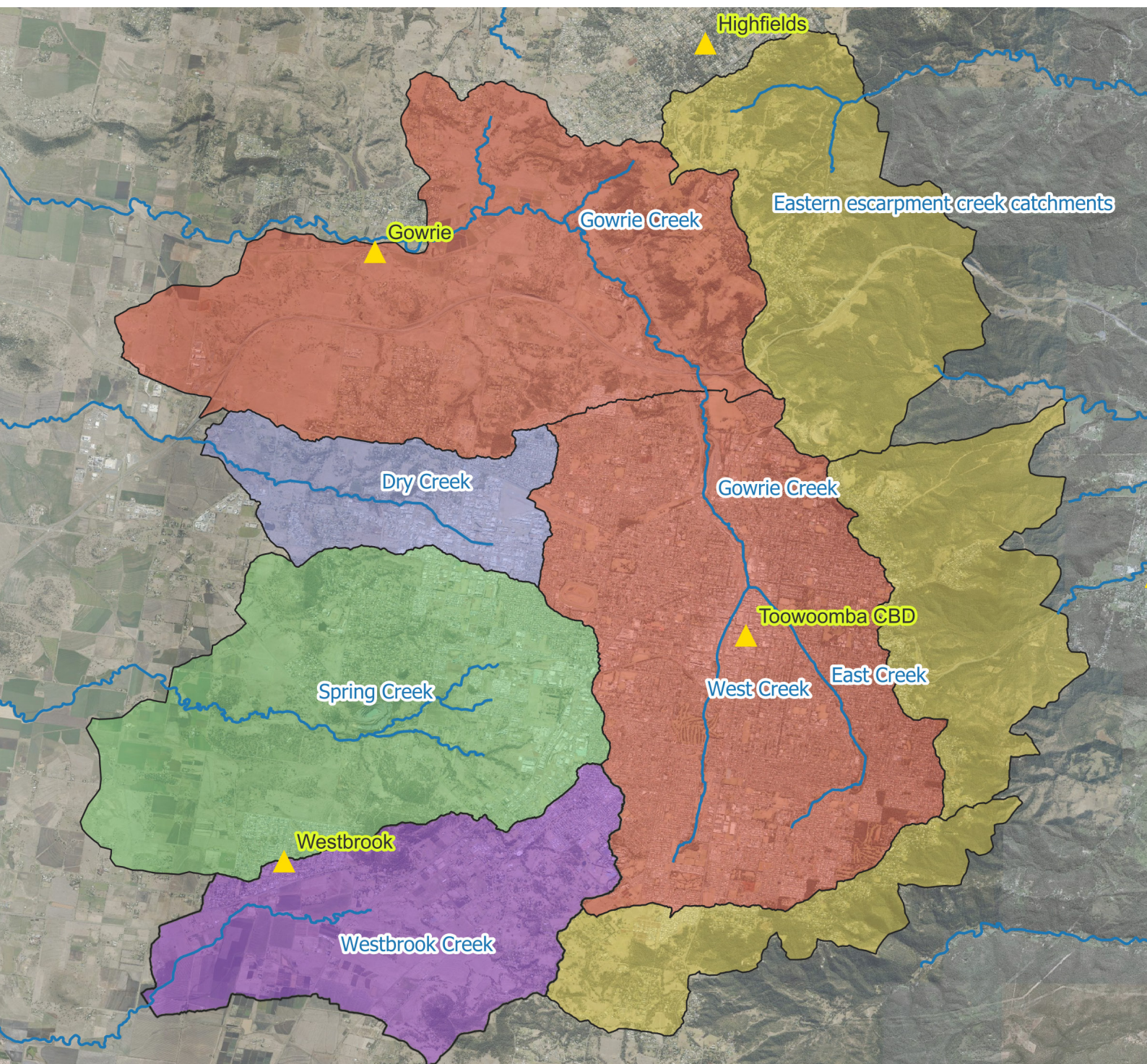
Follows streets and low points

Spreads from creeks onto surrounding land



THE TOOWOOMBA OVERLAND FLOW PATH STUDY

The new Toowoomba Overland Flow Path Study (TOFPS) covers the urban areas of Toowoomba City. This includes the Gowrie Creek, Westbrook Creek, Spring Creek, Dry Creek and Eastern escarpment creek catchments. This study only investigated overland flow and sought to identify major flow paths where localised overland flow may occur during significant rain events and the associated level of risk. Creek flooding was not considered in this study as this has already been covered in Council's previous body of work and is currently available on the Flood Risk Information Portal.



HOW WILL THE STUDY BE USED?



Improve understanding of overland flow risk across Toowoomba and identify areas where overland flow is higher, more continuous and more likely to follow natural low points across the city during intense rainfall.



Support safer planning and development decisions by providing clearer information about existing and future overland flow risk, including potential climate change impacts.



Help Council prioritise future drainage investigations, mitigation options and infrastructure improvements where they are likely to provide the greatest community benefit.



Strengthen emergency management, community preparedness and long-term resilience by improving access to consistent overland flow information.



Provide a long-term framework to guide future studies and help reduce overland flow risk across Toowoomba over time.

HOW WAS THE STUDY UNDERTAKEN?

A rigorous, data-driven approach to understanding overland flow and managing overland flow



Data Collection & Review

- Collate and review existing studies, reports and data
- LiDAR topography and aerial imagery
- Rainfalland catchment conditions
- Asset, land use and planning data
- Community knowledge and past flood experience

Survey & Mapping

- Ground survey and verification of features
- Building floor level survey and validation
- Drainage network and asset mapping
- Update catchment and terrain information

Model Development & Updates

- Update hydrologic (rainfall-runoff) models
- Update hydraulic models
- Refine model parameters and boundary conditions
- Incorporate climate change projections

SUMMARY

KEY INPUTS	OUTCOMES	ONGOING BENEFIT
Topography (LiDAR)	Updated overland flow maps	Better planning and development outcomes
Rainfall & Climate Data	Overland Flow Risk Assessment	Targeted infrastructure investment
Building & Asset Information	Overland Flow Hotspots	Improved emergency management
Land Use & Planning Data	Risk Management Plan	Stronger, more flood resilient community
Community Knowledge	Prioritised Actions & Investments	

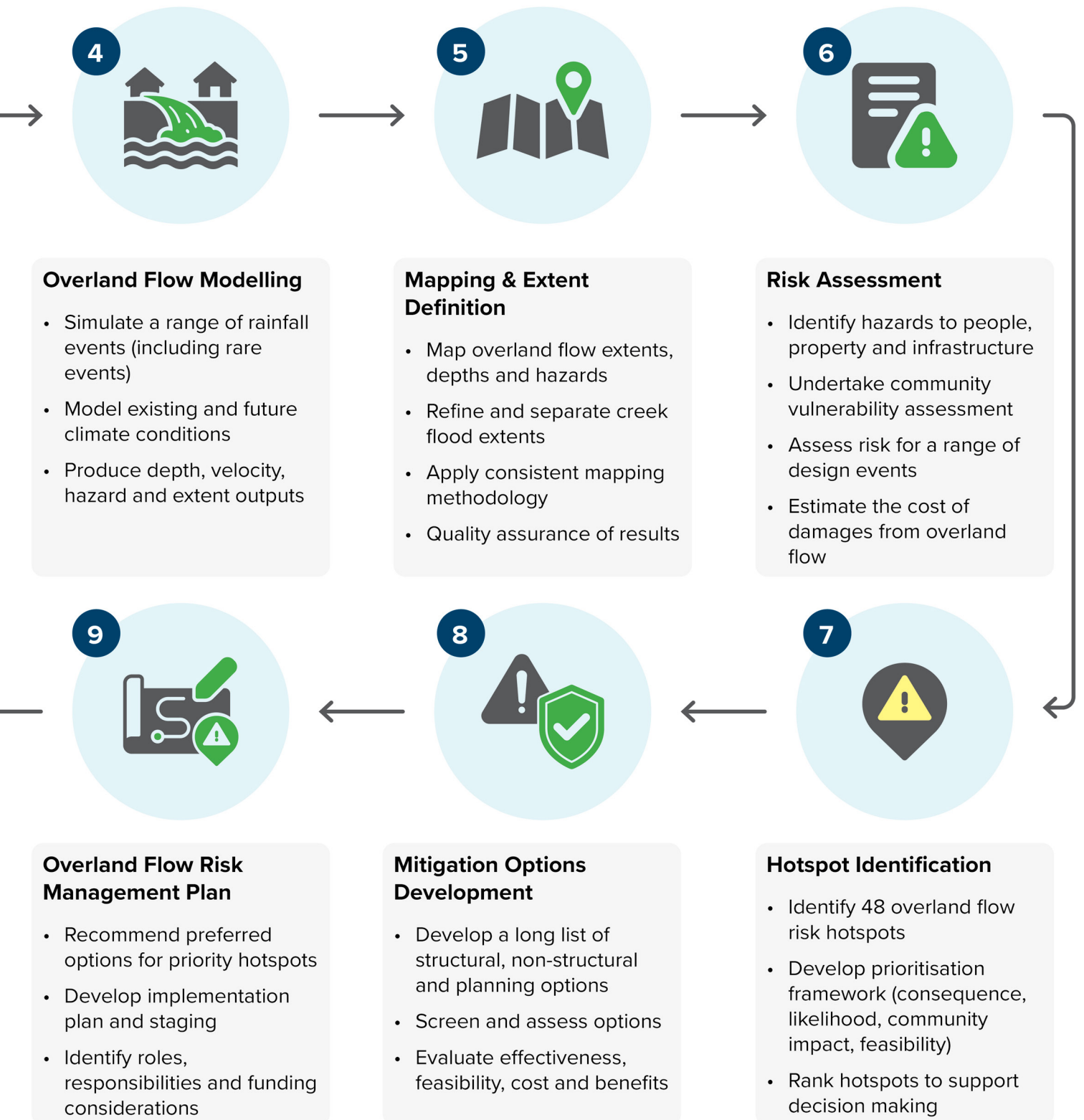
Framework Alignment

This workflow follows the principles of the: **Australian Disaster Risk Management Framework, Queensland Flood Risk Management Framework**



Community Engagement & Communication

- Engage with the community and key stakeholders
- Share results, maps and proposed actions
- Respond to queries
- Support community overland flow readiness and awareness



WHAT DID THE STUDY FIND?

Better information helps us make better decisions.



Where is the risk?

The study has identified areas where overland flow is at a higher risk across the City. Even if your property isn't affected, local roads or nearby areas might be. It's important to be aware of overland flow risks in your neighbourhood.



Major overland flow paths

All properties can be subject to overland flow, but this study focussed on identifying those areas where water is more likely to build up or flow strongly during heavy rain. These are usually natural low points which feed into our creeks and river systems.

Council will use this information to help focus future investigations and possible drainage upgrades in areas with the greatest risk.



Engineering solutions have limits

Managing overland flow in an established urban area is challenging. This study identified that while engineering works could help reduce the likelihood or severity of overland flow in some locations, engineering works alone cannot eliminate overland flow risk everywhere.



Community resilience matters

Being prepared before heavy rainfall remains one of the best ways to reduce impacts. Taking proactive steps can help manage overland flow on your property to minimise damage to buildings and property if you are in an overland flow path



Planning is important

Effective planning and development controls will help communities become more resilient by ensuring that future development is designed and located to consider and accommodate natural overland flow rather than blocking it and increasing the risk.



Rainfall is predicted to increase in the future

The intensity of heavy rainfall, particularly for short storms, is predicted to increase in the future. As a result, overland flow is expected to become more frequent and more severe in some urban areas, highlighting the importance of understanding and planning for future risk.



We all have a role

Overland flow risk cannot be completely eliminated, particularly during very large storms.

Through smart future development, drainage improvements, property level improvements and community education we can reduce the impacts from overland flow over the long term.

View the Study Outputs



PDF overland flow maps
(Hydraulic Risk for all events
but only moderate to high risk
categories)

[https://www.tr.qld.gov.au/
overlandflow](https://www.tr.qld.gov.au/overlandflow)



Flood risk mapping and
information portal

[https://www.tr.qld.gov.au/
Council/Mapping/Flood-risk-
mapping](https://www.tr.qld.gov.au/Council/Mapping/Flood-risk-mapping)



Flood and overland flow
information and previous
studies

[https://www.tr.qld.gov.au/
Council/Council-governance/
Plans-strategies-and-reports/
Flood-Studies](https://www.tr.qld.gov.au/Council/Council-governance/Plans-strategies-and-reports/Flood-Studies)

Contact council for full Technical Report and additional mapping

OVERLAND FLOW PATH MAPPING

The maps shown have been derived from an assessment of overland flow risk across a range of storm events, from frequent through to very rare events. This helps to identify consistent flow paths where deeper, faster or more concentrated flow may create greater risk.

These areas are considered higher risk because they are the places where water is more likely to concentrate and continue moving during heavy rainfall. Building or developing in natural flow paths can therefore have a higher likelihood of overland flow impacts than areas affected only by isolated pockets of water.

It is important to remember that overland flow can still occur outside mapped flow paths, as each storm and local conditions can affect where water travels.

The maps have been provided as a series of images across the study area and show the level of overland flow risk for each location. The risk categories are explained in the table below

Medium Risk

Overland flow may cause noticeable inundation of roads, parks, or private property during significant rainfall events. Water depths or flow velocities may cause inconvenience, minor property damage or temporary access restrictions.

High Risk

Overland flow is expected to be relatively deep and/or fast flowing, presenting a significant risk to people, vehicles and property. Water may enter buildings, damage infrastructure, and rapidly isolate areas. Unsafe for people or vehicles.

Extreme Risk

Overland flow is very deep, very fast, or both, creating conditions that pose a serious threat to life. Water can sweep away people and vehicles, cause severe structural damage, and make evacuation or emergency access difficult.

Disclaimer: The information in this mapping is provided for general information only. It provides limited information and is not a substitute for independent professional advice. Mapping and levels shown in this study are based on computer modelling of a range of synthetic design storm events. Actual rainfall and events may differ significantly from those modelled. Real events can be larger, smaller, or behave differently due to factors such as rainfall patterns, storm movement, antecedent conditions, debris blockages, infrastructure performance, and changes to the natural or built environment. Flooding can occur outside the mapped overland flow extents and depths may vary from those shown.



Medium Risk

High Risk

Extreme Risk



KNOW YOUR RISK AND TAKE ACTION

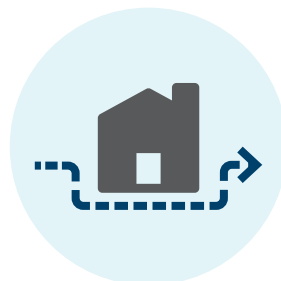
Stay informed and get ready



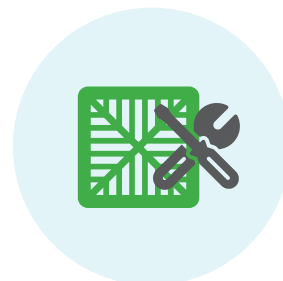
Review the overland flow maps and know your level of risk from overland flow



Keep flow paths clear



Direct water away from buildings



Maintain drainage around your property and undertake maintenance ahead of the storm season.



Review your household or business emergency plan regularly using the study findings and advice available through **Get Ready Queensland**.



Share your experience, photographs or local knowledge with Council to improve future studies.



Subscribe to the Toowoomba Regional Council Disaster Dashboard for warnings and emergency information.



Visit the Get Ready Queensland website for practical advice before, during and after floods.

Who do I contact if I have questions?

Toowoomba Regional Council



Council Customer Service – 131TRC



Council Website

Want to know more?



Visit:

[Toowoomba Disaster Dashboard](#)

[Toowoomba Regional Council Flood Information](#)

[Get Ready Queensland](#)

[Bureau of Meteorology](#)

FREQUENTLY ASKED QUESTIONS

Does this study mean my property will flood?

Not necessarily. The maps show areas that may be affected by overland flow during certain rainfall events, but each property's risk is different. Every storm is different and while the models use highly detailed data, they are still only estimates and should be viewed as an indication of possible overland flow behaviour, not a prediction of what will happen in a certain location during every single storm event.

How accurate are these maps, and how were they created?

The maps are based on advanced computer modelling and highly detailed aerial survey data (LIDAR), which allows engineers to estimate where water is likely to flow during different storm events.

Is overland flow different from creek flooding?

Yes. Overland flow occurs when rainfall exceeds the local drainage capacity as it makes its way to the creek, while creek flooding occurs when rivers or creeks are so full they overflow.

Why does my property show overland flow if I've never seen it?

Overland flow can be hard to observe and predict, especially in urban areas. The models show where water is likely to flow, but may not capture every local detail. This study also considers a range of storm events from frequent storms to very rare events.

Why should I be concerned if my property isn't impacted?

Even if your property is not affected, nearby roads or low points may be. The road network is generally designed to cater for flows that exceed the underground pipe network's capacity, however during heavy rainfall some roads may become unsafe or impassable for pedestrians and vehicles. Knowing where this may happen in your neighbourhood helps you stay prepared.

Has climate change been considered?

Yes. The study includes future rainfall scenarios to help Council understand how overland flow risk may change over time.

What is Council doing about overland flow?

Council considers a range of measures, including infrastructure upgrades and planning controls, but not all risks can be removed by an engineering solution. Living with overland flow risk means being prepared and making smart development choices.

Why has Council put overland flow risk on my property?

Council's study doesn't create overland flow risk—it identifies existing risks to help the community make informed decisions and reduce future impacts.

Is the model up to date with recent development?

The model reflects conditions at the time of the survey. Council updates its studies periodically to account for changes in the landscape.

Can I reduce my own risk from overland flow?

Yes. Simple actions such as preparing a household emergency plan, understanding local flood and overland flow mapping, maintaining drainage around your property and staying informed during severe weather can help reduce impacts.

Where can I view the overland flow maps?

A pdf version of the overland flow maps are available through Council's webpage.

