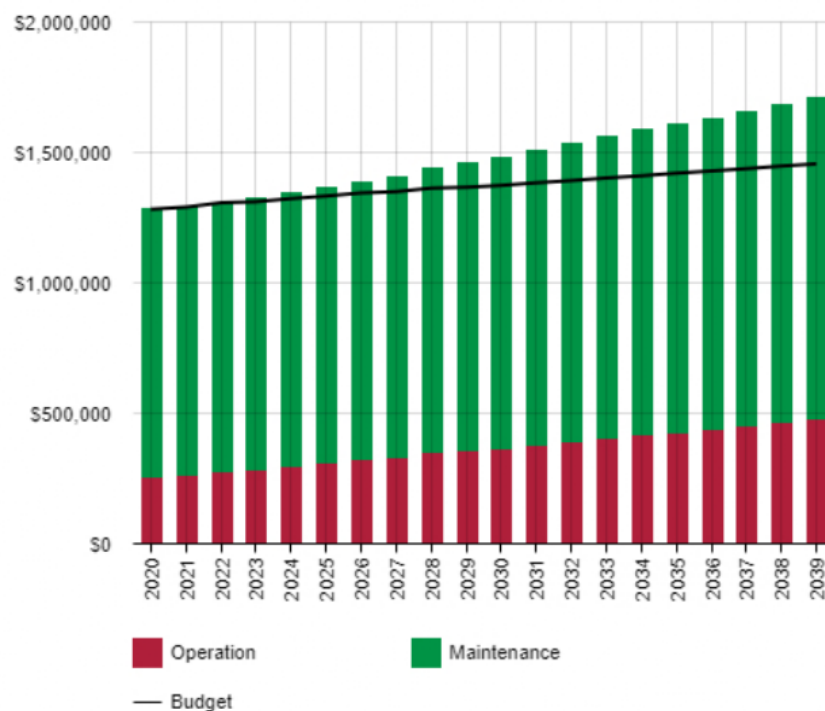


GPT at outfall locations

Improve water quality entering rivers as per locations identified in SMPs once they are adopted.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: Operations and Maintenance Summary

Note: All figure values are shown in 2021 dollars.

The anticipated increase in operations and maintenance is being driven by the need to manage the new assets being constructed as well as the increased requirements due to the aging assets.

Figure 5.2 shows that the projected Operation and Maintenance (O&M) expenditure is gradually increasing over the 20 year period above the budget amount in the LTFP. The LTFP has allowance for O&M costs associated with future assets received from growth over the next 10 year period associated with land development, however due to identified assets acquisitions and upgrade works in the LTIAMP, the O&M cost is increasing at 1.63% on capital cost. This percentage is the ratio of current asset O&M cost to asset replacement cost. Council will need to consider whether it seeks to find extra funding to cover the projected O&M expenditure and alternative options to minimise cost increases or maintain the O&M expenditure at current level by reducing the level of service and deferring acquisitions and upgrades identified in the LTIAMP.

In the LTIAMP, there are two types of capital works identified as non-discretionary and discretionary. The forecast annual average increase of O&M cost for non-discretionary assets is \$9,382 whereas the total annual average increase is \$34,316.

There are new assets which need additional O&M costs. For existing asset upgrades, O&M cost will not increase.

Deferred maintenance (i.e. works that are identified for maintenance and unable to be funded) are included in the risk assessment and analysis in the infrastructure risk management plan.

5.3 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed in 2016.⁵

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Pipes	100 years
Box Culverts	70 years
Concrete Channels	70 years
Pits & Water Quality Improvement Devices	70 & 50 years
Detention/Retention Basins	150 years

The estimates for renewals in this AM Plan were based on the asset register and investigations undertaken on localised issues on stormwater drainage network. Mainly the localised issues are due to functional and under capacity issues of the existing network.

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a section of pipes that has defects), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a water quality improvement device).⁶

⁵ CR16/31408 - Gawler Valuation Review Report Version 8 dated 29-06-2016 by Asset Engineering

⁶ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

It is possible to prioritise renewals by identifying assets or asset groups that:

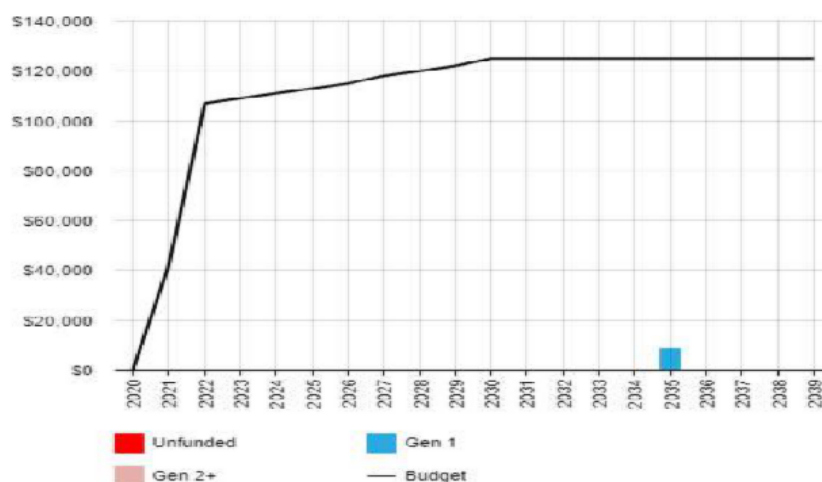
- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁷

Asset renewal programs are prepared based on the physical condition of the assets and risk associated with it. Future condition audits will consider asset's physical condition, risk associated with the asset and the criticality of the asset's service when prioritising asset renewals for preparing renewal works program.

5.4 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 5.4: Forecast Renewal Costs



Note: All figure values are shown in 2021 dollars.

Figure 5.4 shows the projected capital renewal expenditure over 20 year planning period according to the asset remaining life prediction based on the asset average useful life as there is no condition assessment data on stormwater network assets. Projected asset renewal in 2035 is the two side entry pits installed in 1965 at a replacement cost of \$8765. However renewal is subject to future condition audit outcomes.

Council has not identified assets for renewal based on the condition. Future asset condition assessments will determine the extent of any asset renewal works. Noting this audit will be undertaken in the future (likely to be from 2023/24), this has been highlighted in the risk management planning section of this AMP for further consideration. However, there is a planned budget for renewal works in LTFP which is used to repair and replace damage pipes, pit, pit lids, headwalls for ongoing basis. Also, this funding can be used for renewal of asset failures at extreme weather events or minor improvements on existing stormwater drainage systems.

⁷ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Deferred renewal and replacement (i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs) are to be included in the risk analysis process in the risk management plan.

Renewals and replacement expenditure in the capital works program will be accommodated in the LTFP. This is further discussed in Section 7.

5.5 Acquisition Plan

Acquisition reflects a new asset that did not previously exist or works which will upgrade or improve an existing asset beyond the existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to the Town of Gawler (i.e. land developments and infrastructure deeds).

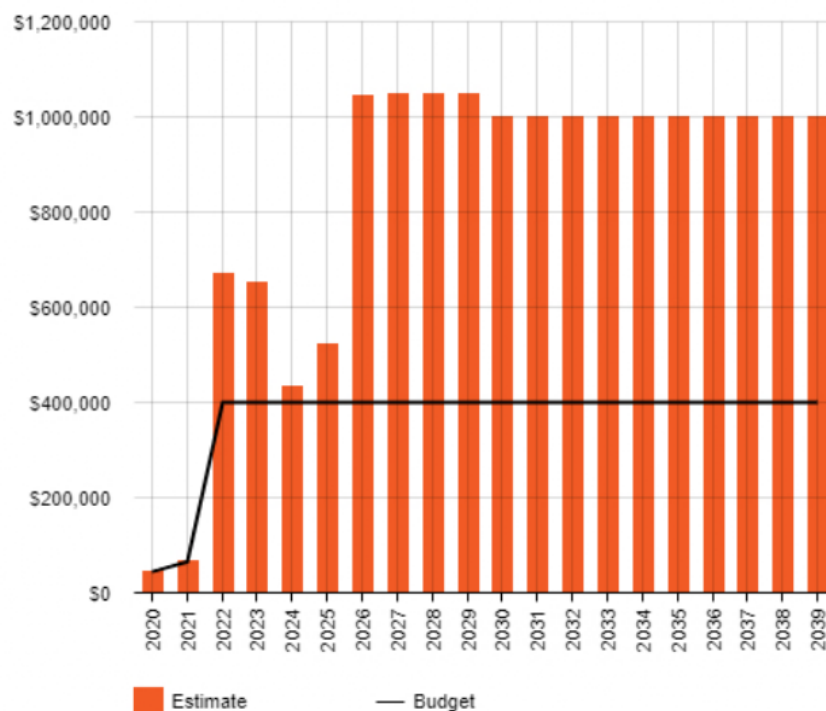
5.5.1 Selection criteria

Proposed upgrade of existing assets, and new assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Council's needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. This is undertaken each year when updating the LTIAMP and annual budget allocations.

5.5.2 Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.5.1 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 5.5.2.1: Acquisition (Constructed) Summary



Note: All figure values are shown in 2021 dollars.

Figure 5.5.2.1. excludes cost of donated assets and assets by growth.

It is forecast that an underground drainage network under Main North Road Willaston would be implemented in 2026 to 2029 where the peaks are shown in the above Figure 5.5.1. However, there is no planned budget for the project in the LTFP. It is also likely the underground drainage along Main North Road Willaston would be upgraded at the time the road pavement is upgraded. Council would consider external grant funding opportunities & a partnership with the State Government to support delivery of the project on an arterial road.

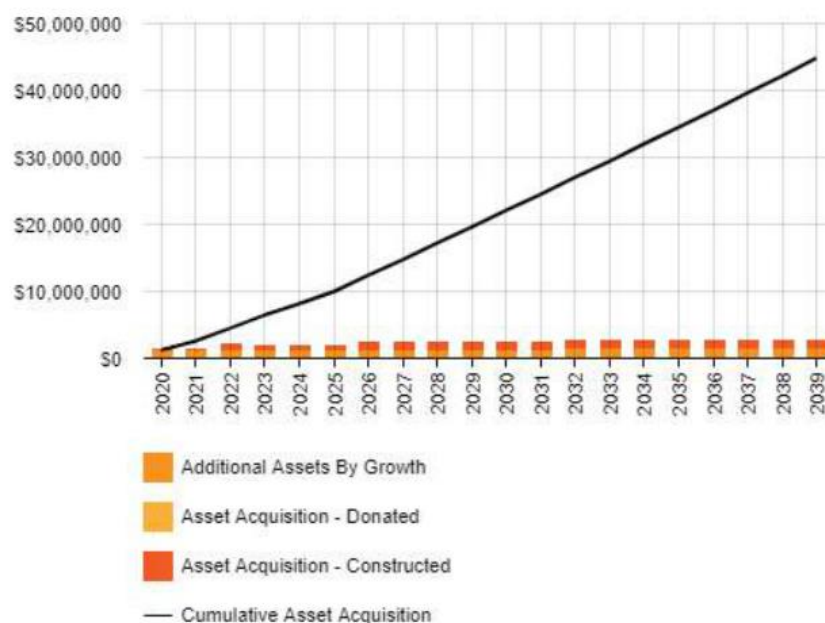
Peaks at 2022 and 2023 are due to non-discretionary projects: Southern Urban Area Infrastructure deed accommodated in LTIAMP (timing subject to change). Other peaks after 2024 are due to discretionary projects: Willaston drainage improvements and projects to be identified from Gawler and Surrounds Stormwater Management Plan (in progress) and Smith Creek Stormwater Management Plan (in progress).

Demand for upgrade and new assets increases due to population growth and to meet service deficiencies and other environmental needs. Therefore, Council may need to upgrade and create new assets to meet service demands in addition to receiving contributed assets from new land developments and external infrastructure upgrades by developers through deeds or separate rate allocations (ie Gawler East). Service deficiencies will be identified and asset upgrade works plan with costing and priority order will be prepared when the various Stormwater Management Plans are completed.

The Stormwater Management Authority (SMA) has commissioned a report: Metropolitan Adelaide Stormwater Infrastructure Valuation and Forecast where it has identified and forecast funding needs for the Councils in South Australia, including Town of Gawler. The SMA may use this finding listed in the report for seeking funding for stormwater drainage improvement works for Councils from the State Government.

The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.5.2.2 for the Town of Gawler.

Figure 5.5.2.2: Acquisition Summary



Note: All figure values are shown in 2021 dollars.

Expenditure on new assets and services in the capital works program will be accommodated in the LTFP, but only to the extent that there is available funding.

Acquiring these new assets will commit the funding of ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required.

Currently, new assets are created as a result of the Council's upgrading or constructing new assets to manage growth and from contributed assets associated with land developments (e.g. Gawler East Link Road, Murray Street Upgrades and various assets in new housing estates).

Figure 5.5.2.1 shows that the forecast acquisition costs compared to the planned budget is higher. Therefore, grant funding options are to be explored for implementation of new asset projects (e.g. Main North Road Willaston underground stormwater drainage project).

Land development assets by growth and donated assets are not accounted for capital costs (i.e. vested in the Council) however O&M costs are accounted for. Growth assets are assumed to be associated with general population growth at 1% (i.e. underground drainage networks).

5.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Currently, Council has not identified assets for disposal.

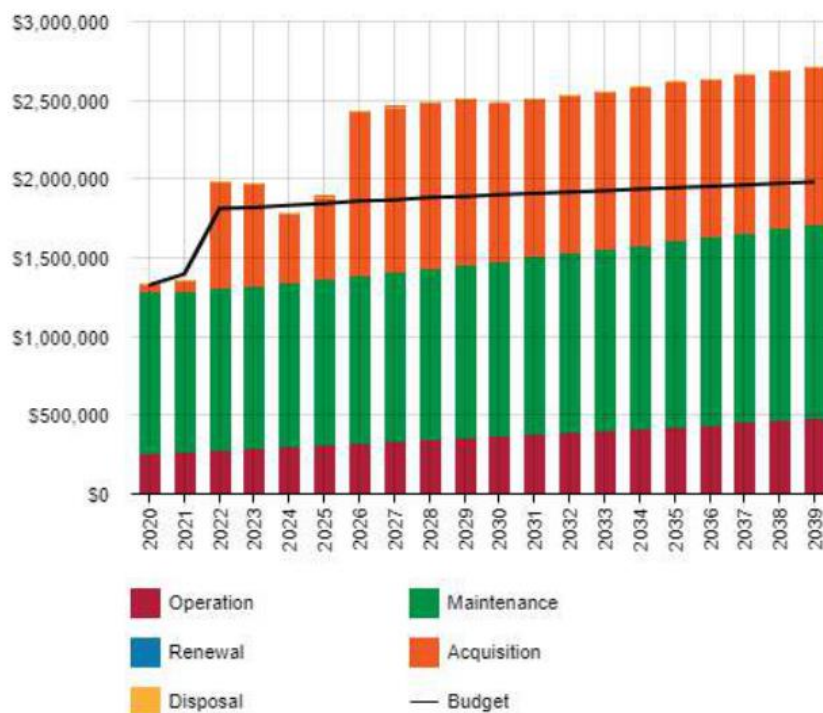
Table 5.6: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Not identified	-	-	-	-

5.7 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.7.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.7.1: Lifecycle Summary

Note: All figure values are shown in 2021 dollars.

Figure 5.7.1 above shows that first two (2) years of the Plan, Council has planned works to match the available funding in the LTFP. However, specifically during years from 2026 onwards, there is a shortfall of funding to cover the projected capital expenditure. It should be noted that maintenance cost is also gradually increasing over the years. This is due to the need of additional maintenance cost associated with projected new assets creation by Council. The O&M cost for assets contributed by land developers associated with growth is already included in the LTFP however further consideration is required for O&M costs associated with acquisitions and asset upgrades in the next update of the LTFP.

6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁸.

An assessment of risks⁹ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Underground drainage network: <ul style="list-style-type: none"> - Under arterial roadways including major transport entries and exits from the Town Centre - At river crossings 	Pipe collapse in roadway or river crossing	Road closure to traffic Inconvenience to road users Public safety hazards
Underground drainage network <ul style="list-style-type: none"> - Under arterial roadways including major transport entries and exits from the Town Centre - Properties subject to known history of flooding 	Pipe blockage	Property flooding Insurance claims Road closure to traffic Inconvenience to road users Public safety hazards

⁸ ISO 31000:2009, p 2

⁹ The Council’s Corporate Risk Management Framework

Critical Asset(s)	Failure Mode	Impact
Wetlands / Basins	Excessive sedimentation, blockage of outlets, pump system failures	Property flooding Insurance claims Vegetation loss Public safety hazards
Watercourses	Erosion of embankments	Private property damage Public land damage Vegetation loss Embankment instability

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.2 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

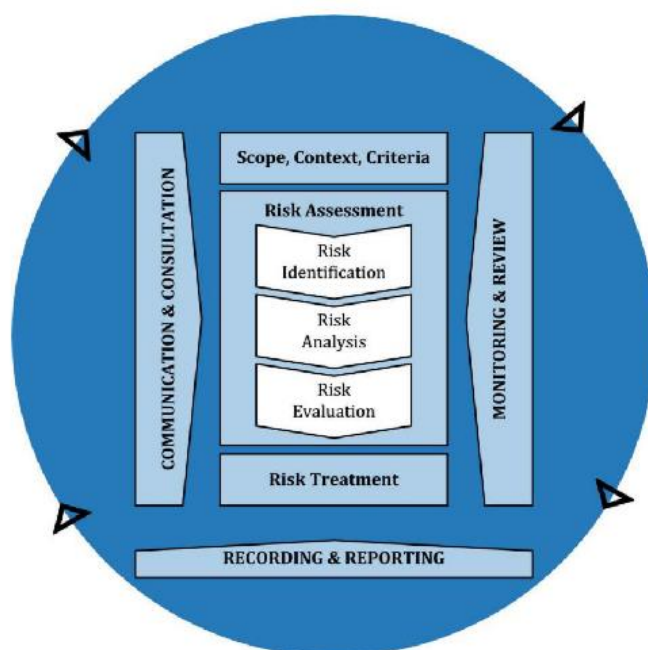


Fig 6.2 Risk Management Process – Abridged

Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks¹⁰ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the Council.

Routine inspections are undertaken for assessing defects and emergency inspections are done for critical assets for asset failure/collapse after extreme events occur.

The risk management process is aligned with ISO 31000 Risk management – Principles and guidelines. It involves risk identification, risk analysis, risk evaluation, risk treatment plans, monitoring and review.

Following the above process, Council will develop a detailed Asset Risk Register.

Table 6.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Key trunk pipes in roadway	May collapse	H	Investigate pipe condition by CCTV survey and develop repair plan	Low	\$10,000/annum,
Underground drainage network	Blockage	H	Clean critical sections of the network	Low	\$15,000/annum
Wetlands / Basins	Siltation and Blockage of outlets	H	Investigate methods to desilt wetlands / basins	Low	\$5,000
Watercourses	Outlet collapse and erosion	M	Complete audit of all outlet structures and watercourse erosion sites	Low	\$10,000

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

¹⁰ The Council's Corporate Risk Management Framework

Our current measure of resilience is shown in Table 6.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

Table 6.3: Resilience

Threat / Hazard	Current Resilience Approach
Road closure due to main pipe in roadway collapse	Temporary closure and implement Council emergency response. Inspect, repair/ renew and reopen.
Flooding due to drainage system blockage	Clear blockage and effect improvement.
Climate Change	Use of alternative materials & methods
Funding shortage	Reprioritise work or Reduce services

6.4 Service and Risk Trade-Offs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

6.4.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

Key underfunded projects -

- Implementation of Main North Road Willaston underground drainage system within next ten (10) years without external funding assistance,
- Upgrading existing under capacity systems which have been identified in stormwater management plans (in progress).

Key unfunded projects -

- Racecourse detention basin as identified in the Gawler and Surrounds Stormwater Management Plan (in progress),
- Milne Road drainage upgrade as identified in the Smith Creek Stormwater Management Plan (in progress)

It is important to note the Council is committed to the Southern Urban Areas Infrastructure Delivery Deed where stormwater harvesting and distribution infrastructure is expected to vest in the Council over the next 10 year period. Noting Council is committed to the Deed and that the stormwater infrastructure, it is expected Council's LTFP will require updating in order to fund O&M costs associated with this infrastructure once delivered.

6.4.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Stormwater ponding on roads can be a nuisance to road users as the existing network does not extend across the entire urban area and has limited capacity,
- Pollutants enter watercourses in the absence of stormwater quality improvement devices in the drainage system,

- Implementation of localised drainage system capital works resulting from small scale engineering investigations would be delayed,
- Implementation of capital renewal works identified in this Stormwater Asset Management Plan would be delayed,
- Implementation of capital works identified in the other Council's draft Stormwater Management Plans would be delayed,
- The condition of stormwater assets would decrease leading to increased future maintenance costs and unplanned capital works costs to repair assets, and
- General deterioration of assets' service,

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- Increase in deterioration of assets and reduce level of service,
- increase in future cost on asset renewal and maintenance,
- Delay providing renewal capital works for Councils drainage system, which would increase the risk of road closures, asset failures and blocking of access to properties.
- Delay providing infrastructure for flood mitigation and reducing nuisance ponding from storm events to the community. Properties would remain at risk of flood damage with no improvement to service level of the drainage system.
- Postponing upgrades that would improve/ increase assets function/ capacity.
- Stormwater quality would not be improved before discharging to natural water courses.
- If there was no financial capacity to maintain the drainage system and respond to localised flooding emergencies, there would be a risk of more frequent road closures, asset failures, and blocking of access to properties.
- Lead to community dissatisfaction and Council subject to public criticism and
- Ramification for public safety.

These actions and expenditures are considered and included in the forecast costs.

7.0 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this Asset Management Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Statements and Projections

7.1.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the Asset Management Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹¹ 105%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have 100% of the funds required for the optimal renewal of assets.

There are not any forecast asset renewals based on the condition, however there has been identified upgrades based in the capacity issues. In this respect, Council is currently considered to be renewing/ undertaking minor improvement works on its assets in accordance with the asset renewal funding ratio target requirements identified in the Council's LTFP.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall/surplus, is illustrated in Appendix D for reference.

Medium term – 10 year financial planning period

This Asset Management Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the 10 year period to identify any funding shortfalls.

The forecast operations, maintenance and renewal costs over the 10 year planning period is \$1,359,740 average per year.

The proposed (budget) operations, maintenance and renewal funding is \$1,422,660 on average per year giving a 10 year funding excess of \$62,920 per year. This indicates that 105% of the forecast costs needed to provide the services documented in this Asset Management Plan are accommodated in the proposed budget. This excludes cost of acquired assets. Excess funds will be used for renewal of asset failures at extreme weather events or minor improvements on existing stormwater drainage systems.

7.1.2 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.2 shows the forecast costs (outlays) for the 10 year LTFP. The forecast acquisition costs are shown in 2021 dollar values.

¹¹ AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Table 7.1.2: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Acquisition	Operation	Maintenance	Renewal	Disposal
2020	44000	256520	1026079	0	0
2021	65000	264705	1027133	0	0
2022	670000	280384	1028452	0	0
2023	651000	286519	1037394	0	0
2024	433000	299419	1046097	0	0
2025	523000	310755	1052053	0	0
2026	1046000	324497	1059143	0	0
2027	1047000	332719	1072822	0	0
2028	1048000	350096	1086514	0	0
2029	1049000	355876	1100219	0	0
2030	1000000	367334	1113937	0	0
2031	1000000	379682	1127037	0	0
2032	1000000	392030	1140137	0	0
2033	1000000	404378	1153237	0	0
2034	1000000	416726	1166337	0	0
2035	1000000	429074	1179437	8675	0
2036	1000000	441422	1192537	0	0
2037	1000000	453770	1205637	0	0
2038	1000000	466118	1218737	0	0
2039	1000000	478466	1231837	0	0

7.2 Funding Strategy

The proposed funding for assets is outlined in the Entity's budget and LTFP.

The financial strategy of the entity determines how funding will be provided, whereas the Asset Management Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

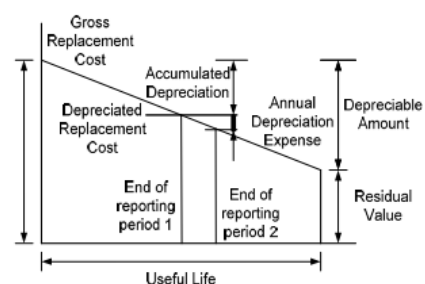
7.3 Valuation Forecasts

7.3.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. The assets are valued at fair value to replace service capacity.

Current (Gross) Replacement Cost	\$81,499,633
Depreciable Amount	\$81,499,633
Depreciated Replacement Cost ¹²	\$53,494,651
Annual Depreciation	\$901,828.00

¹² Also reported as Written Down Value, Carrying or Net Book Value.



7.3.2 Valuation forecast

Asset values are forecast to increase as additional assets are added to service.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require consideration to future renewals. These assets will also add to future depreciation forecasts.

It is expected to continue the receipt of new assets from land developments over next 20-30 years based on population growth associated with the 30 Year Plan for Greater Adelaide and available residential land supply.

7.4 Key Assumptions Made in Financial Forecasts

In compiling this Asset Management Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this Asset Management Plan are in Table 7.4:

Table 7.4: Key Assumptions

Assumption	Description
Indexation Rates	The Local Government Price Index (LGPI) and other indexation factors relevant for each asset class are used to determine current cost.
Financial values	Current day dollars
Renewal Cost	Forecasts have been made by professional judgement.
O&M Cost forecast	The current operations and maintenance budgets have been used and only increased in the forecast relative to the acquisition of new assets.
Asset Growth	The relationship between development growth and associated increases in the asset stock.
Level of Service	Current infrastructure service levels will remain for the life of the Plan.
Funding	Indicated capital replacement/renewal funding is provided for within the Long Term Financial Plan.
Useful Life	The average useful lives of the asset groups based on current local knowledge and experience and historical trends.

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on an A - E level scale¹³ in accordance with Table 7.5.1.

¹³ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	B	Professional Judgement
Growth projections	B	From 2016 Census
Acquisition forecast	B	From LTFP & Gawler growth
Operation forecast	B	From recent budgets and & Gawler growth analysis
Maintenance forecast	B	From recent budgets and & Gawler growth analysis
Renewal forecast		
- Asset values	B	Asset Register is updated annually
- Asset useful lives	B	Reviewed periodically
- Condition modelling	E	No condition data based on field audits
Disposal forecast	E	Professional Judgement

The estimated confidence level for and reliability of data used in this AM Plan is considered to be reliable.

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices¹⁴

8.1.1 Accounting and financial data sources

This Asset Management Plan utilises accounting and financial data. Council uses Civica Authority software as its corporate Accounting/Financial system. There is currently no automated integration between the Civica Authority software and the AssetMaster software used for Asset Management purposes.

The Australian Accounting Standards AA116 and the Local Government (Financial Management) Regulations 2011 provide the statutory benchmark against which Council reports on asset accounting.

The chart of account structure used within the general ledger (i.e. work orders) is designed to facilitate the ease of data extraction required for internal and statutory financial reporting. Currently the existing structure meets the Council's financial reporting needs (including those relating to asset accounting). This structure will be reviewed periodically to ensure that it appropriately meets Council's future financial reporting needs.

The current capitalisation threshold for infrastructure assets is \$10,000 in accordance with Council's Asset Capitalisation Policy. The threshold value is reviewed on three yearly basis.

8.1.2 Asset management data sources

This Asset Management Plan also utilises asset management data. One of the Asset management Information Systems, AssetMaster software, is used by the Council for management of its infrastructure asset data. ESRI ArcGIS Pro software is used for asset mapping, ESRI ArcMap as the map viewer and Civica Authority for customer request management.

AssetMaster manages physical and financial asset data including the physical attributes, repair activities carried out on assets, condition and valuation. AssetMaster provides reports on data that is required in order to plan renewal works programs, value assets and forecast depreciation.

When there is a change in asset information, the relevant data is updated into AssetMaster. When new assets are created asset details are recorded periodically in AssetMaster so that at the end of financial year all created assets are registered in AssetMaster for financial valuation. General errors in the day-to-day administration are corrected as required.

Currently, Stormwater Assets are recorded in AssetMaster.

Asset management process flow chart is given in Appendix G.

8.2 Improvement Plan

It is important that an entity recognise areas of their Asset Management Plan and planning process that require future improvements to ensure effective asset management and informed decision making. In March 2021, an external consultant conducted an internal audit on Council's asset management systems and processes. Responding to the audit findings, Council has prepared an action plan. The improvement plan generated from this Asset Management Plan and from the findings of the Internal Audit is shown in Table 8.2.1.

¹⁴ ISO 55000 Refers to this the Asset Management System

Table 8.2.1: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Implement Internal Audit Report Action Plan (CM Reference: CR21/57866)	MIES	SAIE , WHS&RMO & Finance	1-3 year
2	Section 3.5 – Review and agree to an affordable Customer Level of Service as a part of community consultation of AMP	MIES	SAIE & Finance	0-1 year
3	Section 4.3 – Demand Management Plan Summary to be reviewed based on Land Development Register and update LTIAMP	MIES	SAIE & Finance	1 year
4	Land Development Register	MIES	TLAP	Annually
5	LTIAMP	MIES	TLAP	Annually
6	Section 6.2 - Risk Assessment to be reviewed. Asset Risk Register to be developed.	MIES	SAIE , WHS&RMO & Finance	4 year
7	Section 6.3 – Infrastructure Resilience Approach to be reviewed	MIES	SAIE & Finance	4 year
8	Review asset renewal ranking criteria and new asset priority ranking criteria	MIES	SAIE	4 year
9	Value assets annually with a book value adjustment and periodically with a unit rate review consistent with financial auditor requirements	MIES	SAIE	Annually
10	Section 7.1 – Financial Statements and projections to be revised based on asset cost updates after periodical asset financial valuation	MIES	SAIE & Finance	Annually
11	Review capital expenditure during the Council annual budget preparation and amend to recognise any changes in service levels and/or resources available to provide those services	MIES	SAIE	Annually
12	Review stormwater assets mapped on the corporate GIS system and update layer data where required	MIES	TLAP	Annually
13	Schedule a condition audit program for aged and critical assets – staged approach	MIES	SAIE	> 2 year
14	Schedule next update the Council's Stormwater Asset Management Plan based on a four year cycle	MIES	SAIE	4 yearly

Note: CEO – Chief Executive Officer, MIES – Manager Infrastructure and Engineering Services, TLAP – Team Leader Asset Planning, SAIE – Senior Assets & Infrastructure Engineer, WHS&RMO – Work Safety Health & Risk Management Officer.

The previous Improvement Plan outlined in the previous Stormwater Asset Management Plan adopted in 2013 by the Council identified a number of items for investigating. As an update on progress, the below Table 8.2.2

provides an update on each of the items identified in that Plan for information purposes and to inform the revised Improvement Plan shown in Table 8.2.1 above.

Table 8.2.2: Implementation Progress of 2013 Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline	Progress Update
1	Section 3.3 – Current levels of service to be developed.	Engineering	Staff Time	June 2015	Will be complete following customer survey in this AMP
2	Section 3.4 – Desired levels of service to be developed.	Engineering	Staff Time	June 2016	Will be complete following customer survey in this AMP
3	Section 4.1 – Review of development needs associated with the rate and location of growth.	Planning	Staff Time	June 2016	Complete
4	Section 4.3 – Demand management summary table to be reviewed.	Engineering	Staff Time	June 2015	Complete
5	Section 5.1.1 – Continue to collect and update asset data.	Engineering	Staff Time	Ongoing	Refer latest Improvement Plan. Some asset data collected in GIS. Condition audit identified as required
6	Section 5.1.2 – Asset capacity and performance table to be reviewed.	Engineering	Staff Time	June 2015	Complete
7	Section 5.1.3 – Undertake condition assessment of stormwater assets to enable improved information for future planning and development of maintenance and Capital programs.	Engineering	Staff Time	June 2015	Refer latest Improvement Plan. Some asset data collected in GIS. Condition audit identified as required
8	Section 5.2 – Risk management plan to be developed.	CEO	Staff Time	June 2016	Refer latest Improvement Plan. Some improvements have been made.
9	Section 5.3.1 & Appendix A – Maintenance response levels of service to be developed.	Engineering	Staff Time	June 2014	Complete
10	Section 5.4.1 – Renewal priority criteria to be developed.	Engineering	Staff Time	June 2014	Complete
11	Section 5.5.1 – Asset priority ranking criteria to be reviewed.	Engineering	Staff Time	June 2014	Complete
12	Section 3 – Carry out consultation to ascertain the community's service needs and preferences and	CEO	Staff Time	June 2015	Will be complete following customer survey in this AMP

	confirm target levels adopted.				
13	Section 3 – Review of the customer request report available in Authority.	DPI/DCCS	Staff Time	June 2015 then annually	Complete and updated into Engineering Investigations Register
14	Section 3.2 – Review of legislative requirements to ensure Council's compliance with the latest legislations and regulations.	DCCS	Staff Time	June 2016	Complete
15	Section 5 - Review of useful life of all stormwater assets based on real time assessment of asset deterioration.	Engineering	Staff Time	June 2015	Refer latest Improvement Plan. Some asset data collected in GIS. Condition audit identified as required
16	Section 7.1 – Review capital expenditure threshold values for stormwater assets.	Finance	Staff Time	Annually	Complete
17	Section 7.1 – Review of financial reporting systems to determine whether any changes are required to meet statutory requirements.	Finance	Staff Time	June 2015	Complete
18	Section 7.2 – Review of current asset management systems for improvement, systems integration and expansion.	Engineering	Staff Time	June 2016	Complete
19	Section 8.2 – Completing the improvement plan by November 2016.	All	Staff Time	Nov 2016	Complete

8.3 Monitoring and Review Procedures

This Asset Management Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of four years and is due for complete revision and updating within two years of each Council election.

8.4 Performance Measures

The effectiveness of this Asset Management Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this Asset Management Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the Asset Management Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 1.0).

9.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long-Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- The Gawler Community Plan 2030+
- Town of Gawler Budget and Business Plan 2020/21
- Town of Gawler Long Term Financial Plan 2020-2029
- Town of Gawler Long Term Infrastructure and Asset Management Plan 2019-2028

10.0 APPENDICES

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

There are new and upgrade asset projects are forecast during this plan period. They are upgrades and new drainage network assets to manage stormwater disposal within existing infill development area and rural area. Also there are new assets receiving from new land developments. Timing of some of the works are based on the Gawler East Infrastructure Deed, Southern Urban Area Deed and external funding availability.

A.2 – Acquisition Project Summary

Main projects are stormwater drainage network associated with Gawler East Link Road (\$5.5 million), Southern Urban Area ASR and associated works (\$600,000), Gordon Road Wetland (\$500,000), modification to Dawson Road detention basin and wetland, Lower Willaston drainage network and local stormwater drainage improvements.

A.3 – Acquisition Forecast Summary

Using NAMS+ Outputs, Summary for Acquisition as follows.

Table A3 - Acquisition Forecast Summary

Year	Constructed \$	Donated \$	Growth \$
2020	44000	GELR - 5500000	1222495
2021	65000	0	1240832
2022	670000	0	1259444
2023	651000	0	1278336
2024	433000	0	1297511
2025	523000	0	1316974
2026	1046000	0	1336728
2027	1047000	0	1356779
2028	1048000	0	1377131
2029	1049000	0	1397788
2030	1000000	0	1418755
2031	1000000	0	1440036
2032	1000000	0	1461637
2033	1000000	0	1483561
2034	1000000	0	1505815
2035	1000000	0	1528402
2036	1000000	0	1551328
2037	1000000	0	1574598
2038	1000000	0	1598217
2039	1000000	0	1622190

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

Operation and maintenance cost forecast analysis have included those from the \$68M Gawler East Link Road project and contributed assets from new land developments by the Council Staff according to the timing of the asset creation and available cost information.

B.2 – Operation Forecast Summary

Using NAMS+ Outputs, Summary for Operation is as follows.

Table B2 - Operation Forecast Summary

Year	Operation Forecast \$	Additional Operation Forecast \$	Total Operation Forecast \$
2020	256520	163	256520
2021	264542	241	264705
2022	279981	2479	280384
2023	283637	2409	286519
2024	294128	1602	299419
2025	303862	1935	310755
2026	315669	3870	324497
2027	320021	3874	332719
2028	333524	3878	350096
2029	335426	3881	355876
2030	343003	3700	367334
2031	351651	3700	379682
2032	360299	3700	392030
2033	368947	3700	404378
2034	377595	3700	416726
2035	386243	3700	429074
2036	394891	3700	441422
2037	403539	3700	453770
2038	412187	3700	466118
2039	420835	3700	478466

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

Operation and maintenance cost forecast analysis has been done on the Gawler East Link Road and contributed assets from new land developments by the Council Staff according to the timing of the asset creation and available cost information.

C.2 – Maintenance Forecast Summary

Using NAMS+ Outputs Summary for Maintenance.

Table C2 - Maintenance Forecast Summary

Year	Maintenance Forecast \$	Additional Maintenance Forecast \$	Total Maintenance Forecast \$
2020	1026079	554	1026079
2021	1026579	819	1027133
2022	1027079	8442	1028452
2023	1027579	8203	1037394
2024	1028079	5456	1046097
2025	1028579	6590	1052053
2026	1029079	13180	1059143
2027	1029579	13192	1072822
2028	1030079	13205	1086514
2029	1030579	13217	1100219
2030	1031079	12600	1113937
2031	1031579	12600	1127037
2032	1032079	12600	1140137
2033	1032579	12600	1153237
2034	1033079	12600	1166337
2035	1033579	12600	1179437
2036	1034079	12600	1192537
2037	1034579	12600	1205637
2038	1035079	12600	1218737
2039	1035579	12600	1231837

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

The Renewal Forecast is prepared according to on-going risk management analysis.

D.2 – Renewal Project Summary

Stormwater drainage network assets are long living assets. Asset renewal projects have not been identified. Future asset condition audits will identify asset renewals.

The recurrent budget will be used for minor network improvement projects instead of asset renewal at the current time.

D.3 – Renewal Forecast Summary

Using NAMS+ Outputs Summary for Renewal

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast \$	Renewal Budget \$
2020	0	0
2021	0	41000
2022	0	107000
2023	0	109000
2024	0	111000
2025	0	113000
2026	0	115000
2027	0	118000
2028	0	120000
2029	0	122000
2030	0	125000
2031	0	125000
2032	0	125000
2033	0	125000
2034	0	125000
2035	8675	125000
2036	0	125000
2037	0	125000
2038	0	125000
2039	0	125000

Appendix E Disposal Summary

E.1 – Disposal Forecast Assumptions and Source

At this stage Council has not identified any significant asset disposals.

E.2 – Disposal Project Summary

Council has not identified any asset for disposal.

E.3 – Disposal Forecast Summary

Using NAMS+ Outputs Summary for Disposal

Table E3 – Disposal Activity Summary

Year	Disposal Forecast \$	Disposal Budget \$
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0

Appendix F Budget Summary by Lifecycle Activity

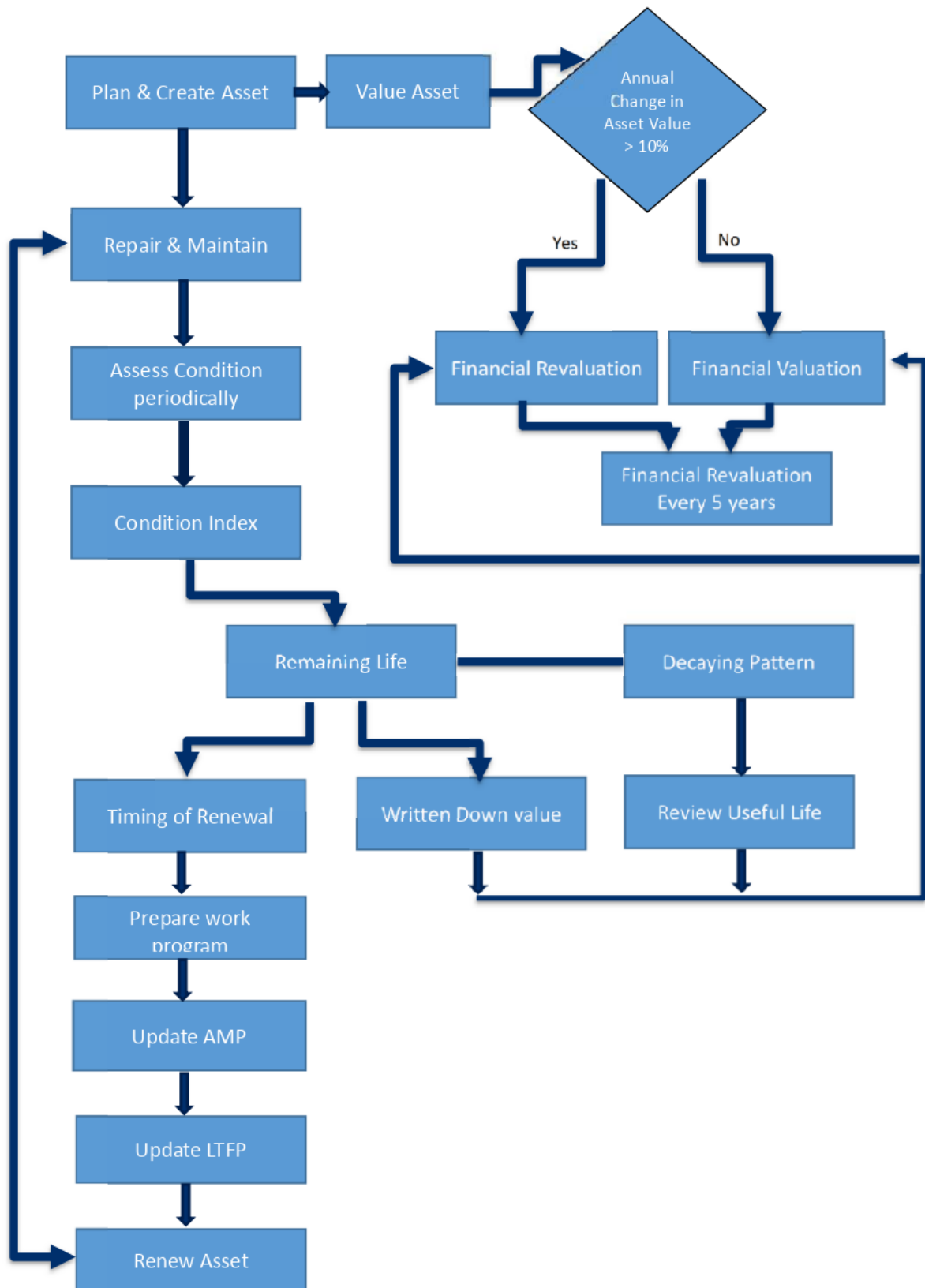
The following budget summary is based on the Council's current Long Term Financial Plan. It is shown in current dollars. This information is the basis of the Planned Budget used in the Lifecycle Model for this Asset Management Plan.

According to LTFP Council has an annual financial capacity of \$3m only for new acquisitions for all asset classes across the Council except that additional \$40 million has been allocated for major iconic project: Karbeethan Reserve upgrade in 2028 and 2029. It is assumed that only \$400,000 is available for new stormwater assets acquisitions/upgrades.

Table F1 – Budget Summary by Lifecycle Activity

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2020	44000	256520	1026079	0	0	1326599
2021	65000	264542	1026579	41000	0	1397121
2022	400000	279981	1027079	107000	0	1814060
2023	400000	283637	1027579	109000	0	1820216
2024	400000	294128	1028079	111000	0	1833207
2025	400000	303862	1028579	113000	0	1845441
2026	400000	315669	1029079	115000	0	1859748
2027	400000	320021	1029579	118000	0	1867600
2028	400000	333524	1030079	120000	0	1883603
2029	400000	335426	1030579	122000	0	1888005
2030	400000	343003	1031079	125000	0	1899082
2031	400000	351651	1031579	125000	0	1908230
2032	400000	360299	1032079	125000	0	1917378
2033	400000	368947	1032579	125000	0	1926526
2034	400000	377595	1033079	125000	0	1935674
2035	400000	386243	1033579	125000	0	1944822
2036	400000	394891	1034079	125000	0	1953970
2037	400000	403539	1034579	125000	0	1963118
2038	400000	412187	1035079	125000	0	1972266
2039	400000	420835	1035579	125000	0	1981414

Appendix G Asset Management Process Flow Chart





Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
V1	11/08/2021	Draft for comments	WK	BD	SD
V2	12/07/2022	After community consultation	WK	WY	WY

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1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

Asset management planning is a comprehensive process ensuring delivery of services from infrastructure is financially sustainable.

Asset management provides strategic guidance in the planning, acquisition, operation and maintenance, renewal and disposal of assets. Its objective is to maximise asset service delivery potential, manage related risks and costs over the asset life cycle.

This Asset Management Plan (AM Plan) details information about open space assets with actions required to provide an agreed level of service to the community in the most cost-effective manner while outlining associated risks and future improvement actions. The Plan defines the services to be provided, how the services are provided and what funds are required to provide over the 2020-2039 year planning period. The AM Plan will link to a Long-Term Financial Plan which typically considers a 10 year planning period.

This plan covers open space assets under the care, control and ownership of the Town of Gawler and outlines expenditure required in order to effectively manage asset service levels into the future while providing structured and informal recreation facilities for a healthy, active, safe and engaged community.

The Open Space Asset Management Plan is also required to support Council's Long Term Infrastructure and Asset Management Plan (LTIAMP), meet regulatory requirements of the Local Government Act 1999 and deliver growth goals identified in the Town of Gawler Community Plan 2030+.

The Asset Management Plans have been prepared using NAMS Plus financial modelling and reporting provided by Institute of Public Works Engineers of Australasia (IPWEA), which is considered to be best industry practice. The Asset Management Plans have also been prepared in 2021 following the latest audited financial statements of the Council as recommended by NAMS Plus financial modelling and therefore financial year 2020/21 is considered the first year of the Asset Management Plans.

1.2 Asset Description

The open space assets comprises:

- Furniture & fittings
- Fences & retaining walls
- Infrastructure & structures
- Irrigation systems
- Playgrounds & equipment
- Monuments and feature structures
- Signs

The Open Space network comprises:

- Active open spaces (e.g. for sports, exercise or active play)
- Natural areas supporting native plants and animal habitats (e.g. river banks)
- Passive open spaces (e.g. unstructured physical activities such as picnics, walking and cycling).
- Specific purpose open spaces (e.g. cemetery, dog parks, and open spaces with heritage significance).
- Linear trails along river corridor.

The above infrastructure assets have total renewal value estimated at \$12million.

1.3 Levels of Service

Council's present funding levels are sufficient to continue to provide existing services at current service levels by renewing and maintaining existing assets and maintaining contributed assets being received from new land developments. However, the Council will need to consider the allocation of additional funding for operations and maintenance costs arising from new assets and upgrade works in the long term.

The Council's present funding levels are sufficient to continue to provide existing services at current service levels in the short term. However, the planned funding allocations are insufficient to continue to provide existing services at current levels mainly due to the associated increase of operation and maintenance costs for new assets.

The main service consequences of the Planned Budget are:

- Reduce service levels in some areas such as recreational assets by not renewing on time when falling below the current acceptable level of service noting risk management considerations.
- Reduce maintenance activities/ practices/ frequency which lower the assets' level service to the community noting risk management considerations.
- Postpone upgrades which would improve/ increase assets function/ capacity.
- Delay creating new open spaces and facilities at local, neighbourhood and district catchment levels.

1.4 Future Demand

The main demands for new services are created by:

- Population Growth by 1% to 2% per annum
- Demographic Change
- Population density increase
- Change of Land use
- Legislative requirements
- Actions to mitigate climate change

These demands will be approached using a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.

- Ensure new open spaces are suitable for a range of activities rather than specific to a particular sport.
- Potential for resource sharing of ovals and fields with schools.
- Upgrading existing open space facilities instead of creating new assets.
- Prioritise upgrades and new asset creations across all Council asset types and implement accordingly.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AM Plan may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AM Plan is the forecast of 10 year total outlays, which for the open space assets service is estimated as \$88,723,344 or \$8,872,335 on average per year. These figures are based on the identified asset renewals, new assets and upgrade capital works in Long Term Infrastructure Asset Management Plan (LTIAMP) and operation and maintenance works on them.

There are non-discretionary asset acquisitions and upgrades in the LTIAMP for open space assets. They are redevelopment of Essex Park and implementation of Karbeethan Reserve Masterplan or other iconic project and development of recycled water supply system in the southern urban growth areas with the remainder being discretionary expenditure for new open space assets.

1.6 Financial Summary

1.6.1 What we will do

The estimated available funding for the 10 year period is \$86,015,936 or \$8,601,594 on average per year as per the Council's Long-Term Financial Plan or Planned Budget (LTFP). This is 96.95% of the cost to sustain the current level of service at the lowest lifecycle cost.

The infrastructure reality is that only what is funded in the LTFP can be provided. The informed decision making depends on the AM Plan emphasising the consequences of planned budgets on the service levels provided and risks.

According to LTFP, the Council has an annual financial capacity of approximately \$3,000,000 for new asset acquisitions and upgrade works across all asset classes. There is an exception that \$40 million has been allocated in LTFP for two year period (2027 & 2028) for an iconic project upgrade (ie Karbeethan Reserve Master Plan implementation). For the purposes of developing these Asset Management Plans it is assumed that that for New Assets annually only \$400,000 is available for stormwater assets acquisitions/upgrades, \$1,600,000 for transport assets, \$400,000 for open space assets, \$300,000 for buildings assets and \$300,000 for other plant/equipment and IT assets. These proportions are based on the Council's expenditure on acquisition (new assets and upgrade works) requirements on each asset class in the recent years. Comparatively a bigger portion of \$1.6m has been allocated for transport asset class because more funding is needed for new footpaths, walking & cycling paths and kerb & water table and upgrading old road pavements and bridge structures, noting it this asset class is valued at approximately \$200M.

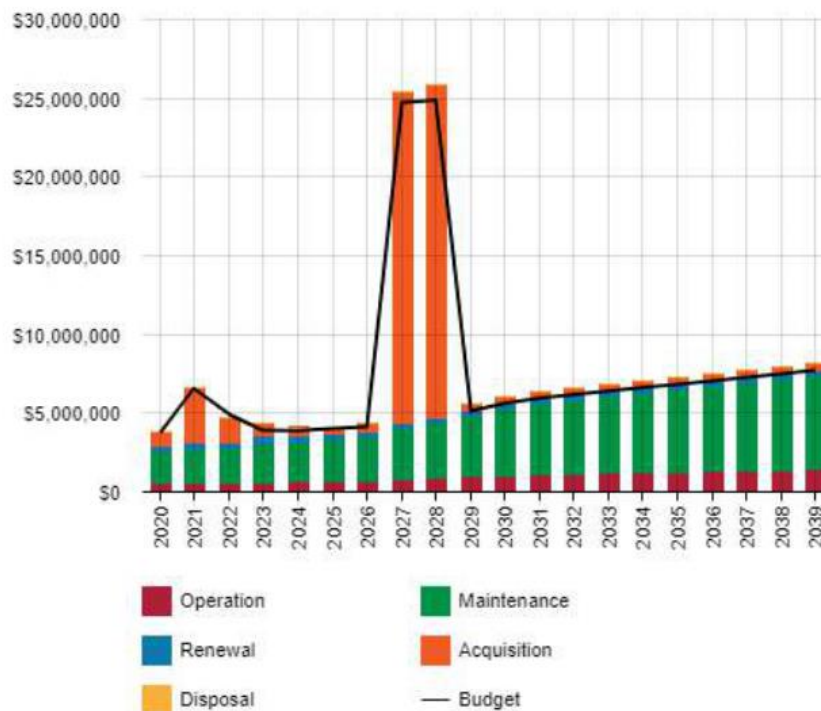
However the LTFP allows for some flexibility in allocating \$3M on any asset class based on the priority of new and upgrade works for any given financial year.

The planned budget for open space assets identifies a shortfall of \$270,741 on average per year of the forecast lifecycle costs required to provide services in the AM Plan compared with the Planned Budget currently included in the LTFP. This shortfall is due to new asset acquisitions, existing asset upgrades and operation and maintenance cost needed following new and upgrade asset projects planned for next 10 years. However, the LTFP has the budget allocation for existing asset replacements and renewals identified in LTIAMP. Therefore, the asset renewal funding ratio is 100% and the overall financial position is shown in the figure below.

There are non-discretionary asset acquisitions and upgrades in the LTIAMP for open space assets and include the implementation of Karbeethan Reserve Master Plan, redevelopment of Essex Park precinct or other iconic project and development of recycled water supply system in the southern urban growth areas with the remainder being discretionary expenditure.

Priority funding from \$3M will be on non-discretionary capital projects and the remainder on the discretionary projects on a priority basis as determined by the council.

Creation of new assets results in additional Operations and Maintenance (O&M) costs. For existing asset upgrades, the O&M cost increase is expected to be low.

Forecast Lifecycle Costs and Planned Budgets

Note: Figure Values are shown in 2021 dollars.

The forecasted peak values in 2027-2028 are on new assets and upgrade works from implementation of an iconic project (i.e. Karbeethan Reserve Master Plan).

Council plan to provide open space asset services for the following:

- Operation, maintenance, renewal and upgrade of open space furniture & fittings, infrastructure, fencing, irrigation systems, playgrounds & equipment and signage to meet service levels set by in annual budgets.
- Parking facilities at Gawler Oval and Dead Mans Pass, Karbeethan Reserve Master Plan implementation, upgrade playgrounds to the current community expectations and standards, implement Council's Biodiversity Management Plan and Gawler Open Space, Sport & Recreation Plan 2025 Directions in stages and design & commission iconic public arts within the 10-year planning period.
- Other works that have been identified in the LTFP within the 10 year planning period.

1.6.2 What we cannot do

We currently do not allocate enough budget in Council's LTFP (i.e. black budget line in the above figure) to provide all new open space assets sought in Council's Long Term Infrastructure and Asset Management Plan. New open space assets (i.e. acquisitions) and services these assets provide that currently cannot be delivered under current funding levels include:

Key underfunded projects:

- Karbeethan Reserve / Essex Park Master Plan or Iconic Project implementation – Operation & Maintenance Costs

- Car park upgrades at reserves
- Additional dog off leash facilities
- Pioneer Park heritage wall restoration

Some are beyond the current LTFP capacity and expected to be delivered based on the highest priority in the future given there is flexibility in the \$3m allocation.

Key unfunded projects:

- Create new open spaces and facilities at various open spaces which are close and convenient to the local community. That is local level open spaces within a 300m catchment, neighbourhood level open spaces within 400m catchment and district level open spaces within 2km catchment.
- Other works that have not been identified in the LTFP such as implementation of Essex Park & Gawler Showgrounds Regional Sporting Precinct Master Plan.
- Provide a higher level of service than the current asset maintenance service levels/ and practices to the assets acquired from new land developments and capital works programs.

1.6.3 Managing the Risks

Our present budget levels are insufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Implementation of future maintenance work associated with new or upgraded assets would have insufficient budget leading to a reduced service life of assets.
- Temporary closure of playgrounds and other public realm assets due to public safety hazards associated with insufficient budget.
- Deferral of planned new or upgraded open space assets.
- Delays associated with implementation of strategic management plans including the Gawler Open Space Sport and Recreation Plan and associated impacts with delivery of the Council's Community Plan.
- Political and reputational risk to the Council associated with curtail of services not providing public realm assets.
- Increased number of complaints from the community about maintenance of open space assets.

We will endeavour to manage these risks within available funding by:

- Ensuring design of new open space areas is in accordance with the standards and requirements outlined in Council's Open Space Guideline to ensure service levels are consistent for the relevant category of open space reserve area (i.e. local park, neighbourhood park, sports field etc.)
- Ensure open space maintenance budgets are forecasted for the next 10 year period and updated on an annual basis for the relevant new open space areas that are to be vested in and maintained by the Council.
- Ensure the 10 year forecasted open space budgets are based on the rate of development, included in the Council's LTFP and updated on an annual basis.
- Seek to implement priorities outlined in Council's strategic management plans that are affordable and planned in accordance with Council's Long Term Infrastructure and Asset Management Plan as updated on an annual basis.
- Renewing open space assets that have reached the end of their service life.
- Promoting use of recycled materials in a sustainable manner that does not reduce the intended service life of assets.

- Implementing hardscaping elements (i.e. fences, bins, seats etc.) at specific locations to manage public safety risks and improve service levels to the community over time.
- Maintaining shared paths if damaged due to river flooding or environmental factors to ensure assets can function for their intended service life.
- Inspecting critical assets frequently and prioritising and repairing defects in accordance with an inspection schedule.
- Adopting a sustainable assets maintenance strategy and associated annual budget.
- Creating sustainable assets in new land developments.
- Creating new assets on priority basis taking holistic approach including risk factors and in alignment with Council's Open Space, Sport & Recreation Plan 2025 Direction Report and Open Space Guideline.

Therefore, adjusting the Long Term Financial Plan to cater for the required costs of new assets into the future should be considered.

1.7 Asset Management Practices

The Town of Gawler manages its assets using the following systems:

- Civica Authority software for financial management and property and open space asset management,
- Tree Plotter software for tree management,
- Microsoft Office software also for open space infrastructure asset management,
- AssetMaster software for stormwater and transport infrastructure asset management,
- Uniqco software for Plant & Equipment Fleet Management,
- Content Manager Software for record management,
- Skytrust software for risk management.

Assets requiring renewal/replacement are identified from either the asset register or various alternative methods. These methods are part of the Lifecycle Model.

- Method 1 - If Asset Register data is used to forecast the renewal costs this is undertaken using the acquisition year and the useful life,
- Method 2 - Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

Method 2 (based on condition modelling systems) was used to forecast the renewal life cycle costs for this AM Plan.

1.8 Monitoring and Improvement Program

All AM Plans are considered to be living documents and where improvements to asset management practices are identified these should be documented in the Council's AM Plans. The following items have been identified in the development of the Open Space Asset Management Plan in order to improve asset management practices:

- Review and agree to an affordable Customer Level of Service,
- Review the Demand Management Plan, Risk Management Plan and Infrastructure Resilience Approach,
- Review asset renewal ranking criteria and new asset priority ranking criteria,

- Review capital expenditure during the Council annual budget preparation and amend to recognise any changes in service levels and/or resources available to provide those services,
- Value assets annually with a book value adjustment and five yearly with a unit rate review consistent with financial auditor requirements,
- Financial Statements and projections to be reviewed and revised based on cost updates after periodical asset financial valuation,
- Migrate open space asset data on to AssetMaster software,
- Review open space assets mapped on the corporate GIS system and update layer data where required,
- Schedule an assets condition audit based on a five yearly cycle,
- Schedule next update the Council's Open Space Asset Management Plan based on a four-year cycle.

2.0 Introduction

2.1 Background

This AM Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the long term planning period.

This AM Plan is to be read with reference to the other strategic documents including but not limited to:

- Gawler Community Plan 2030+
- Gawler Open Space, Sport & Recreation Plan 2025 Directions Report (GOSSRP)
- Gawler Open Space Guideline 2019
- Gawler Design Manual 2019
- Gawler Walking and Cycling Plan 2018
- Gawler (CT) Development Plan July 2019
- Gawler River Open Space Strategy 2009
- Gawler Urban Rivers Master Plan 2013
- Environmental Management Plan 2016
- Long Term Financial Plan update 2021
- Long Term Infrastructure and Asset Management Plan 2020-2029
- Climate Emergency Action Plan (in progress)
- Annual Business Plans 2020-2021 and 2021-2022
- Asset Management Policy
- Asset Capitalisation Policy
- Risk Management Policy

Current status of Asset Management in the Organisation.

The infrastructure assets covered by this AM Plan include:

- furniture & equipment (seat, table, bench bbq's etc.)
- playgrounds & equipment
- shelters & shade structures
- retaining walls & fences
- irrigation systems
- landscape accessory, paved area
- lighting, signs
- monuments and feature structures

For a detailed summary of the assets covered in this AM Plan refer to Table in Section 5.

These assets are used to provide both structured and informal recreational services.

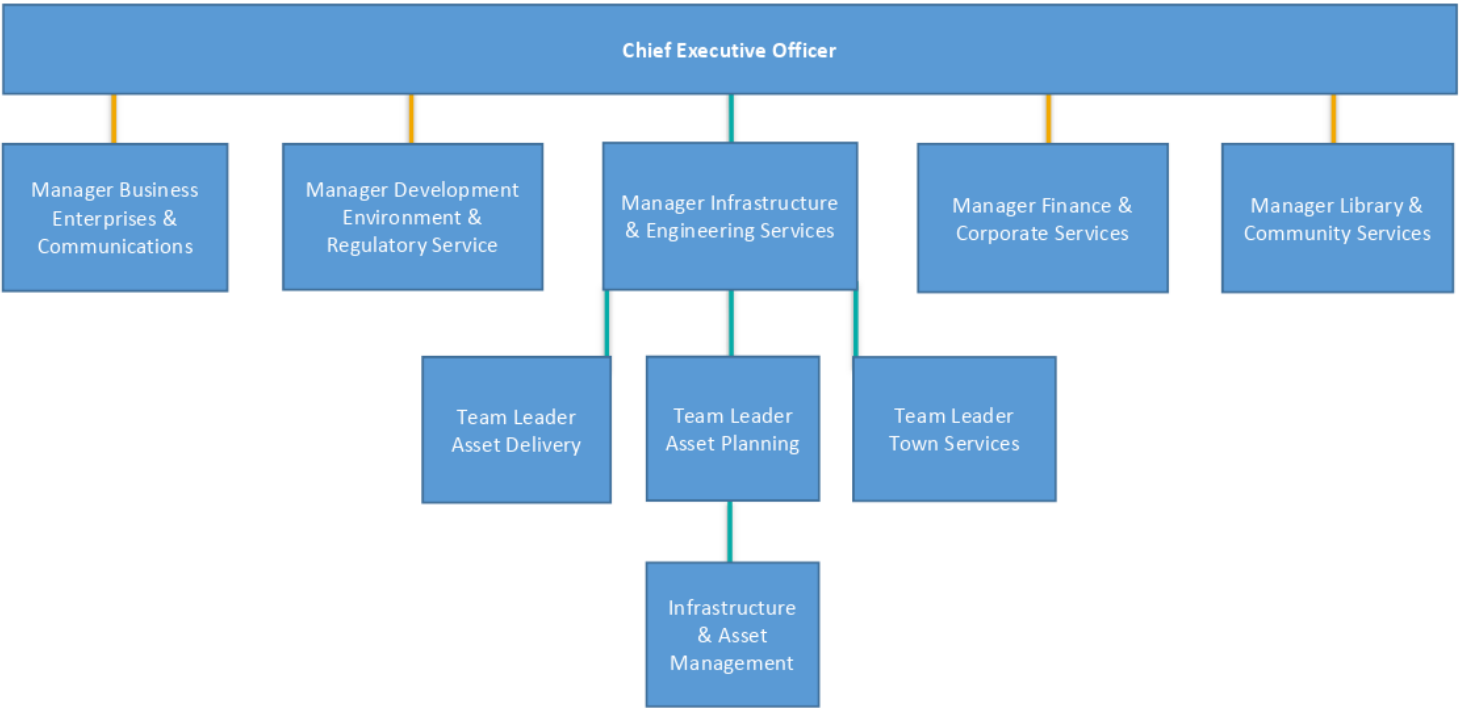
The infrastructure assets included in this Plan have a total replacement value of \$11,871,880. Key stakeholders in the preparation and implementation of this Asset Management Plan are shown in Table 2.1.

Table 2.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Council Members	<ul style="list-style-type: none"> ■ Represent needs of community/shareholders, ■ Allocate resources to meet planning objectives in providing services while managing risks, ■ Ensure services provided by assets are financially sustainable, ■ Approval of the AM Plan.
Executive Management	<ul style="list-style-type: none"> ■ Allocate required funds for the implementation of AM Plan
Council Engineering Staff	<ul style="list-style-type: none"> ■ Programming and implementing capital works and making application for funds to meet standards set, within budget constraints.
Council Operation Staff	<ul style="list-style-type: none"> ■ Programming and implementing maintenance works to meet standards set, within budget constraints.
Developers	<ul style="list-style-type: none"> ■ Vesting of new open space assets in the Council.
External Parties	<ul style="list-style-type: none"> ■ Service level expectations by <ul style="list-style-type: none"> ▪ Community Residents & Businesses; ▪ Tourist and Visitors (as occasional users); ▪ Neighbouring Council's; ▪ Emergency Services; ▪ Developers & Utility Companies; ▪ Local Businesses and; ▪ Federal and State Government authorities & agencies (i.e. Environmental Protection Agency, Department for Environment and Water and others).

Our organisational structure for service delivery from infrastructure assets is shown below.

Town of Gawler Organisational Structure for Service Delivery from Infrastructure Assets



2.2 Goals and Objectives of Asset Ownership

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are

- Levels of service – specifies the services and levels of service to be provided,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

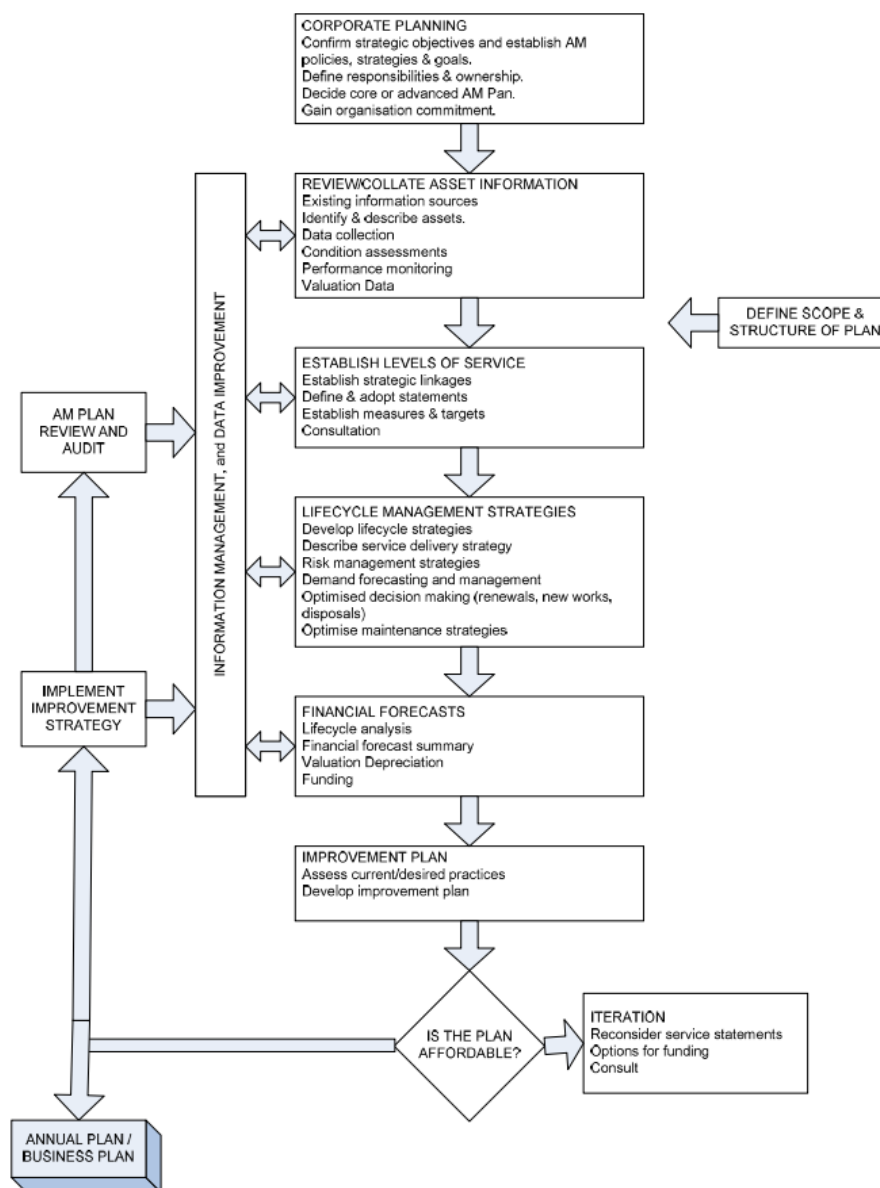
¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



3.0 LEVELS OF SERVICE

3.1 Customer Research and Expectations

This AM Plan is prepared to facilitate consultation prior to adoption of levels of service by the Town of Gawler. Council conducted a public consultation along with a customer satisfaction survey prepared by an external consultant for a period of three weeks from 15th June 2022 to 6 July 2022 using different media platforms (post, e-mail, customer service, telephone call and “Your Voice Gawler” on the web). The responses that Council received were minimal and cannot be used to provide statistically reliable data for the interpretation of satisfaction levels.

Community level of service is the service received by the community in terms of safety and legislative compliance, quality, quantity, reliability, responsiveness, cost and efficiency. Council collects data on community expectations and satisfaction from customer service records system and through community surveys.

Given the lack of response to the 2022 community consultation, it is considered valuable to review other relevant, previous consultations. A community survey was undertaken from 16 March to 24 April 2015 on the quality of the open space services provided by the Council as part of development of the Gawler Open Space Sport & Recreation Plan 2025. This was completed on-line and through hard copies with 116 respondents from the community providing feedback.

Table 3.1.2 summarises the results from our Customer Satisfaction Survey.

Table 3.1.2: Customer Satisfaction Survey 2015

Performance Measure Quality	Satisfaction Level (%)					Overall Satisfied
	Very Satisfied	Fairly Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied	
Sportsgrounds	25	44	27	3	1	96
Large recreational parks (e.g. Clonlea Park)	12	53	31	4	0	96
Small local parks (playgrounds, reserves)	12	41	36	7	4	89
Natural Area	18	48	29	3	1	95
Shared path	32	40	27	1	0	99

The 2015 community satisfaction rate on existing asset services is in the range of 89% to 96% which is high. It is noted that growth in land development and other changes in Gawler have occurred since 2015 resulting in an increased demand for services. It is therefore important that a new customer satisfaction survey be undertaken during the next revision of the Plan to compare to the results of 2015 and to inform future service level provision in the future revision of the Plan.

Future consultation processes will be developed to attract more responses. Future revisions of the AM Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist the Town of Gawler and its stakeholders match the level of service required, and service risks and consequences with the customer's ability and willingness to pay for the service.

3.2 Strategic and Corporate Goals

This AM Plan is prepared under the direction of the Town of Gawler vision, mission, goals and objectives.

Our vision is:

A liveable, cohesive, active, innovative and sustainable community.

Our mission is:

The Town of Gawler is committed to fostering a liveable urban environment, taking advantage of the area's natural beauty and accessibility to both Adelaide and the Barossa Valley. We enjoy a cohesive and active local community which Council is proud to support. Moving forward, the Town of Gawler recognises the serious impacts associated with Climate Change on our environment and are committed to more sustainable practices and enduring innovation in this regard.

Our values are:

Teamwork, integrity, inclusion, creativity and happiness.

Strategic goals have been set by the Town of Gawler. The relevant goals and objectives and how these are addressed in this AM Plan are summarised in Table 3.2. These goals and objectives are based on the Town of Gawler Community Plan 2030+.

Table 3.2: Goals and how these are addressed in this Plan

Goal	Objective	How Goal and Objectives are addressed in the AM Plan
A Uniquely Identifiable Township	Protect and promote Gawler's unique heritage	Maintain historic and unique assets for the appreciation of the community and visitors
Managed and Sustainable Growth	Physical and social infrastructure to service our growing population and economy	An Open Space Strategy that identifies current needs and influences future developments
A Healthy, Active, Safe, Engaged Community	Sporting facilities to meet local and regional community needs and provide facilities for a range of different recreational activities	Sport, recreation, open space and walking and cycle paths are maintained at a level of service that is acceptable and community can afford
To Respect, Protect and Nurture the Environment	Support provision of useable open space that preserves natural habitat and biodiversity	Balance service demand with sustainable and appropriate use of available resources
A Strong, Vibrant Community	Deliver ongoing effective and efficient services, including support for regional collaboration	Provide and maintain purpose built open space assets and facilities to hold community events

3.3 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the open space assets service are outlined in Table 3.3.

Table 3.3: Legislative Requirements

Legislation	Requirement
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<i>Local Government Act 1999</i>	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan and long term infrastructure and asset management plan supported by other asset management plans for sustainable service delivery.
<i>Local Government (Financial Management and Rating) Amendment Act 2005</i>	Impetus for the development of a Strategic Management Plan, comprising an (Infrastructure) Asset Management Plan and Long-term Financial Plan.
<i>Environmental Protection Act SA 1993</i>	An Act to provide for the protection of the environment, and for related purposes.
<i>Planning, Development and Infrastructure Act 2016</i>	An Act to provide for matters that are relevant to the use, development and management of land and buildings, including by providing a planning system to regulate development within the State, rules with respect to the design, construction and use of buildings, and other initiatives to facilitate the development of infrastructure, facilities and environments that will benefit the community.
<i>Landscape SA Act 2019</i>	Set the key framework for managing the state's land, water, pest plants and animals, and biodiversity across the state.
<i>Work Health and Safety Act (2012) & Work Health and Safety Regulations (2012)</i>	The Act and Regulations' objectives include: to secure the health, safety and welfare of persons at work.
<i>Disability Discrimination Act 1992 (DDA)</i>	The responsibilities and powers of the Council in providing equitable access for persons with a disability.
<i>Building code of Australia 2019</i>	Sets out standards for construction of buildings and other structures.

3.4 Customer Values

Service levels are defined in three ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

- what aspects of the service is important to the customer,
- whether they see value in what is currently provided and
- the likely trend over time based on the current budget provision

Table 3.4: Customer Values

Service Objective:			
Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Adequate open space asset & facilities	Customer surveys & Complaints	Minimal number of customer requests for open space assets.	Low cost assets (seat, bin etc.) can be provided with current budget allocation
Easy access	Customer surveys & Complaints	Minimal number of complaints for new playgrounds.	Without major capital expenditure this situation is not expected to improve
Clean and Tidy	Customer surveys & Complaints	Minimal number of complaints.	With the current budget we will not be able to expand the current maintenance practices. The trend of complaint is likely to increase.
Safe environment	Customer surveys & Complaints	Minimal number of complaints.	Not anticipated to change as Council endures to maintain safety.

3.5 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Quality How good is the service ... what is the condition or quality of the service?

Function Is it suitable for its intended purpose Is it the right service?

Capacity/Use Is the service over or under used ... do we need more or less of these assets?

In Table 3.5 under each of the service measures types (Quality, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current funding level.

These are measures of fact related to the service delivery outcome e.g. number of occasions when service is not available, condition %'s of Very Poor, Poor/Average/Good, Very Good and provide a balance in comparison to the customer perception that may be more subjective.

Table 3.5: Customer Level of Service Measures

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Condition of Facilities, Equipment and Furniture	Condition rating of the asset components	Most Assets are in condition 3 (fair) or better	Likely to stay as current. Measures will be refined based on community consultation.
	Confidence levels		Medium (Professional judgement supported by data sampling)	Low (Professional Judgement with no specific model evidence)
Function	Measure of whether the asset is appropriate for its intended use	The proportion of the assets that are “fit for purpose”*	Most assets are fit for purpose, however there is a proportion that require improvements to access with those living with a disability in the community	Likely to result in more assets meeting expectations of “fit for purpose” in the medium to long term at the time of asset renewal or the creation of any new or upgraded assets
	Confidence levels		Medium (Professional judgement supported by data sampling)	Low (Professional Judgement with no specific model evidence)
Capacity	Whether the capacity of the facilities, other equipment and assets are sufficient.	The assets and component assets have adequate capacity: No. of playgrounds and furniture	Most of the facilities have sufficient capacity, however there is an increasing proportion where the capacity is becoming a concern: need more playgrounds at locality	The shortfall in required budget is likely to result in more assets not having sufficient capacity
	Confidence levels		Medium (Professional judgement supported by data sampling)	Low (Professional Judgement with no specific model evidence)

3.6 Technical Levels of Service

Technical Levels of Service – To deliver the customer values, and impact the achieved Customer Levels of Service, are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Acquisition** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).
- **Operation** – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc).

- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. playground equipment repairs, picnic table repairs),
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),

Asset managers should plan, implement and control technical service levels to influence the service outcomes.³

Table 3.6 shows the activities expected to be provided under the current Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

Table 3.6: Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
TECHNICAL LEVELS OF SERVICE				
Acquisition	Expand Sport Centres/Fields with additional facilities	Budget Allocation	Limited by the existing budget	As recommended in the GOSSRP Directions Report
	Provide playgrounds within 300-500m catchment distance	Budget Allocation	Limited by the existing budget	Playground within walking distance of approximately 300–500 metres from home
		Budget	\$4,889,600 (10 year average from LTFP)	\$5,070,400 (10 year average from LTIAMP)
Operation	Inspections	Frequency	Monthly (Playgrounds and Sporting Surfaces)	Remain as current monthly inspections
	Utility Cost	Measure used	Annual Cost	Will increase as additional assets are constructed and require operation
		Budget	\$674,382	\$692,370 (10 year average forecast from NAMS+ modelling)
Maintenance	Maintain grass height in sporting fields and open spaces and Vegetation clearance in reserves	Frequency	To Turf Quality Visual Standards As defined in the Year By Fortnight Plan Risk management	Likely to increase due to additional open spaces, road verges being created
	Playgrounds and furniture & equipment and other assets	Measure used	Annual Cost	Likely to increase due to additional assets being created and the ageing of fences and retaining walls

³ IPWEA, 2015, IIMM, p 2|28.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
		Budget	\$2,678,612	\$2,750,565 (10 year average forecast from NAMS+ modelling)
Renewal	Sustain open space assets that meets users' need and safety - Playgrounds, fences, retaining walls and other assets	As identified by condition and safety audits	The Renewal activities that can be undertaken within the current Planned Budget	The Renewal activities as per the Lifecycle Forecast
		Budget	\$358,900 (LTFP)	\$358,900 (LTIAMP)
Disposal	Disposal of assets no longer in use	Identified assets and cost of disposals after investigations	Frequency or annual amount spent on Activity	Optimal frequency or annual amount spent on Activity
		Budget	No disposals Planned. Zero Total for the 10 years	No disposals Planned. Zero Total for the 10 years

Note: * Current activities related to the annual Planned Budget.

** Forecast required performance related to forecast lifecycle costs.

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time.

4.0 FUTURE DEMAND

4.1 Demand Drivers

Drivers affecting demand include things such as population change (urban growth), regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

4.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

4.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.3.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this AM Plan.

Table 4.3: Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population growth	Increased from 17,800 in 2001 to 23,583 persons in 2016.	1% to 2% annual increase	Asset capacity & function issues. Demand for upgrades/ new assets is likely to be increased significantly.	Combination of managing existing assets, upgrading existing assets and providing new assets funded by various parties. Partnership with other service providers. Reserves are suitable for a range of activities rather than specific to a particular activity.
Demographic change	Greater number of residents aged between 0-24 years and over 65 years old (49%).	Further increase with population growth	Asset capacity & function issues. Demand for more active open space/ facilities as well as passive open space areas	As above
Population density increase	Create smaller land lots that have small private open spaces/ backyards	This practice continues	Demand for neighbourhood reserves/playgrounds	As above
Change of land use	Urbanisation of rural living areas	Increase urbanisation	Demand for more open space facilities at new urban areas	Developers provide sustainable assets or contribute to upgrade existing assets to current standards.
Legislative requirements	Playgrounds installed to standards applicable at the time of installation	Playgrounds to meet DDA compliance to current	Some older playgrounds have DDA access or	Upgrade existing assets at the end of useful lives and/ or provide new assets

	Water body safety guidelines applicable at the time of installation	Australian Standards	equipment limitations	meeting legislative requirements.
Action on climate change	Street furniture, fencing and other structures made with traditional materials	Use of recycled products and materials	Cost for service may increase	Upgrading existing assets and providing new assets funded by various parties. Use of recycled materials and products.
Environmental considerations	Weeds and some tree and plants degrade natural environment	Weed removal, drought resistance plant species in passive open spaces and river corridors	Exotic species and weeds would spread impacting on establishment of native vegetation and biodiversity. Further erosion of watercourses if not rehabilitated.	Weedy wood removal, Planting native species & adopt water sensitive urban designs, rehabilitate and enhance watercourse environments.

4.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

Acquiring new assets will commit the Town of Gawler to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the LTFP (Refer to Section 5).

4.5 Climate Change and Adaption

The impacts of climate change can have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change will impact on assets can vary significantly depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.

As a minimum we should consider both how to manage our existing assets given the potential climate change impacts, and then also how to create resilience to climate change in any new works or acquisitions.

Opportunities identified to date for management of climate change impacts on existing assets are shown in Table 4.5.1.

Table 4.5.1 Managing the Impact of Climate Change on Assets

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Hot Weather	Extreme Hot weather for prolonged periods	Change in asset useful life Hot asset surfaces Users exposure to hot weather	Ensure appropriate asset renewal materials/ treatments adopted, Create adequate tree canopy cover
Storm Intensity	More extreme weather events	Potentially more localised flooding of open spaces	Actions on risk management on river paths and assets in flood plains
Rainfall	A drier climate is anticipated	Cost of water will increase	Include water increase costs in operating budgets

Additionally, the way in which we construct new assets should recognise that there is opportunity to build in resilience to climate change impacts. Buildings resilience will have the following benefits:

- Assets will withstand the impacts of climate change
- Services can be sustained
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 4.5.2 summarises some asset climate change resilience opportunities.

Table 4.5.2 Building Asset Resilience to Climate Change

New Asset Description	Climate Change impact These assets?	Build Resilience in New Works
Open Space Assets to withstand climate change	More extreme weather events	Require water sensitive design to be considered as part of new works to encourage passive irrigation opportunities to plantings
Open Space Assets to withstand climate change	More extreme weather events	Any new open space asset works should allow for increased storm intensity in accordance with current standards
Open Space Assets to withstand climate change	More extreme weather events	Use of appropriate materials and treatments including sustainable / recycled materials
Open Space Assets to withstand climate change	More extreme weather events	Create greater canopy cover and shade provision at playgrounds
Open Space Assets to withstand climate change	More extreme weather events	Plantings to be appropriate to local climatic conditions

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

5.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Town of Gawler plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this AM Plan are shown in Table 5.1.1.

These assets include:

Open Spaces include: Active, passive and specific open spaces, nature areas and linear trails along river corridor.

Open Space Infrastructure includes: Monuments, Entrance & feature Structures, Shelters, Courts, Fencing, Walls, Rotundas, Sporting Oval Infrastructure, Shared path & bus stop accessories and Paved areas.

Open Space Furniture and fittings includes: Seats, Tables, Bollards, BBQs, Bins, Flag Poles, Drinking Fountains and other fittings.

Playgrounds & equipment includes: Playground Equipment, Rubber Softfall Matting and Edging/Kerbing.

Irrigation Equipment includes: Sprinklers, Drippers, Computer, Weather Station and Controllers

Signs includes mainly various information signs on open spaces.

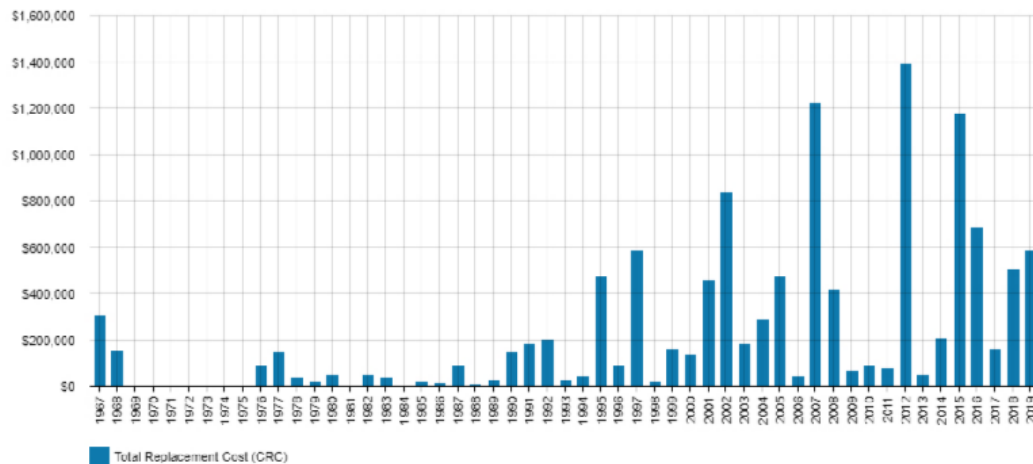
Table 5.1.1: Assets covered by this Plan

Asset Category	No	Value
Fencing	687	\$3,657,164
Irrigation Systems	59	\$1,605,900
Playgrounds	19	\$1,691,166
Furniture & Fittings	505	\$1,264,692
Monuments and Features	42	\$1,756,857
Lighting	66	\$479,000
Paved Area & Accessory	148	\$683,402
Landscape Accessory	30	\$295,587
Retaining Walls	168	\$105,184
Shelters	34	\$276,000
Signs	368	\$56,928
TOTAL		\$11,871,880

The higher valued asset categories are Fencing, Irrigation systems, Playground & equipment, Furniture & fittings and Monuments & structures.

The age profile of the assets included in this AM Plan are shown in Figure 5.1.1.

Figure 5.1.1: Asset Age Profile



Note: All figure values are shown in 2021 dollars.

As can be seen in this graph, there are peaks during recent years. This is mainly due to an increase in new assets created through land developments. There were assets constructed in early part of 1900 and they are indicated as constructed in 1967 in the graph for its clarity on time axis. These assets include monuments and structures made in early 1900.

5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
New / Upgrade Open Space Assets	As identified in the Gawler Open Space Sport and Recreation Plan (GOSSRP), Karbeethan Reserve will require expansion to manage growth in Gawler. Playspaces have also been identified in the GOSSRP as required in the suburb of Reid and Dead Mans Pass area.
Open Space Asset Renewals	Open Space assets are currently being renewed at the end of their service life in accordance with planned budget so there is no service deficiency at the present time.
Open Space Operations	Insufficient operational resources to manage <u>upgraded existing</u> open space areas identified with long term growth in comparison to the existing planned budget (e.g. Karbeethan Reserve). Operational resources to manage <u>new</u> open space areas associated with land development are not considered to be deficient in service provision and have appropriately planned operations budget.
Open Space Maintenance	Insufficient level of maintenance activities to manage <u>upgraded existing</u> open space areas identified with long term growth in comparison to the existing planned budget (e.g. Karbeethan Reserve).

	Maintenance activities to manage <u>new</u> open space areas associated with land development are not considered to be deficient in service provision and have appropriately planned maintenance budget.
Playgrounds	Playgrounds have been installed in accordance with standards applicable at the time of installation. Over time, and as the standards have been updated, some playgrounds require upgrading to current Australian Standards. At the current time, some playgrounds therefore may have access and equipment limitations to those living with a disability in the community.

The above service deficiencies were identified from inspections undertaken by Town of Gawler staff and from the Gawler Open Space Sport and Recreation Plan

5.1.3 Asset condition

Condition is monitored for critical assets frequently (e.g. playground equipment) and assessed for all assets periodically on a 5 yearly cycle. In 2017, a comprehensive open space assets condition assessment was completed and the audited assets data have been used for preparing this AM Plan.

The condition assessments have been completed in accordance with best industry practice by independent professional engineering consultants. Different types of defects for each asset category have been inspected and the overall asset physical condition has been assigned a rating based on the severity and extent of defects. The physical condition has informed the remaining useful life of each asset. At the end of the remaining useful life, the asset has been planned for renewal in order for the asset to continue to provide its service level to the community. The condition index has been validated in the field to match with the actual condition of the asset in the field consistent with best industry practice. Based on the condition assessment undertaken, a 10 year open space assets renewal program with associated costings was prepared with the exclusion of monuments and heritage structures and has been included in the Council's current LTFP.

A repair and safety improvement work program was specifically prepared for Council's open space assets and provided to the Council's maintenance staff for implementation.

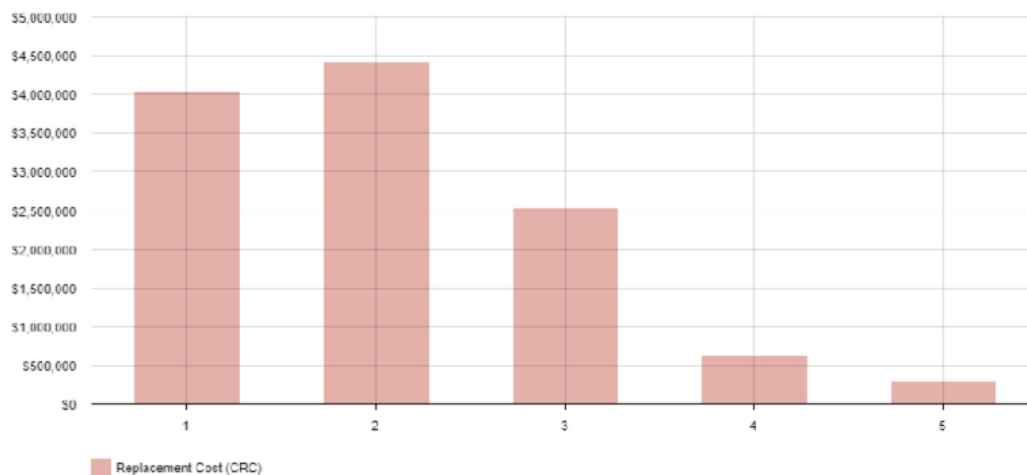
Condition is measured using a 1 – 5 grading system⁴ as detailed in Table 5.1.3. It is important that consistent condition grades be used in reporting various assets across an organisation. This supports effective communication. At the detailed level assets may be measured utilising different condition scales, however, for reporting in the AM plan they are all translated to the 1 – 5 grading scale.

Table 5.1.3: Simple Condition Grading Model

Condition Grading	Description of Condition
1	Very Good: only planned maintenance required
2	Good: minor maintenance required plus planned maintenance
3	Fair: significant maintenance required
4	Poor: significant renewal/rehabilitation required
5	Very Poor: physically unsound and/or beyond rehabilitation

The condition profile of our assets is shown in Figure 5.1.3.

⁴ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Figure 5.1.3: Asset Condition Profile

Note: All figure values are shown in current day dollars.

The graph shows that most assets are in good condition (Condition Grading –1 and 2). They include some playgrounds, irrigation systems and fencing. However, there are short-lived assets within open space asset group of which condition deteriorates within a short term: 5-15 year period. The majority of assets that need renewals within the short term are playgrounds, irrigation systems, fencing and furniture & fittings which are at the condition rating 4 and 5.

Note: All figure values are shown in 2021 dollars.

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning furniture & playground equipment, , asset inspection, and utility services (watering).

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include Furniture repairs, mowing, irrigation system repairs, and equipment repairs.

The trend in maintenance budgets are shown in Table 5.2.1.

Table 5.2.1: Maintenance Budget Trends

Year	Operation and Maintenance Budget
2018/19	\$2,394,823
2019/20	\$2,267,171
2020/21	\$2,593,261

Planned operations and maintenance budget levels are considered to be adequate to meet service levels associated with existing open space assets and new assets vested in the Council from land development. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

The upgrading of existing open space assets is expected to have operations and maintenance budget implications that will require careful consideration in the future as these costs are currently unaccounted for in the Councils LTFP.

Proactive maintenance

Open Space assets condition assessment is scheduled on four yearly cycle. Under condition assessment, asset defects are captured and identified for consideration of maintenance scheduling. Remedial actions are effected under planned maintenance program prepared on the basis of priority using the captured defects during condition assessment.

Reactive maintenance

The defects that are identified from routine asset inspections and mainly from customer requests are rectified under reactive maintenance programs. Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

Achieving strategic objectives

Council plans to operate and maintain the Open Space network to achieve the following strategic objectives.

- Ensure all council owned infrastructure is managed and maintained in a sustainable manner to provide a quality experience for our community,
- Ensure the Open Space network is maintained at a safe and functional standard as set out in this AM Plan,
- Continue to maintain Council's outdoor sport and recreation facilities to appropriate standards for our community.
- Continue to support the preservation of local monuments and statues via appropriate maintenance as required.
- Continue to maintain playground facilities to a high standard for our community.
- Continue to maximise the life of park/garden structures, equipment and furniture via regular and routine maintenance activities.

Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

The service hierarchy is shown in Table 5.2.2.

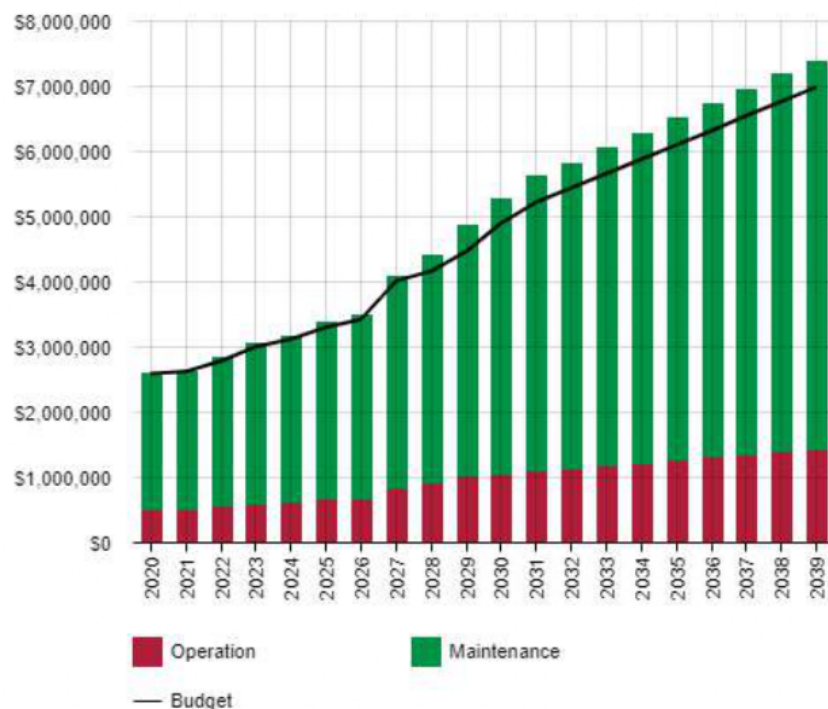
Table 5.2.2: Asset Service Hierarchy

Service Hierarchy	Service Level Objective
Playgrounds	Routine inspection in accordance with Australian Standards. User safety and enjoyment
Sports fields	Maintain to Turf Quality Visual Standards as defined in Council's Landscape Irrigation Management Plan.. User safety and enjoyment
Furniture, fittings & equipment	Maintain hygiene. User safety, convenience and comfort
Fences & retaining walls	Maintain structural integrity. Support user safety and enjoyment

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: Operations and Maintenance Summary



Note: All figure values are shown in 2021 dollars.

Figure 5.2 shows that the projected Operation and Maintenance (O&M) expenditure increases over the 20 year period above the budget allocation in the current LTFP. In long term, due to asset growth in Gawler, operations and maintenance costs are expected to increase and the Council will need to consider allocating additional funding to cover these costs, seek alternative options to minimise cost increases or maintain O&M expenditure at current levels by reducing the level of service.

It is also noted in Figure 5.2 that there is a significant increase in forecasted operations and maintenance (O&M) costs in 2028 and onwards. This is primarily due to the full implementation of an iconic project (i.e. the Karbeethan Reserve Master Plan) with Council maintaining all new and upgraded open space assets. It has been assumed that full development would occur over these two years with a total value of approximately \$40 million (i.e. 20 million split over two years). The projected O&M cost has been assumed to be 0.75% of the total project cost based on existing operations and maintenance cost analysis. Due to the expected operation and

maintenance costs associated with implementation of an iconic project (i.e. Karbeethan Reserve Masterplan), it is expected that Council will consider further options relative to ongoing lease arrangements, availability of external funding (i.e. grant applications) and staging of works over time.

To manage the increase in operations and maintenance costs associated with land development, the Council has developed an Open Space Guideline to ensure the various categories of open space areas are aligned to existing service levels with forecasted budgets informing the Council's LTFP on an annual basis. Also in 2020/21, Council allocated funding to develop an Assets Maintenance Resourcing Strategy (workforce planning for Town Services) which is expected to provide guidance in maintaining the current and future assets efficiently and effectively. This work will be completed in 2021/22.

Implementation of high cost projects such as Karbeethan Reserve upgrade would result in increase of O&M costs. Council will need to consider whether it seeks to find extra funding to cover the projected O&M expenditure and alternative options to minimise cost increases or maintain the O&M expenditure at current level by reducing the level of service and deferring acquisitions and upgrades identified in the LTIAMP. These ongoing annual O&M costs are currently not included in the Council's LTFP or Planned Budget for new and upgraded assets with the exception of land development.

In the LTIAMP, there are two types of capital works identified as non-discretionary and discretionary. The forecast annual average increase of O&M cost for non-discretionary assets is \$73,133 whereas the total annual average increase is \$89,941.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be funded) will be included in the risk assessment and analysis in the infrastructure risk management plan.

5.3 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3.

Asset useful lives were last reviewed in May 2017.⁵

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Playground	15 years
Furniture	10-20 years
Fencing	30-40 years
Irrigation system	30 years

⁵ Enter Reference to Report documenting Review of Useful Life of Assets

The estimates for renewals in this AM Plan were based on the alternate Method.

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing an irrigation system which is not efficient due to blockage and ageing), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁶

It is possible to prioritise renewals by identifying assets or asset groups that:

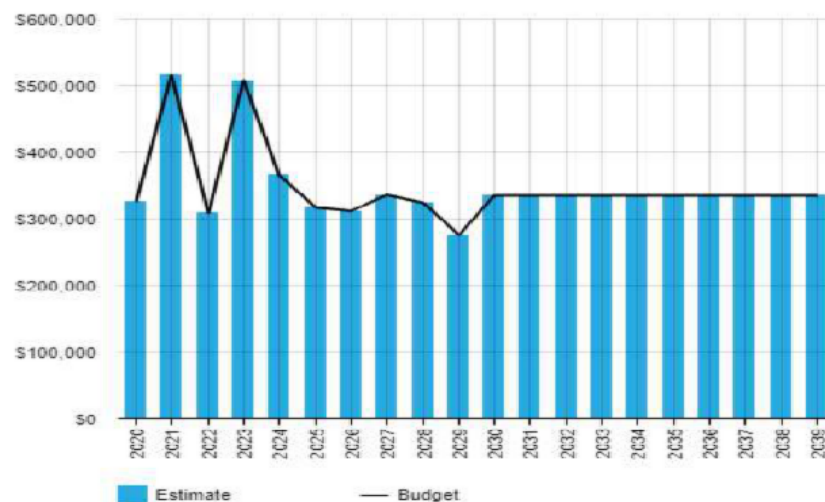
- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁷

Asset renewal programs are prepared based on the physical condition of the assets. Future condition audits will consider asset's physical condition, risk associated with the asset and the criticality of the asset's service when prioritising asset renewals for preparing renewal works program.

5.4 Summary of future renewal costs

Forecast renewal costs are projected to increase over time as the asset stock increases with acquisitions. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 5.4: Forecast Renewal Costs



Note: All figure values are shown in 2021 dollars.

⁶ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁷ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 5.4 shows the projected capital renewal expenditure over 20 year planning period based on the asset remaining life prediction based on the asset condition assessment performed in 2017.

Asset renewal and replacement expenditure identified in the capital works program has been accommodated in the Council's LTFP and there are no unfunded asset renewal works in the current LTFP.

Deferred renewal and replacement (i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs) are to be included in the risk analysis process in the risk management plan.

5.5 Acquisition Plan

Acquisitions are new assets that did not previously exist or works that upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to the Town of Gawler (e.g. land developments and infrastructure deeds).

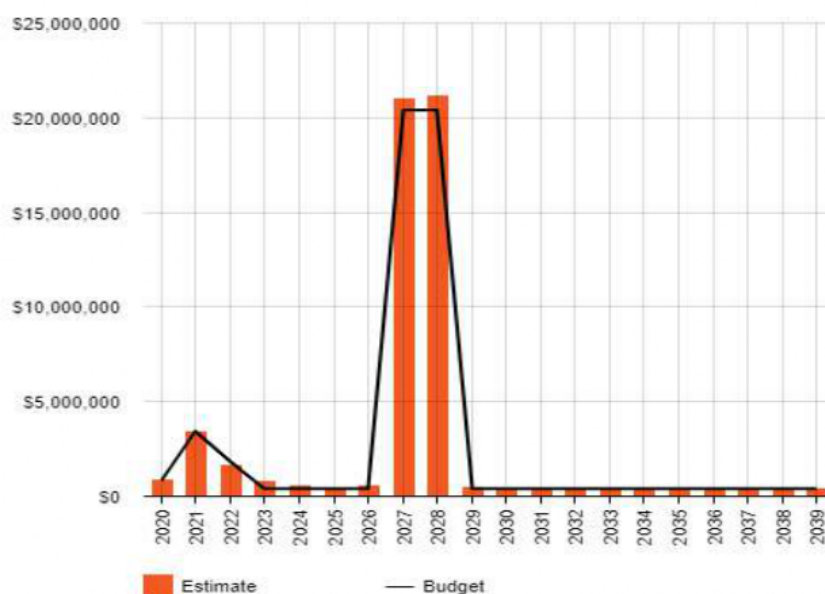
5.5.1 Selection criteria

Proposed upgrade of existing assets, and new assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the community's needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. This is undertaken each year when updating the LTIAMP and annual budget allocations.

5.5.2 Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.5.2.1 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 5.5.2.1: Acquisition (Constructed) Summary



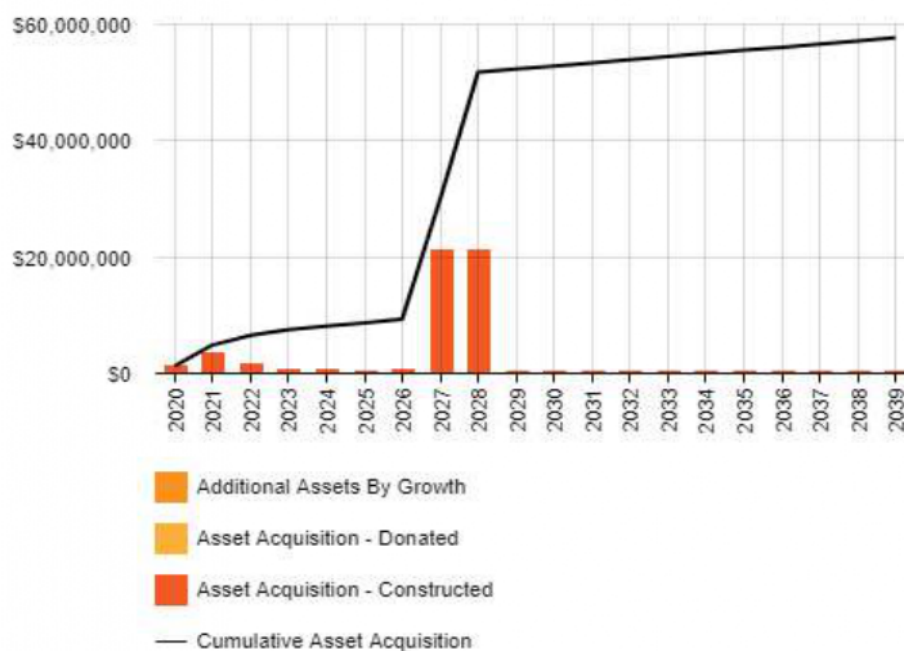
Note: All figure values are shown in 2021 dollars.

Figure 5.5.1. excludes cost of donated assets and assets by growth.

Figure 5.5.2.1 shows that Council has planned a \$40m major iconic project (ie upgrade at Karbeethan Reserve) in the 2027 – 2028 period. Also in 2021/22, a total of \$3.429 million worth of major capital works is planned that includes Lyndoch Road Streetscape upgrade, Essex Park Precinct, Karbeethan Reserve Stage One and landscape integration work associated with the Gawler Rail Electrification Project.

When Council commits to new assets, there is funding required for future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Council. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.5.2.2.

Figure 5.5.2.2: Acquisition Summary



Note: All figure values are shown in 2021 dollars.

It is noted that the acquisition costs associated with growth and donated assets are very small in comparison to constructed assets. The black line also represents the cumulative acquisitions with the increase in 2027 and 2028 associated with the construction of Karbeethan Reserve or other iconic project at that time.

Expenditure on new assets and services in the capital works program will be accommodated in the LTFP, but only to the extent that there is available funding. Grant funding options are to be explored for implementation of new and upgrade asset projects.

Acquiring these new assets will commit the funding of ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required.

Currently, new assets are created as a result of the Council's upgrading or constructing new assets to manage growth and from contributed assets associated with land developments (e.g. Playgrounds, open space irrigation systems).

It shows that the forecast acquisition costs increase significantly in 2027 and 2028, however given the significant increase in cumulative acquisitions and the associated ongoing operations and maintenance costs, it is expected that further budget considerations will be required in the future.

Land development assets by growth and donated assets are not accounted for capital costs (i.e. vested in the Council) however O&M costs are accounted for. Growth assets are assumed to be associated with general population growth at 1%.

5.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the LTFP.

Currently, the Council has not identified any open space assets for disposal.

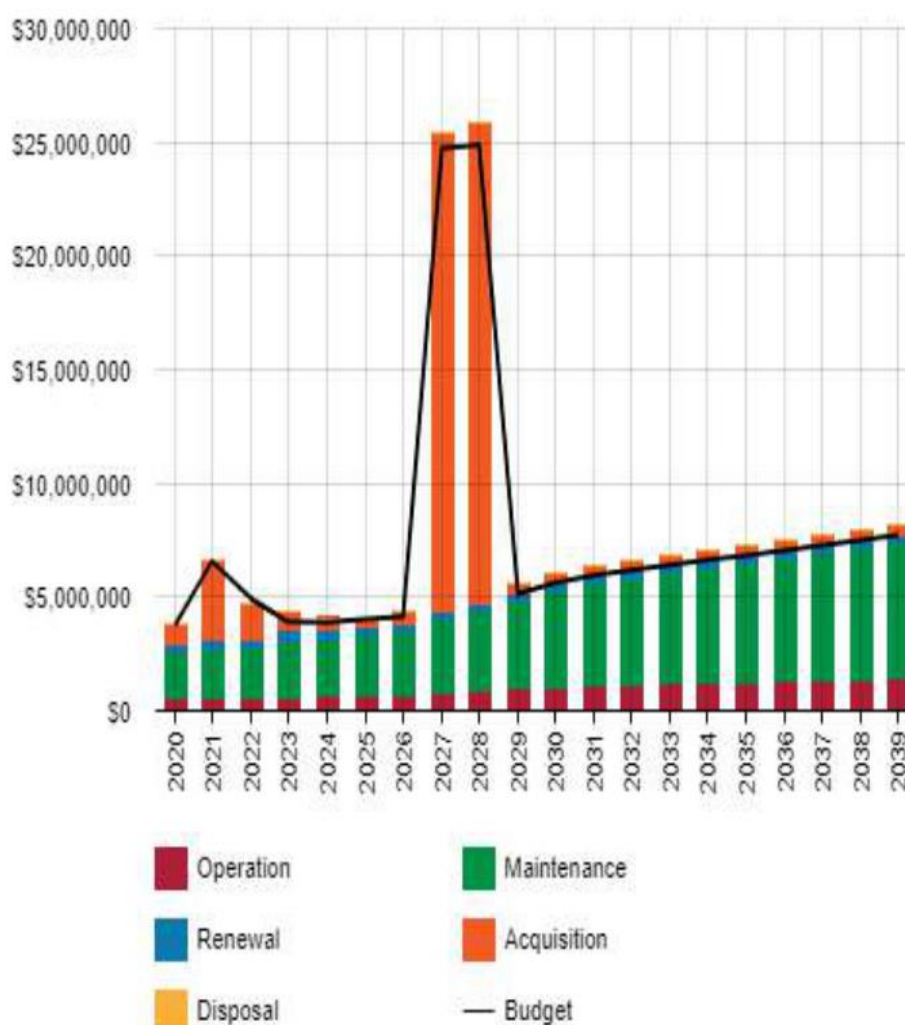
Table 5.6: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Not identified				

5.7 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.7. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.7: Lifecycle Summary

Note: All figure values are shown in 2021 dollars.

As shown in Figure 5.5.3 Council has planned works to match the available funding in the LTFP in the first six years. However, in long term from 2027 onwards, there is a shortfall of funding to cover the projected expenditure. It is noted that operations and maintenance costs are increasing significantly from 2027. This is primarily due to the additional operations and maintenance costs associated with proposed new assets to be acquired by Council through an iconic project (ie Karbeethan Reserve). At the current time the LTFP only includes allowance for operations and maintenance costs associated with open space assets contributed by developers associated with growth from land developments.

6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁸.

An assessment of risks⁹ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Playground Equipment	Damage due to vandalism & improper use	Playground is not available for use until repaired/ renewed.
Sportsgrounds	Unsuitable lawn surface due to flooding or lack of water due to irrigation system failure.	Ground is not suitable and available for sports until recover the surface. Temporary closure of the facility until it is inspected, repaired & made safe.
Shared Path along river corridor	Damage due to flooding	Temporary closure of the path until it is repaired and made safe.
Skate Park	Structural damage due to flooding or vandalism	Temporary closure of the facility until it is inspected, repaired & made safe.

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.2 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

⁸ ISO 31000:2009, p 2

⁹ The Council’s Corporate Risk Management Framework

The process is based on the fundamentals of International Standard ISO 31000:2018.

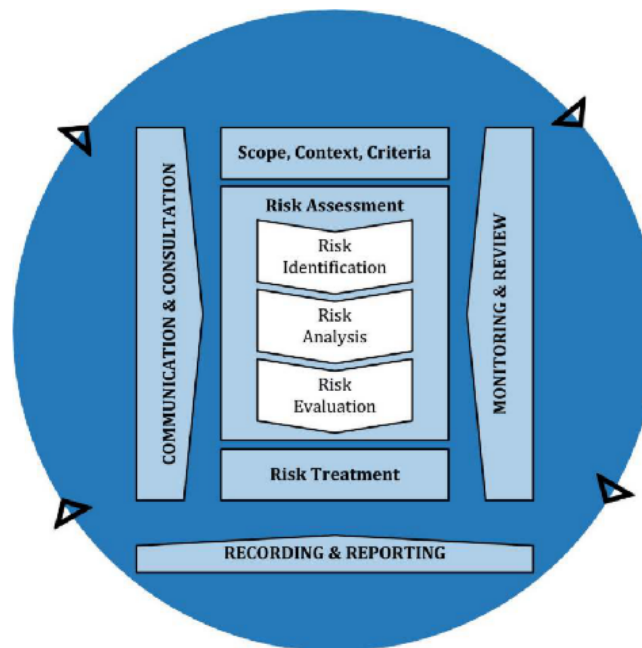


Fig 6.2 Risk Management Process – Abridged

Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks¹⁰ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the Council.

Open space assets are monitored for condition on a four year cyclic program. Routine inspections are undertaken for assessing playground defects and emergency inspections are done for critical assets for asset failure/collapse after extreme events occur.

The risk management process is aligned with ISO 31000 Risk management – Principles and guidelines. It involves risk identification, risk analysis, risk evaluation, risk treatment plans, monitoring and review.

Following the above process, Council will develop a detailed Asset Risk Register.

¹⁰ The Council's Corporate Risk Management Framework

Table 6.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating	Risk Treatment Plan	Residual Risk *	Treatment Costs
Playgrounds	During hot weather useability of playground equipment is reduced (i.e. hot surfaces)	Medium	Consider installation of shade sails as part of playground renewal	Low	\$40,000 per shade sail
Playgrounds	Falling tree branches may cause injuries and bird droppings may cause diseases	High	Tree inspection and effect appropriate actions/ treatments	Low	Included within existing annual budget
Shared path along Gawler river corridor	Users may fall into river at steep slope areas	High	Review shared path to determine works required	Low	Subject to annual budget consideration
Shared path along Gawler river corridor	Some path sections get flooded and damaged Public safety during storm events	High	Monitor weather and temporary closure of the path with barriers and warning signs at heavy storm events. Repair if damaged.	Low	Closure - cost varies per event. Repair if path damage.
Biodiversity Assets	Establishment of invasive species, weeds and other threats impacting on health of native flora and fauna	Medium	Implement actions from the Town of Gawler Biodiversity Management Plan.	Low	Subject to annual budget consideration

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented. Risks have been rated High, Medium and Low in accordance with Councils corporate Risk Management Framework.

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

Our current measure of resilience is shown in Table 6.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

Table 6.3: Resilience

Threat / Hazard	Current Resilience Approach
Shared path along river corridor would be damaged due to river flooding at a stormwater event exceeding 20 year ARI	Temporary closure and implement Council's Emergency Management Plan. Inspect, repair/ renew & reopen. Path would not be available for a prolonged period.
Bush fire destroys native fauna & flora in Natural areas	Remediation and Revegetation.
Climate Change	Consider strategic increase in tree canopy. Use of alternative plants, materials & methods.
Funding shortage	Reprioritise work or Reduce services

6.4 Service and Risk Trade-Offs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

6.4.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years with current LTFP expenditure. These include:

- Create new open spaces and facilities at various open spaces which are close and convenient to communities (neighbourhood type within 400m surrounding area).
- Provide higher asset maintenance service levels/ and practices to future assets acquired under new land developments and capital works programs.

6.4.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Community may not have neighbourhood open space facilities;
- Community may share facilities available at a distance;
- New assets coming under land development may have a lower service level;
- Maintenance services and frequencies may be low in long term;
- General deterioration of assets' service; and

- Community expectation of new open spaces and facilities with high level of services are not met resulting in increased number of complaints.

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- Risk exposure of shared path if repair work is not undertaken and safety review to determine need for barrier fences along river banks;
- Shared paths are not available for use after flood damage until repaired;
- Damaged playgrounds are not available for use until they are made safe;
- Increase in the deterioration of transport assets and reduce level of service,
- Lead to community dissatisfaction and Council subject to public criticism and mistrust,
- Increase in future cost on asset renewal and maintenance,
- A negative impact on the quality of community life, and
- Ramification for public safety.

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

7.0 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Statements and Projections

7.1.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹¹ 100.00%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have 100.00% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

Medium term – 10 year financial planning period

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the 10 year period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is \$3,801,935 on average per year.

The proposed (budget) for operations, maintenance and renewal funding is \$3,711,994 on average per year giving a 10 year funding shortfall of \$89,941 per year. This indicates that 97.63% of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, this calculation excludes cost of acquired assets and given the asset renewal funding ratio is 100.00%, the funding shortfall is consider to be relative to operations and maintenance.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial sustainability for the first few years of the AM Plan and ideally over the 10 year life of the Long-Term Financial Plan.

7.1.2 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.2 shows the forecast costs (outlays) for the 10 year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the long-term financial plan.

A gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing service levels in the AM Plan (including possibly revising the long-term financial plan).

¹¹ AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

We will manage the 'gap' by developing this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community.

Forecast costs are shown in 2021 dollar values.

Table 7.1.2: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Acquisition	Operation	Maintenance	Renewal	Disposal
2020	841000	518652	2074609	326000	0
2021	3429000	519914	2115558	516000	0
2022	1610000	556993	2264334	309000	0
2023	760000	591101	2457978	508000	0
2024	541000	624433	2548784	366000	0
2025	386000	664059	2695275	317000	0
2026	563000	685304	2798609	312000	0
2027	21005000	838858	3238629	336000	0
2028	21142000	907077	3478940	324000	0
2029	427000	1017311	3832931	276000	0
2030	400000	1062548	4215129	335000	0
2031	400000	1098350	4506693	335000	0
2032	400000	1141045	4687771	335000	0
2033	400000	1183740	4868850	335000	0
2034	400000	1226434	5049928	335000	0
2035	400000	1269129	5231006	335000	0
2036	400000	1311824	5412084	335000	0
2037	400000	1354518	5593162	335000	0
2038	400000	1397213	5774241	335000	0
2039	400000	1439908	5955319	335000	0

7.2 Funding Strategy

The proposed funding for assets is outlined in the Entity's budget and LTFP.

The financial strategy of the entity determines how funding will be provided, whereas the AM Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

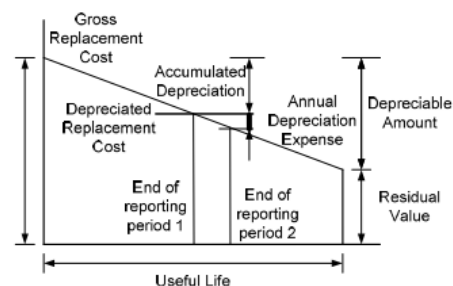
7.3 Valuation Forecasts

7.3.1 Asset valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at fair value at cost to replace service capacity:

Current (Gross) Replacement Cost	\$11,871,880
Depreciable Amount	\$11,871,880
Depreciated Replacement Cost ¹²	\$7,335,640

¹² Also reported as Written Down Value, Carrying or Net Book Value.



Annual Depreciation \$215,936

7.3.2 Asset valuations

Asset values are forecast to increase as additional assets are added to service the community.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts.

It is expected new assets from land developments will continue to be vested in the Council over the next 20-30 years as a result of growth facilitated by available land supply.

7.4 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are in Table 7.4.1.

Table 7.4.1: Key Assumptions

Assumption	Description
Indexation Rates	The Local Government Price Index (LGPI) and other indexation factors relevant for each asset class are used to determine current cost.
Financial values	Current day dollars
Renewal Cost	Forecasts have been made by professional judgement.
O&M Cost forecast	The current operations and maintenance budgets have been used and only increased in the forecast relative to the acquisition of new assets.
Asset Growth	The relationship between development growth and associated increases in the asset stock.
Level of Service	Current infrastructure service levels will remain for the life of the Plan.
Funding	Indicated capital replacement/renewal funding is provided for within the Long Term Financial Plan.
Useful Life	The average useful lives of the asset groups based on current local knowledge and experience and historical trends.

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale¹³ in accordance with Table 7.5.1.

¹³ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	B	Professional Judgement
Growth projections	B	From 2016 Census
Acquisition forecast	B	From LTFP & Gawler growth
Operation forecast	B	From recent budgets and & Gawler growth analysis
Maintenance forecast	B	From recent budgets and & Gawler growth analysis
Renewal forecast		
- Asset values	B	Asset Register is updated periodically
- Asset useful lives	B	Reviewed periodically
- Condition modelling	B	Audit periodically
Disposal forecast	E	Professional Judgement

The estimated confidence level for and reliability of data used in this AM Plan is considered to be reliable.

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices¹⁴

8.1.1 Accounting and financial data sources

Council uses Civica Authority software as its corporate Accounting/Financial system. Currently Open Space asset financial information is in the Civica Authority software but not in the AssetMaster software used for infrastructure asset management purposes.

The Australian Accounting Standards AA116 and the Local Government (Financial Management) Regulations 2011 provide the statutory benchmark against which Council reports on asset accounting.

The chart of account structure used within the general ledger (i.e. work orders) is designed to facilitate the ease of data extraction required for internal and statutory financial reporting. Currently the existing structure meets the Council's financial reporting needs (including those relating to asset accounting). This structure will be reviewed periodically to ensure that it appropriately meets Council's future financial reporting needs.

The current capitalisation threshold for open space and recreation assets is \$5,000 with the exception civil works and structures, which have a threshold of \$10,000 in accordance with Council's Asset Capitalisation Policy. The threshold value is reviewed on three yearly basis.

This AM Plan utilises accounting and financial data. The source of the data is from the open space asset audit reporting done by Calibre Consulting in 2017.

8.1.2 Asset management data sources

This AM Plan also utilises asset's physical and condition data. The source of the data is from the open space asset audit reporting undertaken in 2017.

One of the Asset Management Information Systems, AssetMaster software, is used by the Council for management of its infrastructure assets. Currently, Open Space assets are not recorded in AssetMaster. They are in Civica Authority System. The updated open space assets data collected from 2017 Asset Audit is currently recorded MS excel format. It is appropriate that open space asset data be taken into AssetMaster progressively.

Council uses Civica Authority software for management of open space and building assets. Civica Authority is also used for customer request management. ESRI ArcGIS Pro software is used for asset mapping, ESRI ArcMap as the map viewer and Tree Plotter software is used for tree management.

When there is a change in asset information, the data is updated on the asset management systems. When new assets are created the asset details are recorded periodically in the asset management system so that at the end of financial year all created assets are registered in the system for financial valuation. General errors in the day-to-day administration are corrected as required.

Asset management process flow chart is given in Appendix G.

8.2 Improvement Plan

It is important that an entity recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. In March 2021, an external consultant conducted an internal audit on Council's asset management systems and processes. Responding to the audit findings, Council has prepared an action plan. The improvement plan generated from this Asset Management Plan and from the findings of the Internal Audit is shown in Table 8.2.

¹⁴ ISO 55000 Refers to this the Asset Management System

Table 8.2: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Implement Internal Audit Report Action Plan (CM Reference: CR21/57866)	MIES	SAIE , WHS&RMO & Finance	1-5 years
2	Section 3.5 – Review and agree to an affordable Customer Level of Service	MIES	SAIE & Finance	1 year
3	Section 4.3 – Demand Management Plan Summary to be reviewed	MIES	SAIE & Finance	1 year
4	Section 6.2 - Risk Assessment to be reviewed and Asset Risk Register to be developed	MIES	SAIE , WHS&RMO & Finance	1 year
5	Section 6.3 – Infrastructure Resilience Approach to be reviewed	MIES	SAIE & Finance	1 year
6	Review asset renewal ranking criteria and new asset priority ranking criteria	MIES	SAIE	1 year
7	Value assets annually with a book value adjustment and periodically with a unit rate review consistent with financial auditor requirements	MIES	SAIE	Annually
8	Section 7.1 – Financial Statements and projections to be revised based on asset cost updates after periodical asset financial valuation	MIES	SAIE & Finance	Annually
9	Review capital expenditure during the Council annual budget preparation and amend to recognise any changes in service levels and/or resources available to provide those services	MIES	SAIE	Annually
10	Review open space assets mapped on the corporate GIS system and update layer data where required	MIES	TLAP	Annual
11	Schedule next open space assets condition audit based on a four year cycle	MIES	SAIE	4 yearly
12	Schedule next update the Council's Open Space AM Plan based on a four year cycle	MIES	SAIE	4 yearly
13	Migrate open space assets data on to AssetMaster	MIES	SAIE	1-2 year

Note: CEO – Chief Executive Officer, MIES – Manager Infrastructure and Engineering Services, TLAP – Team Leader Asset Planning, SAIE – Senior Assets & Infrastructure Engineer, WHS&RMO – Work Safety Health & Risk Management Officer.

8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of four years and is due for complete revision and updating within two years of each Council election in accordance with legislative requirements of the Local Government Act 1999.

8.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the LTFP.
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the AM Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 1.0).

9.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long-Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Gawler Community Plan 2030+
- Town of Gawler Budget and Business Plan 2020/21
- Town of Gawler Long Term Financial Plan 2020-2029
- Town of Gawler Long Term Infrastructure and Asset Management Plan 2019-2028

10.0 APPENDICES

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

There are new and upgrade assets forecast for delivery during this plan period. These new and upgrade assets are required to manage environmental and community needs within existing infill development area and rural areas and have previously been identified in the Gawler Open Space Sport and Recreation Plan 2025. Also there are new contributed assets received from developers associated with growth from land developments. Timing of works is also based on the Gawler East Infrastructure Interventions, Southern Urban Areas Infrastructure Delivery Deed and external funding availability.

A.2 – Acquisition Project Summary

The major projects are associated with implementation of the Gawler Open Space, Sport & Recreation Plan 2025, which includes Karbeethan Reserve expansion (\$40,000,000). Other major works include Gawler East Link Road (Donated in 2020), Lyndoch Road Beautification, Essex Park Precinct and Car Park, Playground and Irrigation System upgrades to current standards.

A.3 – Acquisition Forecast Summary

Using NAMS+ Outputs Summary for Acquisition as follows.

Table A3 - Acquisition Forecast Summary

Year	Constructed \$	Donated \$	Growth \$
2020	841000	GELR - 336200	29680
2021	3429000	0	30594
2022	1610000	0	30671
2023	760000	0	30748
2024	541000	0	30824
2025	386000	0	30901
2026	563000	0	30979
2027	21005000	0	31056
2028	21142000	0	31134
2029	427000	0	31212
2030	400000	0	31290
2031	400000	0	31368
2032	400000	0	31446
2033	400000	0	31525
2034	400000	0	31604
2035	400000	0	31683
2036	400000	0	31762
2037	400000	0	31841
2038	400000	0	31921
2039	400000	0	32001

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

Operation and maintenance cost forecasting analysis has been completed on the Gawler East Link Road and contributed assets from new land developments by Council staff according to the timing of the asset creation. The ongoing operation and maintenance costs associated with the full implementation of the Karbeethan Reserve Masterplan have been included and commence in financial years 2027-2028.

B.2 – Operation Forecast Summary

Using NAMS+ Outputs, Summary for Operation is as follows.

Table B2 - Operation Forecast Summary

Year	Operation Forecast	Additional Operation Forecast	Total Operation Forecast
2020	518652	1262	518652
2021	518652	5144	519914
2022	550588	2415	556993
2023	582281	1140	591101
2024	614473	812	624433
2025	653287	579	664059
2026	673953	845	685304
2027	826663	31508	838858
2028	863374	31713	907077
2029	941895	641	1017311
2030	986492	600	1062548
2031	1021694	600	1098350
2032	1063789	600	1141045
2033	1105884	600	1183740
2034	1147978	600	1226434
2035	1190073	600	1269129
2036	1232168	600	1311824
2037	1274262	600	1354518
2038	1316357	600	1397213
2039	1358452	600	1439908

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

Operation and maintenance cost forecasting analysis has been completed on the Gawler East Link Road and contributed assets from new land developments by Council Staff according to the timing of the asset creation.

C.2 – Maintenance Forecast Summary

Using NAMS+ Outputs Summary for Maintenance.

Table C2- Maintenance Forecast Summary

Year	Maintenance Forecast	Additional Maintenance Forecast	Total Maintenance Forecast
2020	2074609	5046	2074609
2021	2110512	20574	2115558
2022	2238714	9660	2264334
2023	2422698	4560	2457978
2024	2508944	3246	2548784
2025	2652189	2316	2695275
2026	2753207	3378	2798609
2027	3189849	126030	3238629
2028	3304130	126852	3478940
2029	3531269	2562	3832931
2030	3910905	2400	4215129
2031	4200069	2400	4506693
2032	4378747	2400	4687771
2033	4557426	2400	4868850
2034	4736104	2400	5049928
2035	4914782	2400	5231006
2036	5093460	2400	5412084
2037	5272138	2400	5593162
2038	5450817	2400	5774241
2039	5629495	2400	5955319

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

The Renewal Forecast has been prepared according to the outcome of the open space assets condition audit in 2017 and on-going risk management analysis.

D.2 – Renewal Project Summary

They are renewal of playgrounds, irrigation systems, fences and furniture, equipment & fittings.

D.3 – Renewal Forecast Summary

Using NAMS+ Outputs Summary for Renewal

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast	Renewal Budget
2020	326000	326000
2021	516000	516000
2022	309000	309000
2023	508000	508000
2024	366000	366000
2025	317000	317000
2026	312000	312000
2027	336000	336000
2028	324000	324000
2029	276000	276000
2030	335000	335000
2031	335000	335000
2032	335000	335000
2033	335000	335000
2034	335000	335000
2035	335000	335000
2036	335000	335000
2037	335000	335000
2038	335000	335000
2039	335000	335000

Appendix E Disposal Summary

E.1 – Disposal Forecast Assumptions and Source

Currently, Council has not identified any significant asset disposals.

E.2 – Disposal Project Summary

Council has not identified any asset for disposal.

E.3 – Disposal Forecast Summary

Using NAMS+ Outputs Summary for Disposal

Table E3 – Disposal Activity Summary

Year	Disposal Forecast	Disposal Budget
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0

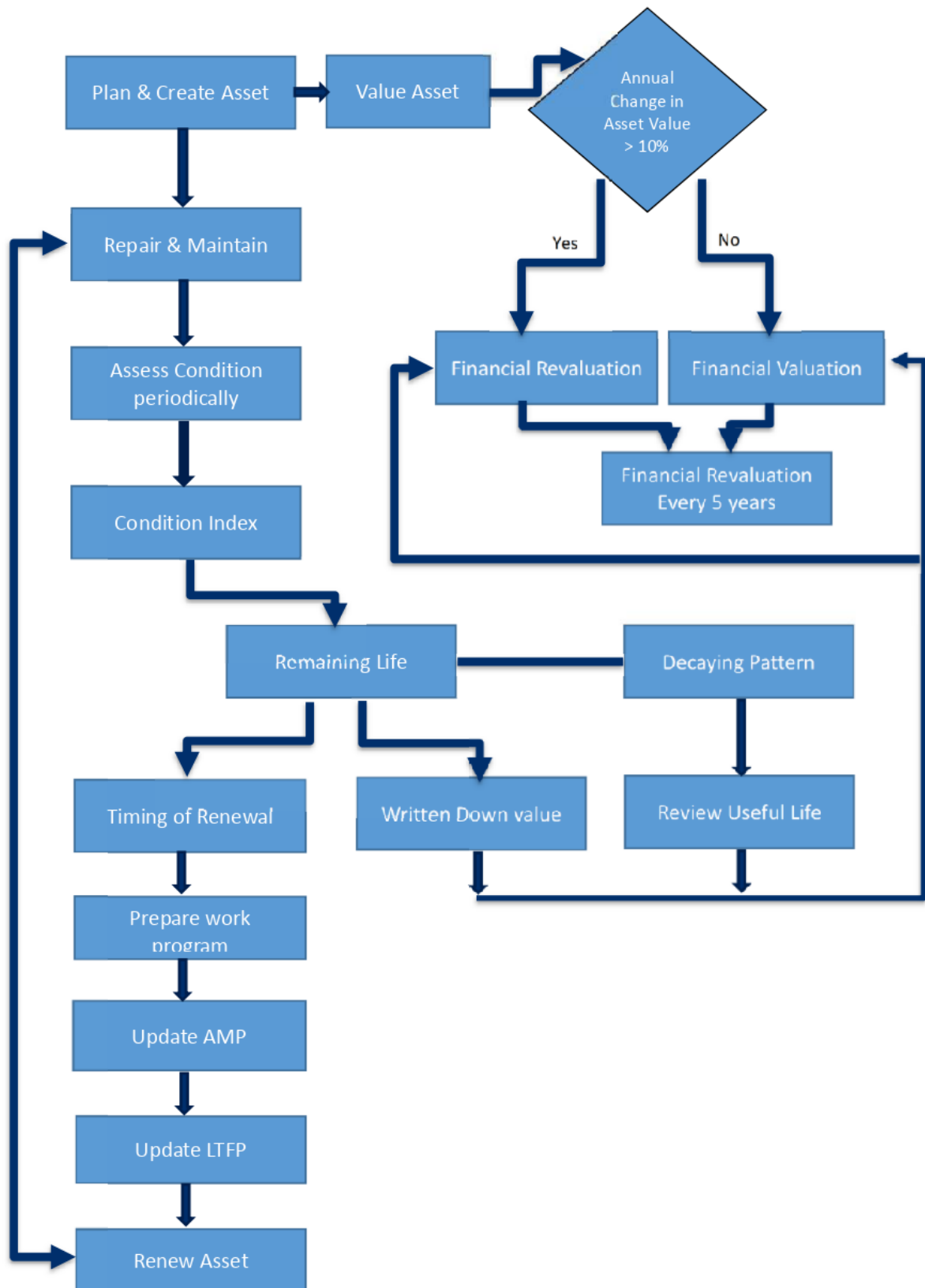
Appendix F Budget Summary by Lifecycle Activity

The following budget summary is based on the Council's current Long Term Financial Plan. It is shown in 2021 dollars. This information is the basis of the Planned Budget used in the Lifecycle Model for this AM Plan.

According to LTFP Council has an annual financial capacity of \$3m for new acquisitions for all asset classes across the Council. It is assumed that only \$400,000 is available for new open space assets acquisitions/upgrades except that additional \$40 million has been allocated for Karbeethan Reserve upgrade in 2027 and 2028.

Table F1 – Budget Summary by Lifecycle Activity

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2020	841000	518652	2074609	326000	0	3760261
2021	3429000	518652	2110512	516000	0	6574164
2022	1826000	550588	2238714	309000	0	4924302
2023	400000	582281	2422698	508000	0	3912979
2024	400000	614473	2508944	366000	0	3889417
2025	400000	653287	2652189	317000	0	4022476
2026	400000	673953	2753207	312000	0	4139160
2027	20400000	826663	3189849	336000	0	24752512
2028	20400000	863374	3304130	324000	0	24891504
2029	400000	941895	3531269	276000	0	5149164
2030	400000	986492	3910905	335000	0	5632397
2031	400000	1021694	4200069	335000	0	5956763
2032	400000	1063789	4378747	335000	0	6177536
2033	400000	1105884	4557426	335000	0	6398309
2034	400000	1147978	4736104	335000	0	6619082
2035	400000	1190073	4914782	335000	0	6839855
2036	400000	1232168	5093460	335000	0	7060628
2037	400000	1274262	5272138	335000	0	7281401
2038	400000	1316357	5450817	335000	0	7502174
2039	400000	1358452	5629495	335000	0	7722947

Appendix G Asset Management Process Flow Chart

Town of Gawler
21ADL-0854
12 July 2022

Public Consultation Report

DRAFT Town of Gawler Asset Management
Plans

SHAPING
GREAT
COMMUNITIES



Draft Asset Management Plans Public Consultation Report

12 July 2022

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1. Why did we engage?

The Town of Gawler has prepared draft Open Space, Stormwater and Transport Asset Management Plans.

Asset Management Plans are a requirement of the Local Government Act, they:

- Identify the funding to maintain and upgrade assets into the future to an agreed level of service and considering changing demands.
- Outline principles by which decisions will be made to provide or manage assets in a way that balances community expectations, risk, and financial means.

The Town of Gawler is changing – the population is growing; residential development is increasing, and Council is needing to respond to a changing climate. These changes are putting increased demand on the assets that Council manages. Council needs to carefully plan to ensure that we can provide assets that best meet community needs within the resources they have available.

The draft Open Space, Stormwater and Transport Asset Management Plans have been prepared to respond to these needs.

Council undertook consultation with its community on the draft Asset Management Plans to understand how satisfied the community is with the provision and quality of our open space, stormwater and transport assets and to seek feedback on key improvements included in each draft plan.

This report summarises the consultation process and results.

2. How did we engage?

2.1 Fact sheet

A fact sheet (Appendix A) was prepared to provide background and a summary of the key content of each draft Asset Management Plan.

The fact sheet was available to view/download from the Town of Gawler Your Voice consultation website (www.gawler.sa.gov.au/your-voice).

2.2 Online survey

An online survey was established on the Town of Gawler Your Voice consultation website (www.gawler.sa.gov.au/your-voice) and was open from 15 June to 6 July 2022. A copy of the survey form is provided in Appendix B.

The survey asked respondents the extent to which:

- they are satisfied with the availability and quality of different open space, stormwater, and transport assets
- they support a list of key improvements in the draft Open Space, Stormwater and Transport Asset Management Plans.

Opportunity was also provided for any other feedback.

The survey was promoted via:

- Council's Your Voice website and an email to people registered to Your Voice
- A public notice in the local paper (the Bunyip)
- Pull up banners and posters in Council centres
- Post to Council's Facebook page.

3. What did we hear?

Only one response was received to the online survey. As such a summary analysis is not appropriate. A copy of the response is provided in Appendix C.

Appendix A – Fact sheet

Draft Open Space, Stormwater and Transport Asset Management Plans

The Town of Gawler has prepared draft Open Space, Stormwater and Transport Asset Management Plans (AMPs) and wants the feedback of community and stakeholders.

The Town of Gawler is changing – our population is growing; residential development is increasing and we are needing to respond to a changing climate. These changes are putting increased demand on the assets that Council manages. We need to carefully plan to ensure that we can provide assets that best meet community needs within the resources we have available.

This factsheet explains why and how Council has prepared the draft AMPs and the key features of the plans.

43 High Street, Gawler East SA 5118
Tel: 08 8522 9211 Email: council@gawler.sa.gov.au

Gawler



ABOUT ASSET MANAGEMENT PLANS

What are asset management plans?

Councils own, operate or manage many assets on behalf of the community including:

- Open space (eg. parks, playgrounds, playing fields)
- Stormwater (eg. pipes, pits and culverts)
- Transport (eg. roads, footpaths and bridges)
- Buildings (eg. community centres, club rooms)
- Strategically acquires assets (eg. land, buildings) to support future needs or its financial position.

Asset Management Plans (AMPs) are a requirement of the Local Government Act, they:

- Identify the funding to maintain and upgrade assets into the future to an agreed level of service and considering changing demands.
- Outline principles by which decisions will be made to provide or manage assets in a way that balances community expectations, risk, and financial means.

Asset Management Plans are for a 10 year period and are linked to a Long-Term Financial Plan to ensure that the management of assets is financially sustainable.

What asset management plans does the Town of Gawler have?

Council has four AMPs which combined form its Long-Term and Infrastructure AMP:

- Open Space AMP
- Stormwater AMP
- Transport AMP
- Building AMP.

Council is seeking feedback on the draft Open Space, Stormwater and Transport AMPs. The draft Building AMP is being prepared and will be released for public consultation later this year.

How do they consider future needs?

Council carefully plans how to provide and manage assets into the future considering how the council area and the demands on it may change. The AMPs consider factors such as:

- Growing population
- Increasing populations of older and younger people (i.e. >65 and 0-25 year olds)
- Increasing urbanisation (e.g. greenfield housing and higher density development)
- Legislative requirements (e.g. stormwater and disability compliance)
- Climate change (e.g. flood mitigation, urban cooling, lowering emissions, low footprint materials).

How are they funded?

All Councils have limited finances. As such AMPs will manage existing assets and carefully consider when upgrades or new assets need to be created to meet new demands.

There are always more things that Council or the community would like to do but cannot be done within the budget available. As such each AMP includes a list of other partially or unfunded upgrades or new assets. Delivery of these is dependent finding savings elsewhere in Council's budget or sourcing additional funding.

ABOUT THE DRAFT OPEN SPACE ASSET MANAGEMENT PLAN

What are open space assets?

The open space network includes:

- Active open spaces (e.g. for sports, exercise or active play)
- Natural areas supporting native plants and animal habitats (e.g. river banks)
- Passive open spaces (e.g. unstructured physical activities such as picnics, walking and cycling)
- Specific purpose open spaces (e.g. cemetery, dog parks, and open spaces with heritage significance)
- Linear trails along river corridor.

Assets include furniture and fittings, fences and retaining walls, infrastructure and structures, irrigation systems, playgrounds and equipment, monuments and feature structures, and signs. These assets have a total estimated renewal value of \$12 million.

What does the draft Open Space Asset Management Plan propose to deliver over 10 years?

- Operation, maintenance, renewal and upgrade of existing open space assets to current service levels.
- New or strategic projects including:
 - Parking facilities at Gawler Oval and Dead Mans Pass

- Karbeethan Reserve Master Plan implementation
- Upgrade playgrounds to the current community expectations and standards
- Implement Council's Biodiversity Management Plan and Gawler Open Space, Sport and Recreation Plan 2025 directions in stages
- Design and commission iconic public art projects
- Other works that have been identified in the Long Term Financial Plan.

The following initiatives are desirable but cannot be fully funded within available budgets. Delivery of these is dependent on finding savings elsewhere in Council's budget, delaying other upgrades or sourcing alternative funding.

- Operation and maintenance of Karbeethan Reserve / Essex Park Master Plan or Iconic Project implementation
- Car park upgrades at reserves
- Additional off-leash dog facilities
- Pioneer Park heritage wall restoration
- Open spaces and facilities that are close and convenient to the local community
- Essex Park and Gawler Showgrounds Regional Sporting Precinct Master Plan implementation.

ABOUT THE DRAFT STORMWATER ASSET MANAGEMENT PLAN

What are stormwater assets?

Stormwater drainage assets including pipes, pits, stormwater quality improvement devices, headwalls, river outfalls, channels and detention basins. These assets have a total estimated renewal value of \$81 million.

Flood mitigation levee banks and infrastructure along Gawler Rivers are not included as they are managed under Gawler River Flood Management Authority.

What does the draft Stormwater Asset Management Plan propose to deliver over 10 years?

- Operation, maintenance and renewal of existing stormwater drainage assets to meet service levels set by annual budgets.
- Operation and maintenance of contributed stormwater drainage assets (e.g. those built by developers and handed to council to manage) to meet service levels set by annual budgets.

Gawler



ABOUT THE DRAFT STORMWATER ASSET MANAGEMENT PLAN *(continued)*

- Upgrades to increase the capacity of some existing drainage network sections identified in the Stormwater Management Plans for Gawler and Surrounds, and Smith Creek catchments.
- Southern Urban Area stormwater harvest and distribution system and miscellaneous drainage improvement works.

The following initiatives are desirable but cannot be fully funded within available budgets. Delivery of these

is dependent on finding savings elsewhere in Council's budget or sourcing additional funding.

- Willaston drainage upgrade Stage 2
- Upgrading to other existing under capacity systems identified in the Stormwater Management Plans for Gawler and Surrounds, and Smith Creek catchments
- Establishing the Gawler River Racecourse detention basin Upgrading Milne Road drainage

ABOUT THE DRAFT TRANSPORT ASSET MANAGEMENT PLAN

What are transport assets?

Transport assets include sealed and unsealed roads (excluding those managed by the State Government), footpaths, shared paths, bridges and culverts, roundabouts, kerbs and water tables. These assets have a total estimated renewal value of \$202m.

What does the draft Transport Asset Management Plan propose to deliver over 10 years?

- Operation, maintenance, and renewal of existing roads, roundabouts, bridges, culverts, footpaths and kerb and water tables to meet current service levels set in annual budgets.
- New or strategic projects: Adelaide Road between Gawler Mill Inn Bridge and Twelfth Street, upgrade Dalkeith Road, Jane Street reconstruction, Barossa Trail to Stuart O'Grady Bike Track, and a portion of identified new footpaths and kerb and gutter works.

The following initiatives are desirable but cannot be fully funded within available budgets. Delivery of these is dependent on finding savings elsewhere in Council's budget or sourcing additional funding.

- Tiver Road and Bentley Road upgrade
- All required new footpath and kerb and gutter construction
- Upgrade of some old road pavements that do not have engineered pavement structures.
- New footpath construction over \$350,000 per year (i.e. approx. 1.6km)
- New kerb and water table construction over \$223,000 (i.e. approx. 1km)
- Walking and cycling network linkages
- Goose Island footbridge upgrade
- Sealing unsealed roads
- Eighteenth Street upgrade.

MORE INFORMATION AND HAVE YOUR SAY

Visit www.gawler.sa.gov.au/your-voice to read the draft plans in full and to complete an online survey by 5pm 6 July 2022.

43 High Street, Gawler East SA 5118
Tel: 08 8522 9211 Email: council@gawler.sa.gov.au

Gawler



Appendix B – Online survey form



Town of Gawler Draft Asset Management Plans

Draft Open Space, Stormwater and Transport Asset Management Plans

The Town of Gawler has prepared draft Open Space, Stormwater and Transport Asset Management Plans and wants the feedback of community and stakeholders. You can view the draft plans and a fact sheet at gawler.sa.gov.au/your-voice.

The Town of Gawler is changing - our population is growing; residential development is increasing and we are needing to respond to a changing climate. These changes are putting increased demand on the assets that Council manages. We need to carefully plan to ensure that we can provide assets that best meet community needs within the resources we have available.

This survey will ask how satisfied you are with the provision and quality of our open space, stormwater and transport assets. It also seeks your feedback on key improvements included in each draft plan. Your feedback will be considered and used to help update and finalise the draft Asset Management Plans.

ABOUT YOU

1. Please provide your contact details if you wish to be kept informed of the outcomes of this consultation

Name

Company

Email Address

* 2. What suburb do you live in?

* 3. What is your relationship to the Town of Gawler (Please tick all that apply)

☐ I live in the area

☐ I work in the area

☐ I own a property or business in the area

☐ I represent a group or organisation (please provide name)

YOUR FEEDBACK

How satisfied are you with Council's assets?

Open space assets

* 4. How satisfied are you with the availability and quality of the following open space assets?

	Very satisfied	Satisfied	Somewhat satisfied	Not satisfied	Unsure / don't know
Parks and reserves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sportsgrounds (eg. ovals, courts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Play spaces (eg. playgrounds, skate parks, halfcourt basketball)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural areas (eg. biodiversity areas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shared paths (e.g. River corridor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Do you have any other comments on your satisfaction with Town of Gawler open space assets? (optional)

Stormwater assets

* 6. How satisfied are you with the provision and quality of the following stormwater assets?

	Very satisfied	Satisfied	Somewhat satisfied	Not satisfied	Unsure / don't know
Stormwater, drains, pipes, and swales to prevent localised flooding of roads and land to an acceptable extent during rain events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watercourses, wetlands and detention basins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stormwater capture, treatment and reuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Do you have any other comments on your satisfaction with Town of Gawler stormwater assets? (optional)

Transport assets

* 8. How satisfied are you with the availability and quality of the following transport assets?

	Very satisfied	Satisfied	Somewhat satisfied	Not satisfied	Unsure/ don't know
Local sealed roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unsealed roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Footpaths	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kerbs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bike lanes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Street Furniture (seats, bins etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Do you have any other comments on your satisfaction with Town of Gawler transport assets? (optional)

Key asset improvements

Each Asset Management Plan includes a series of key improvements (new assets) that it has allocated full or partial funding to deliver. Existing assets will continue to be maintained.

Open space

The draft Open Space Asset Management Plan includes the following key improvements:

- Parking facilities at Gawler Oval and Dead Mans Pass
- Karbeethan Reserve Master Plan implementation
- Essex Park Master Plan implementation
- Playground upgrades
- Implement Council's Biodiversity Management Plan and Gawler Open Space, Sport and Recreation Plan 2025 directions in stages
- Iconic public art projects
- Car park upgrades at reserves
- Additional dog off leash facilities
- Pioneer Park heritage wall restoration

* 10. Do you support the above key improvements for the draft Open Space Asset Management Plan?

- ☐ Support
- ☐ Somewhat support
- ☐ Do not support
- ☐ Unsure / don't know

11. Why did you select this response? (optional)

Stormwater

The draft Stormwater Asset Management Plan includes the following key improvements:

- Upgrades to increase the ability of some existing drainage in Gawler and Surrounds, and Smith Creek Catchments to carry stormwater
- New stormwater drainage, capture and reuse networks in the southern urban area of Gawler (within Evanston South and Evanston Gardens).
- Willaston drainage upgrade Stage 2 on Main North Road

* 12. Do you support the above key improvements for the draft Stormwater Asset Management Plan?

- ☐ Support
- ☐ Somewhat support
- ☐ Do not support
- ☐ Unsure / don't know

13. Why did you select this response? (optional)

Transport

The draft Transport Asset Management Plan includes the following key improvements:

- Upgrade Adelaide Road between Gawler Mill Inn Bridge and Twelfth Street
- Upgrade Dalkeith Road
- Jane Street reconstruction
- Barossa Trail to Stuart O'Grady Bike Track construction?
- Tiver Road and Bentley Road upgrade
- All required new footpath and kerb and gutter construction
- Upgrade of some old roads that do not have engineered pavement structures

* 14. Do you support the above key improvements for the draft Transport Asset Management Plan?

- ☐ Support
- ☐ Somewhat support
- ☐ Do not support
- ☐ Unsure / don't know

15. Why did you select this response? (optional)

Any other feedback

16. Do you have any other feedback about the draft Open Space, Stormwater or Transport Asset Management Plans (optional)



Thank you for taking the time to provide your feedback

Appendix C –Online survey response

Town of Gawler Open Space Asset Management Plans

#1

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, July 05, 2022 9:11:36 PM
Last Modified: Tuesday, July 05, 2022 9:25:31 PM
Time Spent: 00:13:55
IP Address: 58.174.134.203

Page 1: Draft Open Space, Stormwater and Transport Asset Management Plans

Q1

Respondent skipped this question

Please provide your contact details if you wish to be kept informed of the outcomes of this consultation

Q2

What suburb do you live in?

gawler

Q3

I live in the area,

What is your relationship to the Town of Gawler (Please tick all that apply)

I work in the area

Q4

How satisfied are you with the availability and quality of the following open space assets?

Parks and reserves	Satisfied
Sportsgrounds (eg. ovals, courts)	Satisfied
Play spaces (eg. playgrounds, skate parks, halfcourt basketball)	Somewhat satisfied
Natural areas (eg biodiversity areas)	Somewhat satisfied
Shared paths (e.g. River corridor)	Not satisfied

Q5

Do you have any other comments on your satisfaction with Town of Gawler open space assets? (optional)

There are some beautiful parks in Gawler but they need better facilities. Dead mans pass desperately needs a new toilet (it is revolting and there are disgusting, unsafe acts happening in it), a bbq area and a better carpark. There is so much possibility for better playgrounds. Why can't gawler invest in an iconic playground that draws people into the town. More playgrounds should have fences and a toilet block. I don't think Council does much to protect or enhance its natural areas and the river corridor should be a priority for biodiversity. So much potential but this does not seem to be the focus for council.

1 of 2

Town of Gawler Stormwater Asset Management Plan

Q6

How satisfied are you with the provision and quality of the following stormwater assets?

Stormwater, drains, pipes, and swales to prevent localised flooding of roads and land to an acceptable extent during rain events	Somewhat satisfied
Watercourses, wetlands and detention basins	Not satisfied
Stormwater capture, treatment and reuse	Not satisfied

Q7

Do you have any other comments on your satisfaction with Town of Gawler stormwater assets? (optional)

Why isn't there more water sensitive urban design in the new parts of gawler? Lots of space for wetlands and biodiversity projects. All other councils are doing stormwater water recycling - does gawler do any? why not?

Q8

How satisfied are you with the availability and quality of the following transport assets?

Local sealed roads	Satisfied
Unsealed roads	Satisfied
Footpaths	Satisfied
Kerbs	Satisfied
Bike lanes	Somewhat satisfied
Street Furniture (seats, bins etc.)	Satisfied

Q9

Do you have any other comments on your satisfaction with Town of Gawler transport assets? (optional)

Council seems to spend a lot of its budget on roads, some of this should go to stormwater

Q10

Somewhat support

Do you support the above key improvements for the draft Open Space Asset Management Plan?

Q11

Why did you select this response? (optional)

Really want to see investment in biodiversity/climate change instead of sporting grounds

Item 7.2- Attachment 4

Q12

Support

Do you support the above key improvements for the draft Stormwater Asset Management Plan?

Q13

Why did you select this response? (optional)

Please get recycling stormwater happening

Q14

Somewhat support

Do you support the above key improvements for the draft Transport Asset Management Plan?

Q15

Why did you select this response? (optional)

I think these will get more money than the open space and stormwater

Q16

Do you have any other feedback about the draft Open Space, Stormwater or Transport Asset Management Plans (optional)

Please invest more in open space and biodiversity

Page 615



Town of Gawler

SUMMARY Asset Plan (\$,000's)

SUMMARY	2020 /	2021 /	2022 /	2023 /	2024 /	2025 /	2026 /	2027 /	2028 /	2029 /	Item
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
CAPITAL - NEW & UPGRADE	7,948	7,952	7,445	5,817	4,447	4,857	4,252	24,848	24,860	4,557	96,984
TRANSPORT	5,538	2,872	3,429	2,760	2,233	2,804	1,495	1,643	1,513	1,561	25,848
Roads	4,625	470	1,619	2,001	1,468	2,004	794	803	702	711	15,197
Bridges	45	0	0	0	0	0	0	0	0	0	45
Kerb & Gutter	121	0	325	314	319	354	253	392	362	400	2,841
Footpaths	426	973	1,162	413	413	413	413	413	413	413	5,450
Street Assets	321	1,429	323	33	33	34	35	35	36	37	2,316
STORMWATER	44	65	670	651	433	523	1,046	1,047	1,048	1,049	6,576
BUILDINGS AND PROPERTY	1,020	628	643	574	317	221	225	230	234	598	4,689
OPEN SPACE	841	3,429	1,610	760	541	386	563	21,005	21,142	427	50,704
PLANT & EQUIPMENT	105	48	171	152	0	0	0	0	0	0	476
CAPITALISED SALARIES	400	910	923	923	923	923	923	923	923	923	8,690
CAPITAL - REPLACEMENT & RENEWAL	2,415	3,901	3,602	3,635	3,479	2,888	2,902	3,633	3,073	3,698	33,225
TRANSPORT	1,192	1,951	2,067	2,038	2,185	2,214	2,256	2,382	2,314	2,507	21,106
Roads	696	1,131	1,199	1,280	1,346	1,430	1,583	1,578	1,601	1,633	13,476
Bridges	200	80	129	132	134	113	0	118	0	122	1,028
Kerb & Gutter	173	275	270	257	284	268	276	283	294	300	2,680
Footpaths	103	420	416	315	366	346	339	345	358	365	3,375
Street Assets	20	45	53	54	55	57	58	59	60	86	548
STORMWATER	0	41	107	109	111	113	115	118	120	122	956
BUILDINGS AND PROPERTY	362	400	400	620	323	57	58	59	60	61	2,399
OPEN SPACE	326	516	309	508	366	317	312	336	324	276	3,589
PLANT & EQUIPMENT	535	993	719	360	493	188	161	738	255	732	5,174
ANNUAL TOTALS Indexed @ 0.0% pa	10,363	11,853	11,048	9,452	7,926	7,745	7,154	28,480	27,933	8,255	130,209

221 52676 Copy of Long Term Infrastructure Asset Management Plan ~ Attachment to Asset Management Plan Report August 2021

SUMMARY

4

Gawler and Surrounds

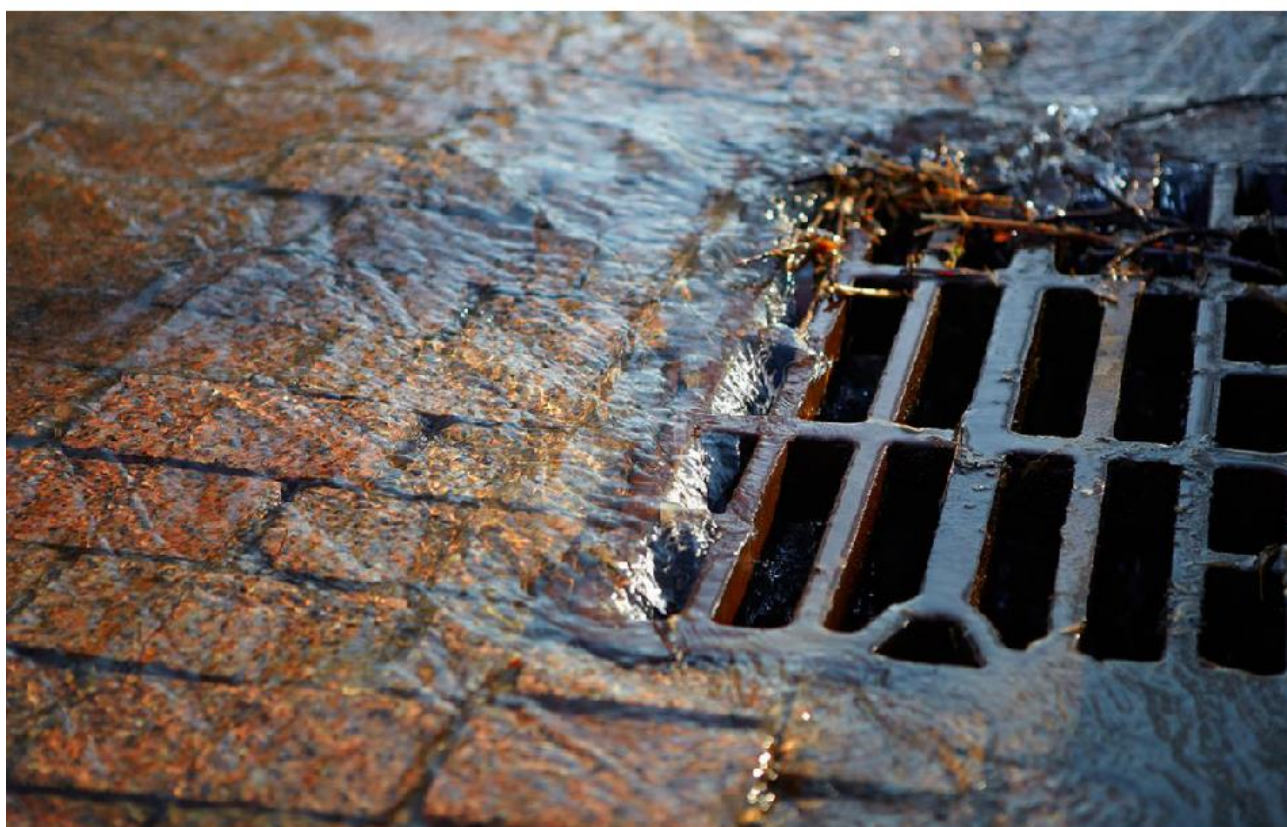
Stormwater Management Plan

Town of Gawler, Light Regional Council & Barossa Council

Client Ref No. TC14/62

3 August 2021

Ref: 20141387R006E





Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	Draft SMP	TAK/OO/JDN	TAK/OO	TAK	1 June 2018
B	For consultation	TAK/OO/JDN	TAK	TAK	25 March 2019
C	Final consultation draft	TAK/OO/JDN	TAK	TAK	13 November 2020
D	For approval	TAK/OO/JDN	TAK	TAK	16 March 2021
E	For approval	TAK/OO/JDN	TAK	TAK	3 August 2021



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20141387R006E Gawler and Surrounds | Stormwater Management Plan

2



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Client: Town of Gawler, Light Regional Council & Barossa Council
Ref: 20141387R006E

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Appendix B – Hydraulic modelling summary report

Appendix C – Gawler River levee bank discussion paper

Appendix D – Development potential discussion paper

Appendix E – Cost estimates for mitigation strategies

Appendix F – Flood inundation and hazard maps

Appendix G – Flood damages data

Appendix H – Consultation summary

Appendix I – Optimised decision making methodology scoring spreadsheet



Glossary

AAD	Annual average damage
AEP	Annual exceedance probability
ARI	Average recurrence interval
ASR	Aquifer storage and recovery
BCR	Benefit-cost ratio
BMP	Biodiversity management plan
DEW	Department for Environment and Water
DIT	Department for Infrastructure and Transport
EMS	Eco Management Services
EPA	Environment Protection Authority
FFL	Finished floor level
GELR	Gawler East Link Road
GWRS	Gawler Water Reuse Scheme
GPT	Gross pollutant trap
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
MAR	Managed aquifer recharge
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NPV	Net present value
NYLB	Northern and Yorke Landscape Board
ODMG	Optimised decision making guidelines
RAM	Rapid Appraisal Method
RCP	Reinforced concrete pipe
SES	State Emergency Service
SMA	Stormwater Management Authority
SMP	Stormwater management plan
SWMZ	Surface water management zone
TN/TP/TSS	Total nitrogen/total phosphorus/total suspended solids
WAP	Water allocation plan
WMLR	Western Mount Lofty Ranges
WRSV	Water Reticulation Systems Virginia
WSUD	Water sensitive urban design



Executive summary

The Gawler and Surrounds stormwater management plan (SMP) covers the township of Gawler and the surrounding areas of Gawler Belt, Evanston Park, Bibaringa, Sandy Creek and Kalbeeba. There are two designated growth areas covered by the SMP: Gawler East and Concordia. Stormwater runoff from the study area drains to the North and South Para Rivers which converge within the township of Gawler to form the Gawler River.

The SMP provides a framework for the holistic management of stormwater within the study area (excluding fluvial flooding from the Gawler River, North and South Para Rivers). It summarises the current state of the catchment, identifies problems and opportunities, defines objectives and develops a list of prioritised strategies for the management of stormwater. The plan, which has been prepared in accordance with the Stormwater Management Authority's (SMA's) *Stormwater Management Planning Guidelines* (2007) addresses issues of flood management, water quality, water harvesting, environmental enhancement and asset management.

THE CURRENT STATE OF THE CATCHMENT

The health of the aquatic ecosystem within the receiving waters is generally poor, largely due to human disturbance. An assessment of the tributaries within the study area determined that they are highly modified with little of the natural habitat remaining. Areas with medium to high erosion potential were also identified.

The urbanised areas of the study area have an extensive underground drainage network which discharges flows directly to the river via a large number of outfalls. Analysis of the existing system found that 67% of the network (by length) has the capacity to convey runoff during a 20% annual exceedance probability (AEP) event. The existing stormwater infrastructure also includes a number of gross pollutant traps (GPTs) and detention basins which reduce pollutant loads that are discharged into receiving waters.

The SMP area is located within the bounds of the Western Mount Lofty Regions Water Allocation Plan (WAP). Bunyip Water harvests up to 800 ML/year from the Gawler River downstream of the study area. There is also a harvesting and reuse scheme proposed for the Gawler Southern Urban Growth Area, located just outside the bounds of the SMP. Additional opportunities for harvesting and reuse have been considered but are limited by the constraints of the WAP.

The modelling undertaken to inform the development of the SMP is based on historical climate conditions. The current projections for a future climate suggest that despite warmer, drier average conditions there is likely to be an increase in rainfall intensities. The changes in future conditions will impact the management of water within the area.

PROBLEMS AND OPPORTUNITIES

A combined one and two-dimensional hydraulic model was developed to identify key flood prone areas within the area. The modelling was based on estimates of long-term development within the catchment. Flood events with annual exceedance probabilities (AEP) of 20% to 0.2% AEP were modelled. Review of the resultant flood maps identified six key flood prone areas:

- Greening Drive in Evanston South: flooding occurs at a localised low spot as a result of overflow from the creek that runs through Trinity College. It is believed that the overflow results from the creek channel and culverts having insufficient capacity through the school grounds.
- Railway Crescent/Przibilla Drive (Evanston): a trapped low spot located in the lower part of the Clifford Road drain catchment that is subject to flooding in a 1% AEP event. The flooding is due to a combination of large flow volumes from the Clifford Road Drain catchment and insufficient capacity of the drainage system under the Gawler Bypass.



- First Street at Gawler South: a trapped low spot adjacent to the Gawler Racecourse. The modelling indicates that flooding occurs in events as frequent as a 20% AEP, with extensive inundation of private properties for events of a 5% AEP or less. The analysis indicates that the flooding is a result of high runoff from the heavily urbanised catchment combined with limited capacity of the drainage system under the racecourse.
- Jarvis Street and Brooks Avenue in Willaston: the limited capacity of the drainage system downstream of a localised low spot in Jarvis Street results in flooding in events as frequent as a 20% AEP. The cause of the flooding observed in the vicinity of Brooks Avenue is a result of the existing detention basin having insufficient capacity. The capacity of the basin is exceeded in floods larger than a 20% AEP, causing the flooding of adjacent properties.
- Jane Street and Davies Street in Willaston: flood modelling indicates that there is flooding of private properties in the 20% AEP event. The flooding is a result of the lack of underground drainage higher in the catchment. It is understood that Council have since installed an underground drainage network with a 20% AEP capacity standard along both Jane Street and Davies Street.
- Gawler Belt: there is a large depression which acts as a drainage basin for the surrounding catchments. Due to the lack of any formal drainage in the area, beyond small roadside swale drains, there is extensive overland sheet flow through properties. Whilst many properties experience sheet flow, it is believed that few homes are flood affected (because floor levels are above the flooding).

A water quality model was developed to understand the patterns of pollutant generation within the study area and to identify opportunities for water quality improvement. The modelling shows that the generation of pollutants is relatively evenly distributed across the areas of current development. Opportunities for environmental protection and enhancement are also explored.

STORMWATER MANAGEMENT STRATEGIES

The SMP draws on the understanding of the study area and identification of problems and opportunities to specify a number of objectives for the management of stormwater within the study area. The objectives relate to flood management, water quality improvement, water use, environmental protection and enhancement and asset management. Structural and non-structural strategies are then developed to address each of the objectives.

FLOOD MANAGEMENT

Strategies incorporating flood control basins, infrastructure upgrades, new drainage infrastructure and augmentation of the Gawler River levee banks have been proposed for the purpose of flood management. Non-structural strategies including education and awareness, the use of the mapping outputs from the SMP to inform flood warning and flood forecasting, changes to policy documents and an assessment of the potential impacts of climate change are also presented. The flood reduction effectiveness of the structural measures was assessed using the results of hydraulic modelling. Capital and ongoing maintenance costs have been estimated for each strategy. The benefits of the major flood management strategies have been quantified using calculations of the associated reduction in average annual damages (AAD).

The modelling found that a 21% (\$343,000) reduction in AAD can be achieved across the study area if all of the structural flood management strategies are implemented. The greatest reduction in AAD (\$167,000) occurs in the vicinity of the Potts Road and Gawler Racecourse detention basins. The Jarvis Street and Willaston drainage upgrades also result in a significant reduction (\$120,000) in AAD.

WATER QUALITY IMPROVEMENT

The heavily developed nature of the urbanised sections of the study area combined with the distributed nature of the outfalls to receiving waters limits the opportunities for the implementation of additional water quality improvement measures. The construction of a wetland at the Gawler racecourse provides the greatest improvement in water quality. Gross pollutant traps, soakage systems and raingardens are also considered a possible strategy. Water quality modelling of the proposed strategies for areas of



existing development show that, while it is not possible to meet the target pollutant load reductions, the proposed measures would provide a measurable reduction in the loads of pollutants discharged to the receiving waters.

The ability to influence water quality is greater in the Gawler East and Concordia growth areas. The recommended strategies for these areas are consistent with best practice principles of water sensitive urban design (WSUD). Works in these areas will focus on maintaining and enhancing natural features within the catchment, limiting peak flows to prevent erosion of downstream channels, WSUD elements to reduce pollutant loads within the catchment combined with instream works. As the planning and design of the growth area infrastructure progresses, water quality modelling should be undertaken to demonstrate that the proposed approaches can achieve the targeted levels of pollutant reduction.

Capital and maintenance costs have been estimated for each of the water quality improvement strategies proposed for the areas of existing development.

WATER USE

The opportunities for beneficial reuse of stormwater within the study area are limited by the constraints of the Western Mount Lofty Ranges WAP. The potential for establishing new water harvesting and reuse schemes was considered at two locations: at the racecourse and adjacent to the Clifford Road drain. However, the racecourse is within the bounds of the WAP and the Department for Environment and Water (DEW) have indicated that all water allocations in this zone are currently allocated. The ability to harvest water is therefore limited. Clifford Road Drain is outside of the WAP zone, however as it is immediately downstream of the area, DEW advised that harvesting from the drain would be subject to approval by the Landscape Board.

The most feasible options for water reuse within the study area are therefore considered to be at a smaller scale. Encouraging the installation of large rainwater tanks to facilitate residential block-scale harvesting and reuse is recommended. This will also help to limit the increase in flows that result from additional development. It is considered that the most effective way of encouraging the installation of rainwater tanks is via a Council funded subsidy scheme. Passive use of water through infiltration (such as raingardens and tree pits) should also be considered.

ENVIRONMENTAL PROTECTION AND ENHANCEMENT

The strategies to achieve the environmental protection and enhancement objectives are consistent with the conservation objectives stated in Council's development plan and draw on work undertaken as part of the Gawler Urban Rivers project. A combination of riparian habitat restoration and erosion protection is proposed. The cost of implementing these strategies is assumed to be an ongoing budget item.

ASSET MANAGEMENT

It is recommended that Council invest in investigations to provide an understanding of the existing condition of their stormwater assets and develop a sustainable asset maintenance plan.

PRIORITISED STRATEGIES

A multi-criteria analysis framework was used to rate the major stormwater management strategies against a wide range of benefits including reduction in flood risk, water reuse and water quality improvements.

Based on the outcomes of the analysis, the following strategies are considered to be high priority:

- Gawler Racecourse flood control basin and wetland: not only do the works provide significant flood reduction, but the wetland also provides water quality improvement and opportunities for habitat creation.
- Trinity College upgrades, Evanston Oval dual pipe and Evanston Park flood control basin: these works provide a reduction in flooding for a relatively low capital cost.



- Utilisation of flood mapping data when assessing new development applications.
- Corey Street flood control basin optimisation: low cost item to reduce downstream flood risks.
- Installation of raingardens: these are suitable in areas where there is a wide road reserve and relatively flat topography. Raingardens not only treat stormwater but can also reduce annual runoff volume and provide amenity value.
- Installation of infiltration systems: improve downstream water quality and allow for passive re-use of stormwater.
- Educating the public about the flood mapping that has been produced, such that they can proactively manage potentially flood impacts.

The following strategies have been assigned a medium priority:

- Jarvis Street drain upgrade and Willaston Drainage upgrade: these works result in a significant reduction in flooding, however the capital costs are high.
- Gawler East flow path improvements: formalising the drainage system would prevent nuisance flooding of private properties. The vegetated open channels would also provide some water quality improvement.
- Hewett rear-of-allotment drainage: the proposed rear of allotment drain will prevent nuisance flooding of private properties.
- WSUD in the backyard: this education program should provide periodic publicity to encourage residents to act at a domestic scale to improve water quality.
- Subsidising large rain tanks: encouraging the installation of large rainwater tanks will help to increase the volume of water harvested at the allotment scale. The tanks would also have the potential to reduce downstream flooding and to not dilute more polluted pavement runoff with cleaner roof runoff water.
- Floodplain mapping to including climate change to enable an understanding of the potential impacts for various scenarios.
- Installation of gross pollutant traps at key outfall locations to improve water quality prior to discharge into the Para Rivers and the Gawler River.
- Riparian habitat restoration and erosion management: the restoration of creek lines through introduction of native species and weed removal will provide for additional native habitat and provide an environment that is less susceptible to erosion.
- CCTV inspection program: a CCTV inspection program should be developed based on asset age and significance. Once an asset condition database has been established the inspection program can focus on infrastructure nearing the end of its service life, so that replacement of assets occurs before they fail.
- Updates to strategic plans, asset plans and development plans: this can result in improved management of stormwater, particularly for future growth areas such as Concordia and Gawler East.

IMPLEMENTATION

The SMP identifies priority strategies for stormwater management. Several of the strategies require considerable expenditure. A 10-year capital works plan is presented based on a total expenditure of between \$1.2 million-\$1.6 million per year, which assumes that funding of \$0.4 million per year can be secured from the SMA for projects that provide flood mitigation for catchments in excess of 40 ha. If the works do not secure SMA funding, implementation of the capital works program is expected to be delayed.



1 Introduction

The Gawler and Surrounds stormwater management plan (SMP) covers the urbanised areas of Gawler and the rural and semi-rural areas of Gawler Belt, Gawler East, Evanston Park and Bibaringa. Also included is the currently undeveloped areas of Sandy Creek, Kalbeeba and Concordia. The study area is centred around the confluence of the North Para River and South Para River which join to form the Gawler River. Fluvial flooding from these rivers is not covered by the SMP.

The study area can be characterised into eastern and western zones. Catchments east of the Gawler Bypass and Sturt Highway drain into the main river channels. The catchments west of these roads drain to a large, natural, trapped low spot. If sufficiently large volumes of runoff reach the low spot, runoff eventually escapes to the west. Within the eastern zone runoff is collected by a formalised network of underground drains, channels and detention basins. In the western zone formalised drainage infrastructure is very limited.

This SMP has been prepared in accordance with the Stormwater Management Authority's (SMA) Stormwater Management Planning Guidelines (2007) and addresses issues of flood management, water quality, water harvesting and environmental enhancement associated with the management of stormwater.

Section 2 of this report provides a description of the study area including a summary of topography and existing stormwater assets.

Section 3 provides a summary of the key flood prone areas, based on the results of the flood mapping that has been undertaken as part of the project and the problems and opportunities with water harvesting, water quality and water reuse.

Section 4 provides a series of catchment specific objectives in relation to the areas of flood management, water quality, water reuse, environmental protection and asset management.

Section 5 provides a series of potential management strategies designed to achieve the objectives set out by Section 4.

Section 6 summarises the costs of the various strategies and identifies who would fund the works.

Section 7 provides a summary of the flood damages assessment work including an economic assessment by comparing costs to benefits.

Section 8 provides a multi-criteria analysis framework for the various strategies and attempts to score them against a range of criteria.

Section 9 prioritises the works and lays out a ten-year capital works program for the study area, in relation to implementing the various strategies.



2 Catchment description

2.1 Catchment

For ease of discussion, the Gawler and Surrounds SMP study area has been divided into four catchment areas based on either their outlet or land use. These four areas are described below and are shown within Figure 2.1. Additionally, a portion of the SMP area is located within the bounds of the Western Mount Lofty Ranges (WMLR) Water Allocation Plan (WAP), also shown in Figure 2.1. The land uses across the entire study area are shown in Figure 2.2.

2.1.1 Gawler Belt

The Gawler Belt area is predominantly comprised of rural living and semi-rural living on allotments ranging in size from one to six hectares. The area is bounded by the Gawler Bypass and Sturt Highway to the south and east, Redbanks Road to the north and Nottle Road to the west. A prominent feature is the dormant, but not officially decommissioned, Roseworthy Railway line.

The area is characterised by the peaks and troughs of quaternary period, inland sand dunes which run in a southeast to northwest direction. In the south-western corner of Gawler Belt there is a large 40-hectare depression which acts as a drainage basin for the surrounding catchments. The total catchment area draining to the depression is just under 2,500 hectares. The catchment extends outside of the study area to a point 3 km north of Roseworthy. If enough runoff (over 13.5 GL) enters the large depression floodwater eventually spills to the west and flows towards Ward Belt. An additional 240 hectares drains to several smaller depressions along the southern boundary of the study area.

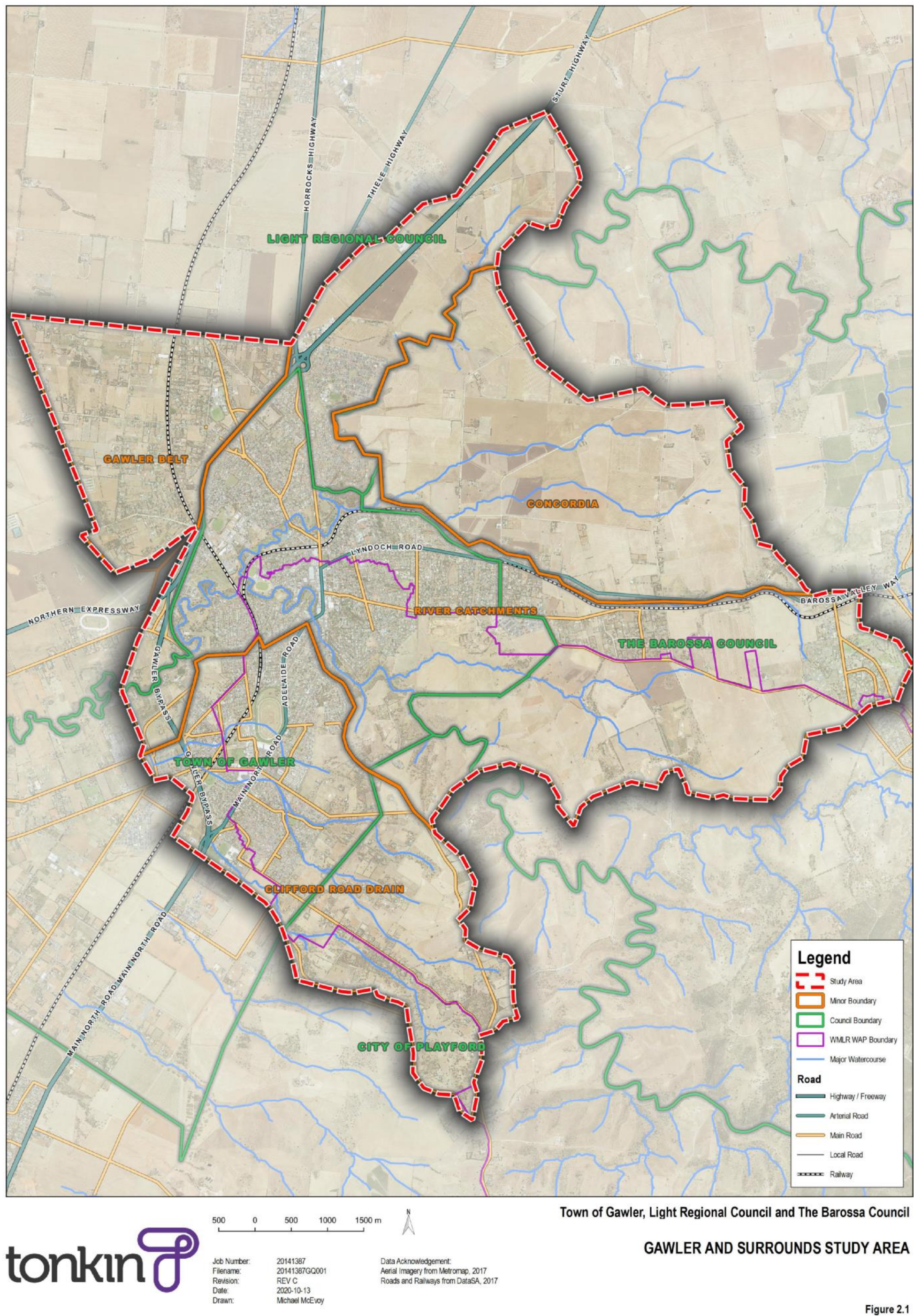
Due to the predominantly rural nature of the catchment, the response time of the catchment is relatively slow. The critical design event duration for the largest catchment is 24 hours for both peak flow and runoff volume. The largest daily rainfall recorded at Roseworthy is 103.1 mm and was recorded in January 1941. This is very nearly equal to the 24-hour, 1% annual exceedance probability (AEP) design rainfall depth of 103.3 mm.

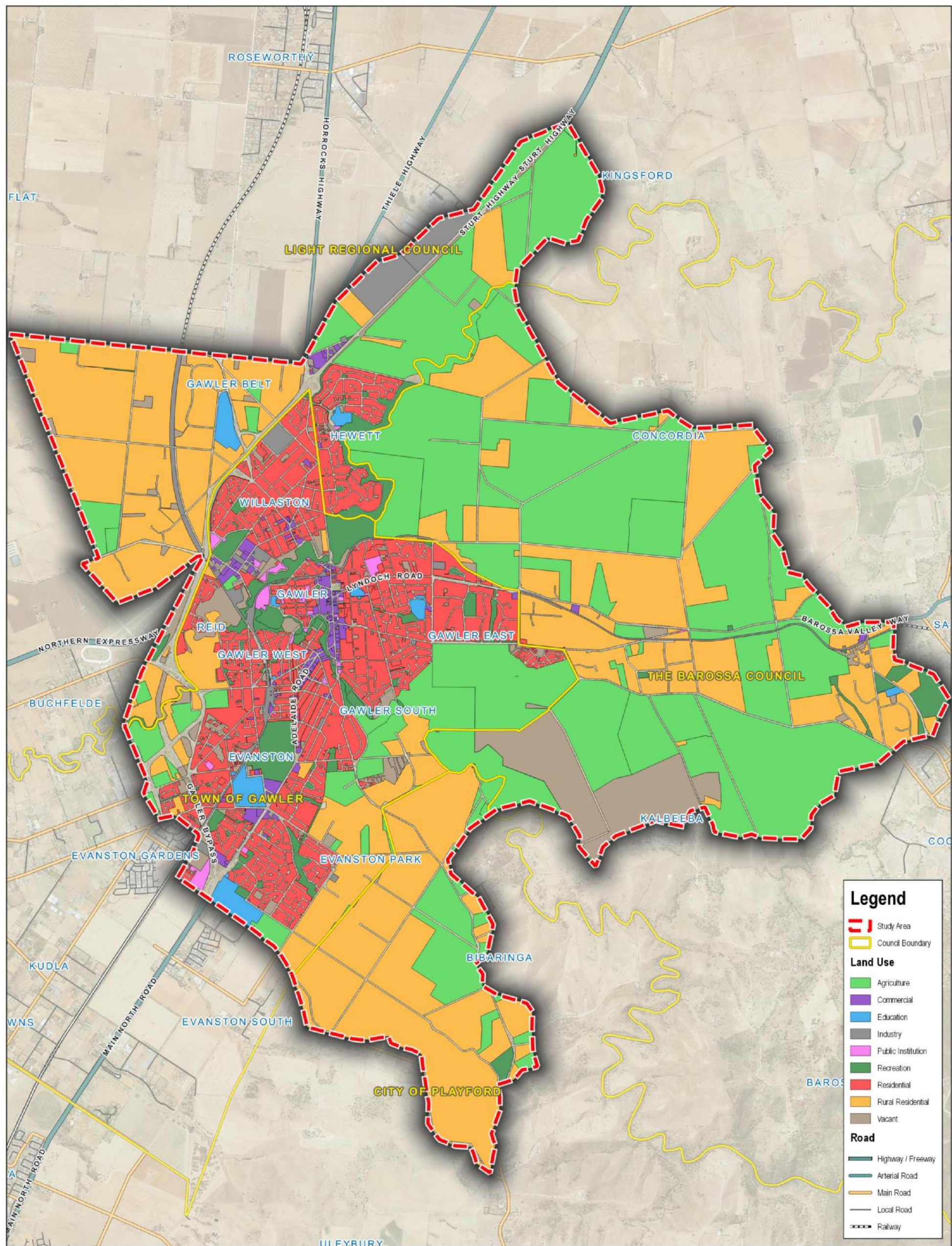
2.1.2 River catchments


The river catchments are the collection of small urbanised catchments within the study area that drain directly into the Gawler, North Para, or South Para rivers (or their main tributaries). These catchments are characterised by residential urban development with short, steep catchments draining directly into main rivers or creeks. These catchments cover the suburbs of Hewett, Willaston, Reid, Gawler, Gawler East, Gawler West, Gawler South and Kalbeeba. There are small pockets of other land-use types, such as the industrial areas of Willaston and the commercial areas of Gawler. The Springwood residential development in Gawler East is an urban development with many elements of water sensitive urban design. The rural watercourse which is central to the Springwood residential development is included within this collection of catchments.

The majority of these catchments are on the steeper elevated slopes of the river valleys and thus are elevated above the main river channels, generally less than a kilometre in length.

In total the catchments have a combined area of 1,470 hectares. Due to the steep slopes and high imperviousness of the catchments, the response times of these catchments is very rapid. Typically, the critical design event duration is 30 to 60 minutes.







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Data Acknowledgement:

Aerial Imagery from Metromap, 2017

Roads and Railways from DataSA, 2017

Land Use type from DataSA, 2017

Town of Gawler, Light Regional Council and The Barossa Council

LAND USE

Figure 2.2



2.1.3 Clifford Road drain

Land use within this area is more varied than the other catchment areas. The lower half of the catchment is predominantly urban residential, however there are notable exceptions. The portion of catchment bounded by Main North Road and the Gawler Railway Line is dominated by the open space of the Gawler Racecourse and the Gawler and District College. The Trinity College grounds and the Evanston oval are other notable areas of open space. The upper half of the catchment is characterised by rural living extending about 3 km from the urban boundary into the Adelaide Hills. Rural areas on the perimeter of the existing urban areas are expected to be transformed into new high-density urban residential living.

The catchment is bounded by the Gawler River to the north, Gawler – One Tree Hill Road to the east, and the Gawler Bypass and Kentish Road to the south and west. The catchment has an area of 1,400 hectares; roughly equal to that of the river catchments combined.

There are three main creeks that flow from the hills face into and through the urban areas. Two of these creeks discharge into large underground pipe systems. The catchment eventually discharges to the Gawler River via the concrete lined Clifford Road drainage channel. There is a 200-metre elevation change from the top of the catchment to the outfall.

The catchment has two distinct responses to rainfall: an early and rapid response from urban areas, followed by a secondary response from the rural areas several hours later that is dependent on storm duration and intensity. This phenomenon has been observed many times in other semi-urban catchments along the Adelaide suburban fringe.

2.1.4 Concordia

The Concordia area is currently used for agriculture on large rural allotments of varying sizes between 25 hectares and 100 hectares; typically the allotments are 30 to 40 hectares in size. Most roads in the area are not sealed and there are few houses. The area is earmarked as a major urban growth area that will undergo significant redevelopment. The proposed developed site coverage is 65%.

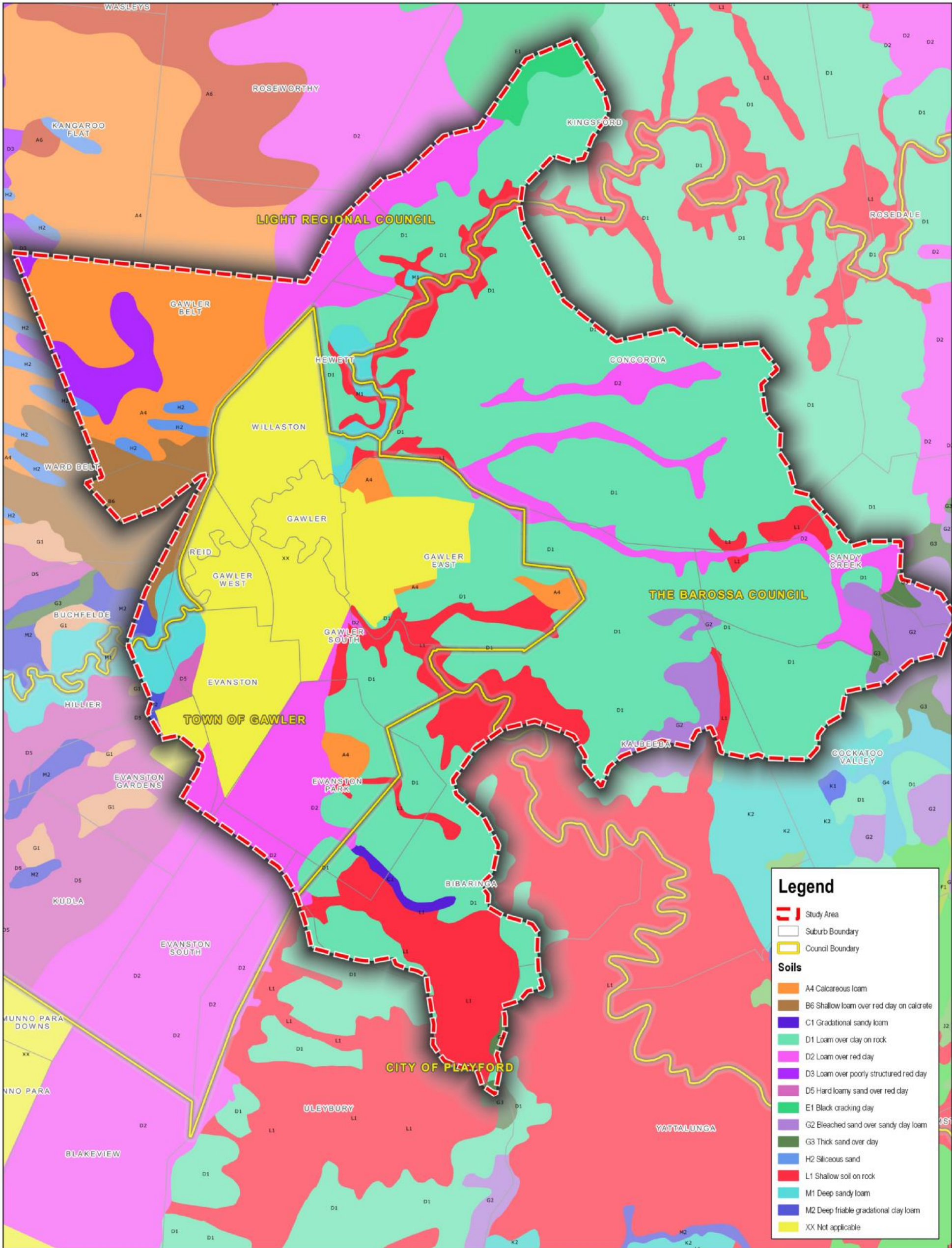
The Concordia area comprises two catchments in gently sloped gullies. The southern gully is named Bergen Gully; the northern gully is unnamed. The total catchment area of the two gullies is 890 hectares. The catchments are bounded by the natural terrain rather than constructed features.

The existing response of the catchments is commensurate with other (rural) hills face catchments of similar size and slope. The critical design event duration for both catchments is 6 hours.

These two catchments are unique in that they are proposed to undergo the most transformative development of any of the catchments within the study area. If the Concordia development proceeds, considerable changes to the hydrological cycle will occur, such as changes to catchment response time, water quality, and runoff volume. Careful management of these changes is required to minimise the impact on receiving waterways.

2.2 Soils

The distribution of soils across the study area was determined from data contained in the Department for Environment and Water (DEW) Soils Database and is shown in Figure 2.3.





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Soil type from Data SA, 2016

Town of Gawler

SOIL TYPES WITHIN THE GAWLER AND SURROUNDS STUDY AREA

Figure 2.3



The hills of the eastern section of the study area are characterised by loam over clay on rock (type D1) with patches of loam over red clay (type D2) along some of the larger tributaries. The predominant soil type in the western sections of the study area is hard loam sands over red clay (type D5). The soils of the Gawler Belt region are typically shallow loams over red clay on calcrete (type B6). The soils along the North Para River and South Para River are predominantly classified as shallow soil on rock (type L1). Along the Gawler River west of the study area the soils are deep loams (type M1 and M2). The soils within the urban area have not been classified, but it is likely that they reflect the characteristics of the soils in the surrounding area.

The presence of relatively shallow rock in the eastern part of the study area may impact the constructability and/or costs of mitigation measures such as basins. Similarly, the presence of clay and calcrete may limit the rates of infiltration that can be achieved.

It is recommended that site specific geotechnical investigations be undertaken during the detailed design phase for any proposed works.

2.3 Existing stormwater infrastructure

The urbanised areas of the study area rely on an extensive underground stormwater drainage system. The vast majority of the systems are relatively short and drain via gravity directly to the surrounding river system. There are many small to medium detention basins spread across the study area. Additionally, there are two large flood control basins that act to mitigate flows from the hills face catchments. There are a number of other large hydraulic structures, such as the Gawler Bypass culvert and associated detention basins and the Clifford Road drain.

The Gawler Belt rural-living area has minimal formal drainage and primarily relies on small open channels and a few detention basins to manage stormwater.

Gross pollutant traps are the predominant stormwater quality infrastructure within the study area.

The Concordia area is served by existing creek lines and some formal structures under roadways. Similarly, the eastern rural living area of Kalbeeba has little to no formal drainage, relying on existing creek lines and short culverts beneath roadways.

Details of the stormwater assets and infrastructure were obtained from the Town of Gawler, Light Regional Council, Barossa Council, and the Department of Planning, Transport and Infrastructure (now Department for Infrastructure and Transport, DIT). Additional details were collected from field measurements and inspection of aerial imagery. A plan showing all existing stormwater infrastructure is shown in Figure 2.4.

The Gawler River has a number of levee banks within the study area which increase the capacity of the main channel before flood flows reach a level that they are able to overtop the levees. Tonkin Consulting (2018) has previously considered levee upgrade options in locations where sections of the levee were considered deficient. These levees are also shown in Figure 2.4.

2.3.1 Capacity of existing stormwater system

A 1D hydraulic model of the existing drainage systems was created to investigate their capacity. This model assumed that inlets to the drainage system do not limit inflow. This assumption ensures that the capacity of the conduits is not overestimated. The hydraulic model was used to assess each pipe segment on the basis that all runoff from upstream areas would be conveyed through the system without restriction. This approach ensures that the capacity of the drainage system is not overestimated in the lower parts of the catchment due to upstream restrictions that would otherwise limit flow.

The hydraulic model was run for the 39.35% (equivalent to a 2-year average recurrence interval (ARI)), 20% and 10% AEP events to assess the standard of each drain. The model was run to provide estimates of the design flow for each pipe for each event. The design flow was compared against the existing pipe



capacity to determine the point at which the design flow would exceed the pipe capacity and thus determine the standard of each pipe. Figure 2.5 shows the colour coded results of the capacity assessment across the study area. Drains highlighted in red may require future upgrade works to reach the desired standard of protection.

Figure 2.5 shows that approximately 80% of the assessed drains (by length) have capacity to convey the estimated flow for a 39.35% AEP event. Approximately 60% have capacity to convey the estimated flow for a 20% AEP event (roughly equivalent to a 5-year ARI).

2.4 Receiving waters

The North Para River and South Para River flow through the Gawler and Surrounds SMP study area, merging within the township of Gawler to form the Gawler River which flows across the Adelaide Plains, discharging into Gulf St Vincent.

The North Para River and South Para River have a combined catchment area of approximately 1,000 km². Land use in the catchments is mixed and includes the townships and vineyards of the Barossa Valley, dryland farming areas, grazing and forests. Stormwater from the SMP study area discharges into the rivers at over 50 locations, either directly or via tributaries. Stormwater infrastructure within the study area is set well-above the river inverts. During times when the rivers are not in flood, there are no hydraulic impacts to the drains within the study area. Given the relatively short response time of the local catchments, compared to the longer response times for the Gawler, North Para and South Para Rivers, it is assumed that there are also no hydraulic impacts during times when the water levels are high.

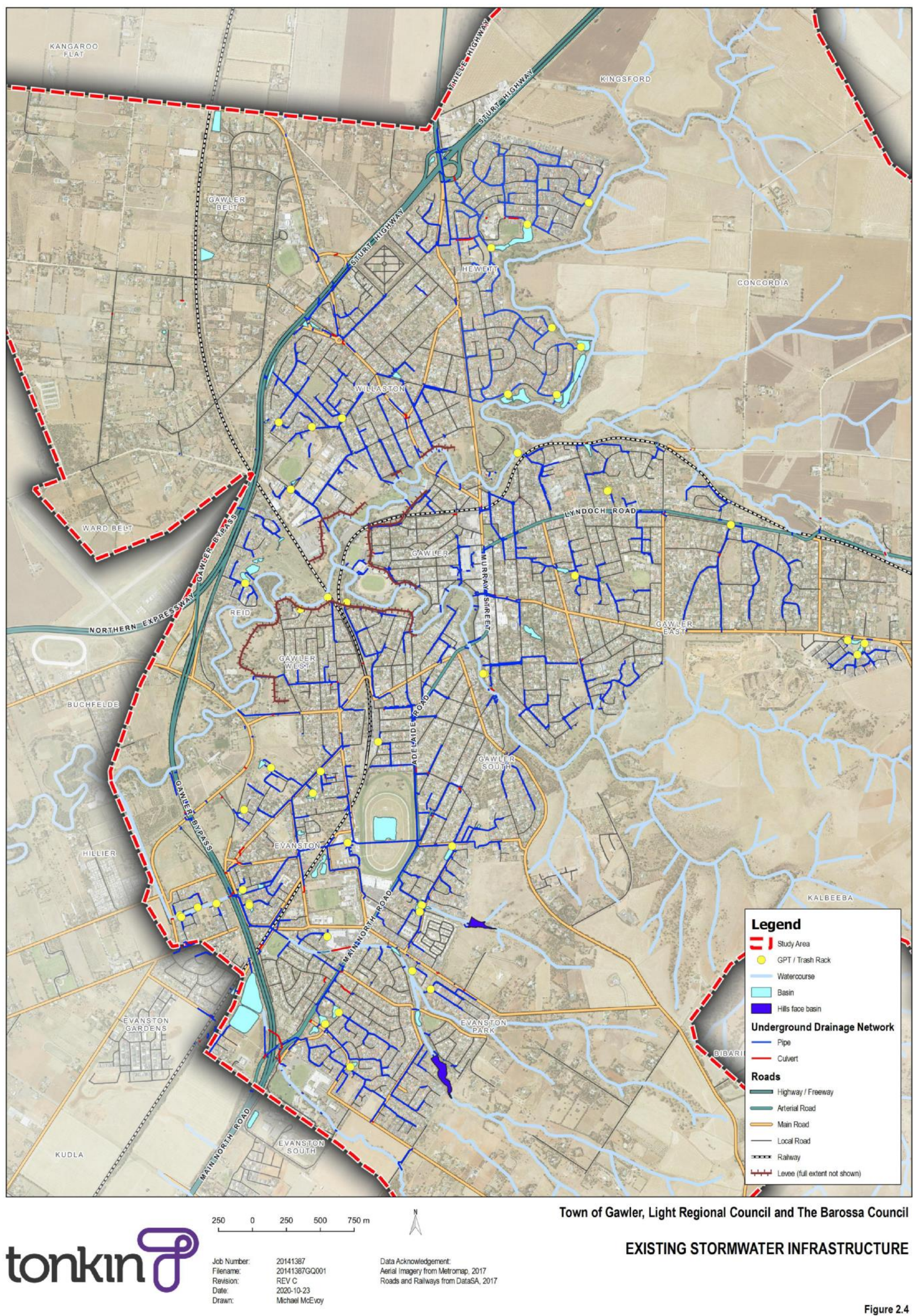
2.5 Existing stormwater quality

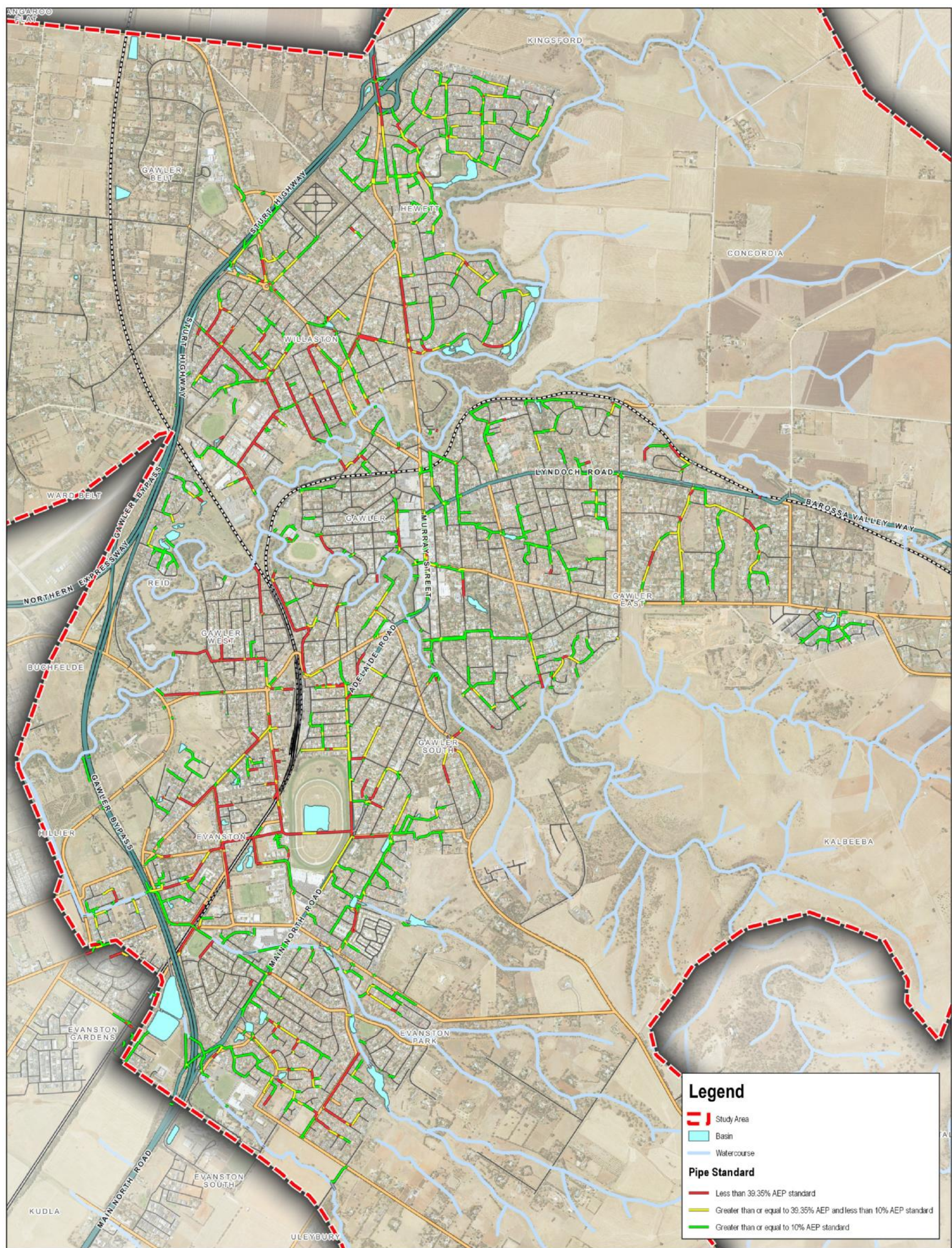
This section provides a summary of the existing water quality within the study area. The assessment of quality and priorities for water quality improvement have been identified via consultation with a representative from the former Adelaide and Mount Lofty Ranges Natural Resources Management Board, review of published studies and studies and modelling undertaken specifically to inform the development of this SMP.

The study area is heavily developed. The land use is mostly residential, with pockets of commercial and industrial areas. The primary pollutants in runoff from urban areas include:

- gross pollutants
- sediment
- dissolved pollutants
- pathogens.

The water quality of runoff from the study area was modelled using the eWater Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The purpose of the modelling was to understand the quality of stormwater runoff from the catchment, identify areas with a high concentration of pollutants and to assess the effectiveness of the existing water quality improvement measures. Following identification of the problems, the MUSIC model is used to assess the effectiveness of proposed water quality improvement strategies.







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Data Acknowledgement:
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Town of Gawler, Light Regional Council and The Barossa Council

STANDARDS MAP SHOWING THE CAPACITY
OF THE EXISTING STORMWATER SYSTEM

Figure 2.5



2.5.1 Existing water quality improvement measures

The MUSIC model of the current state of the catchment includes:

- Detention and retention basins (as identified during the hydraulic model development)
- Gross pollutant traps (GPTs).

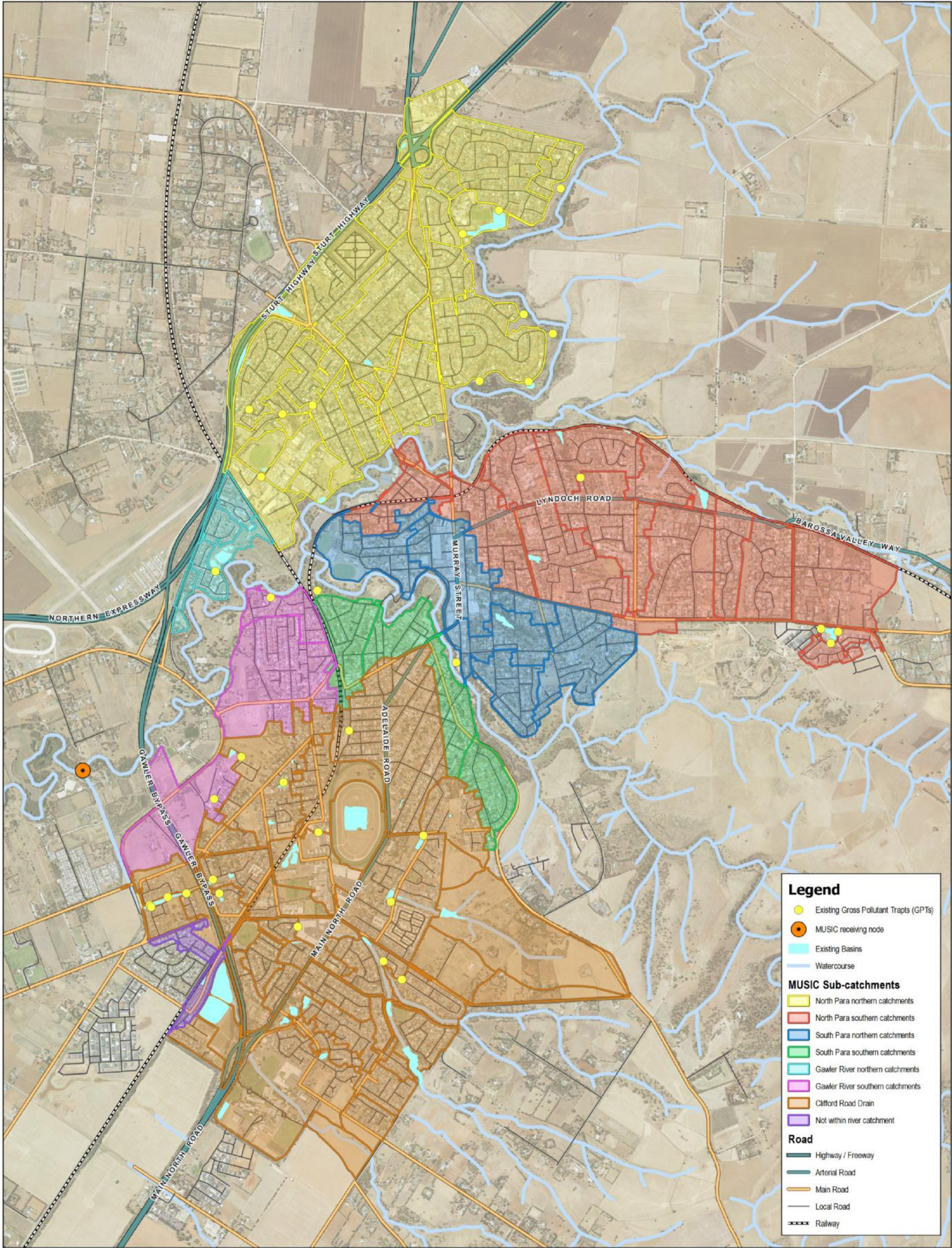
Due to the scale of the model, only water quality improvement measures that are considered to have a significant impact on the water quality at the downstream end of the sub-catchments are included in the model. Small basins, and GPTs that are located in the upper sections of the catchments, are not included as it is considered that at a catchment scale, the contributions to water quality improvement will be negligible.

A schematic of the MUSIC model is shown in Figure 2.6. The modelling assumes infrastructure is appropriately maintained and that the pollutant removal efficiencies of the GPTs are as per the manufacturer's specifications. The location of the downstream node is indicatively located within the Gawler River immediately downstream of the study area such that it captures pollutants generated within the study which are discharged into the North Para River, South Para River and Gawler River.


2.5.2 Water quality modelling

The MUSIC model was run to understand the patterns of flow and pollutant generation based on the existing level of development and historic climatic conditions for the study area. Concordia and the Gawler East growth area have been excluded from the model as these are areas of future development; water quality management for these areas is discussed in Section 5.3. Flows and pollutants are routed through the study area and are recorded at the downstream receiving node (refer Figure 2.6).

The results of the 'base case' model at the receiving node are summarised in Table 2.1 and Table 2.2. The residual load reflects the flows and pollutants arriving at the downstream end of the model and considers the existing water quality improvement measures included in the model. It should be noted that the modelling does not include consideration of block-scale treatment measures including rainwater tanks. It is not considered that these will have a significant impact on the estimates of loads from the area. A breakdown by sub-catchment (as shown on Figure 2.6) is provided in Table 2.3. The source loads represent total flows and pollutants generated within the study area.



Town of Gawler, Light Regional Council and The Barossa Council



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Aerial Imagery from Metromap, 2017
Roads and Railways from DataSA, 2017

MUSIC MODEL LAYOUT

Figure 2.6

**Table 2.1 Annual loads for MUSIC base case model (downstream node)**

	Sources	Residual Load	% reduction
Flow (ML/yr)	2,310	2,270	1.5
Total Suspended Solids (kg/yr)	456,000	291,000	36.2
Total Phosphorus (kg/yr)	938	701	25.3
Total Nitrogen (kg/yr)	4,830	4,400	8.9
Gross Pollutants (kg/yr)	93,600	41,300	55.9

Table 2.2 Daily statistics for MUSIC base case model (downstream node)

	mean	standard deviation	maximum	10th percentile	90th percentile
Average daily flow (m³/s)	0.07	0.25	3.94	0.00	0.15
TSS Concentration (mg/L)	37.90	43.70	184.00	16.10	130.00
TP Concentration (mg/L)	0.16	0.07	0.45	0.13	0.31
TN Concentration (mg/L)	1.54	0.33	2.47	1.41	1.93
TSS Load (kg/day)	802	3310	62700	0.13	1620
TP Load (kg/day)	1.92	7.46	130	0.00	4.02
TN Load (kg/day)	12.10	43.50	711	0.01	25.40
Gross Pollutant Load (kg/day)	113	402	3350	0	121

Table 2.3 Annual loads for MUSIC base case model by sub-catchment

	Flow (ML/yr)	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)	GP (kg/yr)
North Para northern catchments	649	125,275	256	1,326	27,815
North Para southern catchments	432	85,233	177	887	17,645
South Para northern catchments	176	35,723	83	455	7,619
South Para southern catchments	101	20,339	42	209	4,310
Gawler River northern catchments	37	7374	15	76	1,491
Gawler River southern catchments	117	23,336	48	238	4,244
Clifford Road Drain	783	155,753	310	1,608	29,843
Not within River catchment	15	2,967	6	30	632



2.5.3 Comparison with previous study

Richard Clark and Associates developed a water balance model of the Gawler Region as part of a study to estimate water availability and identify options for water supplies for future developments in the Greater Gawler Area. Details of the study are provided in the report, 'Estimation of Water Availability and Preliminary Modelling of Options for Water Supplies to Future Developments in the Greater Gawler Area' (Clark, 2010).

As part of the SMP development, and at Council's request, the outputs from the Gawler and Surrounds SMP MUSIC model were compared to the results of the Richard Clark study for the purpose of validating the model.

Comparison of study areas

The Clark (2010) modelling focused on the Greater Gawler region with a total area of 14,600 ha. The modelling area included catchments discharging to the North Para and South Para Rivers (total area 8,224 ha) and areas to the north of the Gawler township, centred around Roseworthy which drain in a south westerly direction.

By comparison, the Gawler and Surrounds SMP MUSIC model includes a total catchment area of 1,767 ha. The area included in the MUSIC model roughly corresponds with the urban portions of the Gawler Town and Evanston areas defined by Clark (area 1,915 ha). Review of the catchment parameters modelled by Clark show a total impervious area of 512 ha. By contrast, the MUSIC model includes a total impervious area of 592 ha.

The modelling undertaken by Clark (2010) estimated the annual average stormwater runoff from the Gawler Town and Evanston areas to be 983 ML/year, which is significantly less than the 2,310 ML/year estimated by the MUSIC modelling. Limited details regarding the assumptions underlying the Clark model are provided.

Not only do the two models cover different areas, but the models were developed for very different purposes and it is difficult to understand the reasons behind the difference in the estimates of runoff. The catchment definition and the catchment characteristics adopted in the MUSIC model are based on real data and are reflective of the current state of the catchment at the time at which the study was undertaken. The other modelling parameters are consistent with best practice guidelines for MUSIC modelling in South Australia.

The MUSIC model is a simplistic model of flows and pollutant loads and is a useful tool for modelling relative changes to flows and water quality. It is therefore considered suitable for application to the water quality improvement modelling as part of the Gawler and Surrounds SMP.



3 Problems and opportunities

3.1 Introduction

The problems and opportunities identified within this section are based on the results of flood and water quality modelling undertaken for this project. A detailed description of the flood modelling methodology is contained within the *Hydraulic Modelling Report* (refer Appendix B).

3.2 Key flood prone areas

The key areas that have been identified as being flood prone are described in this section. The descriptions are based on the flooding that occurs during the long-term development scenario, however, each of the identified areas are also subject to inundation based on the existing scenario. For reasons of brevity this list does not describe areas that experience only minor flooding. Flood depths shown in the following figures correspond with the legend shown in Figure 3.1.

Flood depth (m)

- Less than 0.025m (not shown)
- 0.025m to 0.1m
- 0.1m to 0.2m
- 0.2m to 0.3m
- 0.3m to 0.4m
- 0.4m to 0.5m
- 0.5m to 0.6m
- 0.6m to 0.7m
- 0.7m to 0.8m
- 0.8m to 0.9m
- 0.9m to 1.0m
- 1.0m to 2.0m
- Greater than 2.0m

Figure 3.1 Inundation depth legend

3.2.1 Greening Drive (Evanston South)

Greening Drive is a localised low spot immediately east of the Main North Road interchange of the Gawler Bypass. Stormwater predominantly arrives in the low spot as a result of overflow from the creek within the grounds of Trinity College (see Figure 3.2). The creek line passes through the Trinity College site before entering a large culvert (3.0 m x 2.5 m) beneath Main North Road and the Gawler Bypass. The culvert discharges into two large flood detention basins which then discharge slowly into the Clifford Road outfall drain via a swale along the western edge of the Gawler Bypass. A significant volume of runoff is diverted away from the large detention basins because water spills from the creek line upstream of the large culvert beneath the Gawler Bypass. The primary reason that water spills from the creek is that the creek and culverts within the school grounds are too small to convey floodwaters in rare flood events. The floodwater that overtops the culverts is directed away from the creek due to the surrounding terrain. A comparatively small amount of stormwater also arrives from nearby streets when the capacity of underground systems is exceeded. This causes the floodwater to pond along Greening Drive. Once the low spot at Greening Drive is full, excess floodwater flows along Main North Road and contributes to flooding in Przibilla Drive, Evanston. Trapped stormwater along Greening Drive causes flooding up to 0.6 m deep in the 1% AEP flood event.

The large culvert beneath the Gawler Bypass is estimated to have the capacity to convey flows of over 8 m³/s. Modelling suggests that the culvert should have ample capacity to convey the flows arriving from the upstream catchment. The modelled flooding is a result of insufficient capacity within the channel through Trinity College.

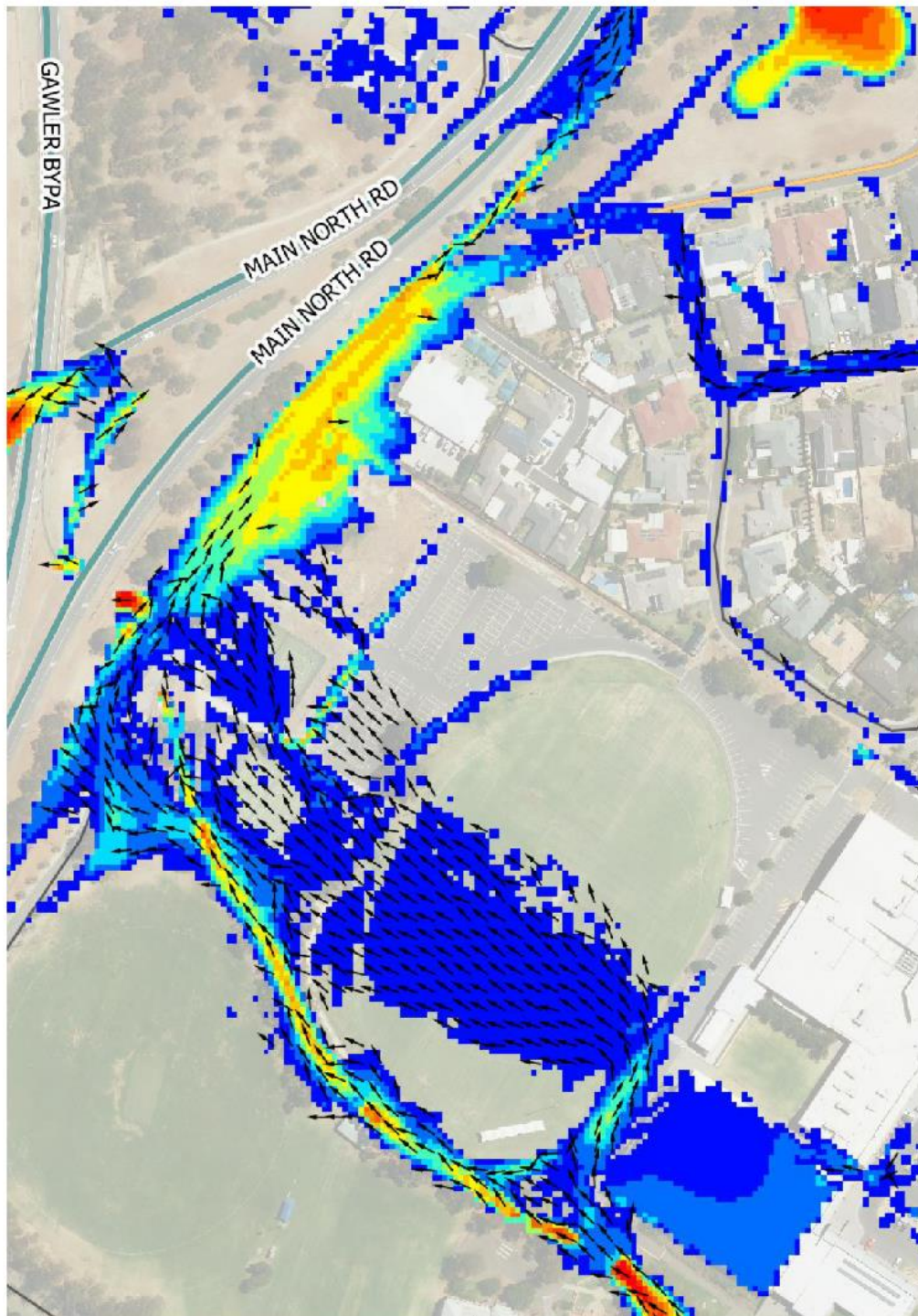


Figure 3.2 Surface flow bypassing main culvert under Gawler Bypass in 1% AEP event (long term development scenario)



3.2.2 Railway Crescent/Przibilla Drive (Evanston)

This location is a trapped low-spot adjacent the Gawler Bypass located in the lower part of the Clifford Road Drain catchment. This area experiences significant flooding in the 1% AEP event (see Figure 3.3) but not in the 5% AEP or 20% AEP events. The primary cause of flooding is the significant amount of floodwater arriving from the upstream areas of the Clifford Road drain catchment and the insufficient capacity of large drains under the Gawler Bypass. These two elements combine to cause floodwater to pond upstream of the Gawler Bypass road embankment.

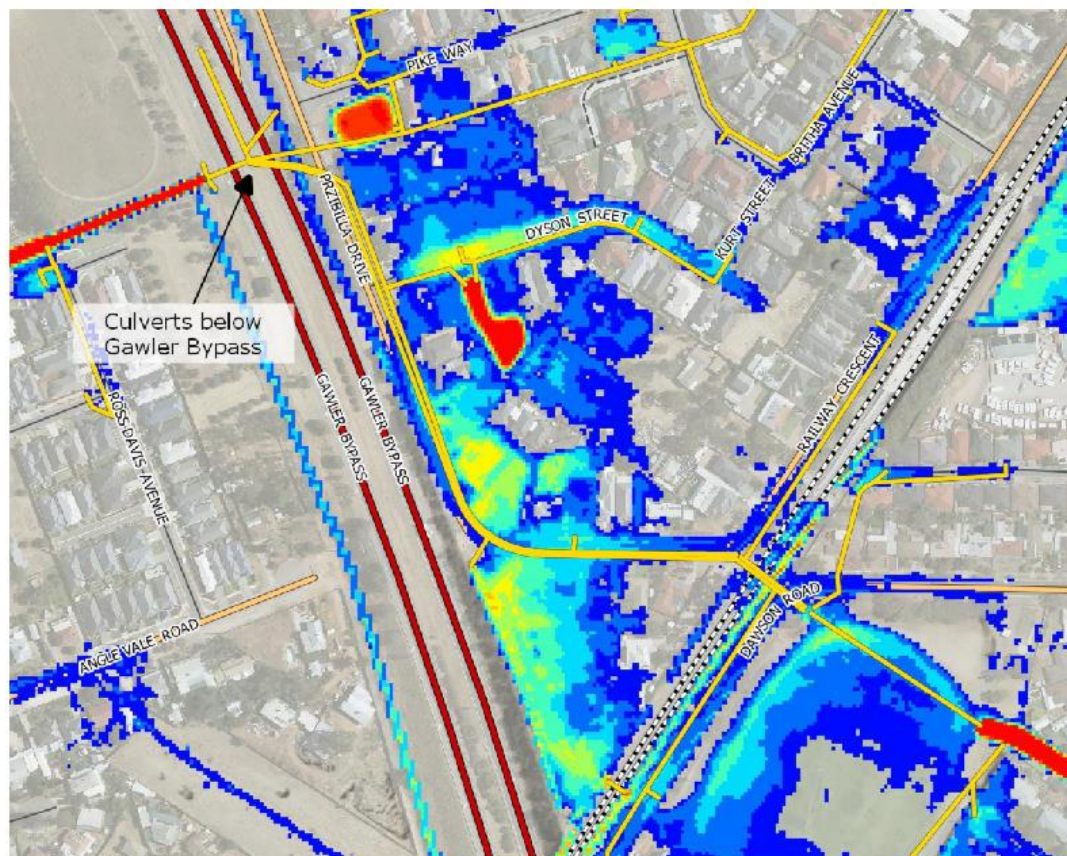


Figure 3.3 Railway Crescent/Przibilla Drive 1% AEP inundation (long term development scenario)

3.2.3 First Street (Gawler South)

This location is a trapped low spot adjacent the Gawler Racecourse with a predominantly urban catchment of just under 220 hectares. Currently, there is little flooding in the 20% AEP event and only slightly more flooding during the 5% AEP event when stormwater inundates the road. During the 1% AEP event there is significant inundation of the road and surrounding properties (see Figure 3.4), as well as significant sheet flow through properties from Coleman Parade and Mount Terrace. Long-term predictions also show significant inundation and sheet flow through properties during the 5% AEP event.

The primary cause of flooding is the capacity of the pipe system that passes beneath the Gawler Racecourse. This pipe system is the only means of draining the low spot as there are no low-level overland flow routes from this area due to the elevation of the racecourse surface.

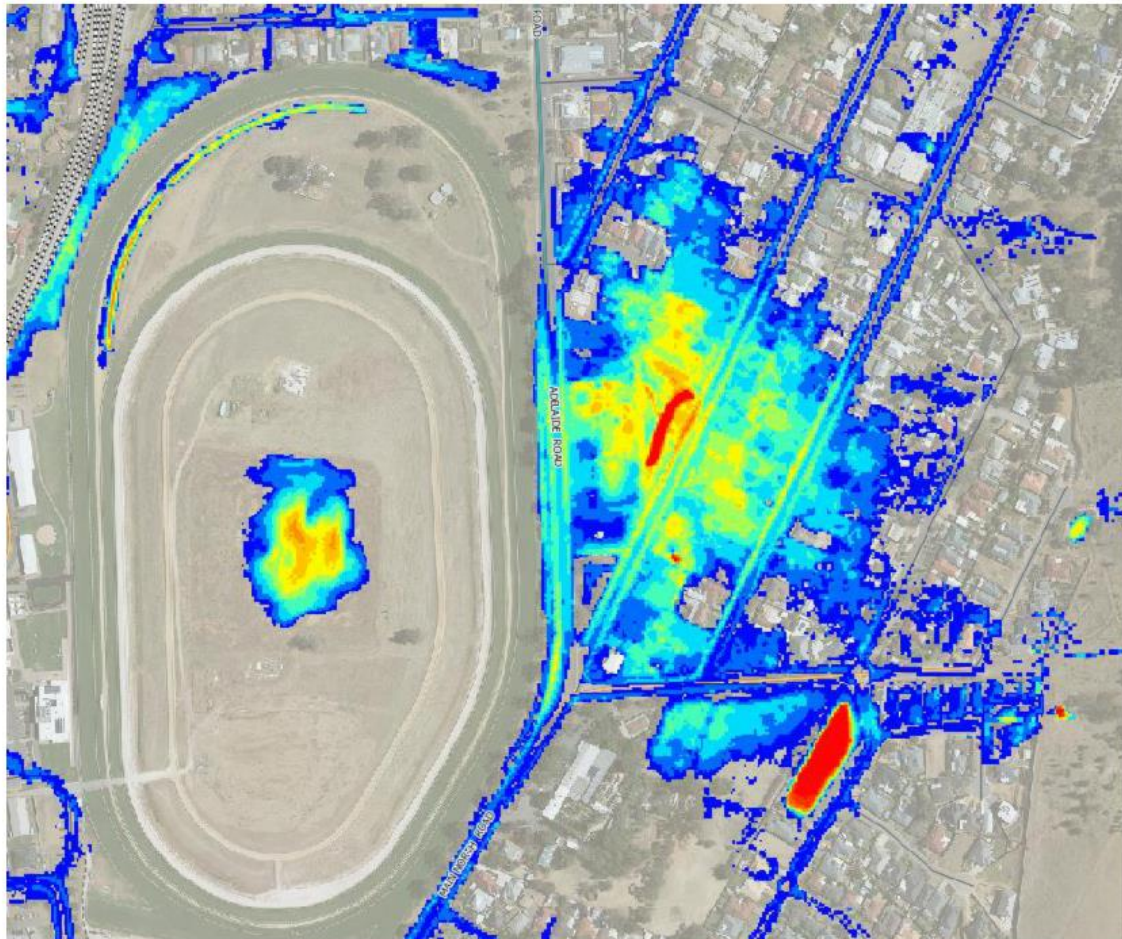


Figure 3.4 Predicted inundation during 1% AEP event (long term development scenario) at First Street

3.2.4 Jarvis Street and Brooks Avenue

These two locations are situated in the suburb of Willaston on the western side of the North Para River.

The Jarvis Street location (see Figure 3.5) is a localised low spot with steep sided hills on three sides. Jarvis Street currently floods in events as frequent as the 20% AEP event due to the capacity of the downstream drains along Jarvis Street and Paxton Road. Stormwater will eventually escape the low spot by flowing along Jarvis Street but not before inundating several properties. Some of these properties have residences that are located below road level.

The Brooks Avenue location (see Figure 3.6) is a trapped low spot caused by the Sturt Highway road embankment. A small elongated detention basin is located between the highway and residential properties in the lowest part of the low spot. The contributing catchment area upstream of the basin is 45 ha; the predominant land use is urban residential development. The basin is capable of managing stormwater in the 20% AEP event, but has insufficient capacity to prevent flooding of adjacent properties during larger floods (such as the 5% and 1% AEP events). Outflow from the basin is restricted by the downstream pipe system which runs against the natural surface and is assumed to have minimal grade. The outflow pipe is a DN600 along Busbridge Way, increases in size to a DN750 pipe after Haines Road and continues along Woodall Court. Approximately 70 m west of Gawler River



Road the system descends steeply and reduces to a DN450 pipe. The transition from DN750 to DN450 occurs within a junction box with secured lid. The total energy head at this transition peaks up to 0.55 m above natural surface level and controls the capacity of the basin outlet.

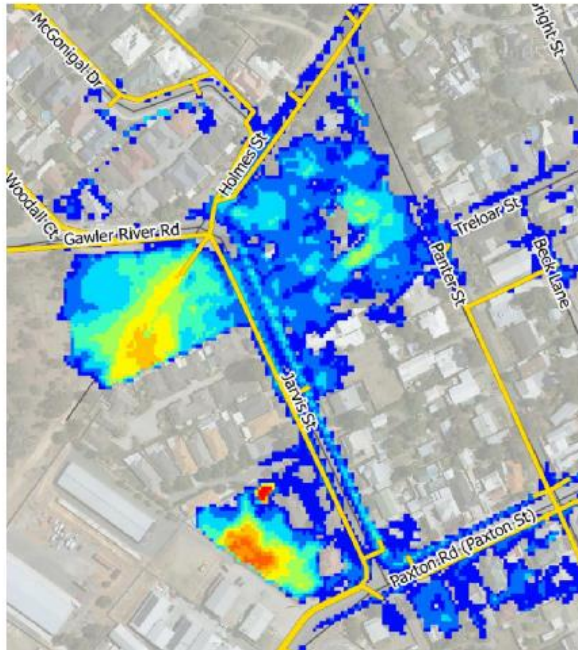


Figure 3.5 Flooding at Jarvis Street during the 1% AEP event (long term development scenario)

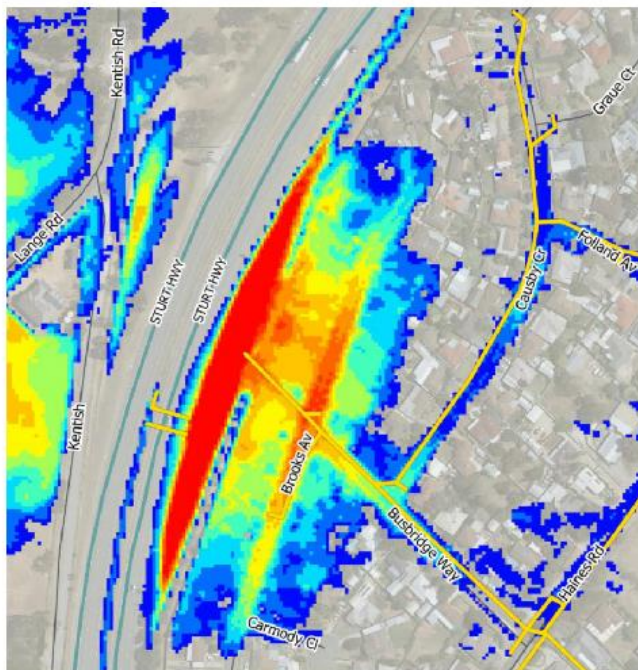


Figure 3.6 Flooding at Brooks Avenue during the 1% AEP event (long term development scenario)



3.2.5 Jane Street and Davies Street

Both Jane Street and Davies Street are well known to Council as locations of frequent flooding. This is supported by the modelling which indicates extensive sheet flow of stormwater through properties in the 20% AEP event. Despite there being a detention basin on the corner of Princess Street and Davies Street, the lack of underground drainage higher up in the catchment leads to flooding of properties. At the time modelling was undertaken (2017) there was no underground drainage network in this area. Council have since undertaken to install 20% AEP standard underground drainage along both Jane Street and Davies Street; flooding is still expected for rarer events. The results of the flood modelling for the 1% AEP event are shown in Figure 3.7.

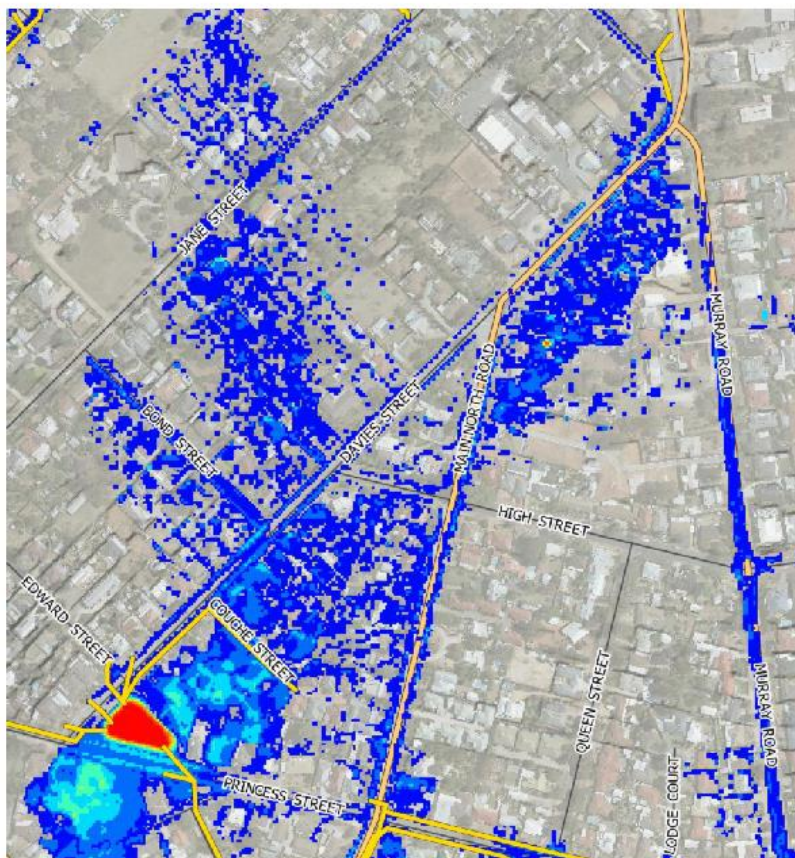


Figure 3.7 Jane and Davies streets 1% AEP inundation (long term development scenario)

3.2.6 Gawler Belt

The Gawler Belt area is characterised by the peaks and troughs formed by inland sand dunes which are aligned in a southeast to northwest direction. In the southwestern corner of Gawler Belt there is a large 40-hectare depression which acts as a drainage basin for the surrounding catchments—the total catchment area draining to the depression is just under 25 km². There is extensive flooding of the low spot in the 1% AEP flood (see Figure 3.8); the maximum depth of flooding is 1.9 m.

Due to the lack of any formal drainage in the area, beyond small roadside swale drains, there is extensive overland sheet flow through properties. Whilst many properties experience sheet flow few homes are believed to be flood affected as it is assumed floor levels will be at least 100 mm above



natural surface. Survey of individual floor levels would be required to assess how many dwellings are flood prone.

A significant amount of future development is proposed in the catchment upstream of the Gawler Belt Area, near Roseworthy. Investigating the mitigation measures to deal with the additional stormwater runoff generated by the development was not within the scope of this SMP. However, it is understood that Light Regional Council has imposed conditions on the development that will ensure that both the rate and volume of runoff from the Roseworthy catchment will be no higher than current levels.

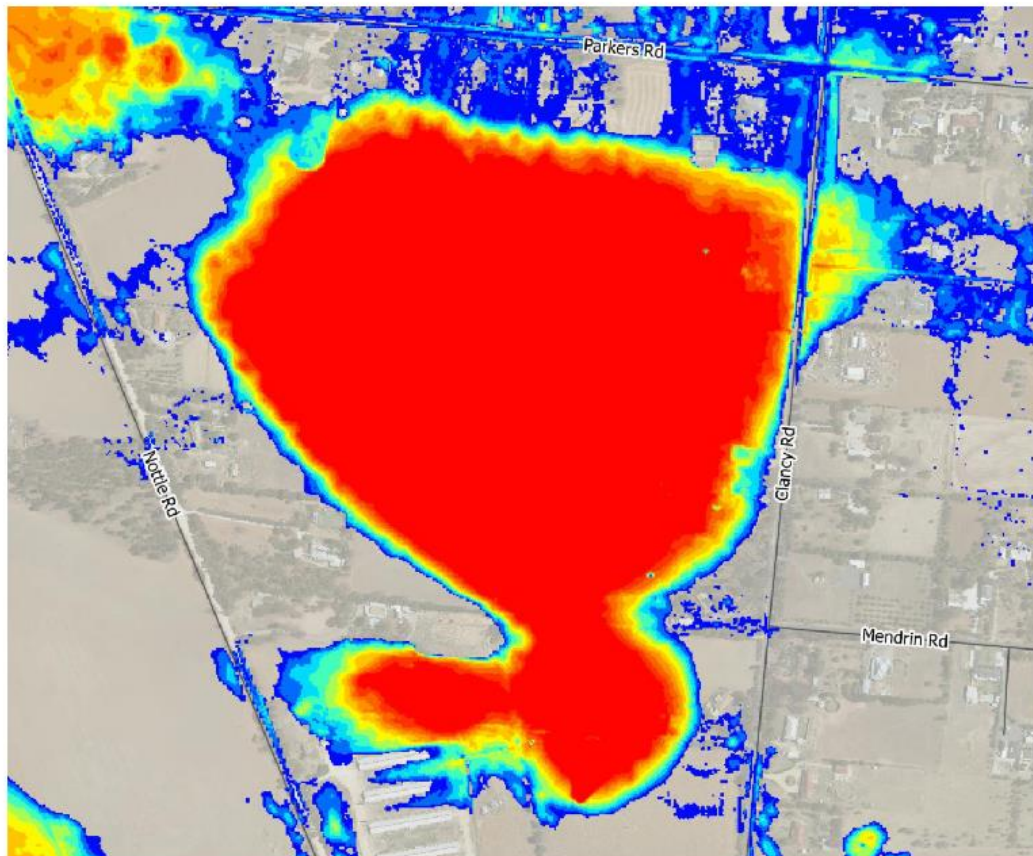


Figure 3.8 Predicted inundation of the Gawler Belt area during the 1% AEP flood event (long term development scenario)

3.3 Climate change

The Intergovernmental Panel on Climate Change (IPCC) has concluded that 'it is now certain' that the climate is changing (IPCC, 1990). The projections of climate change for the Gawler and Surrounds SMP study area include warmer and drier conditions. Despite the projected decrease in average annual rainfall, there is also a projected increase in the intensity of extreme rainfall events.

Review of the climate projections for the study region shows that under a high emissions scenario (RCP 8.5) rainfall intensity will increase by 7.8% by mid-century (2050). Previous studies have found that the resultant percentage increase in peak flows is greater than the increase in rainfall, with the greatest difference in catchments with a large proportion of pervious areas. A single climate change run for the 1% AEP event, with mitigation measures in place, has been undertaken to assess the impact



climate change may have on the size of the proposed mitigation infrastructure, assuming a 7.8% increase in rainfall intensity.

The projected changes to the current climate will impact the management of water resources within the study area – it will reduce the volumes of runoff available for reuse, impact water quality and may increase the frequency and severity of flooding. The potential impacts of climate change on water harvesting schemes and water quality are discussed in this SMP (refer to Section 3.7.4).

3.4 Future projections of water quality

The catchment parameters within the MUSIC model were revised to reflect the long-term state of development within the study area (as calculated for the hydrology and hydraulic modelling). As a result of the predicted development, the impervious areas within the study area increased by approximately 119 ha from 33.3% to 39.7% of the total area. Two simulations were performed: one assuming the current climate and one including consideration of the effects of a warmer, drier climate as a result of the changing climate.

The results for the node downstream of the study area (representative of total discharges into the receiving waters) are summarised in Table 3.1. Estimates of pollutant loads for the long-term climate change scenario are not provided due to limitations associated with the MUSIC model's ability to model the relative changes to pollutant loads in a drier climate. Further details of the limitations are provided in the following section.

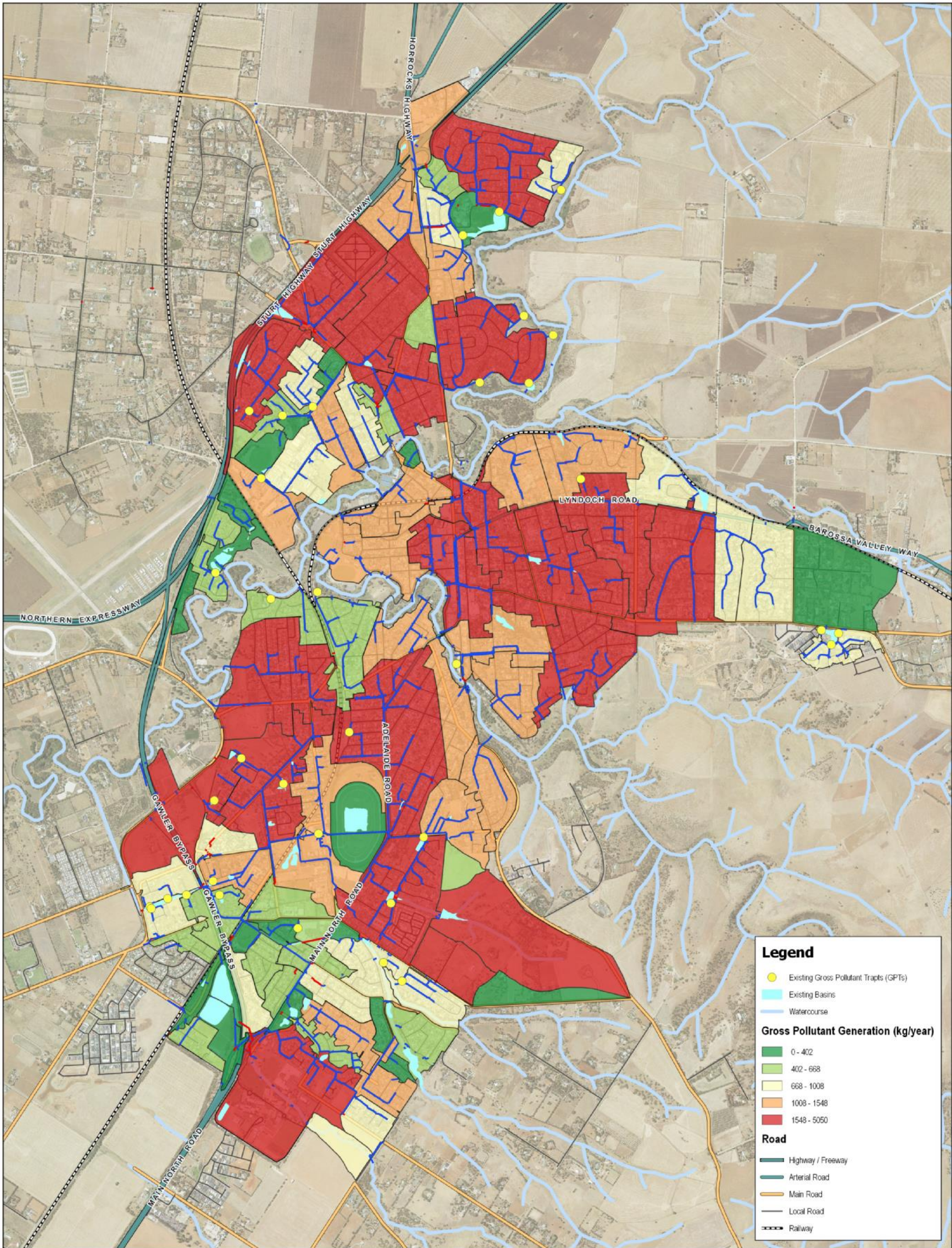
The distribution of gross pollutant generation is shown in Figure 3.9. Review of the patterns of pollutant generation for the other modelled pollutants shows that the distribution of gross pollutants is indicative of the patterns of generation for the other pollutants.


As expected, the MUSIC modelling suggests that development within the catchment will increase the flows, with a resultant increase in the annual pollutant loads. The 6.4% increase in impervious area results in a 12% increase in annual average flows.

When the projected changes to climate are considered (reflective of the end of the century for a high emission scenario), the resultant decrease in flows more than offsets the modelled impacts of long-term development. Based on the climate change projections it is estimated that by 2050, the reduction in rainfall will likely be of a sufficient magnitude to offset the increased flow volumes as a result of development.

Table 3.1 Annual loads for MUSIC models (downstream node)

	Existing	Long Term	Long Term (with CC)
Flow (ML/yr)	2,270	2,590	1,880
Total Suspended Solids (kg/yr)	291,000	328,000	n/a
Total Phosphorus (kg/yr)	701	790	n/a
Total Nitrogen (kg/yr)	4,400	5,010	n/a
Gross Pollutants (kg/yr)	41,300	44,000	n/a





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Job Number: 20141387
Filename: 20141387GQ003A
Revision: REV B
Date: 2019-03-25
Drawn: Dylan Bone

Data Acknowledgement:
Aerial Imagery from Metromap, 2017
Roads and Railways from DataSA, 2017

Town of Gawler, Light Regional Council and The Barossa Council

PATTERNS OF POLLUTANT GENERATION
WITHIN THE STUDY AREA

Figure 3.9

Item 7.3- Attachment 1

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3.4.1 Impacts of climate change on water quality

MUSIC models the generation of pollutants based on user-defined statistical distributions linking pollutant generation to flow. In reality, the generation of pollutants within a catchment is far more complex than can be modelled in MUSIC. It is dependent on a range of factors, including the primary source of each pollutant and the mechanism by which each pollutant is deposited within the catchment. There is no information in the literature as to the potential changes to patterns of pollutant generation for drier climates.

MUSIC is not able to realistically model the impacts of climate change on water quality, as the assumption that the statistical distribution linking flows and pollutant loads is unchanged with a changing climate results in the model predicting reduced pollutant loads for a drier future climate.

It is likely that under a future drier climate (and ignoring changes to the level of development within the catchment), the total annual average pollutant loads will be unchanged. With reduced runoff volumes, it can therefore be expected that the concentrations of pollutants will be higher, particularly with 'first flush' events. Warmer temperatures may also lead to reduced water quality in permanent water bodies due to increased stagnation.

3.4.2 Summary of existing water quality

MUSIC modelling simulates patterns of pollutant generation for urban areas. It demonstrates that under a long term scenario, in an average year the study area may discharge over 330 tonnes of suspended solids, 49 tonnes of gross pollutants, 5 tonnes of nitrogen and 0.7 tonnes of phosphorus into the receiving waters downstream of the catchment. For the South Para River the receiving waters is as defined in Section 2.4, at the confluence of the North and South Para rivers. This feature signifies the start of the Gawler River. The modelling shows the generation and discharge of pollutants is broadly distributed, with no obvious 'hot spots' in Figure 3.9. While figures have not been shown for suspended solids, total phosphorus or total nitrogen, the relative loadings are linked closely to the generation of gross pollutants within the MUSIC model.

The opportunity exists to implement additional water quality improvement measures within the catchment to reduce pollutant discharges to the receiving waters, thereby contributing to the improved health of the receiving waters.

3.5 Receiving water values

Stormwater from the SMP study area discharges into the Gawler River (prescribed watercourse), North Para and South Para Rivers, either directly or via tributaries. There are over 50 piped outlets which discharge stormwater from the urban areas into these watercourses.

The relative contribution of the study area to flows and pollutant loadings at the point at which the Gawler River discharges into the Gulf of St Vincent is relatively small. For context, the Gawler SMP covers an area of approximately 7,300 ha, while the area of the Gawler River catchment upstream of the study area is approximately 100,700 ha. Given the size of the upstream catchment it is considered that the ability of actions within the SMP study area to influence water quality at the mouth of the river would be small.

For the purpose of assessing the potential impacts of discharges from the Gawler and Surrounds SMP on receiving water quality, the receiving waters are considered to be the North Para, South Para and Gawler River immediately downstream of the study area.

3.5.1 Current condition of receiving waters

A 2013 study by the South Australian Environment Protection Authority (EPA) rated the health of the aquatic ecosystems within the South Para River in Gawler as "poor", with extended dry conditions and



“evidence of human disturbance and nutrient enrichment”. There are widespread introduced weeds in the riparian zone. The study concluded that “the South Para River at Gawler provides no significant environmental value”, other than providing a connection from its upper catchment to the discharge point at the junction with the North Para River.

A similar study undertaken in 2008 for the Gawler River at Gawler rated the condition of the river as “very poor”. It was noted that the ecosystem was in a severely degraded condition with major changes to both the animal and plant life, and that there was a significant breakdown in the way the ecosystem functions because of human impact. The study concluded that the impacts of urban stormwater, runoff from agricultural areas and drought had contributed to the highly disturbed condition of the stream. It is not known what, if any, changes to river system health have occurred since the 2008 report.

The closest available water quality data for the Gawler River is at the Virginia monitoring station (A5050510). The data covers the period March 2012 to March 2017 and included 52 water quality readings over this period. Comparison of the recorded data with the ANZECC guidelines confirms the observations made by the EPA. Total phosphorus (TP) readings ranged from 15 µg/L to 1,590 µg/L with 75% of the readings exceeding the ANZECC guideline value (100 µg/L) for ‘slightly disturbed’ ecosystems in lowland rivers in south-central Australia. Similarly, records of nitrates (NO_x) show levels exceeding the ANZECC guideline value of 100 µg/L for 77% of the samples, with recorded values ranging from 3 µg/L to 8,380 µg. As discussed previously, the contributions from the township of Gawler are likely to constitute only a small portion of the recorded nutrients.

3.5.2 Environmental flows

The natural flow regime in the South Para River has been heavily impacted by the construction of dams and other water supply infrastructure. Diversions from the river have reduced flows downstream of the South Para Reservoir by up to 90% and have extended the duration and frequency of periods of no flows.

The WMLR WAP includes formal arrangements for environmental water provisions in the South Para River. The environmental water flows are released from the Barossa Diversion Weir. An environmental flow valve has been installed at the weir and can deliver a maximum flow rate of 7.3 ML/day. All environmental flow components with a discharge rate greater than the capacity of the environmental flow valve are delivered over the weir as a controlled spill (SA Water, 2019).

Results of a three-year environmental flow trial concluded that the provision of environmental flows alone was not sufficient to change long-lived plant communities (Gatti and Muller, 2016). The South Para River was identified as being at risk of converting to drier emergent and terrestrial habitats due to the relatively dry catchment.

Strategies for the management of stormwater within the catchment need to consider the environmental flow requirements of the receiving water bodies. Strategies should aim to generate flow regimes that mimic pre-development patterns as closely as practicable.

EMS (2017) identified a small reach of Tributary 6 (a tributary of the South Para River) within the Gawler East growth area that is fed by a locally recharged spring. The presence of this spring highlights the importance of infiltration of stormwater within this area, and hence future development will need to ensure that impacts to groundwater are minimised. It is uncertain whether the environmental water provisions for the South Para River detailed in the WMLR WAP also extend to the river’s tributaries.

3.6 Tributary assessment

A key conservation objective in Council’s development plan is: “[The] conservation, preservation, enhancement or improvement of land adjoining riverine environments”. In addition to the main water courses, there are a number of tributaries that flow through the study area. Eco Management Services (EMS) was commissioned to undertake an environmental assessment of selected tributaries within the