

Transportation Asset Management Plan

December 2010

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Version Control

This Document is a live Council document and is subject to periodic review. The validity and currency of the document is critical in applying its content as it contains significant asset management and performance data that is “real-time” based.

If you are reading this document please check the version date and the endorsement date below to make sure that the document is current.

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1.0 Executive Summary

1.1 Purpose of the Plan

The fundamental purpose of this Transportation Asset Management Plan (TAMP) is to improve Council's long-term strategic management of its infrastructure Transportation assets in order to cater for the community's desired levels of service in the future, in accordance with Council's key strategic documents and demonstrate reasonable management in the context of Council's available financial and human resources.

The TAMP achieves this by setting standards, service levels and programmes which Council will develop and deliver. The standards and service levels have been set in accordance with user needs, regulations, industry practice and legislative codes of practice.

1.2 Assets Description

The transportation assets considered in this TAMP, are described as including all assets directly associated with the road and located within the road reserve, for which The Tweed Shire is the responsible road authority.

The Tweed Shire does not own and is not responsible for the management of Declared State Roads such as the Pacific Highway. These roads are managed by the RTA. The Tweed Shire under the '*RTA arrangements with councils for road management*' undertakes maintenance and renewal works on Regional Roads with funding assistance provided by the RTA.

It should also be noted that roads constructed by others without Council approval, for the purposes of local access, are not maintained by Council. These roads are maintained by the benefitting property owners even though they are a public road.

Please refer to Council's Asset Register for a complete list of Transportation assets under the control of Council. Assets that have been considered in the preparation of this TAMP include the following:

Transportation Asset Type	Quantity	Length (km)
Sealed Roads	-	1,262
Unsealed Roads	-	185
Kerbs	-	699
Footpaths	-	150
Road Bridges	277	-
Footbridges	62	-
Bus Shelters	157	-

Assets not considered in this TAMP are:

1. Vehicular Crossings – these are the responsibility of the property owner
2. Street trees including landscaping¹
3. Buildings²
4. Street lighting³
5. Artwork – within the road reserves⁴
6. Stormwater drainage⁵
7. Private roads, laneways and car parks – these are the responsibility of the private owners
8. Vehicular and pedestrian crossings that intersect with railway tracks, which includes 2.13m from the outer tracks and associated ancillary assets – Responsibility of Railway Operators

The following table documents the Transportation assets financial values as at 30 June 2010⁶.

Asset	Current Replacement Value	Accumulated Depreciation	Current Written Down Value
Roads, Bridges & Footpaths	\$648,119,000	\$116,352,000	\$531,767,000
Bulk Earthworks (Formation)	\$118,162,000	\$0	\$118,162,000
Total	\$766,281,000	\$116,352,000	\$649,929,000

As at 30 June 2010, the Annual Depreciation (annual asset consumption) for Transportation assets was calculated at \$8.75 million.

1.3 Levels of Service

Levels of Service define the assets performance targets, in relation to reliability, quantity, quality, responsiveness, safety, capacity, environmental impacts, comfort, cost/affordability and legislative compliance.

A key objective of this TAMP has been to match the level of service provided by Council's Transportation network to the expectations of the users (i.e the community) within available resources. This requires a clear understanding of the user needs, expectations and preferences.

¹ Will be considered under a separate Asset Management Plan

² Will be considered under a separate Asset Management Plan

³ Not Tweed Shire Assets

⁴ Will be considered under a separate Asset Management Plan

⁵ Will be considered under a separate Asset Management Plan

⁶ Tweed Shire Council Financial Statements 2010

To achieve and sustain acceptable standards of service for Council's Transportation asset network requires an annual commitment of funds. These funds provide for regular and responsive maintenance and for timely renewal or replacement of the asset. The provision of adequate financial resources ensures that the Transportation network are appropriately managed and preserved. Financial provisions below requirements impacts directly on community development and if prolonged, results in substantial needs for "catch up" expenditure imposed on ratepayers in the future. Additionally, deferred renewal results in increased and escalating reactive maintenance as aged assets deteriorate at increasing rates.

1.3.1 Transportation Asset Hierarchy

No Authority can deliver everything, all the time. In fact, in line with good practice and affordable service delivery, it may not be practical or cost-effective to deliver the same level of service across the entire asset portfolio. Therefore Tweed Shire has documented a hierarchy that classifies the Transportation asset portfolio / network into appropriate groups based.

Sealed Road Hierarchy	Road Description
S1-Regional	For car and truck movements on roads designated as part of the Regional road network. Roads significant to the Region.
S2-Distributor	Not part of the Regional network. Major routes for cars and trucks with local origin or destination.
S3-Collectors	Collector routes for cars and trucks with local origin or destination.
S4-Local Urban	For movement of cars and trucks in urban areas, from higher hierarchies for access to residences or businesses within the Shire.
S5-Local Rural	For movement of cars and trucks in rural areas, from higher hierarchies for access to residences or businesses within the Shire.
S6-Car parks	For parking of cars and trucks.

Unsealed Road Hierarchy	Road Description
U1-Collector	For movement of cars and trucks for access to residences and rural properties within the Shire.
U2-Local	For movement of cars and trucks from collectors for access to residences and rural properties within the Shire.

The Footpath hierarchy adopted for The Tweed takes into account the varying risk levels associated with pedestrian volumes and/or the nature of the footpath usage and is summarised as follows:

Footpath Hierarchy	Footpath Function
F1-High	Footpaths located in the near vicinity of shopping precincts, aged care centers, senior citizen centers, schools, hospitals, libraries, main community facilities, transport hubs and all shared use paths and Car Parks.
F2-Low	All other Footpaths.

The bridge hierarchy adopted for The Tweed takes into account the varying risk levels associated with traffic and pedestrian volumes and/or the nature of the bridges and is summarised as follows:

Bridge Hierarchy	Bridge Description
B1-Major Road & Culvert Structure	Structure over creeks and features for car and truck movements on roads designated as part of the Regional road network.
B2-Minor Road & Culvert Structure	Structure over creeks and features for movement of cars and trucks on all other sealed and unsealed roads for access to residences or businesses within the Shire.
B3-Footbridges & Boardwalks	Structure over creeks and features for pedestrian movements, typically located on shared use paths and in open space areas.

This TAMP has different maintenance interventions, inspection frequencies and response times for each asset classification.

In accordance with the International Infrastructure Management Manual, Council acknowledges that the primary purpose of an asset hierarchy is to ensure that appropriate management, engineering standards and planning practices are applied to the asset based on its function. It also enables more efficient use of limited resources by allocating funding to those assets that are in greater need and the costs are better justified.

Without an adequate Transportation portfolio hierarchy, there may be inefficient allocation of resources, user expectations may vary and the maintenance of these assets made more difficult.

1.4 What are Council's Current Levels of Service being delivered?

At The Tweed Shire Council, we have defined two tiers of service levels:

The first being '**Strategic Levels of Service**' – what we expect to provide in terms of key customer outcomes:

- Appropriateness of service.

- Accessibility to users 24 hours a day, 7 days a week.
- Affordability – acknowledging that we can only deliver what we can afford.
- Relevance of the service being provided – in terms of demand characteristics, future demographics, current back-logs and where the pressure points are.

The second being ‘**Operational Levels of Service**’

- What we will do in real terms, i.e. reliability, functionality and adequacy of the services provided. Typically, this TAMP has documented our standards – i.e. at what point will we repair, renew or upgrade to meet the customer outcomes listed in the strategic levels.
- Operational levels of service are also referred within Council as Technical Levels of Service and have been defined for each of the following:
 - **New Asset** – If we provide new Transportation structures / assets, then what design and maintainability standards shall apply to make them meet our strategic outcomes.
 - **Upgraded or Reconstructed Asset to original standard** - If we upgrade or reconstruct Transportation assets, then what design and maintainability standards shall apply to make them meet our strategic outcomes.
 - **Maintenance** – When will we intervene with a maintenance repair and what will be our responsiveness in terms of customer requests for maintenance faults.

1.4.1 Strategic Levels of Service

Tweed Council’s Strategic Levels of Service that have been adopted as a result of this TAMP are tabulated in the table below as:

Service Criteria	What will Council do?	Performance Standard / Measure
Community		
Quality	Well maintained and suitable transport services.	<2,000 request / complaints per annum.
Customer Satisfaction	Transport assets meet community needs.	>60% customer satisfaction.
Accessibility	Road assets will be accessible 24 hours a day, seven days a week.	100% Compliance. In the instance where a road or footpath or bridge is closed to users for reasons such as maintenance, upgrading, renewal or a Council related public event or non-Council events such as processions, then appropriate notification shall be given to relevant users in accordance with Council’s public information policy.
Responsiveness	Response time to customer requests.	> 70% of all requests adequately responded to within target.

Service Criteria	What will Council do?	Performance Standard / Measure
Technical		
Condition – Sealed Roads	Condition assessment of road network every 3 years.	On average Pavement Condition Index and Surface Condition Index to be in condition 3 (out of 5) or better.
Condition – Unsealed Roads	Condition assessment of road network every 3 years.	On average, unsealed road network to be in condition 3 (out of 5) or better.
Condition – Footpaths	Condition assessment of road network every 3 years.	On average, footpath network to be in condition 3 or better.

1.4.2 Capital Levels of Service – New Assets, Reconstructed Assets, Upgraded Assets

The Engineering Specifications section of Council's website provides links to a suite of documents setting out Council's requirements for engineering design and the construction of Transportation assets.

<http://www.tweed.nsw.gov.au/PlanningBuilding/EngineerSpecsHome.aspx>

These specifications have been documented to ensure the quality of new public assets, the compatibility of private works with Council's infrastructure, and the protection of the environment from the impacts of development.

1.4.3 Maintenance Levels of Service

For the Levels of Service delivered on a day to day nature (i.e. responding to customer requests for maintenance faults and responding to breakdowns), refer to the following manuals, available for display at Council's offices:

- Tweed Road Maintenance LoS V1.0;
- Tweed Road Ancillary Maintenance LoS V1.0;
- Tweed Bridge Maintenance LoS V1.0; and
- Tweed Unsealed Road Maintenance LoS V1.0'

The service manuals documents:

1. The task or work expected to be undertaken, e.g. patch pot-holes to remove hazard.
2. The schedule of inspections to be undertaken of specified matters at specified intervals;
3. The circumstances under which intervention action is to be taken with respect to repair or maintenance needs for defects reported or found on inspection;
4. The priority to be given to intervention level;
5. The type of priority intervention action that will be carried out;
6. Provision, as far as practicable, for the unpredictable, i.e. emergencies, natural disasters; and
7. Assessment of resources required to deliver the specified maintenance services.

Responsibility for immediate dangerous situations with respect to Transportation assets, is initially assessed or undertaken by Councils operational staff or the afterhours response team.

This TAMP acknowledges the importance of understanding and monitoring the linkage between workload indicators and intervention actions, as a substantial increase in area of pavement to be maintained can materially impact upon intervention action (and citizen satisfaction and duty of care requirements) if not accompanied by a comparable increase in budget allocation or productivity improvement.

Given the outcomes of an internal review with respect to Council’s Transportation maintenance services, the standards of maintenance detailed in this TAMP are considered reasonable and meeting community expectations in the context of responsible and reasonable road management.

1.5 Future Demand

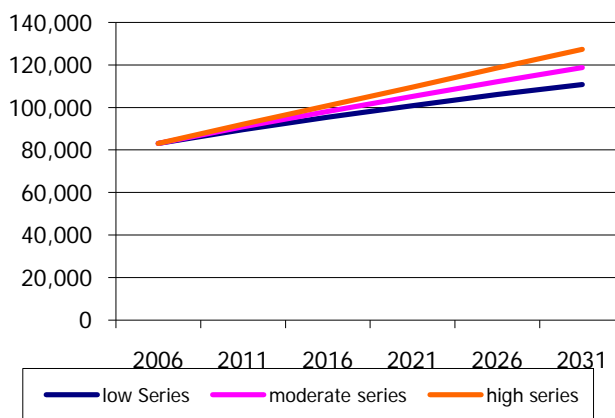
Statistical information from Australian Bureau of Statistics in March 2008 confirms that The Tweed is experiencing and will continue to experience growth.

Tweed Shire is home to an estimated 82,955 people (Australian Bureau of Statistics (ABS) 2006), this is an increase of 10.34% from the 74,380 residents which were living in Tweed in 2001.

The following table illustrates that substantial population increase is expected to occur in the Tweed LGA up to 2031. This is in line with recent population trends in the Shire which has seen it grow at an average annual rate of 2.1%, compared to the NSW average of 0.7%. Tweed Heads continues to grow at the fastest rate of all the Shire’s planning districts.

The total population is projected to grow from a 2001 base of 74,590 people past the 2006 figure of 82,955 to 90,870 by 2011. This growth is not expected to occur evenly across the age groups, with relatively little growth anticipated in the younger age groups, especially those under 15 years of age.

This projected population profile reflects the socio-demographic changes which have resulted in middle to older age groups undertaking a sea change. This movement to the Shire up and out from the rest of NSW, as well as the movement of people down from South East Queensland, along with improved access to the Shire facilitated by upgrading of the Pacific Highway, is expected to result in the continuation of the rapid growth rate over the next two decades.



1.5.1 Current Issues Influencing Service Demand

In the absence of comprehensive service strategies, population trends can be used as a guide to ascertain future demand.

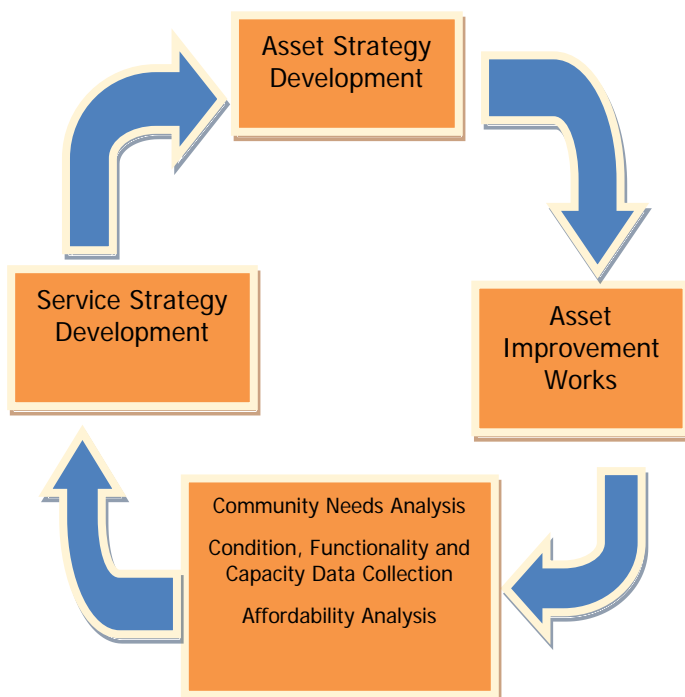
Age Group	Population 2001	Forecast Population 2031	Forecast Population Change
Whole population	74,590	133,390	44%
0 to 14 Years	14,630	30,220	52%
15 to 29 Years	10,900	13,060	17%
30 to 49 Years	19,740	24,420	19%
50 to 64 Years	13,330	23,760	44%
64 Years +	15,990	41,930	62%

Projected Population Changes for Tweed: Source New South Wales Statistical Local Area Projections Report 2005

Although there are many factors that influence the demand for Council’s services and consequently Council’s Building asset portfolio, a 52% increase across the municipality in the population of residents aged between 0 to 14 years and a 62% increase across the municipality in the population of residents aged 64 and over will have a significant impact on service levels.

For example, if the service levels are to be retained, Council will have an increase in its asset stock via developer contributed asset and will also need to increase the number of staff it has providing services to these residents.

Matching the availability of Council assets to community demand is a cyclic process as demonstrated in the following diagram.



The best entry point to the cycle is through the assessment of community wants and needs, condition, functionality and capacity assessment of Council’s current Transportation asset portfolio and forward projections of Council’s financial capacity.

This framework enables the preparation of forward-looking service strategies that compare forecast demands to current capacities. Gap analyses lead into asset strategies that in turn inform Capital Works Programs of asset renewal, upgrade and improvement works.

This process in conjunction with Council's demand management plan will seek to address any service demand issues which will arise in future.

1.6 Lifecycle Management Plan

Life Cycle Management is recognised by The Tweed as an essential component of this TAMP. This section of the TAMP will provide details of Tweed's data and processes required to effectively manage, maintain, renew and upgrade Council's Transportation network. It also documents the analysis that Tweed undertakes regularly to predict and monitor expected future expenditure required to effectively manage Council's Transportation network.

To undertake lifecycle asset management, means considering all management options and strategies as part of the asset lifecycle, from planning to disposal. The objective of managing the assets in this manner is to look at long-term cost impacts (or savings) when making asset management decisions.

The diagram below provides a graphical representation of the asset lifecycle including each of the stages an asset passes through during its life.



1.7 Transportation Asset Stock

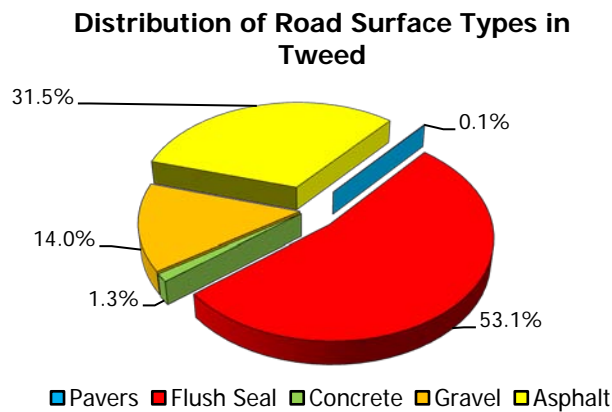
The following table provides a summary of Tweed's Transportation asset stock.

Transportation Asset Type	Quantity	Length (km)
Sealed Roads	-	1,058
Unsealed Roads	-	173
Kerbs	-	739
Footpaths	-	194
Carparks	-	7
Road Bridges	280	-

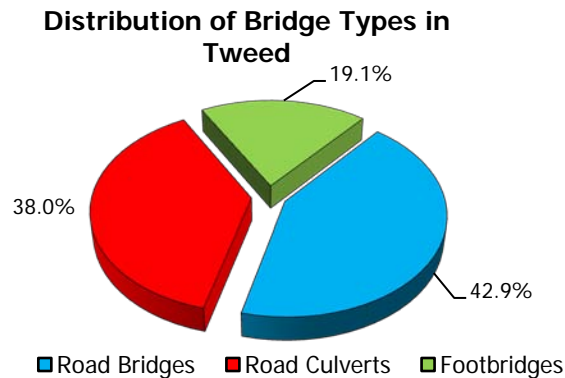
Transportation Asset Type	Quantity	Length (km)
Footbridges	66	-
Bus Shelters	157	-

The following diagram below illustrates that of the 1,231kms of road network maintained by Tweed Council, that the most predominant surface type is spray seal surfaces with 53.1% followed by asphalt road surfaces at 31.5%.

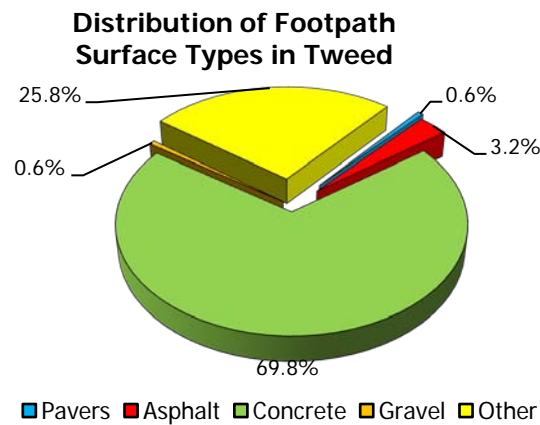
In fact, over 84% of Council’s road network is sealed with only 14% being gravel roads.



The following diagram below illustrates that of the 346 bridges maintained by Council, that 148 are vehicular road bridges, with 131 major road culverts and 66 footbridges.



The following diagram below illustrates that of the 194kms of footpath network maintained by Tweed Council, that the most predominant surface type is concrete surfaces with 69.8%.



1.8 How Council Measures its Transportation Assets Portfolio Condition

Tweed Council has a documented “Road Rating Manual” which is available for viewing at Council’s Offices.

The condition of road assets is measured as follows:

Pavements and Road Wearing Surface

- Measuring the severity and extent of crocodile cracking.
- Measuring the severity and extent of linear cracking.
- Measuring the extent and severity of pavement defects (such as rutting, corrugations and depressions).
- Measuring the extent of local and surface texture defects (such as potholes, flushing, bleeding and stripping).
- Measuring the extent of oxidisation on spray seal road surfaces and ravelling on asphalt road surfaces.

Concrete Roads

- Measuring the severities and extents of stepping, disintegration and spalling.
- Measuring the severities and extents of cracking.
- Measuring the severity of joint sealant.

Unsealed Roads

- Measuring the extent of gravel depth.
- Measuring the severities and extents of rutting, scouring, corrugations and potholes.

Kerb and Gutter

- Measuring the severities and extents of alignment, distortion, cracking, shape loss, structural failures, roll backs and channel deficiencies.

Footpaths

- Measuring the severities and extents of, cracking, trip, breakage and tree root defects.

Bridges

- Measuring the defects as per the Queensland Main Road Bridge Inspection Manual, which Council has adopted as it’s rating manual.

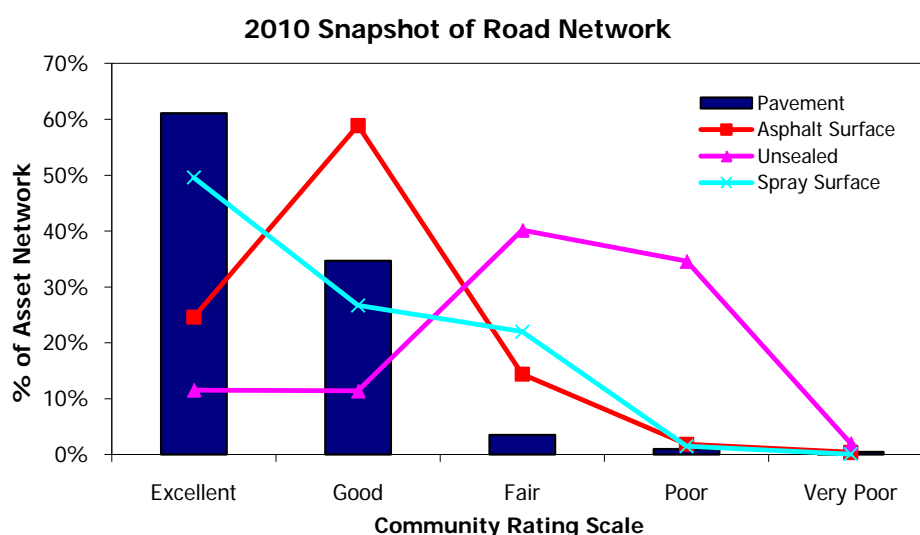
1.9 What is the Useful Lives of Council's Transportation Assets?

The following table below describes the useful life/expected lives that Council has adopted for each Transportation asset included in this TAMP.

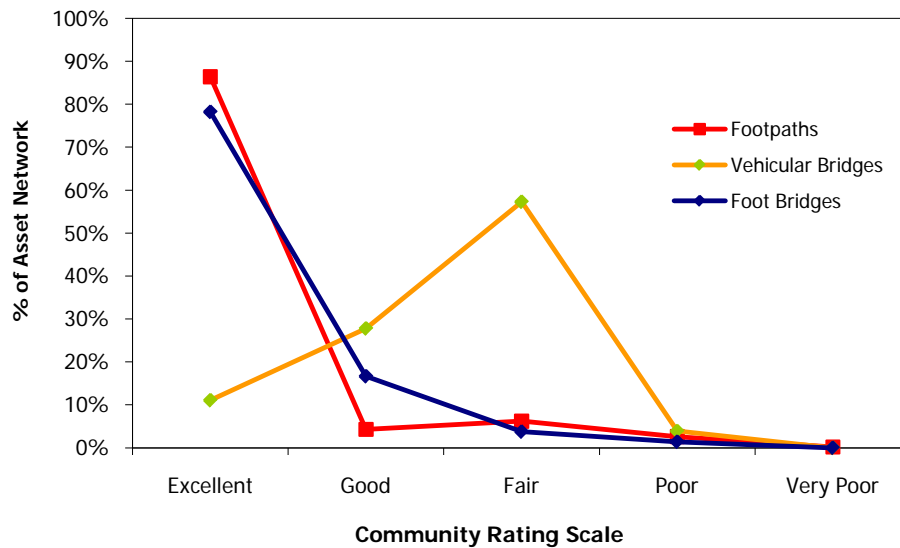
Asset	Asset Type	Useful Life (Years)
Road Surface	Asphalt	25
Road Surface	Spray Seal	20
Road	Concrete	50
Road	Pavers	50
Road Surface	Gravel	10
Road Pavement	Pavements	40
Kerb	All types	50
Footpaths	All types	50
Bridges	All types	80
Road Ancillary	All types	20

1.9.1. Snapshot of Council's Transportation Asset Condition

The following graphs illustrates Tweed's Transportation Network Condition based on Council's condition data collected in 2010, taking into account the above condition rating scales. The graph shows the percentage of Council's network in each category of community condition scale.



2010 Snapshot of Transportation Network



At present, the current hypothetical cost of recouping the back-log (being any asset that represents poor or very poor condition) ie. by immediate capital renewal is **\$37.8 million** (Refer to the table below). It should be noted that this current condition data has been based on data that was collected in 2010.

Area of Asset In Poor or Very Poor Condition	Average Unit Rate of Renewal per	Total Current Cost of repairing Transportation network considered to be in poor and very poor condition
Urban Pavement equates to 175,080m ²	\$81.25	\$14,225,000
Rural Pavement equates to 374,419m ²	\$43.75	\$16,380,000
Asphalt Surface equates to 62,784m ²	\$14.00	\$878,900
Spray Seal Surface equates to 81,683m ²	\$8.67	\$708,200
Unsealed equates to 307,526m ²	\$5.50	\$1,691,400
Footpaths equates to 7,684m ²	\$80.00	\$614,723
Bridges equates to 6 structures – 766m ²	\$5,518.00	\$3,270,731

If undertaken over a period of 10 years, the annualised backlog figure is \$3.78 million per annum.

1.10 Council’s Adopted Financial Strategy for Transportation Assets?

Section 6.3 of this TAMP has a detailed table documenting the assumptions and required financial strategy allocation required over the following 10 years.

In summary, it has been calculated that Tweed Shire will have to allocate \$172 million with regards to maintaining and renewing Transportation assets over the following ten years.

This equates to a commitment of approximately \$17.2 million per annum.

1.11 Monitoring and Improvement Program

Any Asset Management Plan must be a dynamic document, reflecting and responding to changes over time. A full review of the Transportation Assets Management Plan should take place every three to five years to document progress and set out proposals for the next five years.

Any review of this TAMP will, in addition to that set out above have, regard to:

- Asset performance following delivery of maintenance program;
- The level of achievement of asset management strategies against the expected benefits to Transportation users, stakeholders and the community; and
- The consideration of any external factors that is likely to influence the contents of this TAMP.

An Improvement Program in Section 8 has been developed in which it is recommended that Council undertakes a number of actions with an aim to improve the accuracy and confidence in the information and improve its practices with respect to Council's Transportation assets.

2.0 Introduction

2.1 Tweed Shire Background

Tweed Shire is located in the north east corner of New South Wales, in a diverse area featuring coastal villages, urban centres, rural villages and agricultural activities.



Diagram 1 – Tweed Shire – Location Map

The centrepiece of the Shire, is Mount Warning, where the sun first hits the Australian continent most of the year. The surrounding McPherson, Tweed, Burringbar and Nightcap ranges form the caldera of the fertile Tweed Valley.

The shire stretches over 1303 square kilometres and adjoins the NSW shires of Byron, Lismore and Kyogle with the Gold Coast City Council area and Scenic Rim Regional Council to its north.

The Shire has 37 kms of natural coastline, wetlands and estuarine forests, and some of the richest pastoral and farm land in NSW. The Tweed River basin is a unique and diverse mountainous region, containing three world-heritage listed national parks.

Prior to European settlement, the area was blanketed in sub-tropical forest and was home to the Bundjalung people. Many of the Shire's towns and villages derive their names from the language of the local Aboriginal people.

The Tweed River was the first highway and conduit of people and goods through the district. Farms, settlements and villages formed along its banks and tributaries. The area was settled by timber-getters around 1844; the first school opened in 1871; and by the 1890's, the river port of Tumbulgum was the centre of population. The focus of population moved to Murwillumbah when the municipality was created in 1902. The current Tweed Shire was formed in 1947 when the Municipality of Murwillumbah was amalgamated with the Shire of Tweed.

Today some 84,325⁷ people live in Tweed, scattered through 17 villages, two towns, and the major urban areas of Tweed Heads and South Tweed. The last twenty years have seen enormous growth, with the population increasing, 11% between the 1996 and 2001 census, largely due to southern retirees drawn by the temperate climate and relaxed lifestyle. Trends

⁷ Source: ABS - Regional Population Growth, Australia, 2007

suggest that Tweed’s population is projected to increase to 133,390 (by 49,065) persons over the next 21 years to 2031⁸.

The retail, hospitality, and tourism industries are major employers, while construction, fishing, health, and light industry are other significant contributors to the local economy. The retail sector is the largest employer in the Tweed Shire, accounting for

18.5% of total employment, well above the NSW average of 14.2%. This reflects the importance of tourism in the economy of the Shire. Agriculture also plays a major part in the economy of the Tweed (5.5%) compared to the rest of NSW (3.4%), although the numbers employed in this sector have declined over the last decade.

The Tweed Shire is one of the most rapidly growing areas of Australia and it has undergone dramatic changes over the last 20 years, particularly on the coast. The sea change trend is behind many of these changes. In 2001, 23% of the population was over 65, twice the NSW average. However, the Shire also has a high proportion of children under 19, 25%. Youth unemployment is twice the state average. Incomes in the north coast region are the lowest in NSW. In 2001 over 43% received some form of Centrelink income support, compared to 27% in NSW.

The Tweed Shire Council faces major challenges in accommodating high rates of population growth, while protecting the environment of the Shire, providing services for an aging population, and employment opportunities for its large population of young people.

Tweed Shire Council has identified the upgrading of its transportation infrastructure as one of the major areas to be addressed and has initiated a number of significant capital works improvements in the last three years. This involved improvements in the road and footpath network to meet current and future demands. This focus will continue and is reflected in the Capital Works Programs and in this Transportation Asset Management Plan.

2.2 What is the Purpose of The Tweed’s TAMP?

The fundamental purpose of this Transportation Asset Management Plan (TAMP) is to improve Council’s long-term strategic management of its infrastructure Transportation assets in order to cater for the community’s desired levels of service in the future, in accordance with Council’s key strategic documents and demonstrate reasonable management in the context of Council’s available financial and human resources. The TAMP achieves this by setting standards, service levels and programmes which Council will develop and deliver. The standards and service levels have been set in accordance with user needs, regulations, industry practice and legislative codes of practice.

2.3 What will this TAMP Achieve?

The focus of our TAMP is to be pro-active. It will enable us to:

1. Have precise knowledge of what we own or have responsibility or legal liability for;
2. Record and extract information on these assets in a register down to an identifiable level;
3. Report on our annual depreciations and asset consumption at an asset component level;
4. Measure and monitor the condition, performance, utilisation and costs of assets down to the managed component level and aggregate this data up to give outputs of cost and performance at the portfolio level;
5. Understand and record the current levels of service in terms of responsiveness and performance;

⁸ Tweed Shire Urban Land Release Strategy, February 2008

6. Understand the likely future levels of service required based on student growth, demographic changes and community expectations;
7. Understand the long term (10-20 years) funding needs of our transportation asset portfolio to meet our strategic expectations in both capital and maintenance expenditure;
8. Measure, monitor and report on the condition, performance and functionality of our assets against prescribed service levels and regulatory requirements;
9. Have uniform processes across our whole organisation for the evaluation of any investment in:
 - Renewal, upgrades and expansions of existing assets.
 - Creation of new assets.
 - Maintenance of existing assets.
 - Operational expenditure to deliver services.

2.4 Plan Framework

In the application of this TAMP, Council has developed a whole of life approach to the management of its Transportation infrastructure. Council has focused on providing an interdisciplinary view of asset management with the development of an Asset Management Policy and framework for the organisation.

The specific elements considered in this TAMP are to:

- Demonstrate accountability and responsible stewardship of Transportation assets;
- Identify least-cost options to provide agreed levels of service;
- Assess existing Transportation asset stocks and their capacity, condition and functional adequacy;
- Document the Levels of Service that will be provided to the community;
- Identify future demand for Transportation assets;
- Manage the risks of Transportation asset failures and risks of capacity failures;
- Undertake Life Cycle Management;
- Provide the basis for long-term financial planning; and
- Monitor the plan to ascertain if it is meeting Council's objectives.

The implementation of this TAMP reflects a financially responsible approach to meeting the needs of the communities that make up the Tweed Shire in regard to:

1. The level of service provided by the Transportation assets
2. Economic development
3. Intergenerational equity
4. Environmental sustainability
5. Sustainable development

Through its documented Management Plan 2008-2011, Council has identified a need to develop long-term financial management plans for its Transportation network provision as part of a process to adopt continuous improvement programs for the management of this asset class. The purpose of this TAMP will therefore enable this to occur in a structured manner. This is of particular importance as Council's investment in its Transportation assets is valued at approximately \$590.6 million⁹.

⁹ Source: Tweed Shire Financial Statements 2008/2009

2.5 Key Assets Covered by this TAMP

The transportation assets considered in this TAMP, are described as including all assets directly associated with the road and located within the road reserve, for which The Tweed Shire is the responsible road authority. *Please refer to Council's Asset Register for all Transportation assets for which Council is accepting responsibility.*

The Tweed Shire does not own and is not responsible for the management of Declared State Roads such as the Pacific Highway. These roads are managed by the RTA. The Tweed Shire under the 'RTA arrangements with councils for road management' undertakes maintenance and renewal works on Regional Roads with funding assistance provided by the RTA.

It should also be noted that roads constructed by others without Council approval, for the purposes of local access, are not maintained by Council. These roads are maintained by the benefitting property owners even though they are a public road.

Assets that have been considered in the preparation of this TAMP include the following:

Transportation Asset Type	Quantity	Length (km)
Sealed Roads	-	1,058
Unsealed Roads	-	173
Kerbs	-	739
Footpaths	-	194
Carparks	-	7
Road Bridges	280	-
Footbridges	66	-
Bus Shelters	157	-

Table 1- Transportation asset stock values as at June 2010 (data obtained from The Tweed databases)

Assets not considered in this TAMP are:

1. Vehicular Crossings – these are the responsibility of the property owner
2. Street trees including landscaping¹⁰
3. Buildings¹¹
4. Street lighting¹²
5. Artwork – within the road reserves¹³
6. Stormwater drainage¹⁴
7. Private roads, laneways and car parks – these are the responsibility of the private owners
8. Vehicular and pedestrian crossings that intersect with railway tracks, which includes 2.13m from the outer tracks and associated ancillary assets – Responsibility of Railway Operators

¹⁰ Will be considered under a separate Asset Management Plan

¹¹ Will be considered under a separate Asset Management Plan

¹² Not Tweed Shire Assets

¹³ Will be considered under a separate Asset Management Plan

¹⁴ Will be considered under a separate Asset Management Plan

2.6 Tweed's Road Register

The Roads Act 1993, under Section 163, stipulates the following requirements with respect to Roads Authorities maintaining records.

- (1) A roads authority must keep a record of the public roads for which it is the roads authority.
- (2) The record must indicate with respect to each public road:
 - (a) its location, and
 - (b) the name and number (if any) given to it by the roads authority, and
 - (c) the reference of any plan in accordance with which its boundaries or levels have been fixed or varied by the roads authority, and
 - (d) such other particulars as may be prescribed by the regulations.
- (3) The record must be available for inspection by members of the public, free of charge, during the normal business hours of the roads authority.

It is considered that The Tweed complies with these requirements through the management and maintenance of its Asset Registers.

2.6.1 Council's Role and Responsibility

Under the NSW Local Government Act 1993 and Roads Act 1993, Council is responsible for the regulation of the Transportation assets in the Tweed municipality.

Council is exercising its Transportation functions as allowed for under Division 2 Section 7 of the Local Government Act 1993 and Section 7 of the roads Act 1993.

Under Section 7 of the Roads Act 1993, it states the following for Road Authorities:

The council of a local government area is the roads authority for all public roads within the area, other than:

- (a) any freeway or Crown road, and
 - (b) any public road for which some other public authority is declared by the regulations to be the roads authority.
- (5) A roads authority has such functions as are conferred on it by or under this or any other Act or law.

Council is also responsible for undertaking forward planning and administering development control through planning permit assessment, building permit assessment and local laws.

2.6.2 Community's Role and Responsibility

The Roads Act 1993 defines the:

- (a) rights of members of the public to pass along public roads, and
- (b) sets out the rights of persons who own land adjoining a public road to have access to the public road

In addition, prior to carrying out any road related works on Council's assets, the resident, developer or service authority must obtain prior approval from Council. Service authorities are exempted where the works are required to be undertaken during times of an emergency nature, such as a burst water main etc.

2.7 TAMP, Relationship with other Council Policies, Strategies and Plans

This TAMP documents how Council's Transportation assets are managed and maintained to meet the needs of the community. In order to do this effectively, other Council policies, strategies and plans have been considered to determine how this impacts on the TAMP.

These related policies and plans include the following.

2.7.1 Relationship between TAMP and Community Strategic Plan

The Community Strategic Plan and Delivery Program set the course for the delivery of services and projects over the next four years.

The objectives and strategies of the Community Strategic Plan align with Council's vision that *"The Tweed will be recognised for its desirable lifestyle, strong community, unique character and environment, and the opportunities its residents enjoy"*.

Council acknowledges that it will need to prepare sustainable social, environmental and financial strategic plans, policy and infrastructure specifications aligned to Council's Vision, Mission and Charter to ensure capacity availability and essential infrastructures can be provided prior to the approval of development whilst maintaining and improving existing levels of services.

Council has a strategy to 'Ensure sustainable provision of infrastructure is available to support economic development'.

This TAMP has therefore been aligned to deliver Council's Objectives and Strategies as documented in Council's Community Strategic Plan, in terms of providing cost-effective, transparent, quality and affordable service levels in accordance with community expectations.

2.8 Stakeholders in Preparation of this TAMP

The owner of Transportation assets is the Tweed Shire Council. The elected members of Council have a stewardship responsibility for the care and control of these assets.

The responsibility for the management of all Transportation assets within the Tweed Shire municipality rests with the Manager Works.

Council recognises varying needs of external and internal stakeholders depending on whether these stakeholders are the business community, residents, or visitors and they include:

- The Tweed Councillors and Council staff;
- Residents;
- Local businesses;
- State Government Departments, such as the RTA;
- Adjoining Councils;
- Management Committees;
- Council Business Units; and
- Developers.

3.0 Levels of Service

A key objective of this TAMP has been to match the level of service provided by Council's Transportation network to the expectations of the users (i.e the community) within available resources. This requires a clear understanding of the user needs, expectations and preferences.

To achieve and sustain acceptable standards of service for Council's Transportation asset network requires an annual commitment of funds. These funds provide for regular and responsive maintenance and for timely renewal or replacement of the asset. The provision of adequate financial resources ensures that the Transportation network are appropriately managed and preserved. Financial provisions below requirements impacts directly on community development and if prolonged, results in substantial needs for "catch up" expenditure imposed on ratepayers in the future. Additionally, deferred renewal results in increased and escalating reactive maintenance as aged assets deteriorate at increasing rates.

The levels of service documented in this TAMP reflect the current levels of service provided by Council, for the benefit of the community, in the context of Council's financial and human resources.

The levels of service that have been adopted are considered reasonable as demonstrated by the outcomes of Council's Customer Survey undertaken in February 2008 and industry standards and benchmarks.

3.1 Strategic Service Objectives and Strategic Basis for Developing Service Levels

In developing the levels of service as documented in this TAMP, Council has given due regard to the objectives and strategies in the Community Strategic Plan.

The Tweed's major challenges like many other coastal communities, is the task of servicing an expanding population with finite resources. It is always a challenge to strike a balance between the needs and desires of residents and what can realistically be achieved.

Council is managing these challenges by ensuring that all future works and planning for assets is consistent with the framework of this TAMP and ensuring that the natural environment, economic development, and community well-being, are all considered in the decision making process.

The objectives as documented in Tweed's Community Strategic Plan clearly acknowledge that Council is committed to developing clearly defined service levels in consultation with the community. Council is clearly committed to the orderly development, maintenance and replacement / renewal of infrastructure to provide these services at the lowest sustainable lifecycle cost whilst achieving triple bottom line outcomes and balancing inter-generational equity.

3.2 What Customer Research and Expectations were used in setting these Service Levels?

Council currently receives feedback from the community from the following various sources:

- Consultation and research when developing the Community Strategic Plan; and
- CWR ¹⁵ – customer work requests and reactive asset complaints.

¹⁵ Council's Customer Request System can provide regular reports on infrastructure request/complaint numbers, locations and priorities.

It is important to note that Council uses this information in developing the Community Strategic Plan and in the allocation of resources in the Long Term Financial Plan.

3.3 Legislative and Statutory Requirements Relevant to NSW Transportation Management

This TAMP is governed by the following legislative and statutory requirements:

Legislation	Purpose
NSW Local Government Act 1993	<p>This Act provides the purpose, objectives, functions and powers of municipal Councils in relation to the management of a municipal Transportation network.¹⁶</p> <p>Examples of these functions include the provision, management or operation of:</p> <ul style="list-style-type: none"> • environment conservation, protection and improvement services and facilities • waste removal, treatment and disposal services and facilities • water, sewerage and drainage works and facilities • stormwater drainage and flood prevention, protection and mitigation services and facilities • fire prevention, protection and mitigation services and facilities
Roads Act 1993	<p>This Act provides for the functions and powers of road authorities in particular:</p> <p>(c) to establish the procedures for the opening and closing of a public road, and</p> <p>(d) to provide for the classification of roads, and</p> <p>(e) to provide for the declaration of the RTA and other public authorities as roads authorities for both classified and unclassified roads, and</p> <p>(f) to confer certain functions (in particular, the function of carrying out road work) on the RTA and on other roads authorities, and</p> <p>(g) to provide for the distribution of the functions conferred by this Act between the RTA and other roads authorities, and</p> <p>(h) to regulate the carrying out of various activities on public roads.</p>
Environmental Protection Act 1994	<p>This Act places a 'duty of care' on people not to undertake activities that will cause environmental harm.</p>
Road Transport (General) Act 2005	<p>The objects of this Act are to secure and promote the health, safety and welfare of people at work and hence when Council employees undertake works, must do so with regards to the various requirements of this act.</p>

¹⁶ Refer to Division 2, Part 3, Chapter 6 of the Local Government Act 1993

Legislation	Purpose
Road Transport (Safety and Traffic Management) Act 1999	Facilitates the adoption of nationally consistent road rules in NSW, the Australian Road Rules. It also makes provision for safety and traffic management on roads and road related areas including alcohol and other drug use, speeding and other dangerous driving, traffic control devices and vehicle safety accidents.
Road and Rail Transport (Dangerous Goods) 1997 No 113	The purpose of this Act is to regulate the transport of dangerous goods by road and rail in order to promote public safety and protect property and the environment.

In addition, The Tweed where appropriate complies with the following design specifications and Australian Standards:

Standards / Specifications	Purpose
Council Standard Drawings	Provides the standards of design and construction for those assets that will vest in Council following the new property developments.
Australian Standards	Provides standards for design and construction and also sets out procedures to meet Australia's need for contemporary, internationally aligned Standards and related services.
Austrroads Guides, Commentaries and Reports	Austrroads works with local government to improve Australia's roads and transport systems, recognising the value and importance of developing the local road component of the national road network.
Tweed Development Control Plan Section A5	Provides the standards of design and construction for new assets as a result of developments.

3.4 What is Council's Transportation Hierarchy?

No Road Authority can deliver everything, all the time. In fact, in line with good practice and affordable service delivery, it may not be practical or cost-effective to deliver the same level of service across the entire asset portfolio. Therefore Tweed Shire has documented a Transportation asset hierarchy that classifies the Transportation system / network into appropriate groups based on the appropriate levels of service.

In accordance with the International Infrastructure Management Manual, Council acknowledges that the primary purpose of an asset hierarchy is to ensure that appropriate management, engineering standards and planning practices are applied to the asset based on its function. It also enables more efficient use of limited resources by allocating funding to those assets that are in greater need and the costs are better justified.

Without an adequate Transportation hierarchy, there may be inefficient allocation of resources, user expectations may vary and the scheduling of Transportation works and priorities made more difficult.

3.4.1 Roads and Kerb Hierarchy

The Transportation asset hierarchy comprises assets which provide a measure of Transportation provision to the community and are documented in the tables below.

In developing the road hierarchy/classification system Council has used the following guiding principles to develop its road hierarchy:

1. The road hierarchy/classification system links with or is consistent with the RTA Classification System.
2. The classification system needs to be functionally based. Traffic volumes and vehicle types can impact on the road classification.
3. The width of a road or whether it is sealed is not necessarily criteria that influence a classification.
4. Special purpose roads, ie sugar cane routes or tourists roads should be made to fit existing classifications rather than establish a separate classification.
5. Unused road reserves are to be ignored, and used only for mapping purposes.

Sealed Road Hierarchy	Road Description
S1-Regional	For car and truck movements on roads designated as part of the Regional road network. Roads significant to the Region.
S2-Distributor	Not part of the Regional network. Major routes for cars and trucks with local origin or destination.
S3-Collectors	Collector routes for cars and trucks with local origin or destination.
S4-Local Urban	For movement of cars and trucks in urban areas, from higher hierarchies for access to residences or businesses within the Shire.
S5-Local Rural	For movement of cars and trucks in rural areas, from higher hierarchies for access to residences or businesses within the Shire.
S6-Car parks	For parking of cars and trucks.

Unsealed Road Hierarchy	Road Description
U1-Collector	For movement of cars and trucks for access to residences and rural properties within the Shire.
U2-Local	For movement of cars and trucks from collectors for access to residences and rural properties within the Shire.

This TAMP has different maintenance interventions, inspection frequencies and response times for each road classification.

3.4.2 Footpath Hierarchy

The Footpath hierarchy adopted for The Tweed takes into account the varying risk levels associated with pedestrian volumes and/or the nature of the footpath usage and is summarised as follows:

Footpath Hierarchy	Footpath Function
F1-High	Footpaths located in the near vicinity of shopping precincts, aged care centers, senior citizen centers, schools, hospitals, libraries, main community facilities, transport hubs and all shared use paths and Car Parks.
F2-Low	All other Footpaths.

This TAMP has different maintenance interventions, inspection frequencies and response times for each footpath classification.

3.4.3 Bridge Hierarchy

The bridge hierarchy adopted for The Tweed takes into account the varying risk levels associated with traffic and pedestrian volumes and/or the nature of the bridges and is summarised as follows:

Bridge Hierarchy	Bridge Description
B1-Major Road & Culvert Structure	Structure over creeks and features for car and truck movements on roads designated as part of the Regional road network.
B2-Minor Road & Culvert Structure	Structure over creeks and features for movement of cars and trucks on all other sealed and unsealed roads for access to residences or businesses within the Shire.
B3-Footbridges & Boardwalks	Structure over creeks and features for pedestrian movements, typically located on shared use paths and in open space areas.

This TAMP has different maintenance interventions, inspection frequencies and response times for each bridge classification.

3.5 Current Council Practices

The following are special service level consideration for the provision of transportation assets currently carried out by Council or others.

3.5.1 Construction of Unsealed Roads

At present, there is no formal Policy with respect to upgrading unsealed roads to sealed roads. This will be considered in future plan revisions. However, at present, Council will consider upgrading unsealed roads on a case by case basis.

The aspects considered include current and projected traffic volumes, risk, maintenance issues and overall benefit to the neighbouring community.

Tweed Shire currently has a sealing program for roads which have been identified as School Bus routes.

Unsealed roads which have been constructed by others on public road reserves and not identified in Council's Asset Register will not be considered for upgrading by Council.

However, Council will accept responsibility for these roads should they be constructed to Council's current standards by developers or adjoining residents.

3.5.2 Construction of Footpaths where None Exist

At present, there is no formal Policy with respect to constructing footpaths where none exist. This will be considered in future plan revisions. However, at present, Council will consider construction of a new footpath where one does not exist on a case by case basis.

The aspects considered in the decision making process will include analysis of linkages of existing footpaths, consideration of pedestrian volumes, risk, maintenance issues and overall benefit to the neighbouring community.

3.5.3 Works by Others

Council is not the only organisation to have assets in the road reservations. Other organisations, especially Service Authorities, also have assets that may be constructed adjacent to, underneath or overhead of Council's assets.

Maintenance and renewal works on one asset will often affect other assets in the road reservation. The close proximity of the assets means that works by Service Authorities will inevitably affect many of Council's assets. Uncoordinated works can mean continual disruption to residents and deterioration both of the assets and the environment.

Section 138 of the Roads Act 1993 stipulates the following when it comes to on public roads;

- (1) A person must not:
 - (a) erect a structure or carry out a work in, on or over a public road, or
 - (b) dig up or disturb the surface of a public road, or
 - (c) remove or interfere with a structure, work or tree on a public road, or
 - (d) pump water into a public road from any land adjoining the road, or
 - (e) connect a road (whether public or private) to a classified road, otherwise than with the consent of the appropriate roads authority.

In accordance with Section 138 of the Roads Act 1993, a road-opening permit is required to be obtained by residents or service authorities prior to carrying out works in the road reserve, who must complete a 'Driveway Access To Property Application' form.

When a Service Authority is repairing a failure or is renewing its infrastructure, it generally results in the disturbance of the road pavement or footpath / nature strip. If the road pavement requires patching, the integrity of the pavement is weakened particularly at the edges of the patch. Subsidence can occur if correct compaction of the patch material is not obtained, which can also lead to failures around the patched areas. When footpath areas are disturbed, whole bays of footpath are replaced if it is concrete and larger areas replaced if it is asphalt.

Council's Engineering and Operations Division monitors the works undertaken by the Service Authority in accordance with Council's requirements or Council's Depot undertakes the reinstatement work for the Service Authority at their cost.

3.5.4 Assets Owned and Maintained by Others

Key Service Authority Services & Owners include:

Water and Sewerage

The Tweed provides the major water and sewerage infrastructure for Tweed. Council has many assets such as water and sewerage treatment plants, reservoirs, rivers and creeks.

All infrastructure such as manholes, pipes, which are located within the road reservation and required to deliver the above service is the responsibility of Water and Wastewater Department to maintain.

Electricity

Country Energy provides the high voltage electricity transmission supply, with lines generally above ground strung on large steel towers located in easements.

They also provide electricity distribution for the Tweed municipality. Most is above ground, strung on poles in the nature strips. In recent developments, electricity is often installed underground in the nature strip.

All infrastructure such as overhead cables, pits and pipes which are located within the road reservation and required to deliver the above service is the responsibility of Country Energy or other electricity service providers to maintain.

Gas

Energex, AGL, Boral and Origin Energy provide the gas distribution for The Tweed Shire. As with the water and sewerage, gas pipes are generally installed under the road pavement or in the nature strip.

All infrastructure such as access points and pipes/conduits which are located within the road reservation and required to deliver the above service is the responsibility of Energex, AGL, Boral or Origin Energy to maintain.

Telephones/ Cable TV

Telecommunications authorities such as Telstra, Vodafone and Optus have a mixture of above and below ground assets. The telecommunications cables within The Tweed are either below ground connected by a series of pits under the footpath or the nature strip or strung between electricity poles.

All infrastructure such as overhead cables, pits and pipes /conduits which are located within the road reservation and required to deliver the above service is the responsibility of the telecommunication service provider to maintain.

Public Transport – Bus Services

Surfside Bus lines service the Tweed Heads & Coast areas of the shire, with other smaller bus companies in the Murwillumbah & rural areas (mainly for school buses).

These service providers do not have any assets in the road reserve.

Signs and shelters for patrons along the bus route installed in the footpath / nature strip area are installed and maintained by The Tweed Shire.

It should be acknowledged that no train service exists within the Tweed Shire at present.

Main Roads in NSW - RTA

The RTA and Council have joint control over the road reservations on Regional Roads such as Tumbulgum Road, but not on State Highways such as the Pacific Highway. On Regional road reservations, the road pavement assets are under the management of the RTA, whilst Council controls the remainder of the road-related assets.

3.5.5 Contracts for Works Carried Out

Typically the majority of the works delivered within the Shire, are delivered by Council's Depot staff.

Council's Manager Design is responsible for managing external consultants/contractors who undertake design, while Council's Manager Works and Senior Contracts Engineer are responsible for managing the contractors who undertake the upgrade or renewal works as identified in Council's capital works program, each financial year.

The consultants/contractors are awarded the work through a competitive tender process for works above \$150,000.

3.5.6 Occupation of the Road Reserve

Approval in writing is required to occupy any part of the road reserve for which Council is the responsible authority.

The procedures are documented in Council's 'Application for Approval of Driveway Access to Property' as allowed for under Section 138

Of the Roads Act 1993.

3.6 What are Council's Levels of Service being delivered?

At The Tweed Shire Council, we have defined two tiers of service levels:

The first being '**Strategic Levels of Service**' – what we expect to provide in terms of key customer outcomes:

- Appropriateness of service.
- Accessibility to users 24 hours a day, 7 days a week.
- Affordability – acknowledging that we can only deliver what we can afford.
- Relevance of the service being provided – in terms of demand characteristics, future demographics, current back-logs and where the pressure points are.

The second being '**Operational Levels of Service**'

- What we will do in real terms, i.e. reliability, functionality and adequacy of the services provided. Typically, this TAMP has documented our standards – i.e. at what point will we repair, renew or upgrade to meet the customer outcomes listed in the strategic levels.
- Operational levels of service are also referred within Council as Technical Levels of Service and have been defined for each of the following:
 - **New Asset** – If we provide new Transportation structures / assets, then what design and maintainability standards shall apply to make them meet our strategic outcomes.
 - **Upgraded or Reconstructed Asset to original standard** - If we upgrade or reconstruct Transportation assets, then what design and maintainability standards shall apply to make them meet our strategic outcomes.
 - **Maintenance** – When will we intervene with a maintenance repair and what will be our responsiveness in terms of customer requests for maintenance faults.

3.6.1 Strategic Levels of Service

Tweed Council's Strategic Levels of Service that have been adopted as a result of this TAMP are tabulated in the table below as:

Service Criteria	What will Council do?	Performance Standard / Measure
Community		
Quality	Well maintained and suitable transport services.	<2,000 request / complaints per annum.
Customer Satisfaction	Transport assets meet community needs.	>60% customer satisfaction.
Accessibility	Road assets will be accessible 24 hours a day, seven days a week.	100% Compliance. In the instance where a road or footpath or bridge is closed to users for reasons such as maintenance, upgrading, renewal or a Council related public event or non-Council events such as processions, then appropriate notification shall be given to relevant users in accordance with Council's public information policy.
Responsiveness	Response time to customer requests.	> 70% of all requests adequately responded to within target.
Technical		
Condition – Sealed Roads	Condition assessment of road network every 3 years.	On average Pavement Condition Index and Surface Condition Index to be in condition 3 (out of 5) or better.
Condition – Unsealed Roads	Condition assessment of road network every 3 years.	On average, unsealed road network to be in condition 3 (out of 5) or better.
Condition – Footpaths	Condition assessment of road network every 3 years.	On average, footpath network to be in condition 3 or better.

3.6.2 Capital Levels of Service – New Assets, Reconstructed Assets, Upgraded Assets

The Engineering Specifications section of Council's website provides links to a suite of documents setting out Council's requirements for engineering

design and the construction of Transportation assets.

<http://www.tweed.nsw.gov.au/PlanningBuilding/EngineerSpecsHome.aspx>

These specifications have been documented to ensure the quality of new public assets, the compatibility of private works with Council's infrastructure, and the protection of the environment from the impacts of development.

3.6.3 Maintenance Levels of Service

For the Levels of Service delivered on a day to day nature (i.e. responding to customer requests for maintenance faults and responding to breakdowns), refer to the following manuals, available for display at Council's offices:

- Tweed Road Maintenance LoS V1.0;
- Tweed Road Ancillary Maintenance LoS V1.0;
- Tweed Bridge Maintenance LoS V1.0; and
- Tweed Unsealed Road Maintenance LoS V1.0',

The service manuals documents:

8. The task or work expected to be undertaken, e.g. patch pot-holes to remove hazard.
9. The schedule of inspections to be undertaken of specified matters at specified intervals;
10. The circumstances under which intervention action is to be taken with respect to repair or maintenance needs for defects reported or found on inspection;
11. The priority to be given to intervention level;
12. The type of priority intervention action that will be carried out;
13. Provision, as far as practicable, for the unpredictable, i.e. emergencies, natural disasters; and
14. Assessment of resources required to deliver the specified maintenance services.

Responsibility for immediate dangerous situations with respect to Transportation assets, is initially assessed or undertaken by Councils operational staff or the afterhours response team.

This TAMP acknowledges the importance of understanding and monitoring the linkage between workload indicators and intervention actions, as a substantial increase in area of pavement to be maintained can materially impact upon intervention action (and citizen satisfaction and duty of care requirements) if not accompanied by a comparable increase in budget allocation or productivity improvement.

Given the outcomes of an internal review with respect to Council's Transportation maintenance services, the standards of maintenance detailed in this TAMP are considered reasonable and meeting community expectations in the context of responsible and reasonable road management.

3.7 Community Expectations and Perceptions

At present, Council does not participate in an Annual/Bi-annual Community Survey with regards to detailed community engagement on their satisfaction with Council's Transportation assets.

It is proposed that prior to the review of this TAMP, that a Community Survey or Participation Focus Group will be undertaken to gauge the community's satisfaction. These results will then feed back into the review TAMP.

3.7.1 Customer Requests – Data Analysis

Council also undertakes an analysis of annual customer service requests. The number of requests / complaints received throughout the last three years, with respect to transportation issues is shown in the table below.

Nature of Complaint	2006	2007	2008
Bridges	4	5	24
Footpaths	245	233	227
Bitumen Surface	246	171	249
Causeways	17	4	35
Concrete Surface	2	7	5
Construction Work	29	26	33
Flood & Storm Damage	7	7	188
Gravel Surface	181	112	134
Illegal Dumping	35	25	16
Roadside Drainage	348	287	406
Roadside Furniture	55	75	56
Roadside Rubbish Removal	158	159	227
Roadside Slashing	116	209	177
Sign Maintenance	6	9	9
Roadside Trees	163	233	221
Vandalism Furniture	20	17	25
New Signage	133	115	103
Street Lighting	12	8	6

Table 2- Customer Requests Data Analysis

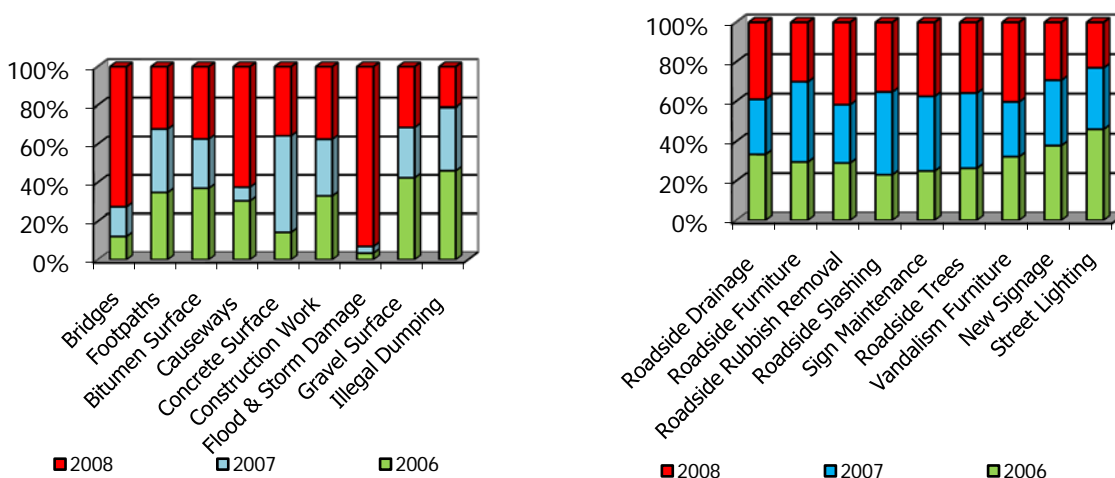


Diagram 2 - Trends in Customer Complaints – 2006 to 2008

The above graphs indicate that there has been a steady requirement and in some cases, an increase in the amount of requests / complaints received from residents with respect to Council's transportation assets between the years 2006 to 2008.

This does not mean Council's service levels have dropped. The constant requests and for some services, changes in numbers of annual request are an indication of increasing resident needs, i.e. changes in the level of service expected by the residents or as a result of natural disaster events.

3.8 How will Council Identify and/or Measure the Continuous Improvement of its Services?

The internal review process is intended to gain corporate ownership of service level standards. The process employed (each step) is described below and for all TAMP reviews, this same process is applied.

1. Draft service levels are developed in consultation with key maintenance and capital staff.
2. The draft levels, along-with associated data and parameters is then presented to the internal executive committee for feed-back and comments. Revisions are made where appropriate, with reasons for revisions clearly documented.
3. The Revised frameworks are then presented to Councillors and Executive Team for draft approval. Valid suggestions are incorporated and further revisions made where necessary and reasons for revisions are documented.
4. Once Council approves the service levels/resource levels, these will be deemed as draft adopted levels and presented to Community, via this TAMP.
5. Community feedback will be constructively utilised to refine service/resource levels and the adopted service levels will be locked in. Adopted service levels will take into account total funding available and the skills and resource base of Council.
6. The frameworks will be reviewed at-least once every four years or at more regular intervals if required for any other compelling reason.

3.9 Desired Levels of Service

Indications of desired levels of service are obtained by Council from a variety of various sources including feedback from Councillors, Community Satisfaction Surveys, residents' feedback to Councillors and staff, service requests and correspondence.

Given the outcomes of the internal and external review with respect to Council's Transportation asset services, the standards of maintenance detailed in this TAMP are considered reasonable and meet community expectations.

In the preparation of the Community Strategic Plan, extensive community consultation was undertaken. The consultations with the community identified the importance of considering sustainability in our decision-making. In terms of asset management, this translates to the following key principles:

- Making informed decisions with a long-term view – aiming to balance current community needs and expectations with the future needs of our community.
- Integrating social, economic and environmental criteria in the management and assessment of our assets – aiming for a more holistic, systems based approach.

3.10 Transportation Service Delivery

The provision of Transportation services to the Tweed Shire is the responsibility of the Director Engineering and Operations, who is responsible for the management of the Engineering and Operations Department. The role of the Engineering and Operations Department, amongst other roles is as follows:

- Planning Applications for Works Projects
- Surveying
- Manage Design Consultants
- Project Management
- Infrastructure Planning
- Developer Contribution Plans
- Traffic, Parking Management
- Floodplain Management & Mitigation
- Street Lighting
- Contract & Tender Administration, Supervision & Claims
- Tender & Contract Documentation
- Contract Policy & Procedures
- Road, Bridge, Cycleway & Footpath Network
- Construction & Maintenance Works
- Works Depots, Store & Mechanical Workshop
- RTA Grants & Works

The following organisational chart identifies the roles and the reporting structure of the Engineering and Operations Department.

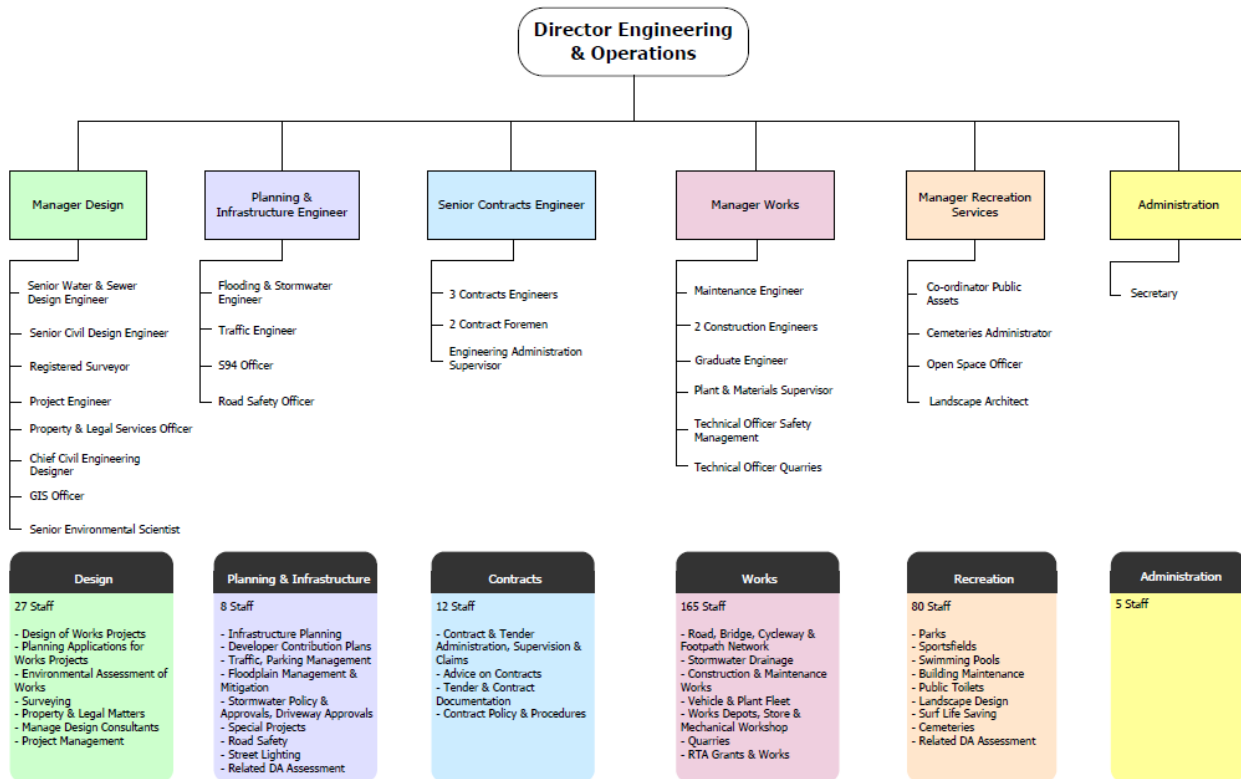


Diagram 3 - The Tweed Transportation Organisational Structure

It is considered that the above structure is adequate at present in terms of being able to effectively provide the services to the community. However, this may be reassessed in the near future in terms of number of staff who undertake inspections and testing. Should these resources be required, it may not necessarily involve the employment of additional staff, but could involve the shifting of resources from one area to another after a further detailed assessment is undertaken.

4.0 Demand Management

Council's fundamental role is to provide services to the community and its Transportation assets are a means to support this. Consequently, future demand for Transportation assets are tied to the demand for Council's services and this is a more complex consideration than population growth.

Issues such as changing demands for particular services, changing mixes in the balance between public and private service provisions and changing community expectations of service levels, all affect the need for Transportation assets.

Transportation asset management plans are critically driven by the needs of the services to be delivered and therefore meaningful Transportation asset strategies cannot be developed in isolation or in absence of comprehensive service strategies. Maintaining Council's Transportation assets without adequate regard for service needs may result in a well-maintained portfolio of Transportation but it may also result in an asset portfolio which does not meet the needs of staff who provide services to the community.

The following sub-sections discussing forecasted demographic trends and documented service strategies will assist The Tweed Shire in understanding the Transportation asset portfolio needs across the municipality.

4.1 Understanding Demand and Growth in the Tweed Region

Statistical information from Australian Bureau of Statistics in March 2008 confirms that The Tweed is experiencing and will continue to experience growth.

Tweed Shire is home to an estimated 82,955 people (Australian Bureau of Statistics (ABS) 2006), this is an increase of 10.34% from the 74,590 residents which were living in Tweed in 2001.

4.1.1 Council's Future Population Change?

The following table illustrates that substantial population increase is expected to occur in the Tweed LGA up to 2031. This is in line with recent population trends in the Shire which has seen it grow at an average annual rate of 2.1%, compared to the NSW average of 0.7%. Tweed Heads continues to grow at the fastest rate of all the Shire's planning districts.

The total population is projected to grow from a 2001 base of 74,590 people past the 2006 figure of 82,955 to 90,870 by 2011. This growth is not expected to occur evenly across the age groups, with relatively little growth anticipated in the younger age groups, especially those under 15 years of age.

This projected population profile reflects the socio-demographic changes which have resulted in middle to older age groups undertaking a sea change. This movement to the Shire up and out from the rest of NSW, as well as the movement of people down from South East Queensland, along with improved access to the Shire facilitated by upgrading of the Pacific Highway, is expected to result in the continuation of the rapid growth rate over the next two decades.

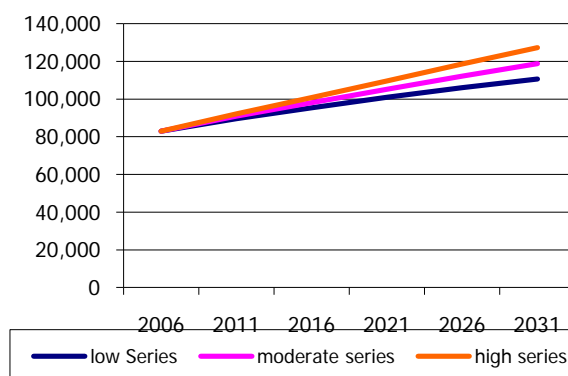


Diagram 4 – Tweed Projected Population Figures

4.2 Current Transportation Asset Utilisation

In the context of this TAMP, it is assumed that all existing Transportation assets are being utilised at their optimal level.

Further analysis regarding asset utilisation may be considered in future revisions of this TAMP.

4.3 Current Issues Influencing Service Demand

In the absence of comprehensive service strategies, population trends can be used as a guide to ascertain future demand.

Age Group	Population 2001	Forecast Population 2031	Forecast Population Change
Whole population	74,590	133,390	44%
0 to 14 Years	14,630	30,220	52%
15 to 29 Years	10,900	13,060	17%
30 to 49 Years	19,740	24,420	19%
50 to 64 Years	13,330	23,760	44%
64 Years +	15,990	41,930	62%

Projected Population Changes for Tweed: Source New South Wales Statistical Local Area Projections Report 2005

In terms of overall population and demand for infrastructure based on the need to service the continuous demand for new and additional housing, will play a role in future infrastructure demand.

The projection population changes indicate that there will be a population increase which will in turn seek to live in areas that have been urbanised and in existing Greenfield sites.

In addition, the rapid increase in urban and commercial traffic on previously classified rural roads is causing an accelerated deterioration in some cases; particularly in some parts of Council. This will result in higher demands for maintenance funds and for renewal and/or upgrade.

The changes in population demographics, such as the increase in older residents require Council to ensure adequate footpaths are provided in those areas, whilst an increase in younger residents who have settled in Salt and Casuarina will require access to cycleways.

Matching the availability of Council assets to community demand is a cyclic process as demonstrated in the following diagram.

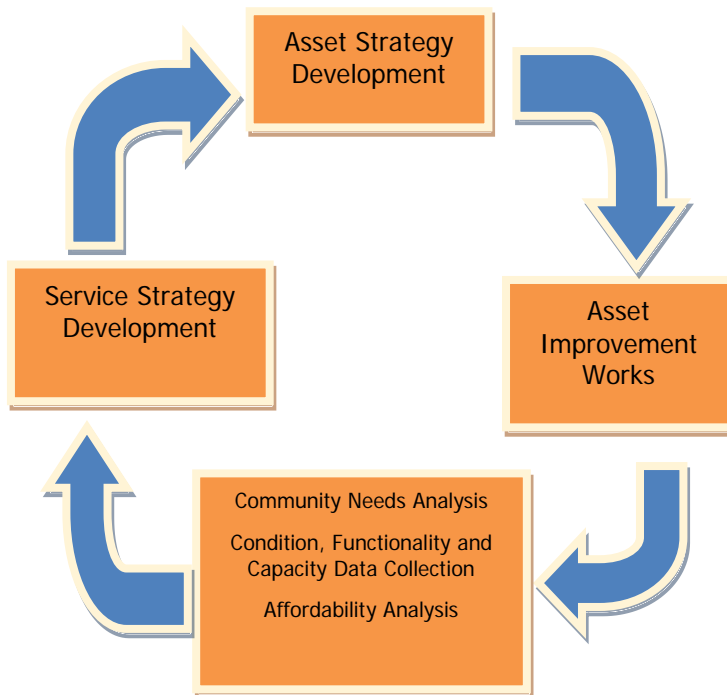


Diagram 5 – Tweed Strategy Development Cycle to Match Assets to Future Demand

The best entry point to the cycle is through the assessment of community wants and needs, condition, functionality and capacity assessment of Council's current Building portfolio and forward projections of Council's financial capacity.

This framework enables the preparation of forward-looking service strategies that compare forecast demands to current capacities. Gap analyses lead into asset strategies that in turn inform Capital Works Programs of asset renewal, upgrade and improvement works.

This process in conjunction with Council's demand management plan will seek to address any service demand issues which will arise in future.

4.4 Changes in Technology

Council is continuously monitoring new asset treatments that may be available to increase the life of its assets.

As previously identified, Council is not the only organisation to have assets within the road reservation. The works carried out by the service authorities has a major effect on Council's road and footpath pavements as the saw cutting and digging of trenches, weakens the base layer.

Even though the trench is reinstated, the integrity and soundness of the pavement layer is never the same and susceptible to failure.

To ensure the integrity of the road and footpath assets, Council requests that all service authorities when appropriate use trenchless methods when renewing or upgrading their assets underground.

In time, Council will explore various other methods of reinstatement and renewal works such as:

- Incorporating the use of recycled materials in specifications and designs; and

- Applying new techniques to strengthen and increase the life of pavement materials.

4.5 Demand Management Plan

Clearly Tweed's demand of road asset use is going to increase proportionally with the predicted population growth and predicted demographic changes.

Council has already identified footpaths and out of date pavement design standards as a critical issues from a risk perspective, given that the proportion of population is bound to increase significantly. This fact has been taken into account in the financial planning.

At this stage Council does not have a formal demand management Plan, as more data on demographics needs to be collected to review the impacts and pressures of population growth on these road assets.

However, the key drivers that have been recognised in the preparation of this TAMP with respect to Transportation asset capacity and maintenance are as follows.

For capacity, the demand drivers include:

- rapid population growth;
- peak tourism requirements; and
- increased legal load limits.

For capital and maintenance works, the demand drivers include:

- rapid asset growth;
- increased age of these assets;
- increased community expectation of accountability of asset maintenance;
- increased community expectation of, for example, quality of road network;
- improved surfacing - gravelled to seal or asphalt;
- inclusion of both on-road bikeways and off-road pathways;
- remaining useful life of existing infrastructure;
- early failure of some donated assets; and
- increased costs associated with working in more congested traffic and as a result of supply / purchase of materials and labour.

In conjunction with implementing and utilising the risk analysis matrices for prioritising renewal and maintenance works, The Tweed will also consider non-asset/alternative asset solutions as an appropriate method of managing demand.

Some examples are:

- Use of appropriate signage wherever practical, to make safe critical intersections or alignments instead of complete re-design and reconstruction;
- Improvement/widening of existing arterial roads and collector roads instead of introducing new roads.

4.6 New Assets from Growth

Since 2000, 74 kilometres of roads, 37 kilometres footpaths and 148 kilometres of kerbs (mainly from the Casuarina, Salt, Seabreeze and Koala Beach areas), have been added to Council's Transportation asset portfolio.

There have been no bridges or major culverts handed over to the Shire during this time.

These Transportation assets are considered to have increased the replacement cost of the Transportation asset portfolio in the vicinity of \$31 million. That equates to an increase of \$3.4 million per annum.

Existing and proposed developments in Depot Road, Kings Forest, Cobaki Lakes, Seaside City, Black Rocks, Terranora Village, Hundred Hills, Sovereign Heights, Fraser Drive and Rivervue A (Barnby Street) will continue to contribute to Council's Transportation asset portfolio.

It is estimated that the additional values of these assets will increase Council's Transportation asset portfolio stock from \$326.5 million to \$343.5 million¹⁷.

These new assets will require additional maintenance and operational funds in the order of \$340,000 per annum.

¹⁷ Using the past yearly average of \$3.4 million and multiplying it by 5 years as this is considered to be the duration of these developments.

5.0 Lifecycle Management Plan

Life Cycle Management is recognised by The Tweed as an essential component of this TAMP. This section of the TAMP will provide details of Tweed’s data and the processes required to effectively manage, maintain, renew and upgrade Council’s Transportation network. It also documents the analysis that Tweed undertakes regularly to predict and monitor expected future expenditure required to effectively manage Council’s Transportation network.

To undertake lifecycle asset management, means considering all management options and strategies as part of the asset lifecycle, from planning to disposal. The objective of managing the assets in this manner is to look at long-term cost impacts (or savings) when making asset management decisions.

The diagram below provides a graphical representation of the asset lifecycle including each of the stages an asset passes through during its life.



Diagram 6 – Asset Lifecycle Diagram

5.1 Transportation Asset Stock

The following table provides a summary of Tweed’s Transportation asset stock.

Transportation Asset Type	Quantity	Length (km)
Sealed Roads	-	1,058
Unsealed Roads	-	173
Kerbs	-	739
Footpaths	-	194
Carparks	-	7
Road Bridges	280	-
Footbridges	66	-
Bus Shelters	157	-

Table 3- Transportation Asset Stock

The following diagram below illustrates that of the 1,231kms of road network maintained by Tweed Council, that the most predominant surface type is spray seal surfaces with 53.1% followed by asphalt road surfaces at 31.5%.

In fact, over 84% of Council’s road network is sealed with only 14% being gravel roads.

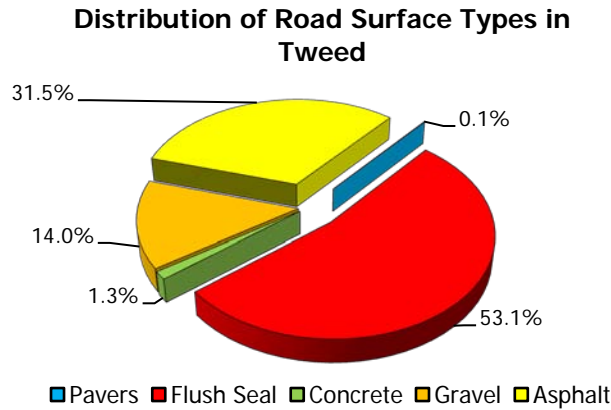


Diagram 7 – Distribution of road surface types

The following diagram below illustrates that of the 346 bridges maintained by Council, that 148 are vehicular road bridges, with 131 major road culverts and 66 footbridges.

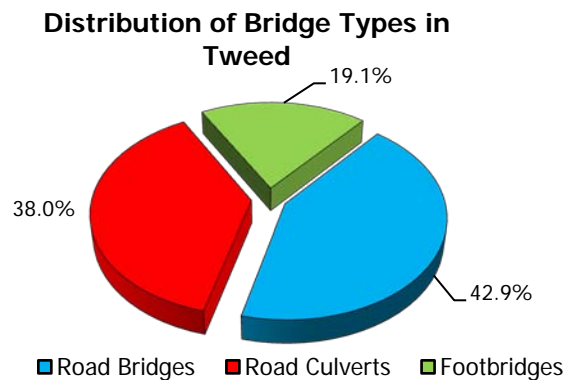


Diagram 8 – Distribution of bridges by type

The following diagram below illustrates that of the 194kms of footpath network maintained by Tweed Council, that the most predominant surface type is concrete surfaces with 69.8%.

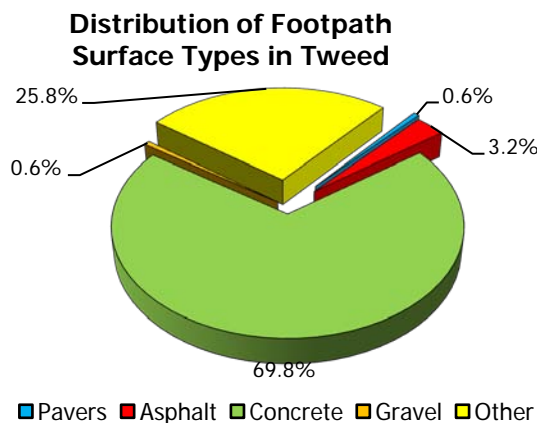


Diagram 9 – Distribution of footpath surface types

5.2 Road Information Management

All information pertaining to location, type, dimensions, materials, known constructed dates and condition of these Transportation assets are recorded and stored in Council's Asset Register which is Assetic's myData. It is estimated that Council's Asset Register is 98% up to date.

5.3 How Council Measures its Transportation Assets Network Condition

Tweed Council has a documented "Road Rating Manual" which is available for viewing at Council's Offices.

The condition of road assets is measured as follows:

Pavements and Road Wearing Surface

- Measuring the severity and extent of crocodile cracking.
- Measuring the severity and extent of linear cracking.
- Measuring the extent and severity of pavement defects (such as rutting, corrugations and depressions).
- Measuring the extent of local and surface texture defects (such as potholes, flushing, bleeding and stripping).
- Measuring the extent of oxidisation on spray seal road surfaces and ravelling on asphalt road surfaces.

Concrete Roads

- Measuring the severities and extents of stepping, disintegration and spalling.
- Measuring the severities and extents of cracking.
- Measuring the severity of joint sealant.

Unsealed Roads

- Measuring the extent of gravel depth.
- Measuring the severities and extents of rutting, scouring, corrugations and potholes.

Kerb and Gutter

- Measuring the severities and extents of alignment, distortion, cracking, shape loss, structural failures, roll backs and channel deficiencies.

Footpaths

- Measuring the severities and extents of, cracking, trip, breakage and tree root defects.

Bridges

- Measuring the defects as per the Queensland Main Road Bridge Inspection Manual, which has been adopted by Council as it's condition rating standard.

5.4 What is the Useful Lives of Council's Transportation Assets?

The following table below describes the useful life/expected lives that Council has adopted for each Transportation asset included in this TAMP.

Asset	Asset Type	Useful Life (Years)
Road Surface	Asphalt	25
Road Surface	Spray Seal	16
Road	Concrete	50
Road	Pavers	50
Road Surface	Gravel	10
Road Pavement	Pavements	40
Kerb	All types	50
Footpaths	All types	50
Bridges	Vehicular	100
Bridges	Foot	30
Road Ancillary	All types	20

Table 4- Transportation Asset Useful Lives

5.5 Transportation Issues in Tweed

Council is continually improving the manner in which it manages its assets. Council has identified the following issues with regards to the provision of roads;

- The maintenance crews are finding many defects within the road network during times of wet weather. These instances create additional workloads for Council's work crews and in some cases the times required to respond to these defects are often exceeded.

5.6 Asset Valuations

Tweed Council's accepted practice of asset valuations is based on the 'fair-value' method covering replacement cost, useful life and depreciation of Council's assets, in conformity with the Australian Accounting Standards Board. Under accounting guidelines, all Transportation assets at Tweed Council are valued on the basis of 'replacement cost of the asset's future economic benefits'.

It is important to note that Council is required to complete a revaluation of its roads and drainage assets as at the 30 June 2010.

5.6.1 Valuation Summary Based on Replacement Costs

The following table documents the Transportation assets financial values as at 30 June 2010¹⁸.

Asset	Current Replacement Value	Accumulated Depreciation	Current Written Down Value
Roads, Bridges & Footpaths	\$648,119,000	\$116,352,000	\$531,767,000
Bulk Earthworks (Formation)	\$118,162,000	\$0	\$118,162,000
Total	\$766,281,000	\$116,352,000	\$649,929,000

Table 5- 2009 Transportation Financial Values

As at 30 June 2010, the Annual Depreciation (annual asset consumption) for Transportation assets was calculated at \$8.75 million.

5.7 Maintenance Inspections of Road Assets

The frequency of proactive and reactive maintenance inspections is undertaken as per the frequency, documented in Council's maintenance levels of service.

5.8 Network Inspections of Road Assets

Full road condition inspections of the entire road network are undertaken on a three to four year cycle. This also includes assessing the condition of the kerb and channel and footpaths.

Level 1 bridge inspections are undertaken on an annual basis with more detailed inspections via Level 2 inspections, being undertaken dependent upon the outcomes of Level 1 inspections.

5.9 New Transportation Assets - Initial Design and Construction

The creation and construction of new road assets involves two distinct processes - first design and then the construction.

Council sets design standards for assets such as road pavement and kerbs in these developments, so that the proposed assets take into account site features and the level of use of the asset.

All new roads infrastructure required for new developments are built by the developers and their contractors, in accordance with Council's design standards and the Tweed Development Control Plan Section A5 and approved by Council. Council staff supervises the works to ensure compliance to Council's specifications.

When the works are completed the developer hands these assets over to Council for ownership and maintenance for the remainder of their useful life. However, a defect liability period of 6 months is applicable to all assets created by the developer.

¹⁸ Tweed Shire Council Financial Statements 2010

5.10 Routine Maintenance

Over time, minor faults can occur within the Transportation network. Council addresses the repairs and maintenance of these faults on the basis of defined intervention levels and response times.

The intervention level defines the condition, state or risk level associated with an asset component, i.e. the point in time at which the asset is considered to be below an acceptable level of service. Maintenance is scheduled as soon as the asset reaches this point.

Response time defines a reasonable time frame within which the residents can expect Council to remedy the defect. The intervention levels and response times are contained in Council's maintenance levels of service documents, (available for inspection at Council's offices or download from Council's public website).

5.11 Renewal and Upgrade Works

The cost to undertake the following treatments, vary from year to year and depend on the quantity of works undertaken. However, typical average unit rates applicable to these treatments are contained in Council's asset management system and/or financial system.

Treatment Type	Unit Rate / m2
Surfacing - Varies on the surface treatment type	\$3.00 - \$22.00
Rehabilitation - Varies on the treatment type	\$30.00 - \$35.00
Reconstruction Urban Pavement Only	\$51.15
Reconstruction Rural Pavement Only	\$35.75
Concrete Panel Replacement	\$120.00
Gravel Resheeting	\$5.50
Gravel Grading	\$0.50
Footpaths	\$80.00
Kerb	\$55.00
Bridges	Varies on type of works required

Pavement Reconstruction Treatment

The most extensive form of road rehabilitation involves the reconstruction of all or the vast majority of the road related assets. Typically this would involve the replacement of the kerb and channel, road pavement, road surface and possibly the footpath.

Occasionally, some of the road pavement can be retained allowing the costs to be reduced whilst gaining the benefits of a full reconstruction. This is more likely to be the case where the road requiring replacement has not suffered extensive failures or has not required lowering as a result of excessive crossfall.

The full reconstruction of a road consists of the replacement of road pavement and road surface along with the replacement of the kerb and channel. Often the footpath is also replaced because of level changes (particularly full width footpaths), however, it is a distinct asset group that has less impact on the integrity of the road than the kerb and channel, and given the function each serves.

Full reconstruction is usually applied where the road suffers from pavement deformation/shape loss which usually equates to a Pavement Condition Index (PCI) score of 4 or 5 out of 5 and/or the sub-base has insufficient pavement depth and/or the road segment has poor kerb and channel.

This treatment is typically considered as a last option and used in cases where all other treatments are not viable. However, this treatment is also utilised in cases where the road may require widening or realignment or adjustment of levels.

Generally, the reconstruction will result in the extension of the life of the road equivalent to that of a brand new road.

Pavement Rehabilitation Treatment

In some situations the reconstruction of a road may not involve the replacement of the entire road pavement or road surface. This is particularly the case where the distress does not involve a road pavement that has extensively failed or one that displays signs of nearing the end of its life. Typically, this might occur in residential streets that carry low volumes of heavy vehicles and the deterioration of the road pavement and road surface is very slow.

Pavement rehabilitation is usually applied where the road suffers from pavement deformation/shape loss and crocodile cracking is predominately present.

It is important, where roads are considered for rehabilitation, that all of the options are compared in terms of their costs and benefits over time. Increasingly, this includes specific pavement testing to better predict the remaining life of the asset.

Ideally, the solution with the best 'cost benefit' is selected, although the opportunity to do this is always subject to the available funding.

Road Resurfacing Treatments

The selection of a resurfacing treatment for a road where the surface has worn out and the road pavement is in otherwise good condition is not always relatively straightforward.

The following summaries of broad groupings of treatments are the key ones used in Tweed.

- **Sprayed C170 Bituminous Reseal** – Typically a 7mm, 10mm or 14mm Sprayed Seal on an existing sprayed seal. Generally used in Rural areas.

This treatment is typically driven by the age of the existing surface and/or surface texture defects. The pavement must be in sound condition.

This treatment is not viable when the segment has a high pavement defect or crocodile cracking defects present or in situations where the existing segment has an asphalt surface (typically in Urban areas commonly).

- **Sprayed PMB Bituminous Reseal** – Typically a 10mm or 14mm Poly Modified Binder (PMB) and/or Fibredec seal. This treatment can be applied in any area.

This treatment is typically used because of extensive environmental cracking (to limit the extent of reflective cracking coming through the seal).

This treatment is not viable when the segment when the segment has a high pavement defects or crocodile cracking defects are present.

- **20mm AC Overlay** – This is a fine gap graded 7mm nominal stone/mix. Typically use a C320 binder. Used generally in urban areas only or where roundabouts are present. This treatment is typically used because of extensive environmental cracking (to limit the extent of reflective cracking coming through the seal).

Typically age (i.e. ravelling) is used as a driving factor and/or local surface defects. This is a more expensive treatment and offers a smoother surface for high and residential

traffic and lowers noise in urban areas and stops the sheer distresses from parked vehicles.

This treatment is not used when the segment has a high pavement or crocodile cracking defects present or on roads in rural areas.

- **AC Rejuvenation** – An emulsion based product used to raise the maltene oil levels in the asphalt. Keeps the asphalt flexible.

Used only on low trafficked residential asphalt roads, where no defects are present.

This treatment is not suitable on high trafficked roads and where there are any types of defects present. It is also not used on roads with steep grades.

Generally Council aims to get 2 rejuvenation treatments prior to undertaking an asphalt overlay. By doing so, this can extend the asphalt overlay treatment time.

- **Sprayed PMB with Heavy Patching** – Typically a 10mm or 14mm PMB and/or Fibredec seal, with preparatory patching. This treatment can be applied in any area.

It is used because of extensive environmental cracking (to limit the extent of reflective cracking coming through). Also there will be some minor pavement defects that are present on the segment.

This treatment is not viable when the segment has a high pavement defect or crocodile cracking defect presence.

- **20mm AC Overlay with Heavy Patching** – Fine gap graded 7mm nominal stone/mix, with preparatory patching. Typically use a C320 binder. Used generally in urban areas only or where roundabouts are present.

Typically age (ravelling) used as driving factor and/or local surface defects. There are also minor pavement or crocodile defects that are present. This is a more expensive treatment and offers a smoother surface for high and residential traffic and lowers noise in urban areas and stops the sheer distresses from parked vehicles.

This treatment is not viable when the segment when the segment has a high pavement defect or crocodile cracking defect presence. It is also not used on rural roads.

- **30mm Mill & Overlay** – A dense graded 10mm nominal stone/mix, where the existing asphalt surface is removed and replaced. Typically use a C320 binder to provide strength and durability. This treatment is used generally in urban areas only or where roundabouts are present.

Typically this treatment is effective where extensive defects are present in terms of local surface defects. This treatment will also rectify very minor pavement defects or crocodile cracking defects. However, it should be noted that this is a more expensive treatment.

When the segment has a high pavement defect or crocodile cracking defect presence, this treatment is not as effective.

- **Rip & Reseal** – Treatment involves ripping the existing sprayed seal surface and tye into the pavement. After this process, a new sprayed seal surface is applied where the old surface used to be.

This treatment is used because of local surface defects and if a straight spray seal is applied directly on top of the old one, it will create a rough ride. Hence this treatment is used mainly on high speed distributor roads.

This treatment is not used on rural residential access roads. This treatment is therefore an effective treatment undertaken to reduce roughness and allow for a smooth ride.

- **Granular Overlay** – This treatment is used where there are extensive pavement failures and/or insufficient cover to subgrade. Typically a bituminous seal will not rectify the current defects and hence this more expensive treatment option is required.

This treatment is not used where there are insufficient batter widths or the treatment will result in a reduced lane width that is not acceptable to current traffic volumes. Also where there are level limitations in the form of kerb and gutter.

Concrete Road Treatments

- **In situ Stabilisation** – A two pass operation that involves the addition of chemical add mixtures to the surface, which is then pulvi mixed with the underlying pavement (typically up to 200mm in depth). Pavement is then compacted with a final seal applied over this new underlying pavement.

This treatment is considered to be effective where there are pavement failures and/or insufficient cover to subgrade and where a bituminous seal will not rectify the current defects.

If there are services are located within limits of the pavement, this treatment is not effective as the pavement cannot be worked upon without interfering with these services.

A for the final seal on top, typically the rule of thumb is to use a sprayed seal in rural areas and asphalt seal in urban areas.

- **Joint Sealant** – Treatment used on concrete roads. Replacement of deteriorated joint sealant material on concrete roads.

This treatment is employed where the existing joint sealant has deteriorated and therefore will allow water to ingress into the pavement.

When other concrete defects are present and another treatment will be required which will override this treatment.

- **Cross Stitching** – Treatment is used on concrete roads. This treatment requires the drilling and installation of dowels with an epoxy to arrest the linear cracking from progressing further.

It should be noted that when other concrete defects are present, another treatment will be required which will override this treatment.

- **Panel Replacement** – This treatment is employed on concrete roads. It requires the removal and replacement of defective concrete bays with new concrete bays.

This treatment is employed in cases where there are extensive defects present such as disintegration, stepping, cracking and spalling.

Unsealed Road Treatments

- **Gravel Resheeting** – This treatment is used on unsealed roadways. It requires the addition of imported granular material to the road with the road then being graded and compacted.

This treatment is employed to replace the basecourse material which has disappeared over time due to environmental and traffic conditions.

- **Gravel Grading** – This treatment is used on unsealed roadways. This treatment corrects the wearing surface of the road by grading and compacting the existing material only. Very minimal additional material is required to be imported.

This treatment is not effective when insufficient gravel depth is present.

Footpath Treatments

- **Footpath Replacement** – This treatment is employed on concrete, asphalt and paved footpaths. It requires the removal of defective footpath areas and replacement with a new surface material. Typically the existing surface material will decide on the new surface material.

This treatment is employed in cases where there are extensive defects present such as stepping, cracking, unevenness and spalling.

Kerb and Gutter Treatments

- **Kerb and Gutter Replacement** – This treatment requires the removal of defective kerb lengths and replacement with new kerb and channel. This treatment is employed in cases where there are extensive defects present such as stepping, cracking, rotation, depressions and ponding. In some cases, this treatment is undertaken in conjunction with a road rehabilitation or reconstruction.

Bridge Treatments

- **Bridge Renewal** – This treatment can comprise of a number of treatments ranging from replacement of the bridge surface or abutments through to the renewal of the bridge balustrades. For detailed bridge works, the treatment is always reflective of the condition distress and the application of the treatment is always undertaken in line with the Department of Main Roads 'Timber Bridge Maintenance Manual'.

This Manual covers maintenance activities applicable to the various components of bridges which have been constructed either fully or partially using timber materials. Unless specifically associated with timber bridges, components in steel and concrete will be covered in the appropriate parts of the Bridge Maintenance Manual.

5.12 Disposal Plan

Disposal is any activity associated with removing an asset from 'service' through decommissioning, including sale, demolition or relocation. Tweed Council has not identified any Transportation assets within its network that are excess to requirements or not required for possible decommissioning and disposal at this stage. However, this is a continuous process which will be reviewed on an as required basis.

5.13 Risk Management Plan

It is important to note that any approach that an organisation takes with respect to the management and maintenance of its assets involves the acceptance of an inbuilt level of risk. This risk arises from the potential for events or failures to occur, and will vary depending on the capacity, age and state of the asset. Mitigation of risks occurs primarily through the level of initial investment, and putting processes in place to ensure that maintenance and renewals occur in a timely manner.

5.13.1 Risk Management Context

The Tweed acknowledges that risk management is an essential part of best practice asset management. Council considers risk management as the application of formal processes of a range of various and possible factors which can be associated to risk to determine the resultant scenarios of outcomes and their possibility to occur. Council has implemented an Enterprise Risk Management Policy and associated systems.

5.13.2 Evaluation of Risk

In terms of evaluating risk, Tweed has undertaken the following initiatives to mitigate its risk in relation to managing its road network:

Development of a Road Hierarchy and Maintenance Analysis:

Tweed has developed a road hierarchy, giving higher importance to risk assessment and the appropriate levels of inspection and maintenance for each classification. This TAMP has set different maintenance interventions, inspection frequencies and response times for each Transportation asset classification taking into consideration the Risk Management Standards, AS/NZS 4360:2004.

The following tables have been utilised to determine the maintenance response times dependent upon the asset hierarchy and documented in Council's TAMP.

Level	Descriptor	Detailed Description
1	Insignificant	No injuries, very low financial loss
2	Minor	Typically first aid type treatment required, low financial loss
3	Moderate	Medical treatment required, medium financial loss
4	Major	Extensive injuries, major financial loss
5	Catastrophic	Resultant in death, huge financial loss

Qualitative Measures of Consequence – AS/NZS 4360:2004

Level	Descriptor	Detailed Description
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Might occur, some time
D	Unlikely	Could occur, some time
E	Rare	May occur, but only in exceptional circumstances

Qualitative Measures of Likelihood – AS/NZS 4360:2004

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A	H	H	E	E	E
B	M	H	H	E	E
C	L	M	H	E	E
D	L	L	M	H	E
E	L	L	M	H	H

Qualitative Risk Analysis Matrix – AS/NZS 4360:2004

Legend:

- E – extreme risk, immediate action
- H – high risk, attention required
- M – moderate risk, manage responsibly
- L – low risk, manage by routine procedures

Major Condition Assessments:

The Tweed has undertaken condition audits of the entire road network to identify the current condition of the roads at a segment level.

Tweed will use its pavement management system (myPredictor) to develop forward programs based on objective condition based rules.

These project level programs are then prioritised based on a Project Level Risk Prioritisation Matrix. This risk matrix is based on AS/NZS 4360:2004.

Project Level Risk Assessment Criteria

Consequence of not Undertaking the Potential Project	
Criteria	Definition
Catastrophic	Personal loss and/or damage to community or stakeholders. In excess of \$10 million financial impact to Council
Very High	Community and stakeholder outrage. Between \$5 million and \$10 million financial impact
High	Community and stakeholder anger. Between \$0.5 million and \$5 million financial impact
Low	Community and stakeholder concerned. Between \$500 and \$0.5 million financial impact
Negligible	Community and stakeholder unconcerned. Less than \$500 financial impact to Council

Likelihood of occurrence/consequence	
Criteria	Definition
Almost certain	Likely to occur, once every day
Highly likely	Likely to occur, once every week
Likely	Might occur, once every month
Unlikely	Possible but unlikely to occur, once every year
Rare	Highly unlikely, might occur once in 10 years/once in 50 years

Priority Ratings

1. High	Imperative that project be programmed immediately. Cannot wait until next budget period.
2. Medium	Important that action be taken as soon as possible. Response Time rules as per the Performance Standards apply.
3. Low	Action should be taken as soon as practicable. Response Time rules as per Performance Standards apply. Budget may dictate timing.
4. Normal	Action should be taken when possible. May be dealt with after other, more immediate priorities actioned. Evaluation may be made to defer action until other, more immediate priorities are completed. Action may take place whilst undertaking normal working practices & utilising general budget.

Project Level Risk Evaluation Process

Project Risk Rating Matrix					
<i>Consequence</i>					
Catastrophic	L	M	H	H	H
Very High	L	M	M	H	H
High	L	M	M	M	H
Low	N	N	M	M	M
Negligible	N	N	N	L	L
	Rare	Un-likely	Likely	Highly likely	Almost certain
	<i>Likelihood</i>				

High inherent risk (H); Moderate inherent risk (M); Low inherent risk (L), Normal (N)

The Tweed recognises that prioritisation based on the project prioritisation risk matrix is critical in demonstrating reasonable and responsible asset management practices.

Given the outcomes of the internal and external review with respect to Council's Transportation services, the standards detailed in the TAMP are considered reasonable and meet community expectations.

5.14 Life Cycle Costing Plan

5.14.1 How Much Capital Expenditure has been spent on Transportation Assets in the Past?

Capital expenditure refers to works undertaken to address major condition or service capacity issues such as road reconstructions / rehabilitations (considered to be **renewal expenditure** as it returns the life or service potential of the asset to that which it had originally) or widening the width of the road or footpath, so that it can carry increased volumes (considered to be **upgrade expenditure** as it enhances the existing asset to provide a higher level of service).

These treatment works are undertaken to improve the overall condition (capital renewal) or to provide an improved service (capital upgrade) to users of Council's Transportation assets.

The following table below identifies the past Transportation capital renewal and upgrade expenditure and expenditure for the 2007/2008, 2008/2009 and 2009/2010 financial years.

Year	2007-08	2008-09	2009-10
Capital Activity			
Rehabilitation Program - AC resurfacing	\$2,006	\$510,562	\$232,649
Asphalt Resheeting	\$204,851	\$501,736	\$309,733
Bus Route Sealing	\$648,873	\$662,292	\$573,055
Gravel Resheeting of Unsealed Roads	\$343,381	\$668,871	\$666,670
Sealed road resurfacing	\$212,009	\$515,592	\$463,412
Sealed road rehabilitation	\$753,237	\$757,837	\$573,055
Kerb & gutter rehabilitation	\$108,905	\$88,349	\$55,114
Urban Street Reconstruction	\$2,209,000	\$2,373,976	\$1,480,183
Rural Road Reconstruction	\$1,818,031	\$1,565,126	\$962,943
Roads to Recovery Program	\$804,143	\$1,183,693	\$308,538
Black Spot Program	\$871,801	\$1,502,383	\$42,066
Federal Assistance Grants Program	\$2,205,600	\$2,150,000	\$1,587,172
Repair Program	\$575,094	\$532,000	\$792,645

Year	2007-08	2008-09	2009-10
Capital Activity			
Bus Shelters	\$30,321	\$30,000	\$57,570
Footpaths	\$485,698	\$251,251	\$392,684
Total Capital Renewal	\$6,742,532	\$7,795,300	\$5,986,658
Total Capital Upgrade	\$4,530,417	\$5,498,368	\$2,510,831

Table 6- Transportation Past Capital Renewal and Upgrade Expenditure

It is noted that there is almost a 50/50 distribution of annual funds allocated between capital renewal and capital upgrade expenditure. What this indicates is that whilst monies are spent on parts of the Transportation network, in some cases these monies, have not been used to optimally manage the existing network via renewal works, but used to improve the network to cater for increased demands placed on the assets.

5.14.2 How Much Maintenance Expenditure has been spent on Transportation Assets in the Past?

Routine maintenance refers to works undertaken to address minor defects such as potholes or section 'blow outs' or footpath trip points. These treatment works are undertaken to keep Council's Transportation assets in a safe and operational condition, but not necessarily to improve the overall condition of the Transportation assets.

It should be noted that when undertaking the lifecycle modelling, these types of costs are taken into consideration by assuming that, each year; a percentage of these distresses will be repaired as part of Council's routine maintenance. If the Transportation assets are left to deteriorate (i.e. sufficient capital expenditure is not allocated), then the amount of distresses being fixed under routine maintenance will increase and hence the routine maintenance expenditure required will also increase. Equally, if the condition of the Transportation assets improves then the routine maintenance expenditure required will decrease.

In addition, operation costs are costs that are required on a day to day basis to keep the service working. Such operational costs for the Transportation service include wages, chemicals and waste disposal fees.

Tweed's past operational and maintenance expenditure is shown in the following table below:

Year	2007-08	2008-09	2009-10
Operation & Maintenance Activity			
Bridges	\$738,175	\$703,506	\$363,111
Footpaths	\$193,713	\$128,657	\$129,624
Kerbs	\$52,879	\$12,253	\$34,925
Road Ancillary	\$469,832	\$389,366	\$356,979
Road Surface and Pavement	\$2,073,642	\$1,933,718	\$2,147,761
Roadside Maintenance	\$1,415,784	\$1,342,407	\$1,716,863
Total Operations & Maintenance	\$4,944,025	\$4,509,907	\$4,749,262

Table 7- Transportation Past Maintenance Expenditure

5.15 Forecasted Transportation Asset Funding Requirements

The objective of this Section has been to model the deterioration of Tweed’s Transportation network, by developing a simulation model using the **myPredictor** modelling software.

This process typically involves setting up life cycle paths for each Transportation condition, identifying the current treatments and unit rates to deliver these treatments and setting up treatment decision matrices (matrices based on selected condition criteria that when matching will drive a treatment based on the condition).

By utilising the above this process and setting up the criteria and logic within the **myPredictor** modelling software, it is typically possible to model the future costs of Council’s Transportation asset renewal requirements and also to predict the future condition of Council’s Transportation assets based on the current expenditure.

5.15.1 Asset Data Confidence Levels

This TAMP is based upon the best available information that was available at the time the plan was written. The following Table below summarises the confidence levels of information contained in this TAMP.

Asset Category	Confidence Rating				
	Quantity	Condition	Age	Performance	Overall
Roads – Sealed	A	A	C	B	B+
Roads - Unsealed	A	C	C	C	C
Footpaths	A	A	C	B	B+
Kerbs	A	A	C	B	B+
Bridges	A	A	C	B	B+
Road Ancillary	D	D	D	C	D

Table 8 – Transportation Data Confidence Rating

Confidence Grade	General Meaning
A	Highly Reliable < 2% uncertainty Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment
B	Reliable ± 2-10% uncertainty Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings’ for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.

Confidence Grade	General Meaning
C	<p>Reasonably Reliable ± 10 – 25 % uncertainty</p> <p>Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings' for example the data is old or incomplete, some documentation is missing and reliance is placed on unconfirmed reports or significant extrapolation.</p>
D	<p>Uncertain ± 25 –50% uncertainty</p> <p>Data based on uncertain records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited TAMP for which grade A or B data is available.</p>
E	<p>Very Uncertain > 50% uncertainty</p> <p>Data based on unconfirmed verbal reports and/or cursory inspection and analysis</p>

Table 9 – Transportation Data Confidence Grade

Note that uncertainty is cumulative. Therefore the uncertainty limits in financial forecasts will be the sum of the inaccuracies of the data and quality of assumptions that is used to produce it.

5.15.2 Snapshot of Council’s Road Network Condition - Current Levels of Service

The following tables below provides details of Council’s adopted condition rating scales and community assessment scales for road pavements, road wearing surfaces, unsealed gravel roads and footpaths.

Pavement Condition Index	Community Rating
1	Brand new or Excellent
2	Good
3	Fair
4	Poor
5	Very Poor

Table 10 - Pavement Condition Definitions

Surface Condition Index	Community Rating
1	Brand new or Excellent
2	Good
3	Fair
4	Poor
5	Very Poor

Table 11 - Road Wearing Surface Condition Definitions

Unsealed Condition Index	Community Rating
1	Brand new or Excellent
2	Good
3	Fair
4	Poor
5	Very Poor

Table 12 - Unsealed Road Condition Definitions

Footpath Condition Index	Community Rating
1	Brand new or Excellent
2	Good
3	Fair
4	Poor
5	Very Poor

Table 13 - Footpath Condition Definitions

For this first generation Asset Management Plan, the above rating scales have been determined utilising a single or combination of condition distress criteria to determine a single overall score that can effectively represent the condition of the road pavement and road wearing surface.

**Sealed
Pavement**

Pavement Defects / Rutting	PCI
1	1
2	2
3	3
4	4
5	5

Example

5	5
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Table 14- Sealed Pavement Condition Weightings

In this example, the overall Pavement Condition Index (PCI) would be rounded up to a score of 5 out of 5.

Sealed Surface	Local Surface Defects	SCI
	1	1
	2	2
	3	3
	4	4
	5	5

Example	3	3
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Table 15- Road Wearing Surface Condition Weightings

In this example, the overall Surface Condition Index (SCI) would be rounded down to a score of 3 out of 5.

Unsealed Roads

Deformation	UCI
1	1
2	2
3	3
4	4
5	5

Footpaths

Footpath Defects	FCI
1	1
2	2
3	3
4	4
5	5

Example	2	2
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Example	4	4
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Table 16- Unsealed Roads and Footpaths Condition Weightings

In these examples above, the overall Condition Index will have a one to one relationship.

The following graphs illustrates Tweed’s Transportation Network Condition based on Council’s condition data collected in 2010, taking into account the above condition rating scales. The graph shows the percentage of Council’s network in each category of community condition scale.

2010 Snapshot of Road Network

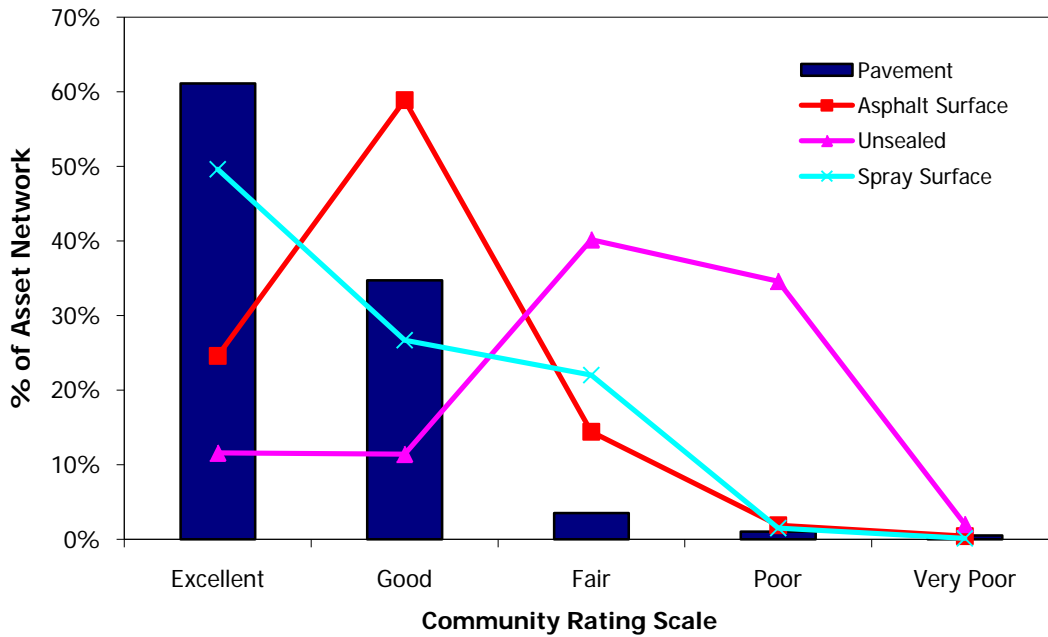


Diagram 10 – 2010 Snapshot of Condition of Road Network

2010 Snapshot of Transportation Network

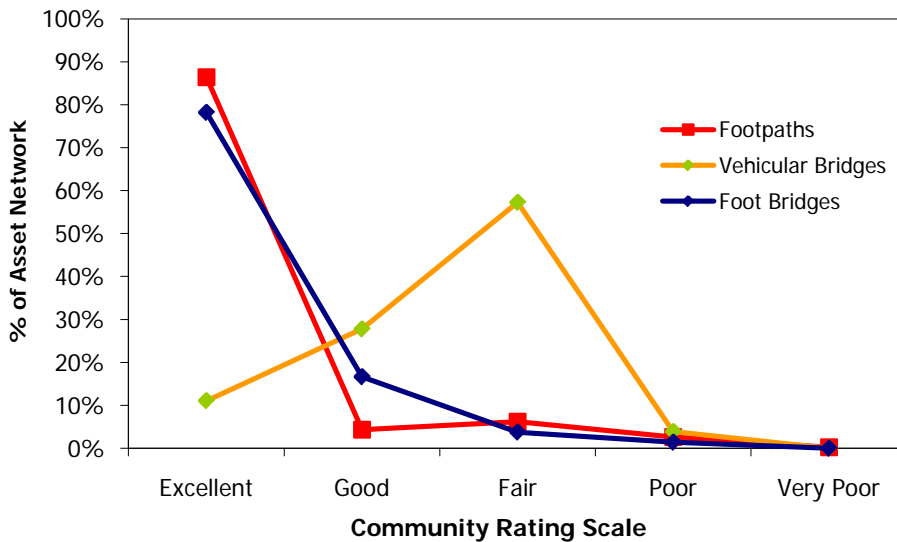


Diagram 11 – 2010 Snapshot of Condition of Transportation Network

At present, the current hypothetical cost of recouping the back-log (being any asset that represents poor or very poor condition) ie. by immediate capital renewal is **\$37.8 million** (Refer to the table below). It should be noted that this current condition data has been based on data that was collected in 2010.

Area of Asset In Poor or Very Poor Condition	Average Unit Rate of Renewal per	Total Current Cost of repairing Transportation network considered to be in poor and very poor condition
Urban Pavement equates to 175,080m ²	\$81.25	\$14,225,000
Rural Pavement equates to 374,419m ²	\$43.75	\$16,380,000
Asphalt Surface equates to 62,784m ²	\$14.00	\$878,900
Spray Seal Surface equates to 81,683m ²	\$8.67	\$708,200
Unsealed equates to 307,526m ²	\$5.50	\$1,691,400
Footpaths equates to 7,684m ²	\$80.00	\$614,723
Bridges equates to 6 structures – 766m ²	\$5,518.00	\$3,270,731

Table 17- Transportation Funding Backlog

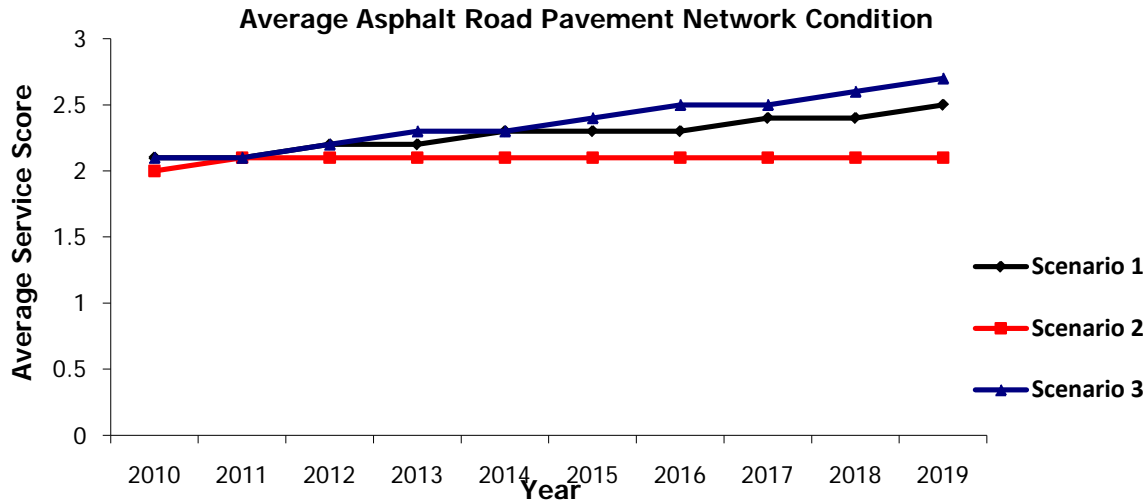
If undertaken over a period of 10 years, the annualised backlog figure is \$3.78 million per annum.

5.15.3 Financial Scenarios

The diagrams below illustrate the predicted Tweed sealed road pavement and road surface average condition scores for the various levels of expenditure projected into the future.

Scenario 1 recognises that \$6,262,000 will be allocated annually, whilst scenario 2 recognises that \$11,200,000 will be allocated annually and scenario 3 recognises that \$4,500,000 will be allocated annually. Scenario 1 is the current annual funding allocation by Council, while Scenario 2 has been identified as the optimal expenditure and Scenario 3 allocates a 30% of the current funding.

The condition assessment for road wearing surfaces and pavements is based on condition score ranges from 1 to 5 with 5 being the worst. The average network condition score as at 2010, for spray sealed road wearing surfaces and pavements is considered to be at a score of **1.5 and 2** out of **5** respectively and for asphalt road wearing surfaces and pavements is considered to be at a score of **2** out of **5**.

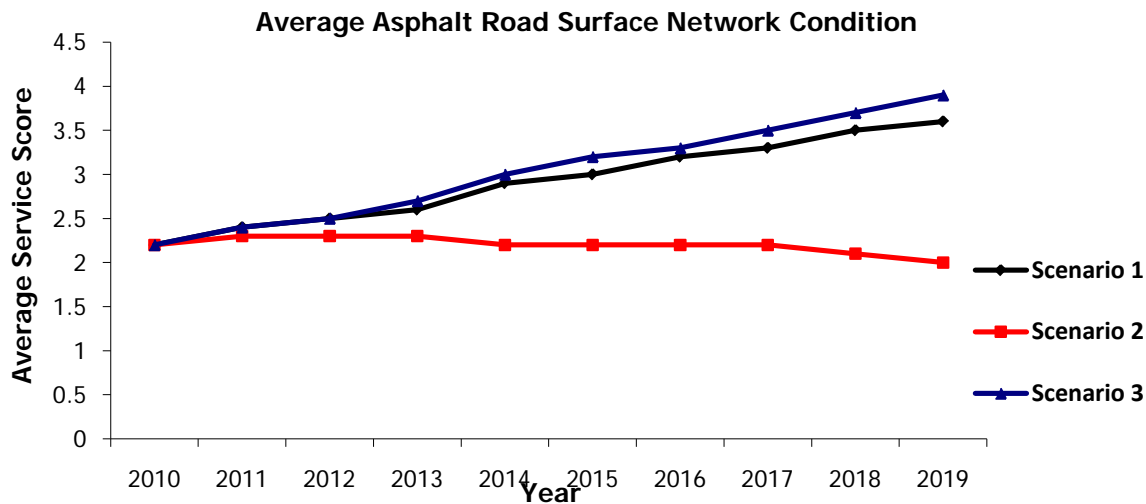


Diagram

12 – Predicted Outputs for Asphalt Road Pavement Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5
Scenario 2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Scenario 3	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7

Table 18 – Predicted Outputs for Asphalt Road Pavement Network Condition



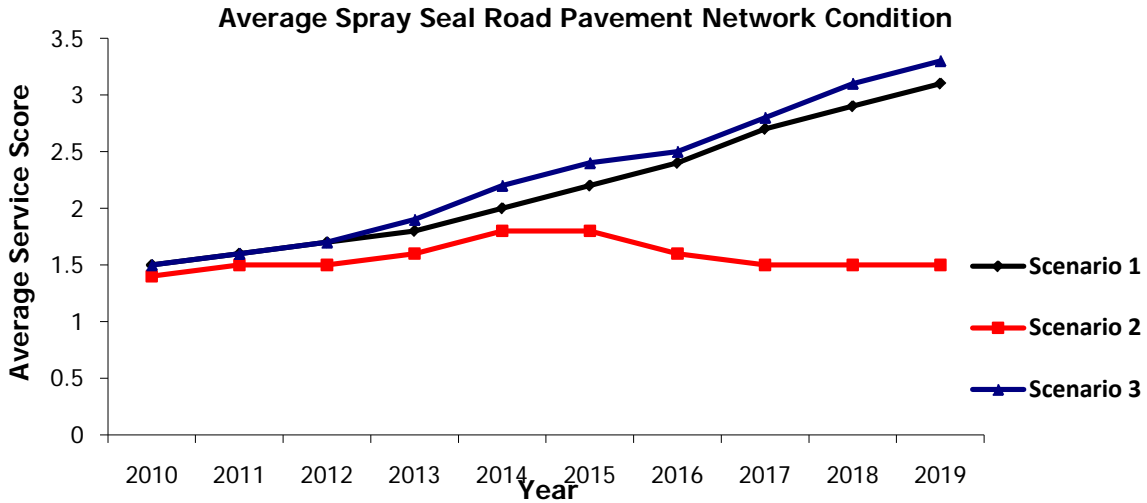
Diagram

13 – Predicted Outputs for Asphalt Road Surface Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	2.2	2.4	2.5	2.6	2.9	3	3.2	3.3	3.5	3.6
Scenario 2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2
Scenario 3	2.2	2.4	2.5	2.7	3	3.2	3.3	3.5	3.7	3.9

Table 19 – Predicted Outputs for Asphalt Road Surface Network Condition

The above graphs illustrate that for the cases of Scenario 1 through to 3 being current spend and reduced spend respectively, that the average condition score for Council's sealed pavement and surfaces will exceed the fair condition score trending towards the poor condition states, while Scenario 2 being the optimal preferred expenditure, will maintain the current level of service (condition) into the future ensuring no further quantities of asset loss.

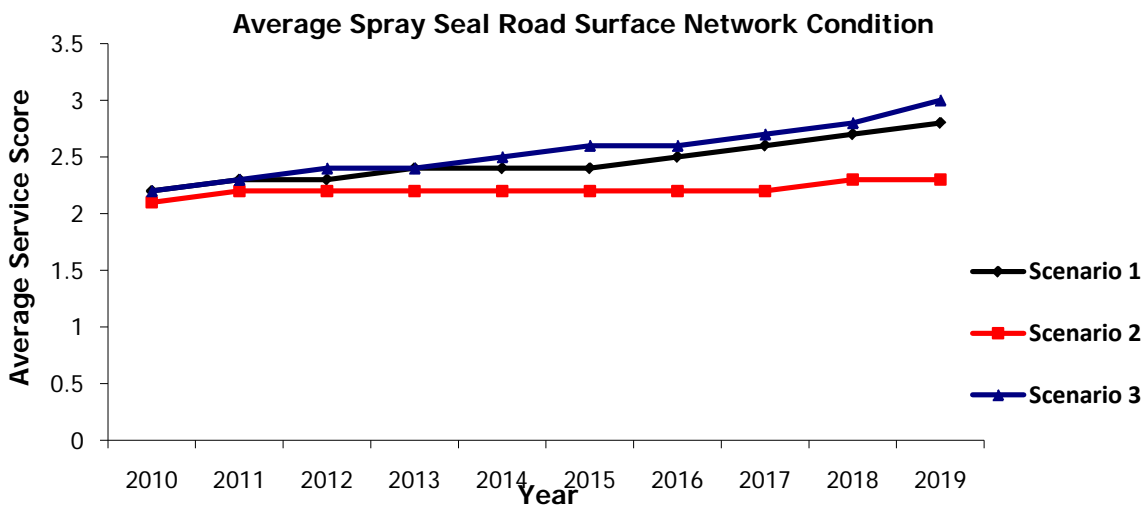


Diagram

14 – Predicted Outputs for Spray Seal Road Pavement Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	1.5	1.6	1.7	1.8	2.0	2.2	2.4	2.7	2.9	3.1
Scenario 2	1.4	1.5	1.5	1.6	1.8	1.8	1.6	1.5	1.5	1.5
Scenario 3	1.5	1.6	1.7	1.9	2.2	2.4	2.5	2.8	3.1	3.3

Table 20 – Predicted Outputs for Spray Seal Road Pavement Network Condition



Diagram

15 – Predicted Outputs for Spray Seal Road Surface Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.6	2.7	2.8
Scenario 2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
Scenario 3	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8	3.0

Table 21 – Predicted Outputs for Spray Seal Road Surface Network Condition

The above graphs illustrate that for the cases of Scenario 1 through to 3 being current spend and reduced spend respectively, that the average condition score for Council’s sealed pavement and surfaces will exceed the fair condition score trending towards the poor condition states, while Scenario 2 being the optimal preferred expenditure, will maintain the current level of service (condition) into the future ensuring no further quantities of asset loss.

The following graphs illustrate the amount of assets in the various condition states dependent upon the expenditure profile.

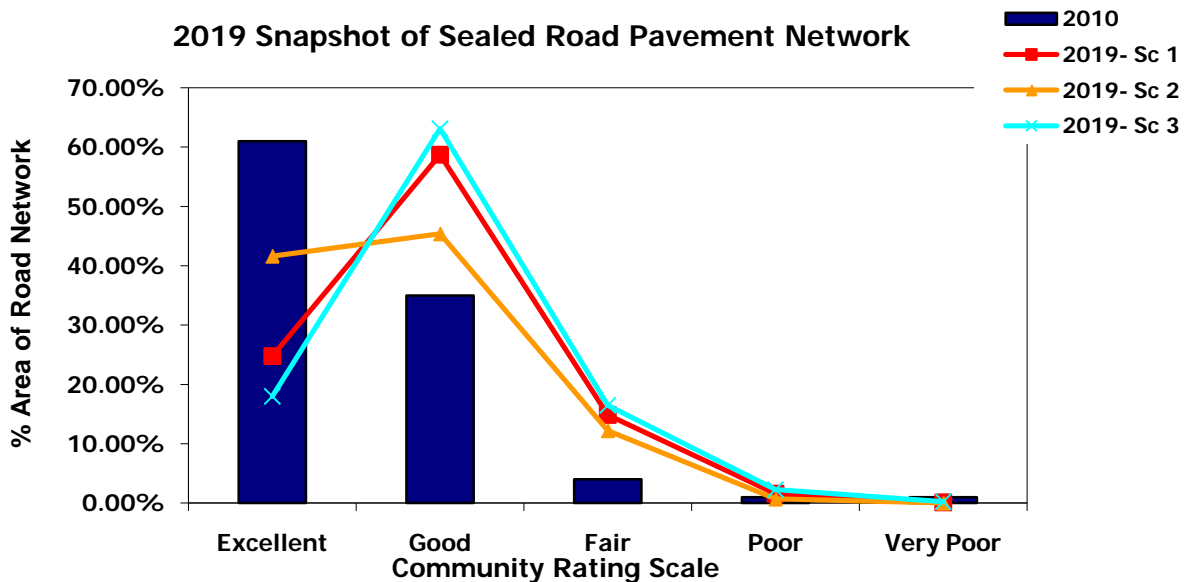


Diagram 16 – 2019 Predicted Snapshot of Sealed Pavement Road Network

The above graph illustrates that should funding be allocated as per Scenario 1 or 3 (being in the order of \$6.26 million and \$4.5 million per annum respectively) that whilst the pavements in condition states poor and very poor will remain status quo, that the road network over the following 10 years will lose pavements which are in excellent condition. This reduction is in the order of 36% and 43% of the road pavement network.

However, if funding is allocated as per Scenario 2 (being \$11.2 million per annum), it will provide a better result.

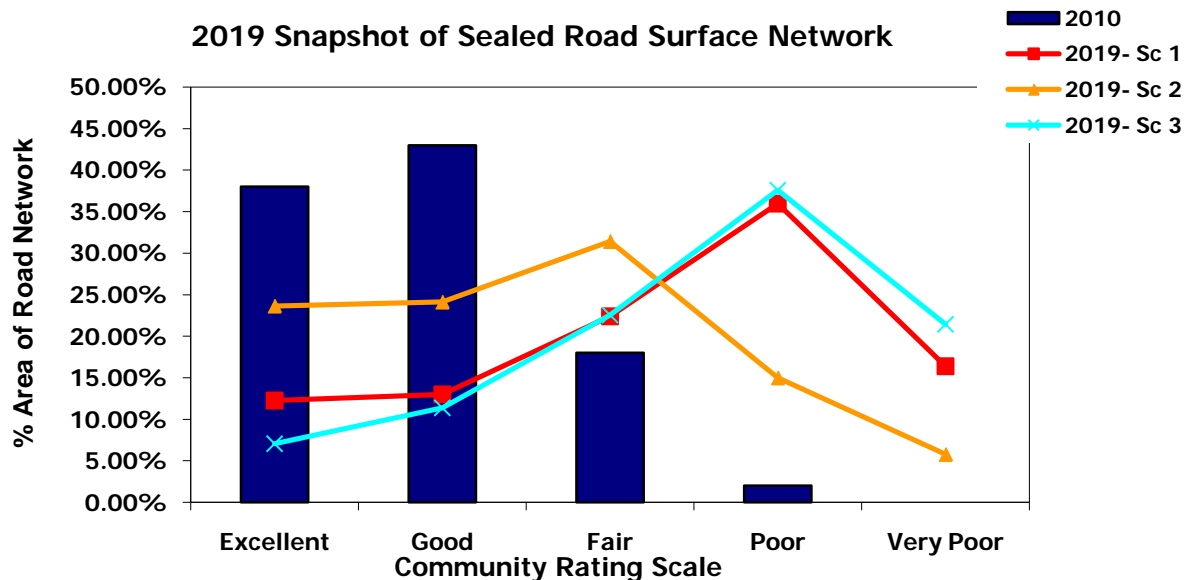


Diagram 17 – 2019 Predicted Snapshot of Sealed Road Wearing Surface Road Network

The above graph illustrates that should funding be allocated as per Scenario 1 or 3 that the road network over the following 10 years will significantly lose road surfaces in excellent condition. This reduction is in the order of 25% and 31% of the road surface network, respectively. The road assets with surface scores in condition states in poor and very poor will also significantly increase by around 16% if funding is allocated as per Scenario 1 and 21% if funding is allocated as per Scenario 3. However, if funding is allocated as per Scenario 2, it will provide a much better result.

Therefore, by allocating the expenditure profile of Scenario 2, this will maintain the overall average network condition and also mitigate any risk of additions to the current asset backlog.

5.15.4 Unsealed Roads

The diagrams below illustrate the predicted Tweed unsealed road average condition scores for the current level of expenditure projected into the future. Scenario 1 recognises that \$500,000 will be allocated annually being the current budget spend, whilst scenario 2 recognises that \$900,000 will be allocated annually and scenario 3 recognises that \$400,000 will be allocated, a reduction of 20%.

The condition assessment for unsealed roads is based on condition score ranges from 1 to 5 with 5 being the worst. The average network condition score for unsealed roads is currently at a score of **3** out of **5**.

Distribution of Unsealed Road Network 2010

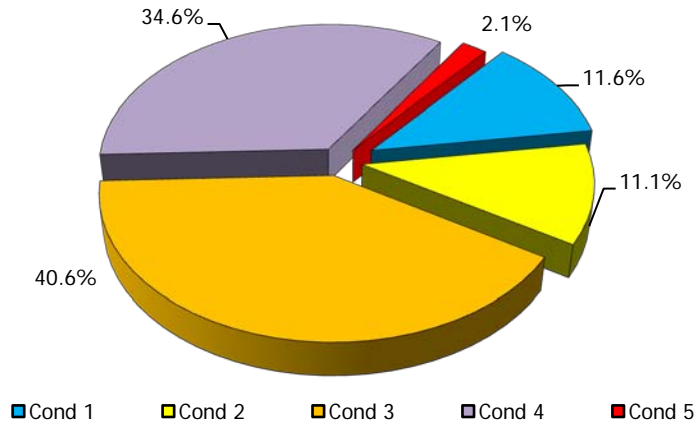


Diagram 18 – Distribution of Unsealed Roads

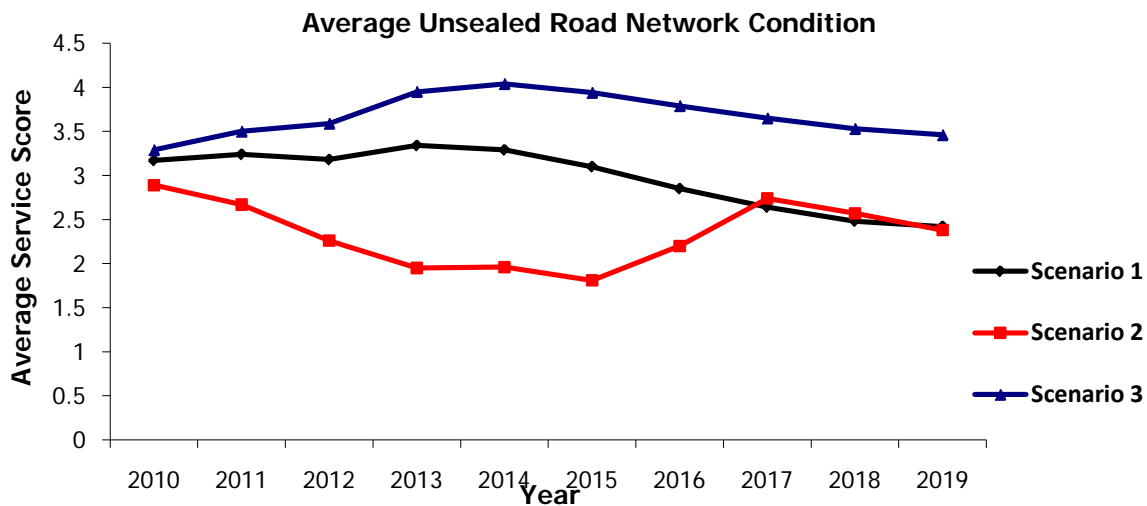


Diagram 19 – Predicted Outputs for Unsealed Road Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	3.17	3.24	3.18	3.34	3.29	3.1	2.85	2.64	2.48	2.42
Scenario 2	2.89	2.67	2.26	1.95	1.96	1.81	2.2	2.74	2.57	2.38
Scenario 3	3.29	3.5	3.59	3.95	4.04	3.94	3.79	3.65	3.53	3.46

Table 22 – Predicted Outputs for Unsealed Road Network Condition

The above graph illustrates that for the case of Scenario 1 being the current spend, that the average condition score for Council’s unsealed surfaces will on average slightly improve whilst Scenario 2 will provide a far better network average condition result. Scenario 3, spending less money will result in a far worse result with an increase in the number of roads in the very poor condition state.

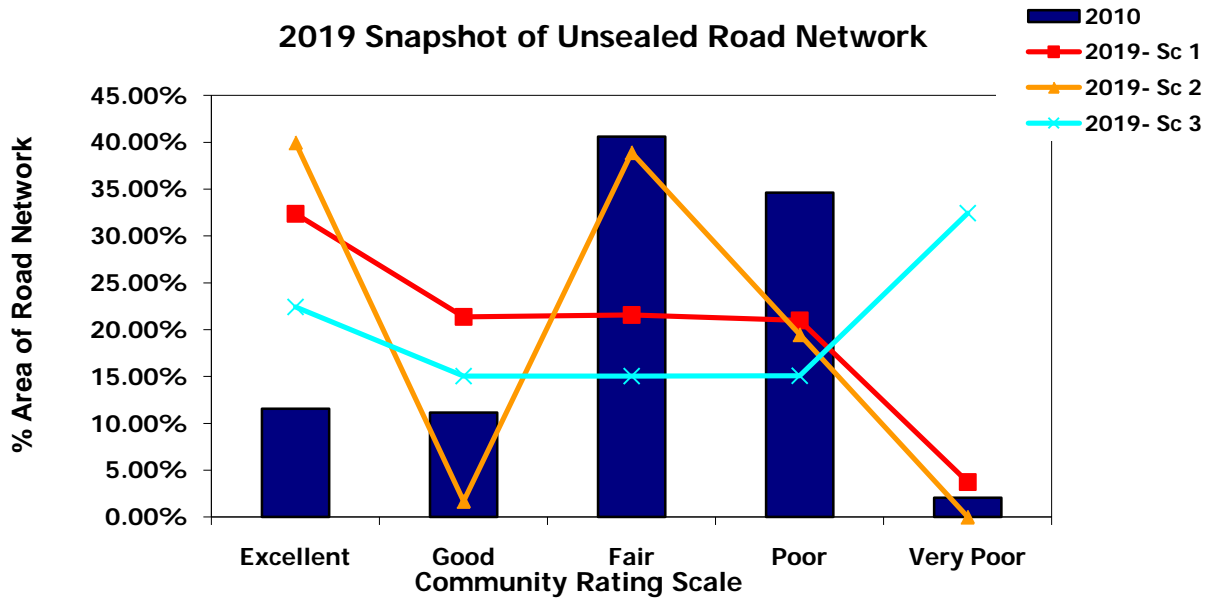


Diagram 20 – 2019 Predicted Snapshot of Unsealed Road Network

Therefore, by allocating the expenditure profile of Scenario 2, this will improve the overall average network condition and also mitigate any risk of additions to the current asset backlog, whilst Scenario 1 will maintain current average condition.

5.15.5 Footpaths

The diagrams below illustrate the predicted Tweed footpath average condition scores for the current level of expenditure projected into the future. Scenario 1 recognises that \$320,000 will be allocated annually being the current budget allocation, whilst scenario 2 recognises that \$360,000 will be allocated annually being the optimal budget and scenario 3 recognises that \$160,000 will be allocated, to represent what would happen if funding were reduced by 50%.

The condition assessment for footpaths is based on condition score ranges from 1 to 5 with 5 being the worst. The average network condition score for the footpath network is currently at a score of 1.3 out of 5.

Distribution of Footpath Network in 2010

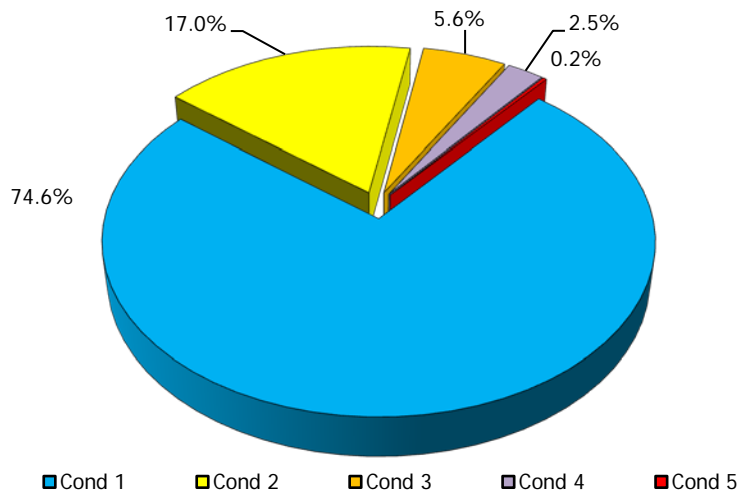


Diagram 21 – Distribution of Footpath Network in 2010

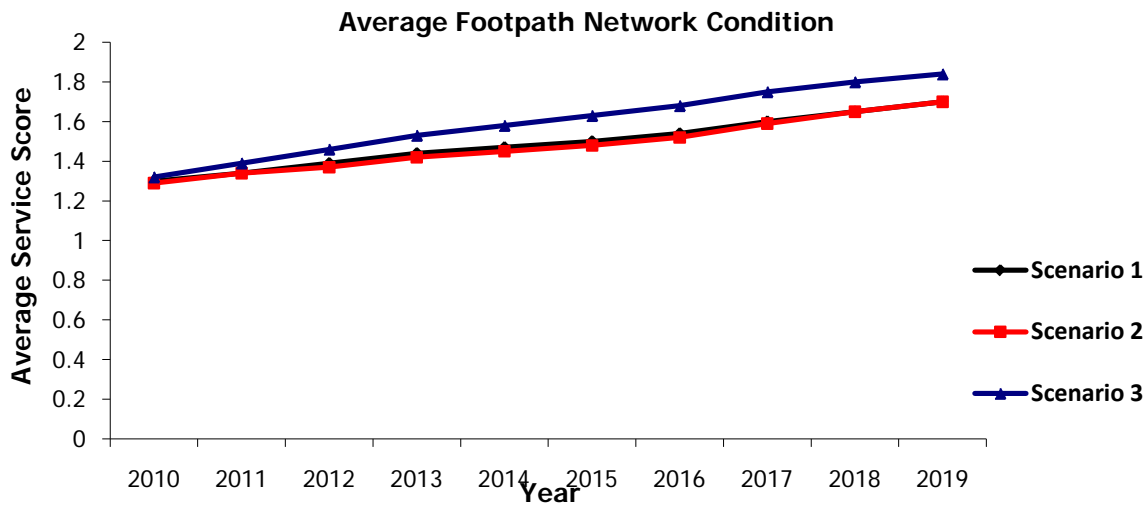


Diagram 22 – Predicted Outputs for Footpath Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	1.3	1.34	1.39	1.44	1.47	1.5	1.54	1.6	1.65	1.7
Scenario 2	1.29	1.34	1.37	1.42	1.45	1.48	1.52	1.59	1.65	1.7
Scenario 3	1.32	1.39	1.46	1.53	1.58	1.63	1.68	1.75	1.8	1.84

Table 23 – Predicted Outputs for Footpath Network Condition

The above graph illustrates that for the cases of Scenario 1 through to 3 that the average condition score for Council’s footpath network will not exceed the good condition score on average.

However, each scenario will have a different effect on the footpath network in terms of the current backlog and this effect is further analysed in the following graphs below.

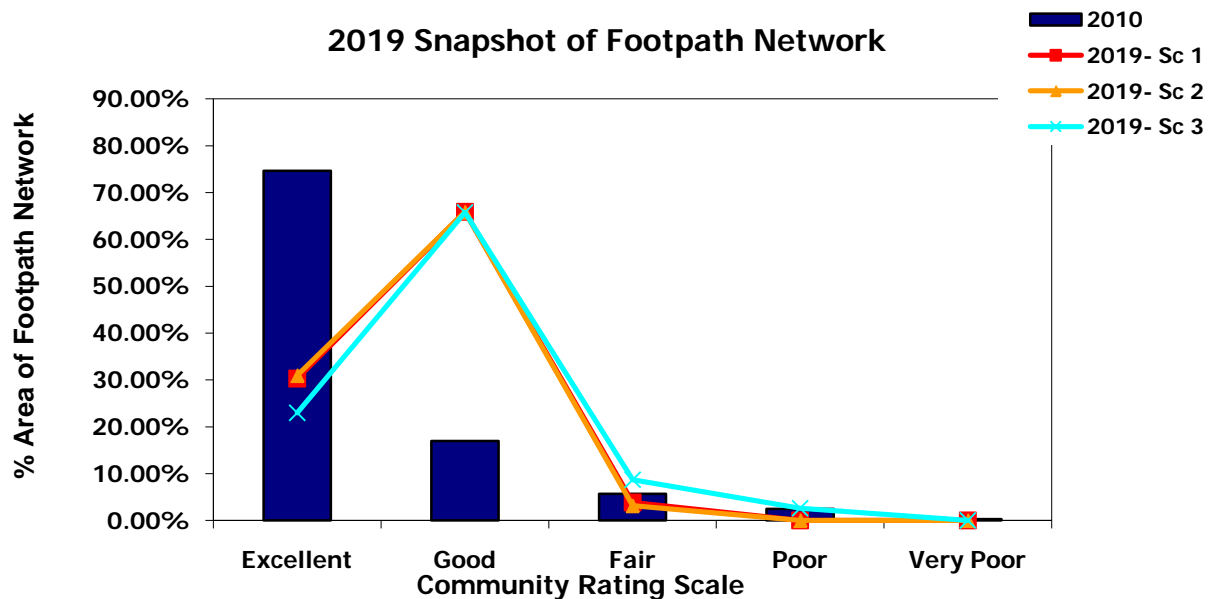


Diagram 23 – 2019 Predicted Snapshot of Footpath Network

The graph above illustrates that should funding be allocated as per Scenarios 1 to 3 that the footpath network over the following 10 years will lose footpaths from the excellent. Scenario 1 will lose 44% of footpaths in excellent condition, whilst Scenario 2 will lose 40% of footpaths in excellent condition and Scenario 3 results in a loss of 51%. The backlog of footpaths in poor and very poor condition will improve for all Scenarios.

What is important to note is that whilst the average condition of the footpath network is in very good condition, that this can change from year to year as a result of weather conditions (tree roots searching for water or too much water which can cause subsidence) and community and business behaviour (i.e. vehicles being driven over the footpath causing damage or service authorities digging up the footpaths to construct their services).

It should also be acknowledged that these Scenarios do not account for any new footpaths which would be required to maintain footpath connectivity where footpaths did not previously exist.

5.15.6 Bridges

The diagrams below illustrate the predicted Tweed bridge average condition scores for the current level of expenditure projected into the future. Scenario 1 recognises that \$1.5m will be allocated annually being the current budget allocation, whilst scenario 2 recognises that \$2m will be allocated annually being the optimal budget and scenario 3 recognises that \$750,000 will be allocated, to represent what would happen if funding were reduced by 50%.

The condition assessment for bridges is based on condition score ranges from 1 to 5 with 5 being the worst. The average network condition score for the footpath network is currently at a score of 1.3 out of 5 for vehicular bridges and 2 out of 5 for footbridges.

Distribution of Foot Bridge Network in 2010

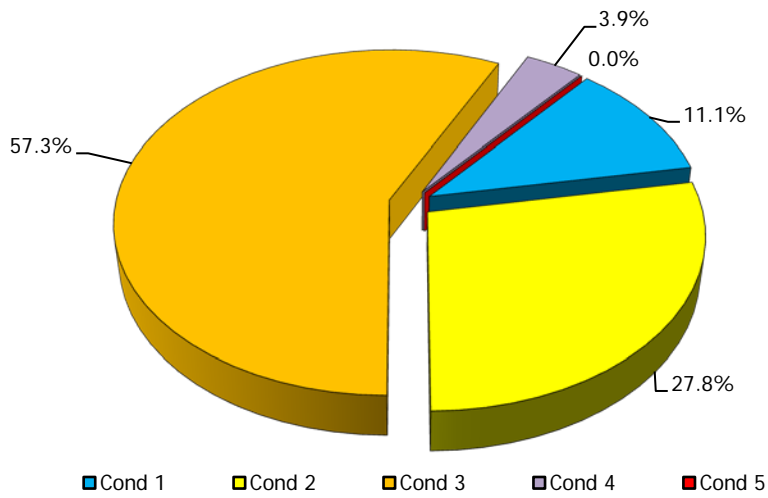


Diagram 24 – Distribution of Footbridge Network in 2010

Distribution of Vehicular Bridge Network in 2010

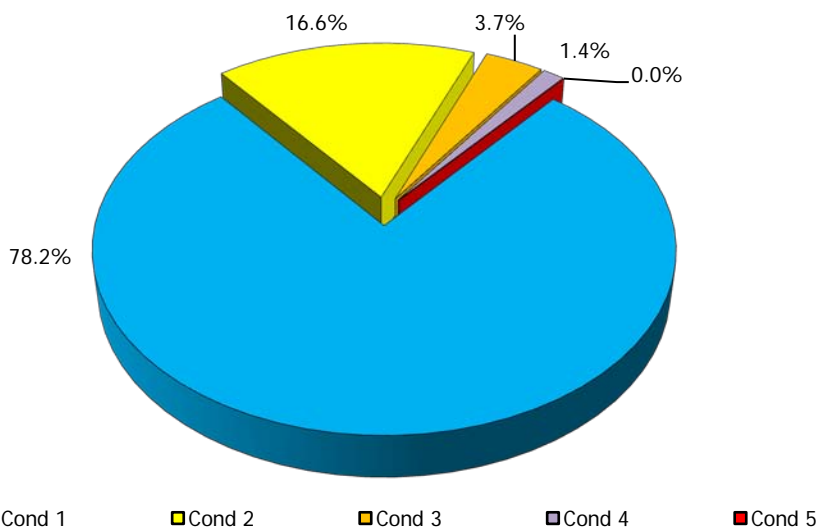


Diagram 25 – Distribution of Vehicular Bridge Network in 2010

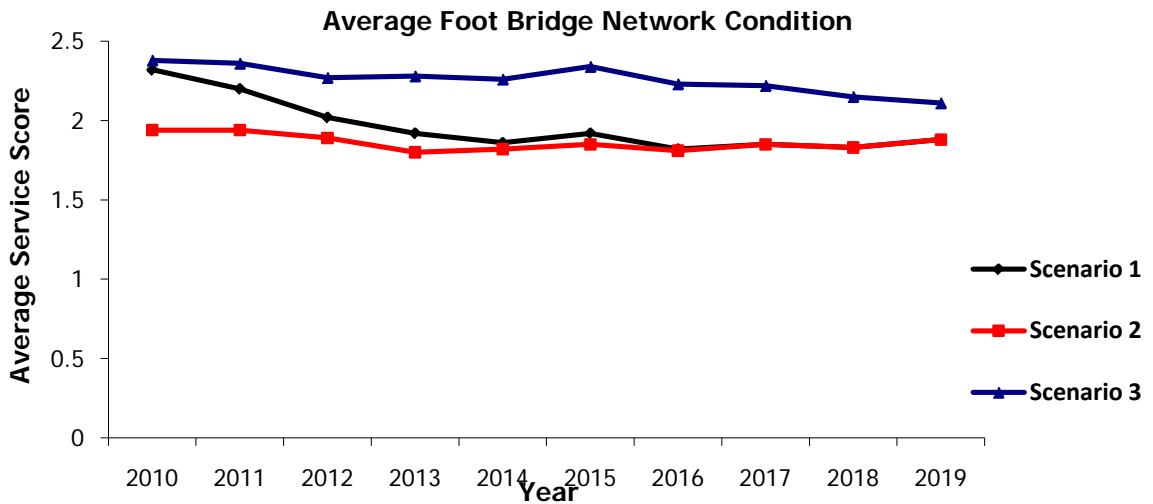


Diagram 26 – Predicted Outputs for Foot Bridge Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	2.32	2.2	2.02	1.92	1.86	1.92	1.82	1.85	1.83	1.88
Scenario 2	1.94	1.94	1.89	1.8	1.82	1.85	1.81	1.85	1.83	1.88
Scenario 3	2.38	2.36	2.27	2.28	2.26	2.34	2.23	2.22	2.15	2.11

Table 24 – Predicted Outputs for Foot Bridge Network Condition

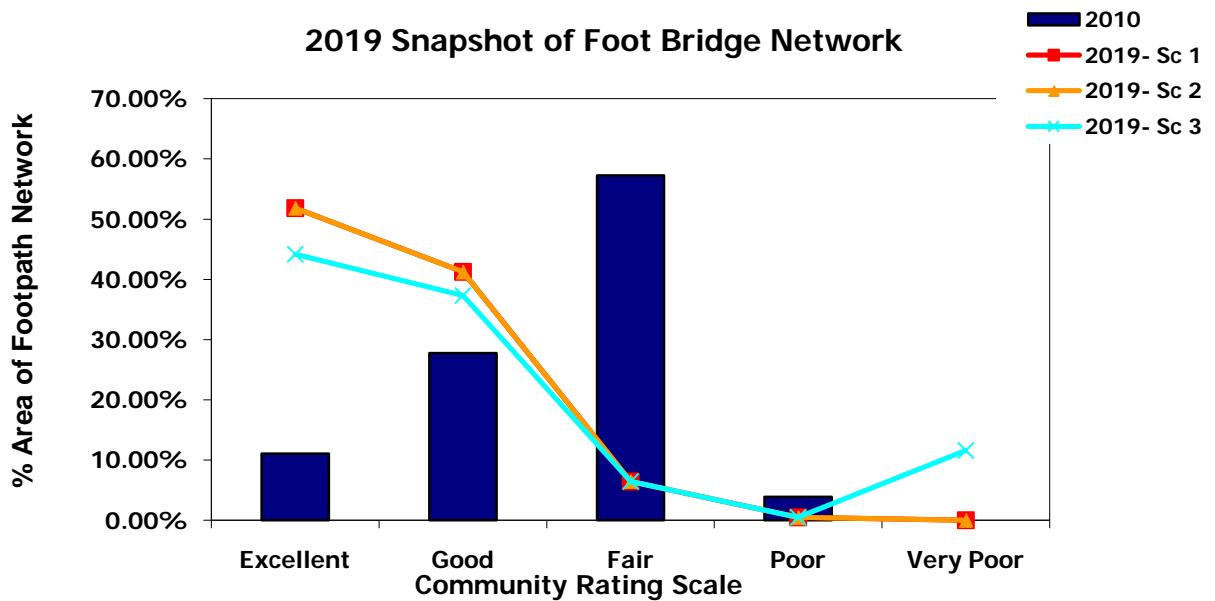


Diagram 27 – 2019 Predicted Snapshot of Foot Bridge Network

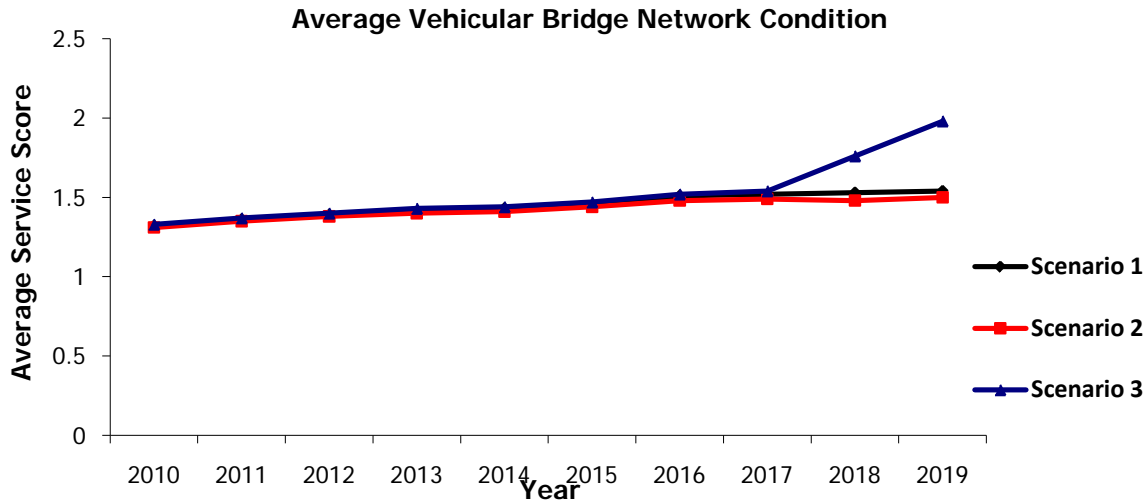


Diagram 28 – Predicted Outputs for Vehicular Bridge Network Condition

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	1.32	1.36	1.39	1.41	1.43	1.45	1.51	1.52	1.53	1.54
Scenario 2	1.31	1.35	1.38	1.4	1.41	1.44	1.48	1.49	1.48	1.5
Scenario 3	1.33	1.37	1.4	1.43	1.44	1.47	1.52	1.54	1.76	1.98

Table 25 – Predicted Outputs for Vehicular Bridge Network Condition

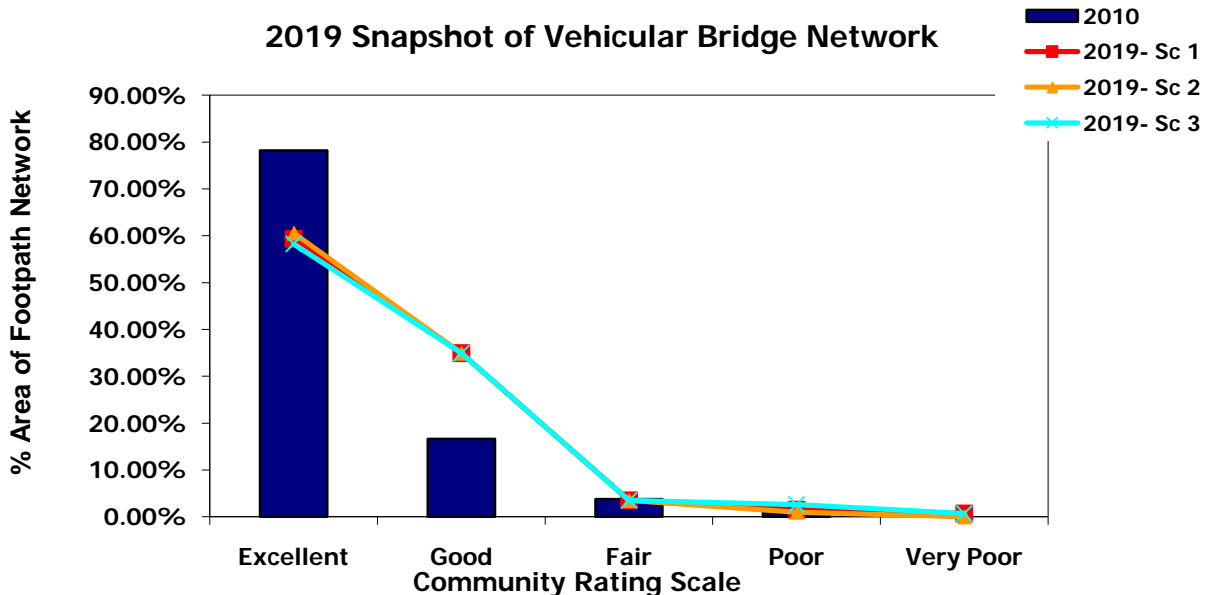


Diagram 29 – 2019 Predicted Snapshot of Vehicular Bridge Network

The above graph illustrates that should current funding levels be maintained (Scenario’s 1 and 2) for a period of 10 years, that the average condition score of Council’s bridge network will remain status quo. In fact from an asset portfolio with 6 bridges in poor and very poor condition, these funding strategies predict that the poor and very poor conditions will see a

reduction in these areas, with no bridges identified as poor or very poor for Scenario 2 and 1 bridge in poor condition for Scenario 1.

If we look at Scenario 3, being a reduced capital expenditure, this prediction strategy predicts a reduction in all of the condition rates from the current 2010 distribution. The predicted changes sees a reduction of 2 bridges in with 4 bridges in poor and very poor condition.

6.0 Financial Summary

The provision of adequate financial resources ensures that the Transportation asset network is appropriately managed and preserved. Financial provisions below requirements impacts directly on community development and if prolonged, results in substantial needs for “catch up” expenditure imposed on ratepayers in the future. Additionally, deferred renewal results in increased and escalating reactive maintenance as aged assets deteriorate at increasing rates.

For The Tweed Shire, additional factors occur compared to those experienced by more established regions in NSW. These refer to the urbanisation of areas within the Shire which impacts on parts of the Transportation network, which was not originally designed for these urban demands.

In-fact during the 2005-2006 budget period, Council's then Administrator's wrote an open letter to the Tweed community signalling their intention to plan for infrastructure provision over a longer (7 year) period and to seek the communities endorsement to implement a series of rate rises above the CPI in order to finance any new initiatives.

They identified that it was imperative that the community gets the infrastructure and services it needs.

Tweed Shire Council's relatively low rates coupled with high community expectations, did not match Council's ability to fund new or expanded services without reducing existing service levels.

Conservative population growth projections suggest that the Tweed population may increase by an additional 40,000 people.

This Section supports the strategic allocation of financial resources over the long term so as to ensure that adequate provision is made by Council in order to sustain the benefits sought from the investment made.

6.1 Financial Statements and Projections

6.1.1 Past Financial Statement Expenditure

The following documents contain information pertaining to Council's past and future financial expenditure profiles and projections:

- Tweed Shire Council 2007-2008 and 2008-2009, 2009-2010 Budgets;
- Tweed Shire Council Management Plan 2007-2008, 2008-2009, 2009-2010; and
- Tweed Shire Council 2007-2008, 2008-2009 and 2009-2010 Annual Reports.

6.1.2 Future Financial Statement and Projections

The future financial projections for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets) are documented in the:

- Long Term Financial Plan.

6.2 What are our sources of Funding?

Funding for creating, renewing or maintaining Council's Transportation network is obtained from a number of sources.

6.2.1 General Rate Revenue

Funding required for the maintenance, renewal and construction of the Transportation asset network is heavily reliant on Council's rate revenue as the main source of funds and as such, competes with other Council projects and programs for funds, such as building, recreation and stormwater drainage works.

6.2.2 Federal Governments Roads to Recovery

The Roads to Recovery Act became law on 21 December 2000. The first round of funding was provided in March 2001. The programmes intention is to address the problems that much of the local government road infrastructure in Australia was about to reach the end of its useful life and its replacement was beyond the capacity of councils to pay.

The Roads to Recovery programme operates fairly uniformly across Australia. Each council is guaranteed a share of the total available funds. It is enshrined in legislation. Money is paid directly from the Australian Government to each council under simple administrative procedures whereby funding decisions are made locally and reported to the Government.

The Commonwealth Government has announced it will extend the Roads to Recovery Programme for an additional four years, under expanded guidelines until 30 June 2014. Details of the amount of funding and the formula used to calculate the funding per each Council across Australia is available from the Roads to Recovery website.

6.2.3 NSW Grants Commission - Financial Assistance Grant

Commonwealth funding is distributed under the Local Government (Financial Assistance) Act 1995 which aims to provide financial assistance to improve financial capacity, equitable level of services, certainty of funding and efficiency and effectiveness of local governing bodies. These are spread across all Councils based on ensuring several key principles, e.g. ability of Councils to function at a standard not lower than the average standard of other Councils.

6.2.4 Developer Contribution Plan

Council obtains funds from developers under the Tweed Road Contribution Plan. Developers who undertake works within the Shire are required to pay a contribution¹⁹ which is utilised by Council to fund the upgrade to Transportation assets to be able to meet the service needs of the community in future due to the population growth.

Council considers that the proposed works are necessary to service population growth and traffic volume increases in the Tweed Shire over the next 20 years. The Tweed Road Contribution Plan includes a listing of road priorities.

Among the future additional roads are service roads between Kirkwood Road and Kennedy Drive and provision for better connection to growth areas in west Murwillumbah.

6.2.5 RTA Repair Program

The RTA allocates funds to Council with regards to undertaking works on all Regional roads. This is a cost share arrangements where the funds required to undertake works are shared 50/50.

¹⁹ Refer to Tweed Contribution Plan for exact details of contribution requirements and formulas

6.2.6 RTA Block Grant

The RTA distributes funding to Councils for the maintenance of the Regional Road Network. Funding allocation is generally based on the Regional Road Network length as well as urban / rural considerations. Funding is reviewed annually.

6.2.7 NSW Local Infrastructure Fund

The NSW Local Infrastructure Fund has been established as an interest-free loan scheme for Councils to bring forward infrastructure projects which have been delayed due to a lack of funding and are essential to urban development.

6.3 What is our Proposed Financial Strategy for Transportation Assets?

The scenarios discussed in Section 5.15.3 clearly indicate that Council should take action to slightly increase its spending on asset renewal of its Transportation asset portfolio.

The proposed capital renewal, upgrade and new expenditure is shown in the following table below. It should be noted that these financial allocations are based on the prediction modelling outcomes utilising the Scenario 2 funding allocations which is considered to be the most affordable and achievable based on Council's human and financial resources. It is envisaged that this funding strategy will also provide the best intergenerational benefit for the current Transportation asset stock, while Scenario 3 provides the lowest benefit, due to the asset stock loss.

The following table documents the required financial strategy allocation over the next 10 years. From year 2 onwards, a 3% increase to the financial values has been added to account for changes in unit rates for the materials required to undertake these works.

Capital	2010/11 (\$,000)	2011/12 (\$,000)	2012/13 (\$,000)	2013/14 (\$,000)	2014/15 (\$,000)	2015/16 (\$,000)	2016/17 (\$,000)	2017/18 (\$,000)	2018/19 (\$,000)	2019/20 (\$,000)
Asphalts Reseals and Rehabilitations - Local Roads	\$4,500	\$4,635	\$4,774	\$4,917	\$5,065	\$5,217	\$5,373	\$5,534	\$5,700	\$5,871
Asphalts Reseals and Rehabilitations - Regional Roads	\$650	\$670	\$690	\$710	\$732	\$754	\$776	\$799	\$823	\$848
Spray Seals Reseals and Rehabilitations - Local Roads	\$3,850	\$3,966	\$4,084	\$4,207	\$4,333	\$4,463	\$4,597	\$4,735	\$4,877	\$5,023
Spray Seals Reseals and Rehabilitations - Regional Roads	\$2,200	\$2,266	\$2,334	\$2,404	\$2,476	\$2,550	\$2,627	\$2,706	\$2,787	\$2,871
Concrete Road Renewals	\$350	\$361	\$371	\$382	\$394	\$406	\$418	\$430	\$443	\$457
Unsealed Road Re-Sheeting	\$900	\$927	\$955	\$983	\$1,013	\$1,043	\$1,075	\$1,107	\$1,140	\$1,174
Bridge Replacement	\$2,000	\$2,060	\$2,122	\$2,185	\$2,251	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610
Bus Shelter Renewal	\$250	\$258	\$265	\$273	\$281	\$290	\$299	\$307	\$317	\$326
Footpath Renewal	\$300	\$309	\$318	\$328	\$338	\$348	\$358	\$369	\$380	\$391

Capital Total	\$15,000	\$15,450	\$15,914	\$16,391	\$16,883	\$17,389	\$17,911	\$18,448	\$19,002	\$19,572
Maintenance										
Bridges - Local Roads	\$350	\$361	\$371	\$382	\$394	\$406	\$418	\$430	\$443	\$457
Bridges - Regional Roads	\$100	\$103	\$106	\$109	\$113	\$116	\$119	\$123	\$127	\$130
Bus Shelters	\$66	\$68	\$70	\$72	\$74	\$77	\$79	\$81	\$84	\$86
Footpaths	\$130	\$134	\$138	\$142	\$146	\$151	\$155	\$160	\$165	\$170
Kerbs	\$12	\$12	\$13	\$13	\$14	\$14	\$14	\$15	\$15	\$16
Asphalt Maintenance	\$1,380	\$1,421	\$1,464	\$1,508	\$1,553	\$1,600	\$1,648	\$1,697	\$1,748	\$1,801
Spray Seals Maintenance	\$1,300	\$1,339	\$1,379	\$1,421	\$1,463	\$1,507	\$1,552	\$1,599	\$1,647	\$1,696
Regional Road Maintenance	\$1,026	\$1,057	\$1,088	\$1,121	\$1,155	\$1,189	\$1,225	\$1,262	\$1,300	\$1,339
Maintenance Total	\$4,364	\$4,495	\$4,630	\$4,769	\$4,912	\$5,059	\$5,211	\$5,367	\$5,528	\$5,694
Capital & Maintenance Total	\$19,364	\$19,945	\$20,543	\$21,160	\$21,794	\$22,448	\$23,122	\$23,815	\$24,530	\$25,266
Capital & Maintenance Total - Council Funded	\$17,588	\$18,138	\$18,705	\$19,288	\$19,890	\$20,509	\$21,147	\$21,803	\$22,480	\$23,177

Table 26 – Proposed Transportation Asset 10 Year Funding Strategy

It must be noted that confidence in the current maintenance expenditure profile is based on the capital expenditure levels being adopted.

7.0 Asset Management Practices

This section outlines the decision-making tools Council currently uses, to determine long term maintenance, renewal and upgrade expenditure for Building assets. Asset Management systems are generally categorised as follows:

- **Asset Management Systems** – The information support tool used to store and manipulate asset data.
- **Data** – Data available for interrogation by information systems to produce outputs.

7.1 Accounting / Financial Systems

Tweed Shire Council currently has the Technology One - Financials software system.

The Manager Financial Service has accountability and responsibility for this system.

7.2 Asset Management Systems

Tweed Shire Council currently utilises the 'myData' and 'Works & Assets' software systems for Asset Management purposes. The system stores inventory, attribute, condition, financial and historical data.

The Engineering and Operations Division has accountability and responsibility for this system.

In addition, Tweed utilises 'myPredictor' for prediction analyses and determining future strategies and capital expenditure (Capex) planning.

Tweed also utilises Open Spatial and Enlighten as its Geographical Information System (GIS). The GIS system stores asset and other information spatially.

7.3 Accounting Framework

The following Accounting Framework applies to Local Government in New South Wales:

- Local Government Code of Accounting Practice and Financial Reporting
- AASB 116 Property, Plant & Equipment – prescribes requirements for recognition and depreciation of property, plant and equipment assets
- AASB 136 Impairment of Assets – aims to ensure that assets are carried at amounts that are not in excess of their recoverable amounts
- AASB 108 Accounting Policies – specifies the policies that Council is to have for recognition of assets and depreciation

7.4 Tweed Corporate Accounting Policy

The Tweed's Corporate Accounting Procedures, identifies that the asset materiality threshold limit has been set at \$5,000. This means that if Council spends less than this amount, that the created or purchased object is not considered an asset in terms of the accounting practices.

It is also considered that at this stage that there will not be any changes to the accounting/financial systems resulting from this BAMP.

7.5 Information Flow Requirements and Process

The key information flows into this BAMP are:

- The asset register data on material types, dimensions, age, replacement cost, remaining life of the asset;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of various factors affecting future demand for services;
- Historical maintenance and capital works treatments;
- Correlations between maintenance and renewal, including decay models; and
- Data on new assets acquired by Council.

The key information flows from this infrastructure and asset management plan are:

- The assumed Capital Works Program and trends;
- The resulting budget, valuation and depreciation projections; and
- The useful life analysis.

These will impact the Long Term Financial Plan, Council Plan, annual budget and departmental business plans and budgets.

As the 'myData' system maintains core asset data and financial data, the flow of information is entered directly into this one system.

Information is updated within 'myData' on an as required basis.

8.0 Improvement Plan

8.1 Review of TAMP

Any Asset Management Plan must be a dynamic document, reflecting and responding to changes over time. A full review of the Transportation Assets Management Plan should take place every three to five years to document progress and set out proposals for the next five years.

Any review of this TAMP will, in addition to that set out above have, regard to:

- Asset performance following delivery of maintenance program;
- The level of achievement of asset management strategies against the expected benefits to Transportation users, stakeholders and the community; and
- The consideration of any external factors that is likely to influence the contents of this TAMP.

8.2 TAMP Improvement Program

Improvements	Urgency	Importance	Responsible Officer	Time Line	Policy or Procedure Required?
Policies and Guidelines					
Obtain Council approval : <ul style="list-style-type: none"> • Levels of service. • Funding Gaps and Future Funding Levels. • Capex Prioritisation. 	H	H	Manager Works	Immediate	Asset Management Policy endorsement.
Service Levels and Life Cycle Analysis					
Collect condition information for entire sealed road network to refine prediction models, utilising Council's data collection manuals.	L	H	Maintenance Engineer	42 months	No
Collect condition information for entire unsealed road network to refine prediction models, utilising Council's data collection manuals.	H	H	Maintenance Engineer	12 months	No
Collect condition information for entire footpath network to refine prediction models, utilising Council's data collection manuals.	L	H	Maintenance Engineer	42 months	No
Collect condition information for entire bridge network to refine prediction models, utilising Council's data collection manuals.	L	H	Maintenance Engineer	24 months	No
Collect inventory and condition information for entire road ancillary asset network.	M	H	Maintenance Engineer	18 months	Yes
Undertake work to monitor future demand requirements for road corridors within municipality.	M	H	Maintenance Engineer	18 months	No

Improvements	Urgency	Importance	Responsible Officer	Time Line	Policy Procedure Required?
Test the current levels of service, to determine 'a confidence level' for reasonableness.	M	M	Maintenance Engineer	12 months	No
Test the current levels of service to determine if they are achievable for current budgets.	M	M	Manager Works & Maintenance Engineer	12 months	No
Financial Planning					
Incorporate the prediction modelling process into Council's annual budgeting and capital works identification.	M	H	Manager Works & Manager Finance	12 months	Yes
Continue with condition audits of the road asset network to enable financial modelling and capital works program development.	M	M	Maintenance Engineer	ongoing	No
Evaluate maintenance priorities and allocate appropriate funding.	M	H	Maintenance Engineer	12 months	No
In line with DLG mandate, undertake a comprehensive revaluation of Transportation Assets.	L	H	Manager Works & Manager Finance	42 months	No
Asset Management Practices					
Implement integration within the Asset Management System software that has integrated capability for: <ul style="list-style-type: none"> • Asset register. • Works management. • Prediction 	M	L	Manager Works & Manager Finance	24 months	No.
Develop process to ensure that asset condition data is transferred into Council's asset register, in a timely manner.	H	M	Maintenance Engineer	12 months	Procedures only
Develop process to ensure that treatment data is transferred into Council's asset register on an annual basis.	H	M	Maintenance Engineer	12 months	No but update business process manual.
Develop process to ensure that new asset data from developments, is transferred into Council's asset register on an annual basis.	H	H	Maintenance Engineer	12 months	Procedures only
Document demarcation agreements with neighbouring council's, RTA and Railways.	M	L	Maintenance Engineer	24 months	No
Link asset management system to GIS system	M	M	Maintenance Engineer	18 months	No
Test use of new technology & data collection methods (ie. Palm-tops)	L	L	Maintenance Engineer & IT	24 months	No

Improvements	Urgency	Importance	Responsible Officer	Time Line	Policy or Procedure Required?
Train Depot staff in using activity guidelines, TAMP service levels, TAMP intervention levels, TAMP inspection regime	H	H	Maintenance Engineer	12 months	No
Refine the current system so that it can generate a work order with an automatically generated response time. This response time is based on Council's service level matrix and is preconfigured in the system based on asset hierarchy.	M	H	Manager Works & Maintenance Engineer	24 months	No

9.0 References

1. Community Strategic Plan
2. NSW Local Government Act 1993
3. Roads Act 1993
4. Tweed Shire Financial Statements 2009 - 2010
5. Tweed Shire Annual Report 2009-2010
6. Australian Bureau of Statistics Website
7. Tweed Shire Transportation Management Strategy
8. Tweed Shire Council Annual Report 2009-2010
9. Tweed Shire Urban Land Release Strategy February 2008
10. Tweed Shire Council, Community profile, communities working together May 2008

10. Glossary of Terms

Accrual Accounting: Recognition of revenues as they are earned and expenses as they are incurred.

Administration: Council staff.

Asset: Is an item with service potential or future economic benefits controlled by Council as a result of past transactions or other past events.

Asset Accounting: Is financial accounting as it relates to assets.

Asset Management: The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.

Asset Register: A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, and technical information about each.

Asset Renewal: The process of improving the service potential an asset delivers through such methods as upgrade, refurbishment or replacement.

Asset Values: A determination of the value of the asset, which depends on the purpose for which it is required.

Capital Expenditure: Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. Capital expenditure increases the value of the asset.

Components: Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

Condition Monitoring: Continuous or periodic inspection, assessment, measurement and interpretation of the resultant data, to indicate the condition of a specific component so as to determine the need for some preventative or remedial action.

Current Replacement Cost: The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.

Data Management The management of data that is held within the Corporate computer system to ensure its structure complies with the requirements and specifications of the system.

Depreciated Replacement Value: The replacement cost of an existing asset less an allowance for wear or consumption having regard for the remaining economic life of the existing asset.

Depreciation : The wearing out, consumption or other loss of value of an asset wether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the cost (or revalued amount) of the asset less its residual value over its useful life.

GIS: Geographic Information System. GIS is a system of computer software, hardware and data and personnel to help manipulate, analyse and present information that is tied to a spatial location.

Level of Service: The defined service quality for a particular activity (i.e. pit repair) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.

Maintenance: All actions necessary for retaining an asset as near as practical to its original condition, but excluding rehabilitation.

The work needed to maintain an asset in a condition that enables it to reach its service potential and may expand the assets service life.

Note maintenance does not include modification of an asset from its original design.

Maintenance Program: A specific plan of identified maintenance activities to be undertaken & recorded for an asset or aggregation of assets.

Community Strategic Plan: A plan containing the long-term objectives and strategies of the community. Strategic plans have a strong external focus and identify major targets, actions and resource allocations relating to the long term survival, value and growth.

Performance Monitoring: Continuous or periodic quantitative assessments of the actual performance compared with specific objectives, targets or standards.

Planned Maintenance: Planned maintenance activities fall into three categories:

- (i) Periodic - necessary to ensure the reliability or to sustain the design life of an asset.
- (ii) Predictive - condition-monitoring activities used to predict failure.
- (iii) Preventive - maintenance that can be initiated without routine or continuous checking (eg using information contained in maintenance manuals or manufactures' recommendations) and is not condition based.

Rehabilitation: Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset to deliver its original level of service (i.e. heavy patching of roads etc.) without resorting to significant upgrading or renewal, using available techniques and standards.

Renewal: Works to upgrade, refurbish or replace existing facilities with facilities of equivalent capacity or performance quality.

Repair: Action to restore an item to its previous condition after failure or damage.

Replacement: The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.

Replacement Cost: The cost of replacing an existing asset with a substantially identical new asset, in today's dollar terms.

Residual Value: The net market or recoverable value, which would be realised from disposal of an asset or facility at the end of its life.

Risk Assessment: The process used to determine risk measurement priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels and other criteria.

Risk Management: A management technique used to identify and analyse potential risks and to implement appropriate responses.

Useful life: The period over which a depreciable asset is expected to be used. The period over which a depreciable asset is expected to be used.

Valuation: Assessed asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels, market value for lifecycle costing and optimised deprival value for tariff setting.

Written Down Value: Is the appropriate value of an asset in current dollar terms minus its accumulated depreciation.



Customer Service | 1300 292 872 | (02) 6670 2400

tsc@tweed.nsw.gov.au
www.tweed.nsw.gov.au

Fax (02) 6670 2429
PO Box 816
Murwillumbah NSW 2484