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State of our Roads Published November 2014
Introduction

The State of our Roads 2014 report provides a summary of the condition of the State road network at a point in time. The report summarises data and trends relating to the condition, use and performance of the State road network.

State Road Strategic Direction

The Transport Infrastructure Services Division of the Department of State Growth is responsible for managing the State road network on behalf of the Minister for Infrastructure and is committed to providing efficient road infrastructure and services for our customers and visitors that:

» are as safe as reasonably possible;

» support economic growth through responsible investment; and

» enhance the travelling experience for road users.

This report isn’t intended to provide a description of the strategic and practical approach to the management of the State road network or how Transport Infrastructure Services uses data in its decision making processes.

Information relating to the strategic approach for development and maintenance of the network can be found in the following documents:

» Tasmanian Infrastructure Strategy

» State Roads Infrastructure Service Policy

» Tasmanian Road Safety Strategy 2007-2016

» State Road Hierarchy

» State Road Infrastructure Asset Management Policy

» State Roads Infrastructure Strategic Asset Management Plan
Inventory
The State Road Asset

<table>
<thead>
<tr>
<th>Road Category</th>
<th>Road Length (km)</th>
<th>Number of Structures</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sealed</td>
<td>Unsealed</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>454</td>
<td>0</td>
<td>454</td>
</tr>
<tr>
<td>2</td>
<td>428</td>
<td>0</td>
<td>428</td>
</tr>
<tr>
<td>3</td>
<td>725</td>
<td>0</td>
<td>725</td>
</tr>
<tr>
<td>4</td>
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<td>853</td>
</tr>
<tr>
<td>5</td>
<td>1,025</td>
<td>248</td>
<td>1,273</td>
</tr>
<tr>
<td>Total</td>
<td>3,485</td>
<td>248</td>
<td>3,733</td>
</tr>
</tbody>
</table>

(a) Category 1 roads are the most strategically important grading to Category 5 roads which are the least strategically important.

(b) Road Length is the distance in one direction (i.e. not considering dual carriageways or ramps).

(c) Of the 3,733 kilometres of road length, 645 kilometres are located in urban areas and 3,088 kilometres are located in rural areas.
Tasmania has a road network covering approximately 24,000 kilometres. The State road network consists of 3,733 kilometres of these roads and comprises the most important and heavily used transport infrastructure in Tasmania. To plan and manage this network within a clear and strategic framework, Transport Infrastructure Services has developed a five-tier hierarchy:

**Category 1 - Trunk Roads**
Tasmania’s primary freight and passenger vehicle roads

**Category 2 - Regional Freight Roads**
Tasmania’s major regional roads for carrying heavy freight

**Category 3 - Regional Access Roads**
The main access roads to Tasmania’s regions, carrying less heavy freight traffic than Regional Freight Roads

**Category 4 - Feeder Roads**
State roads that provide connections between towns, major tourist destinations and industrial areas

**Category 5 - Other Roads**
The remainder of the State roads
Traffic
All Vehicles

Average Annual Daily Traffic (AADT) is a measure of the average number of vehicles using a section of road each day.

AADT is based on periodic counts of all vehicle types on defined road segments having a relatively constant traffic volume along their lengths.

Main Features

» Between 2003 and 2013 the use of State roads has grown by 7.5% at an annual compound rate of 0.7%.

» In 2013 use was greatest on Category 1 roads. This graded to least on Category 5 roads and is consistent with the parameters used for determining road classification.

» Between 2009 and 2013 most of the traffic growth was on Category 1 roads while the other categories have shown small fluctuations from year to year.

» While most permanent traffic counters have recorded increases between 2003 and 2013, some counters in rural areas have recorded decreases.

» The State roads with the highest recorded levels of use in 2013 were: the Tasman Highway (reaching a maximum of about 66,000 AADT over the Tasman Bridge); the Brooker Highway (about 52,000 AADT between Risdon Road and the Domain Highway); the Southern Outlet Highway (34,000 AADT between Kingston and Mt Nelson); and the East Tamar Highway (30,000 AADT at the Charles St Bridge).

» Between 2003 and 2013, permanent road counters with large numerical increases in AADT were: Midland Highway near South Launceston (increase of about 6,000 AADT); the Tasman Highway near Cambridge Park (increase of about 5,000 AADT); the Tasman Bridge (increase of about 3,000 AADT); and the Bass Highway over Victoria Bridge in Devonport (increase of about 2,000 AADT).
Traffic All Vehicles

Average Traffic Volumes by Road Category

Statewide Average Traffic Volumes

Note: King Island and Flinders Island are not shown as data is not regularly collected.
Some of the factors causing the change in truck and commercial vehicle numbers which have had local and system-wide impacts are:

- Decrease in woodchip exports;
- Decrease in seaport throughput since the peak of 2004-05;
- Transfer of container handling from Bell Bay to Burnie;
- Rail decreasing its market share of heavy freight;
- Changes in agricultural production, in particular increases in milk and salmon production;
- Rationalisation of regional landfill at Copping in the South and Dulverton in the North-west; and
- Increasing demand for deliveries by commercial vehicles, particularly in urban areas.

Consistent with the above observations, Category 1 roads have had most of the growth in truck use.

Vehicle traffic is greatest on Category 1 roads and grades to least on Category 5 roads and this is consistent with the parameters used for determining road classification.

Category 2 roads in rural areas have shown consistent decreases in truck traffic volumes.

Category 3, 4 and 5 roads have shown small variations in truck use from year to year.

Between 2003 and 2013, most of the permanent traffic counters recording decreases in trucks and commercial vehicles were in rural areas while most of the increases were on the Category 1 highways.
Traffic Trucks and Commercial Vehicles

Average Truck Traffic by Road Category

<table>
<thead>
<tr>
<th>Road Category</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
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<tr>
<td>2</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>3</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>5</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Note: King Island and Flinders Island are not shown as they have no permanent counters.
The road pavement comprises layers of crushed rock and manufactured materials underlying the surface road seal. Roads carrying significant heavy traffic are constructed with stronger, thicker pavements to withstand the increased weight of heavy loads.

New road pavements typically have a design life of 20 years. Good regular maintenance practices can result in an economic life extending to about 40 years for highly used roads and 60 years for less used roads.

Pavements older than their economic life normally require reconstruction. Without it, the need for more regular reactive maintenance increases and becomes inefficient. Reconstruction brings a road back to as-new condition and pavement age is reset to that of a newly constructed road.

Old pavements in need of reconstruction have poor user comfort and cause increased wear and tear on vehicles.

**Main Features**

- In 2013 the average pavement age was 38 years. This was an increase in average age of 3 years since 2009.
- Pavement ages show a bipolar distribution with peaks at about 50 years of age and another about 30 years of age.
- The older peak coincided with a burst of new road construction in the 1960s, many associated with hydro-electric dam construction. Some of these roads are reaching the end of their economic lives.
- The other peak coincides with increased road building and reconstruction during the 1980s.
- In 2013 the proportion of pavements over 40 years old was 45%, with the proportion over 60 years being 8%.
- Category 1 roads had the lowest average pavement age and the decrease in average age from 2012 to 2013 was largely due to the opening of the Brighton Bypass.
- Category 2 roads had the second lowest average pavement age and the decrease in average age between 2012 and 2013 was largely due to the opening of the Kingston Bypass.

**Pavement Age by Road Category**
Seal age indicates the time span in years since the last resurfacing. While varying seal types have different life spans, the overall average is about 15 years. Seals on roads with significant heavy traffic will deteriorate faster than less trafficked roads. Seal age data excludes gravel roads.

**Main Features**

» In 2013 the average seal age was 10 years.

» 21% of the network had a seal age of 15 years or more.

» 6% had a seal age of 20 years or more.

» Since 2009 the average seal age has been decreasing because of a program to increase skid resistance.

» Since 2009, Category 1 roads have had their seal age fall from 11.2 years old to 7.8 years old and they now have the lowest average seal age.

» Category 2 roads had the second lowest average seal age.

» Category 5 roads, those that usually have the lowest level of use, had the oldest average seal age.

### Seal Age By Road Category

<table>
<thead>
<tr>
<th>Year</th>
<th>Road Category</th>
<th>Average Seal Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Category 1</td>
<td>11.2</td>
</tr>
<tr>
<td>2010</td>
<td>Category 1</td>
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<td>2011</td>
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<td>10.8</td>
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<td>2012</td>
<td>Category 1</td>
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<td>2013</td>
<td>Category 1</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>11.2</td>
</tr>
</tbody>
</table>

### Seal Age Profile

- **Length (km):**
  - 0
  - 50
  - 100
  - 150
  - 200
  - 250
  - 300
  - 350

- **Age (years):**
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30

**Graph:**
- 2009
- 2010
- 2011
- 2012
- 2013
Bridges are critical pieces of the road network because weight limits on bridges decrease road transport productivity. Closures can have major impacts, especially when there are few alternative routes. When bridges reach the end of their lives they can be particularly costly to replace. Since the 1970s most bridges have been constructed to have an economic life of 100 years. Before the 1970s most steel and concrete bridges have been found to have an average economic life of about 70 years. Some bridges over salt water have shorter lives, for example, the Sorell Causeway Bridge lasted only 40 years.

There are 14 bridges which were built before 1900 which are managed as historic bridges.

**Main Features**

» In recent years the number of bridges over 70 years of age has increased by about 10 per year.

» In the next 10 years about 150 additional bridges will become 70 years of age or older; i.e. will become older than the average expected bridge economic life.

» In the last 10 years 22 bridges have been replaced.

» Most of the existing bridges older than 70 years are on Category 3, 4 and 5 roads.

» Six bridges on Category 1 roads are 70 years old or older.
Sealed Roads
Road Roughness

Road roughness is a measure of road surface irregularities in the direction of travel. Roughness affects vehicle dynamics, road user costs and ride quality. Increases in roughness may indicate structural deterioration in the road pavement. It is a key indicator of user perception of the ride quality of a road.

Defects contributing to roughness are potholes, depressions, uneven patches and deformations.

Intervention levels for roughness are set by road category, i.e. the highly used Category 1 roads are managed to be smoother than other categories.

Roughness data is collected by laser profiling of the roads and is measured using a road International Roughness Index (IRI).

Results of roughness surveys are comparable between surveys.

Surveys exclude roads on King and Flinders Island and gravel roads.

Main Features

» Between 2005 and 2012 the average roughness of all State road categories has remained relatively constant.

» Category 1 roads are the least rough.

» Category 2 roads are the next least rough.

» Category 5 roads are the roughest.
Sealed Roads Rutting

Rutting is the measure of wheel rutting along the length of the road. It is usually associated with depressions caused by heavy vehicle wheel paths.

Some degree of rutting is normally expected towards the end of the economic life of a road.

Rut depth is defined as the maximum gap under a 2.0m straight edge placed across the road pavement.

Rutting data is collected by laser profiling of the road surface and averaging along set lengths.

Results of rutting surveys are comparable between surveys.

Surveys exclude gravel roads and roads on King and Flinders Island.

Main Features

» Between 2007 and 2012 the average rutting depth of the network increased from 3.4mm to 3.9mm.

» All road categories have shown deterioration since 2007 though Category 5 roads showed improvement from 2010 to 2012.

» Category 1 roads, those that carry the highest levels of heavy traffic, have become the most rutted category with an average rut depth of 4.5mm in 2012.

» Category 2 roads had the second deepest average rut depth of 4.4mm in 2012.

» The roads with least rutting were Category 3 and Category 4 roads.
Sealed Roads Rutting

Average Rut Depth 2012

- High
- Medium
- Low
- Gravel Roads (not tested)

Average Rutting by Road Category

- Road Category 1
- Road Category 2
- Road Category 3
- Road Category 4
- Road Category 5
- Total

Average Rut Depth (mm)

- 5.0
- 4.5
- 4.0
- 3.5
- 3.0
- 2.5
- 2.0
- 1.5
- 1.0
- 0.5
- 0.0

Year

- 2007
- 2008
- 2010
- 2012
Sealed Roads
Surface Cracking

Cracked road seals allow water to penetrate into the road pavement. Moisture weakens pavement structural strength and may result in rapid pavement deterioration and failure. Early intervention by sealing cracks is an effective maintenance response.

Surface cracking surveys detect cracks of 1mm width or greater:
Surveys exclude roads on King and Flinders Island.
Cracking measurements are relatively volatile from survey to survey due to improvements in technology. The consequence is that inter-year comparisons should be used with caution.
Within surveys, the comparative level of cracking between locations is reasonably reliable and consistent and so measurements are useful for differentiating the more cracked from the less cracked segments of the network.

Main Features
» Average cracking across all road categories is low.
» Category 1 roads have the highest average cracking.
» Category 2 roads have the lowest average cracking.

Average Cracking by Road Category

<table>
<thead>
<tr>
<th>Road Category</th>
<th>2004</th>
<th>2006</th>
<th>2008</th>
<th>2011</th>
<th>2013</th>
<th>total</th>
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</thead>
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<td>3.0</td>
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<td>3.0</td>
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<td>2.5</td>
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</tr>
<tr>
<td>3</td>
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<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>1.5</td>
<td>1.5</td>
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<tr>
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<td>2.0</td>
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<tr>
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<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>
Finance
Valuation of State Roads

The Department of State Growth values the State roads in terms of the value of its roads, bridges, structures and land under roads and in the road corridors.

The valuation does not include electronic and intelligent transport systems and non-road infrastructure in the road corridor such as power and telecommunication lines, gas and water supply pipes and rail infrastructure.

Replacement value represents the cost it would take to construct the network, with the same attributes and in the same locations as the existing one, from scratch.

Over time, vehicles and the environment wear out roads and bridges. In financial terms, the decrease in value is measured by depreciation. The depreciated value represents the replacement value less the depreciation.

**Main Features**

» The replacement value of the State roads is a little less than seven billion dollars

» The depreciated value is a little over four billion dollars.

» The land value represents 9,680 hectares under roads and within road corridors.

» The depreciated value for 30 June 2014 represents 19% of the Tasmanian Government’s total assets of just over 21 billion dollars.

<table>
<thead>
<tr>
<th>State Road Asset Valuation 30 June 2014</th>
<th>Replacement Value ($million)</th>
<th>Depreciated Value ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Replacement Value</td>
<td>$4,991</td>
<td>$2,645</td>
</tr>
<tr>
<td>Bridges and Structures Replacement Value</td>
<td>$1,777</td>
<td>$1,238</td>
</tr>
<tr>
<td>Land Value</td>
<td>$158</td>
<td>$158</td>
</tr>
<tr>
<td>Net Valuation</td>
<td>$6,927</td>
<td>$4,042</td>
</tr>
</tbody>
</table>
The State road network in Tasmania has been subject to an economic environment where the level of capital investment in renewal of assets has exceeded depreciation in only two of the last 10 years. With an average annual depreciation charge of approximately $86 million over the last ten years this has resulted in cumulative unfunded depreciation totalling $234 million.

Between 2003-4 and 2013-14 capital investment in renewal of State road assets has averaged 76% of the level of depreciation. The State road network in Tasmania has been subject to an economic environment where the level of capital investment in renewal of assets has exceeded depreciation in only two of the last 10 years. With an average annual depreciation charge of approximately $86 million over the last ten years this has resulted in cumulative unfunded depreciation totalling $234 million.

Between 2003-4 and 2013-14 capital investment in renewal of State road assets has averaged 76% of the level of depreciation.
Contact

For further information, contact the Department of State Growth

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