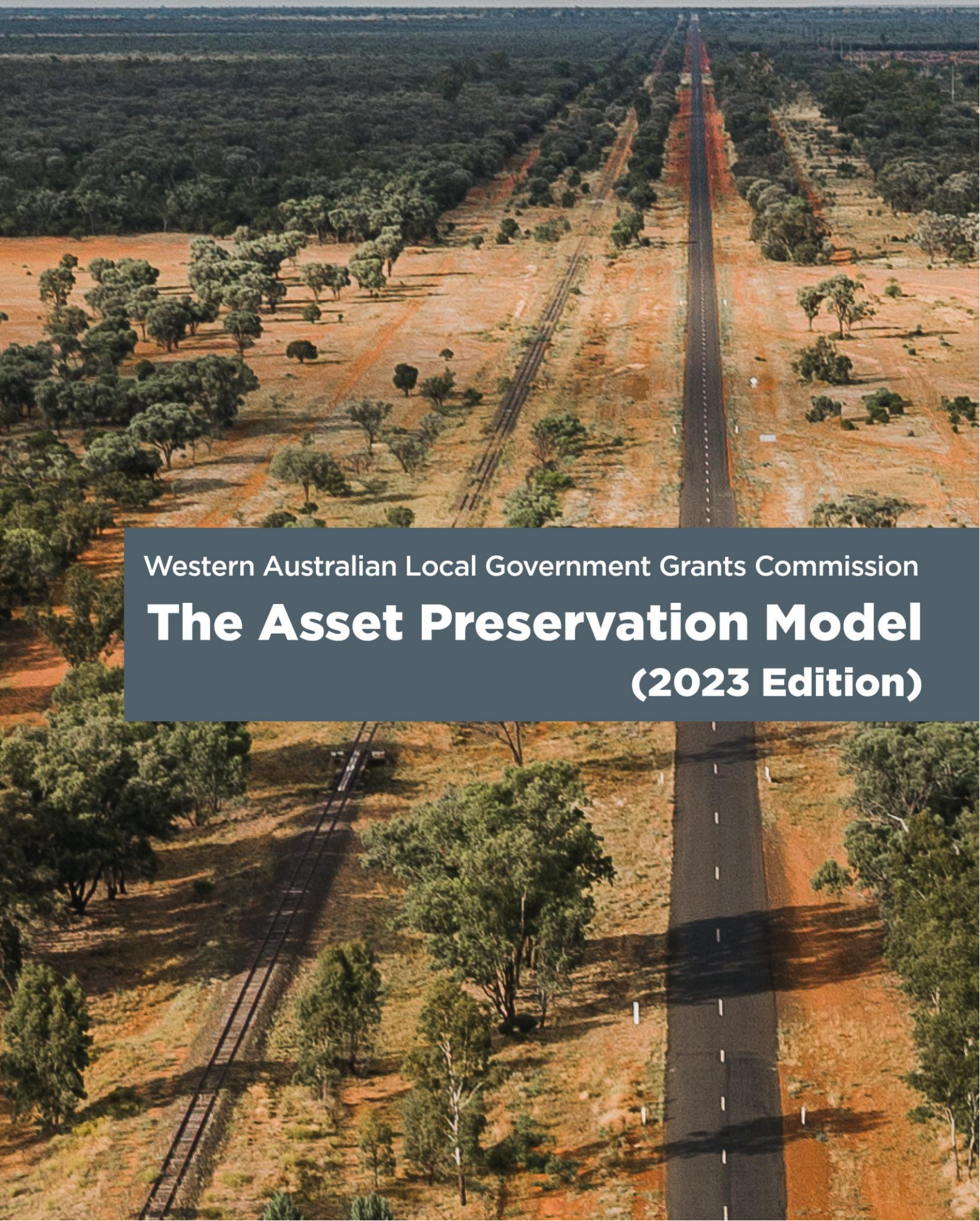
GOVERNMENT OF WESTERN AUSTRALIA

Department of **Local Government, Sport and Cultural Industries**
WA Local Government Grants Commission



Western Australian Local Government Grants Commission

The Asset Preservation Model (2023 Edition)

WESTERN AUSTRALIAN LOCAL GOVERNMENT GRANTS COMMISSION

THE ASSET PRESERVATION MODEL

INTRODUCTION

The WA Local Government Grants Commission has used an Asset Preservation Model to distribute Commonwealth road funds to local governments in Western Australia since 1991-92. This paper describes the current (2023) version of the Asset Preservation Model.

BACKGROUND

The original Asset Preservation Model was developed by Main Roads Western Australia and local government in 1989-90 and was used in 1990-91 for distributing Commonwealth local road funds. It was derived from a theoretical model developed by the Australian Road Research Board.[1]

The Local Government Grants Commission assumed responsibility for the distribution of Commonwealth local road funds in 1991-92, following the decision of the Special Premiers Conference in October 1990 to untie these funds. Although the funds were untied, the Commonwealth Government agreed to continue identifying the funds for roads. This meant that these funds would continue to be distributed to local governments in accordance with the road needs of each local government.

When the Grants Commission took over responsibility for distributing the identified Commonwealth road funds, it undertook a comprehensive review of the Asset Preservation Model. The aim of the review was to establish that it was the most appropriate method; that it reflected Local Government road needs; and was compatible with principles that were being developed by the National Office of Local Government for the distribution of the road funds. The review found that the Asset Preservation Model was the most appropriate and equitable method of distributing road funding.

Many refinements were made to the original Main Roads WA model and the Commission's reviewed Asset Preservation Model was widely accepted by Local Government.

PRINCIPLES FOR DISTRIBUTION OF ROAD FUNDS

The National Principle relating to the allocation of the identified road component of the financial assistance grants under section 12 of the Commonwealth *Local Government (Financial Assistance) Act 1995* is as follows:

> *The identified road component of the financial assistance grants should be allocated to local governing bodies as far as practicable on the basis of the relative needs of each local governing body for roads expenditure and to preserve its road assets. In assessing road needs, relevant considerations include length, type and usage of roads in each local governing area.*

The following additional policies, developed in consultation with the National Office of Local Government, are also applied by the Local Government Grants Commission.

1. *Seven percent of the funds will be reserved for special projects: two-thirds for bridges and one-third for roads serving Aboriginal Communities.*
2. *The remaining 93 per cent of funds will be distributed according to Asset Preservation Needs as determined by the Western Australian Model.*
3. *The Asset Preservation Needs will be adjusted to provide for minimum standards as determined by the Western Australian model.*
4. *All roads that are the responsibility of local government will be used in assessing asset preservation needs.*

ROAD FUNDING

In 2023-24 Western Australia was allocated $146,262,920 of the $954.8m of Commonwealth road funds.

In accordance with the above policies 7% ($10.222m) of the Commonwealth road funds in WA are allocated for Special Projects and the remaining 93% ($136.04m) distributed according to Asset Preservation Needs.

Two thirds ($6.812m) of the 7% for special projects is allocated for preservation of bridges. The Grants Commission allocates these funds in accordance with recommendations by Main Roads WA, which assesses priorities using bridge condition reports. These recommendations are put to the Grants Commission after being reviewed by a committee, guided by a policy on bridge project funding. The Bridge Committee comprises representatives of the WA Local Government Association, Main Roads WA and Local Government Grants Commission.

One third ($3.409m) of the special project funds is allocated to roads serving remote Aboriginal communities. The Grants Commission has established a committee, comprising representatives from the Western Australian Local Government Association, Main Roads WA, the Department of Planning, Lands and Heritage, the National Indigenous Australians Agency, and the Department of Local Government, Sport and Cultural Industries, to recommend allocations for roads serving remote Aboriginal communities. The Committee has established funding criteria based on factors such as the number of Aboriginal people served by an access road and the distance of the Community from a sealed road. The aim of the criteria is to better meet the needs of Aboriginal communities.

The Commonwealth special project funds allocated for bridges and Aboriginal Roads are technically un-tied funds. The special project allocations are however augmented by State funds. Main Roads WA contributes a third of the cost of all projects funded under the special projects program. This contribution of State funds is subject to the condition that local governments spend the special project funds on the project for which the funds were allocated.

AN OVERVIEW OF THE ASSET PRESERVATION MODEL

The aim of the Asset Preservation Model is to assess the level of annual expenditure required by a local government to maintain their road assets. It assesses the average annual cost requirement to maintain each council's road network. It takes into account:

- annual and recurrent maintenance costs; and
- reconstruction at the end of the road's useful life.

The model recognises the different needs of urban and rural roads, and the different levels of development of these roads. The needs of sealed, gravel and formed roads are each treated according to their particular needs.

The model calculates annual asset preservation expenditure needs for each work activity by the general formula:

Unit cost per km x frequency factor x road length = Annual expenditure need

For example, the annual expenditure needs for resealing for a local government that has 10 kilometres of road sealed 6 metres wide would be:

$38,000 (unit cost per km) x 1/15 (frequency factor) x 10 (length) = $26,000

The frequency factor refers to how often work is carried out. In this example, a resealing frequency of 15 years is applied to reflect general local government practice in resealing roads outside built up areas.

The annual cost of all relevant road work activities is calculated in this way for each local government, to obtain its total asset preservation expenditure needs.

The Asset Preservation Model has the facility to equalise road standards through minimum standards. These standards help councils that have not been able to develop their road systems to the same degree as longer established and more affluent councils.

The model requires comprehensive road statistics, costs, and work standards. These are discussed in the following sections of this report.

ROAD STATISTICS

WA's road classification has three categories – Commonwealth Government roads, State Government roads and Local Government roads. Local Government roads consist of local distributor roads and local roads. Roads formerly classified as arterial roads (prior to 1994) are included as local distributor roads.

Statistics for all Local Government roads are used in assessing the needs of each local government. These include public roads constructed by developers and transferred to local governments but exclude national park and forestry roads that are the responsibility of the Department of Biodiversity, Conservation and Attractions.

Aggregated road statistics for each local government are obtained from Main Roads WA via IRIS in March each year. These statistics represent a snapshot of the road inventories as provided by local governments at that point in time.

Roads are categorised into two types - roads in built up areas and roads outside built up areas. This is necessary because roads in built up areas generate greater expenditure needs than roads outside built up areas, because of higher traffic, large numbers of intersections and the need for expensive treatments such as kerbing and longitudinal drainage. The definition of built up areas used by the Local Government Grants Commission in the Asset Preservation Model is given in Appendix 1.

The road statistics used in the model are shown in Table 1.

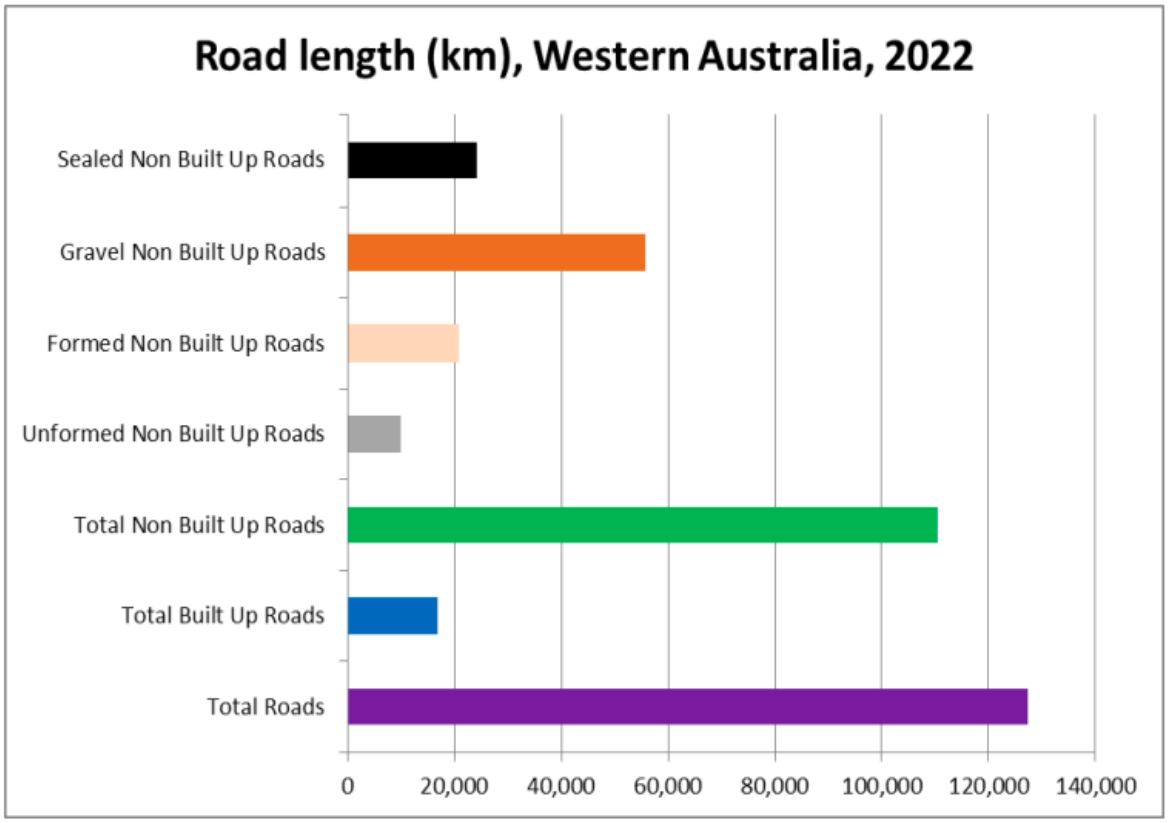
Table 1
Road Classes and Statistics Used in the Asset Preservation Model

Roads in Built up Areas	Roads Outside Built up Areas
ROAD CLASSES	
Residential roads	Local Roads
Local distributor roads	
STATISTICS	
Aggregate seal (Length) x (Width)	Aggregate seal (Length) x (Width)

Roads in Built up Areas	Roads Outside Built up Areas
Asphalt seal (Length) x (Width)	Gravel (Length)
Gravel (Length)	Formed (Length)
Kerbing (Length)	Unformed (Length)
Longitudinal piped drainage (L)	
Bridges (concrete, timber, foot) (Area)	Bridges (concrete, timber, foot) (Area)
	River crossings (Area)
Dual use paths (Length)	
Lanes (Length) x (Width)	

Where Length = length in kilometres
Width = width in metres
Area = area in square metres

Sealed roads have many different widths. One road can be of different widths alongst its length. To simplify the model, the sealed road lengths are converted to lane kilometres with a standard width of 3.5 metres. One lane kilometre = 3500 square metres.



Widening of Highways and Main Roads through Country Cities and Towns

In many country cities and towns, Main Roads WA are responsible for the through lanes on highways and main roads, and councils are responsible for any widening required for local traffic and parking. To make allowance for local government responsibility on these roads, the widened sections of highways and main roads through country cities and towns were classed as local roads. These roads are referred to as T roads in the Asset Preservation Model.

Roads Serving Remote Aboriginal Communities

Access roads to Aboriginal communities (including those funded via the special project grants) and internal community roads are included in the statistics used in assessing asset preservation needs, provided that they satisfy the following conditions:

- The roads are open to the public.
- Councils accept responsibility for them and include them in their road inventories.
- Councils regularly maintain the roads.

Many roads serving small Aboriginal communities and most internal community roads do not meet these conditions and are therefore not included in the road data for the Asset Preservation Model and not recognised in the grant determination process. [2]

UNSEALED ROADS CARRYING HIGH VOLUMES OF TRAFFIC

In 2000 the Local Government Grants Commission undertook a Heavy Haulage Study to examine:

- The impact of heavy haulage on the local government road system; and
- Means of considering the impact of heavy haulage through the Commission's Asset Preservation Model.[3]

The Commission adopted the recommendations of the Heavy Haulage Study. The Commission provides an increased maintenance allowance in the Asset Preservation Model for gravel roads carrying an Equivalent Average Annual Daily Traffic [EQ AADT] of 75 or more, where local governments supply traffic count data in accordance with the Commission's specifications.

The following arrangements now apply:

1. Equivalent Average Annual Traffic [EQ AADT], based on the equivalence factors in Table 2, is used as the measure of traffic.

Table 2
Equivalence Factors for Trucks on Gravel Roads

Vehicle	Number of axles	Equivalence Factor
Classes 1 and 2		1
Class 3 truck	2	4
Class 4 truck	3	6
Class 5 truck	4	8
Class 6	3	6
Class 7	4	8
Class 8	5	10
Class 9 semi trailer	6	12
Class 10 B double	8	16
Class 11	8	16
Class 12 Triple road train	6-19	26

The equivalence factors apply to unsealed roads only.

2. Gravel or formed roads with an EQ AADT of 75 or greater will qualify for the increased allowance.

3. The allowance for traffic will be made by increasing the allowances provided in the Asset Preservation Model. The allowances are set out in Table 3. The maximum of $9,935 per km is equivalent to the allowance for a road sealed 7.0 metres wide.

Table 3
Allowances for Traffic on the Cost of Maintaining Gravel Roads
$ per Year

EQ AADT	Annual Maintenance	Re-sheeting	Total Allowance
Less than 75	$1,537	$3,128	$4,665
75 to 99	$2,690	$3,756	$6,445
100 to 149	$3,843	$4,324	$8,167
150 to 199	$4,918	$5,008	$9,926
Greater than 200	$5,224	$5,320	$10,544

The maximum allowance of $10,544 is the allowance for a road sealed 7.0m wide.
Allowances are indicative and will vary between cost regions and from council to council.
Local governments receive 12.89% of these allowances because the Commonwealth funds are 12.89% of assessed asset preservation needs

4. Local governments on minimum standards will not be eligible for an additional allowance, except in situations where the allowance lifts the grant above the minimum standard. This is because these councils are already receiving higher grants through the application of the minimum standards in the Asset Preservation Model.

5. Gravel and formed roads that meet the criteria in Table 4 will be deemed to qualify for sealing, and these will be taken into account in setting minimum standards.

Table 4
Intervention Levels for Sealing Gravel Roads

Traffic EQ AADT	Seal Width
75 - 300	6.0 m
> than 300	7.0 m

6. Two traffic counts are required at each location, one taken during peak traffic such as wheat carting and one in the off-peak period. The EQ AADT is estimated by weighting the counts using estimated periods of peak and nonpeak traffic.

ANNUAL MAINTENANCE OF BRIDGES

The Asset Preservation Model makes provision for the annual cost of bridge maintenance for all bridges ((including those funded via the special project grants)), but not for major maintenance and replacement of bridges. The reason for this is that the Grants Commission makes Special Project grants for major maintenance and replacement of bridges. These grants are matched with a one third contribution from Main Roads WA.

The allowance for annual maintenance is based on deck area. It is $16.5 per square metre for concrete and steel bridges and $32.9 per square metre for timber bridges in the southern part of the State. These rates are adjusted to compensate for higher costs in the northern regions.

MAINTENANCE OF TRAFFIC CONTROL DEVICES AND CATTLE GRIDS

The model makes provision for annual maintenance of traffic control devices in both built up areas and outside built up areas. Traffic management devices include:

- Traffic control signals
- Intersection treatments
- Islands and medians
- Passing lanes
- Pavement marking
- All traffic signs.

The allowance includes work carried out to maintain visibility.

Local governments in the pastoral region also receive an additional allowance for the cost of maintaining cattle grids.

GROWTH AND CHANGE IN THE ROAD NETWORK

The different rates at which councils' road networks grow and develop are brought to account through the use of annually updated road statistics.

It is in every local government's interest to ensure that their road inventory is accurate and kept up to date, particularly when new roads are being added to the network or when there have been extensive upgrades of existing roads. A local government could be missing out on significant grant funding if the Local Government Grants Commission is using an outdated snapshot of the local road inventory.

ROAD COSTS

The Local Government Grants Commission pays special attention to road costs because the reliability of the Asset Preservation Model depends on realistic unit costs and work standards.

The State has been divided by the Grants Commission into 21 regions to properly reflect the main cost differences within the State. The allocation of local governments to each region are detailed in Appendix 2. They were identified using the Commission's adjustment factors, which take into account the effect of location, climate and terrain; and the report Environmental Regions of Australia[4] which divided the State into regions based on climate, landform, lithology, soils etc.

Costs for each region were reviewed in 2012 using information provided by the ten Regional Road Group, and further reviewed in 2019-20 with information provided by local governments. The costs currently used by the Commission are based on 2019 prices, and these costs are adjusted in subsequent years using the ABS road and bridge construction price Index for WA.[5] This ensure that the road costs used in the model each year are kept current and reflect inflationary movements.

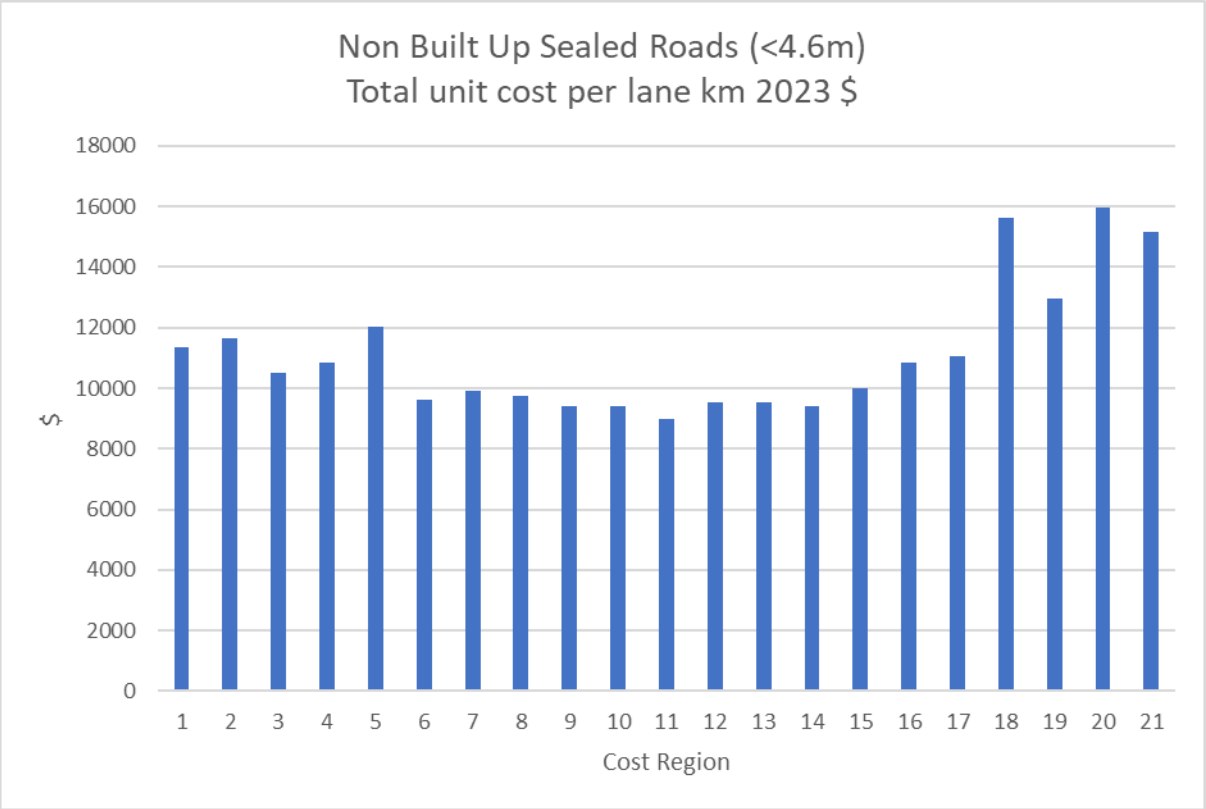
Note that while there are 21 cost regions, some costs vary from region to region while some costs may be common to two or more regions.

The following are an example of the costs applied in the Asset Preservation Calculation for one kilometre of sealed rural road ($ per annum) (cost region 16):

Annual maintenance cost	$2,781
Resealing every 15 years	$5,157
Reconstruction after 45 years	$6,596
Total annual allowance	$14,534

A local government will receive (in 2023-24) 12.89% of the calculated requirement in their road grants ($1,874)

Costs in six country cities and towns are higher than the costs in their regions. To avoid creating six new regions, the regional reconstruction costs were adjusted for these six councils. The regional costs were increased by 30% for Albany, Bunbury, and Greater Geraldton, 20% for Narrogin and by 15% for Kalgoorlie-Boulder and Northam.



ADJUSTMENT FACTORS

The regional costs reflect regional factors that influence road costs such as remoteness and climate. For example, the costs obtained from the Kimberley shires reflect the cost of labour or contractors, plant and transporting bitumen to the region. However, there are differences within a region that affect standards and costs, such as terrain and the distance that gravel must be carted.

Four adjustment factors have been included in the model to take these differences into account. These factors are:

1. the distance that gravel has to be carted for resheeting gravel roads and reconstructing sealed roads

2. soil conditions which affect the thickness of sealed pavements

3. terrain; and

4. salt.

Each of these adjustment factors has been calculated using quantitative data, based on the best data available. They are discussed in the next section.

1. Cost of Pavement Materials for Sealed Roads

The cost of pavement materials varies considerably depending on whether they are bought from a supplier or obtained from a local government controlled gravel pit. Many councils do not pay for gravel, or pay very little for gravel, but have informal arrangements with landowners that involve grading and gravelling their roads in return for access to gravel on their property.

The distance that pavement materials are carted has a big impact on road costs. The distance typically varies from 5 km to 50 km. The distances and the amounts paid for the materials were obtained from a questionnaire sent to all councils. A model was developed to estimate the cost per cubic metre of sub-base and base course materials delivered and placed on the road for every local government.

It was found that in the metropolitan area pavement material costs depend on individual contractual arrangements rather than geographical factors. Average costs were therefore used for the metropolitan region. Elsewhere, however, individual costs were used for each council.

The cost of pavement materials was reviewed by the Commission in 2019-20.

2. Pavement Thickness for Sealed Roads

Pavement thickness has a significant influence on reconstruction costs. Evaluating pavement thickness requires data on soil strengths and traffic volumes.

Data on soil types were obtained from a report 'Biophysical Attributes of Local Government Areas'.[6] The soil types were based on agricultural classifications rather than their suitability as a road subgrade. The Main Roads WA's Materials Engineering Branch estimated design Californian Bearing Ratios (CBR) for each of these agricultural classifications, using CBR records which were available for many of the soil types in WA. The CBR is a measure of the bearing capacity of a soil obtained from a standard soil penetration resistance test.

The Materials Engineering report identified four ranges of design CBRs.[7]

- < CBRs less than 5
- < CBRs between 5 and 10
- < CBRs between 10 and 15
- < CBRs greater than 15

The design CBRs take rainfall and drainage conditions into account. A CBR of 15 or more indicates that a local government is relatively advantaged by better soil types for road construction than those prevailing in other local governments. Similarly, a CBR of 5 or less indicates that a local government is relatively disadvantaged with poor soil types for road construction. The Main Roads WA materials report is considered an authoritative, independent source for the Commission and in the absence of other comprehensive data it is an appropriate basis for the Commission's use.

The Equivalent Standard Axles (ESAs) in Table 5 were used to calculate pavement thicknesses. The ESAs were estimated from information supplied by local governments and Main Roads WA. They were based on small samples and would benefit from further refinement in the future. However, as fairly large changes in ESAs are required to make an appreciable change to pavement thickness, the ESAs in Table 5 can be used with reasonable confidence.

Table 5
Equivalent Standard Axles for Local Government Roads

Road Type	Equivalent Standard Axles (ESA)	
	Metropolitan	**Country**
Roads in Built Up Areas		
Residential Streets	60,000	30,000
Local Industrial and Distributor Roads	2,000,000	800,000
Roads Outside Built Up Areas		
Local Roads	400,000	400,000

Pavement thicknesses were calculated using the Australian Road Research Board report[8] and Main Roads WA Engineering Road Note No. 9.[9]

3. Terrain

Generalised information on the terrain in each local government area was obtained from the report 'Physical Attributes of Local Government Areas'.[10] The report provided the percentage of each local government area in each of four terrain categories - plains, undulating, rolling and hilly.

Analysis of information provided by local governments on road costs indicated that the effect of terrain on the costs of forming a road would be:

Flat	1.0
Undulating	1.2
Rolling	1.4
Hilly	1.6

Based on this information, adjustment factors for terrain were calculated for each local government, ranging from 1.0 in local governments that are predominantly flat to 1.48 in local governments that have extensive hilly areas. These factors are applied to the cost of formation in the reconstruction of sealed roads.

4. Salt

It is well known that roads built over salt affected land are more expensive to maintain and do not last as long as roads elsewhere, but there is little quantitative information on the increased costs and how long salt affected roads last. Some local governments estimated that the presence of salt could reduce road life by up to half. Discussions with Main Roads WA and local government engineers suggested that a reduction of one-third would be more realistic, and this reduction has been used in determining an adjustment factor. The estimated effect of salt is shown in Table 6.

Table 6
Effect of Salt on Road Life

	Normal Life Years	**Life in Salt Affected Areas Years**
Unsealed gravel pavements	12	8
Sealed gravel pavements	45	30
Seal	15	10

Adjustment factors were formerly calculated for each local government using satellite based data obtained in 1998 from the Department of Land Administration – Land Monitor Project. The project measured the area of land affected by salt using satellite imagery. Some 1.2 million hectares are affected, and the projections were that the affected area would double in the next 15 to 25 years and will double again before equilibrium is reached.

Updated satellite data from 2018 has now been analysed by the Department of Primary Industries and Regional Development (DPIRD). The Commission's previous factor was based on the percentage of salt affected land in each local government. The new DPIRD analysis is based on the percentage of roads in each local government that are salt affected.

Given the extent that the salt affected land has increased across the state, it is reasonable to translate this into higher costs in the Asset Preservation Model.

The salt adjustment factors were applied to all gravel and sealed roads, impacting on the cost of maintenance and the cost of regravelling and resealing and reconstructing sealed roads (including kerbs and drainage).

WORK STANDARDS IN THE MODEL

Road works, including reconstruction and resealing of sealed roads, regravelling of gravel roads and reforming formed roads, contribute the largest components to the calculation of asset preservation needs. Work standards for these operations were based on road engineering practice and were adopted after discussions with local government and Main Roads WA engineers. These work standards are set out in the following pages:

Resealing - Aggregate Seals

A resealing frequency of 15 years was used throughout the State, except in the Pilbara and Kimberley where 12 years was used.

Resealing - Asphalt Seals

The thickness and frequency of asphalt reseals are shown in Table 7.

Table 7
Standards for Resealing Asphalt Roads

Category	Thickness (mm)	Frequency Years
Residential Streets	25	25[(1)]
Local Distributor Roads	30[(2)]	20

(1) In the Pilbara and Kimberley, the frequency for residential streets was reduced to 20 years.
(2) Outside the metropolitan area a thickness of 25mm was used for local distributor roads.

Regravelling of Gravel Roads

The model recognises that part of the gravel pavement is lost each year through the wear of traffic, road grading and wind and water erosion, and makes provision for periodic replacement of the gravel. Local government estimates of how frequently regravelling is necessary varied from 6 years to 20 years, depending mainly on traffic. The model provided for all gravelled roads to be re-gravelled every 12 years to a thickness of 100mm.

Gravel and formed roads in pastoral and mining areas and on the fringes of the agricultural area tend to be of a lower standard. To provide recognition of the need for improvement of the standard of these roads, the allowance for regravelling was increased by 30% in pastoral and mining areas and 10% on the fringes of the agricultural area.

Reformation of Formed Roads

Formed roads lose their shape through traffic and repeated road grading and eventually get to the point where the side drains are filled with material graded off the running surface. Roads in this condition present drainage problems and are difficult to maintain. Reformation is the process of restoring the raised formation and side drains. The model provided for all formed roads to be reformed every five years.

As with the gravel roads, the allowance for reformation was increased by 30% in pastoral and mining areas, and 10% in the fringe areas to allow for improvement of the standard of formed roads.

Reconstruction of Sealed Roads

The frequency of reconstruction of sealed roads has a major impact on the estimated cost of asset preservation. There is however very little factual information on how long roads last because most of the State's roads are still in their first life cycle.

The Task Force on Road Funding considered this issue using road life - road roughness curves and concluded that secondary roads could be expected to last 40 to 50 years.[11] Based on this work, a road life of 45 years was adopted for sealed local government roads outside built up areas.

A road life of 45 years was also used for local distributor roads within built up areas.

For residential streets, however, allowance was made for the fact that these streets carry very little heavy traffic and have high standards of construction in the metropolitan area. Discussions with local government engineers indicated that 55 years would be realistic life in the metropolitan area.

Shorter life cycles and higher levels of reconstruction were adopted for residential streets in country areas as shown in Table 8. The reasons for this are:

- Metropolitan councils have ready access to crushed limestone and crushed rock, materials that are produced under controlled processes and have high quality and uniformity. These materials result in high quality pavements with a low risk of failure.

- While some country councils have good natural gravels, most councils have to use low quality gravels which have a high degree of variability. This situation is made worse by the lack of soil testing facilities. As a consequence, there is a greater risk of pavement failure on streets in country towns.

- Many streets in country towns were built without proper drainage. The deficiencies are not only in the drainage systems themselves, but in the longitudinal grades. Because of this, reconstruction works not only involve rebuilding the pavement, but also grade modification and drainage reconstruction.

- Country councils are also disadvantaged in the availability of important items of plant, such as compaction equipment, pavement stabilisation equipment and recycling equipment. These items of plant can only be obtained at a much higher cost than in the metropolitan area.

Table 8
Standards for Reconstruction

ROAD	METROPOLITAN		COUNTRY	
	Frequency	**Standard**	**Frequency**	**Standard**
All roads outside built up areas	45	Reshape and add 75% of pavement(1)	45	Reshape and add 75% of pavement(1)
Local distributors in built up areas	45	Remove asphalt, replace 25% of pavement and add 75mm of rockbase (2)	45	Remove asphalt, replace 50% of pavement and add 100mm of gravel (2)
Residential streets	55	Remove asphalt, replace 25% of pavement and add 30mm of rockbase (2)	45	Remove asphalt, replace 50% of pavement and add 75mm of gravel (2)

(1) The Model provides for single lane seals to be widened to two lanes during reconstruction.

(2) The Model provides for kerbing to be reconstructed at the same time as the pavement. Longitudinal drainage will be reconstructed at twice the reconstruction interval for the road (ie. if the road is reconstructed every 45 years, the longitudinal drainage will be reconstructed every 90 years).

MINIMUM STANDARDS

An early criticism of the Asset Preservation Model was that it favoured local governments with highly developed road networks and discriminated against those which were not able to develop their roads adequately.

The Grants Commission addressed this criticism by applying minimum standards to each road type. Local governments that fell below the minimum standard had their asset preservation assessed on the minimum standards, while those above the minimum standards had their asset preservation assessed on their actual standard. Two calculations (minimum standard and actual) are made for each local government and the greater of the two figures is applied in the final need calculation.

The Grants Commission developed two sets of minimum standards, one for roads inside built up areas, and one for roads outside built up areas.

Minimum Standards for Roads within Built up Areas

Residential streets and other local roads in built up areas generally have similar functions throughout the State, so it is possible to set State-wide minimum standards for these roads. For example, if 97% of the residential streets in the Metropolitan area are kerbed, it would be reasonable to set a standard that 97% of all residential streets in the State should have kerbing.

Using this principle for roads within built up areas, the average standards for the inner metropolitan area were used as the minimum standard throughout the State. The average width and the percentages in Table 8 were calculated for the inner metropolitan area. These were applied as a minimum standard for all gravel and sealed roads in built up areas throughout the State.

Table 9
Minimum Standards for Roads within Built up Areas
Residential streets

	Standard
Seal	100%
Minimum Seal Width	7.4m
Asphalt Seal	90%
Kerbing	97%
Longitudinal Drainage	65%

In the case of local distributor roads, no attempt was made to specify a minimum width, because the variations in traffic volumes are so great on these roads that the appropriate width could vary from a single 6 metre carriageway to dual 11 metre carriageways. The model is based on existing widths.

Minimum Standard for Local Roads outside Built up Areas

Roads outside built up areas vary from quite heavily trafficked sealed roads to tracks serving isolated Aboriginal Communities and pastoral stations. Ideally traffic volumes are needed to define minimum standards. As traffic volumes are not universally available an alternative method was used.

The State was divided into ten regions, each composed of councils with similar characteristics and development. Population density and geographical factors were considered. The regions are shown in Appendix 3. Percentages for the five road types, shown in Table 10, were calculated for each region and applied as minimum standards for that region.

Table 10
Criteria used in Applying Minimum Standards to Local Roads outside Built Up Areas
(example of minimum standard region 3; South West)

Type of Road	Percentage for Region
Sealed roads - narrower than 4.6 m	6%
Sealed roads - wider than 4.6 m	47%
Gravel roads	41%
Formed roads	4%
Unformed roads	2%

To reiterate, local governments with a network status below the minimum standard receive an asset preservation assessment based on the minimum standards, while those above the minimum standards had their asset preservation assessed based on the actual status of their roads.

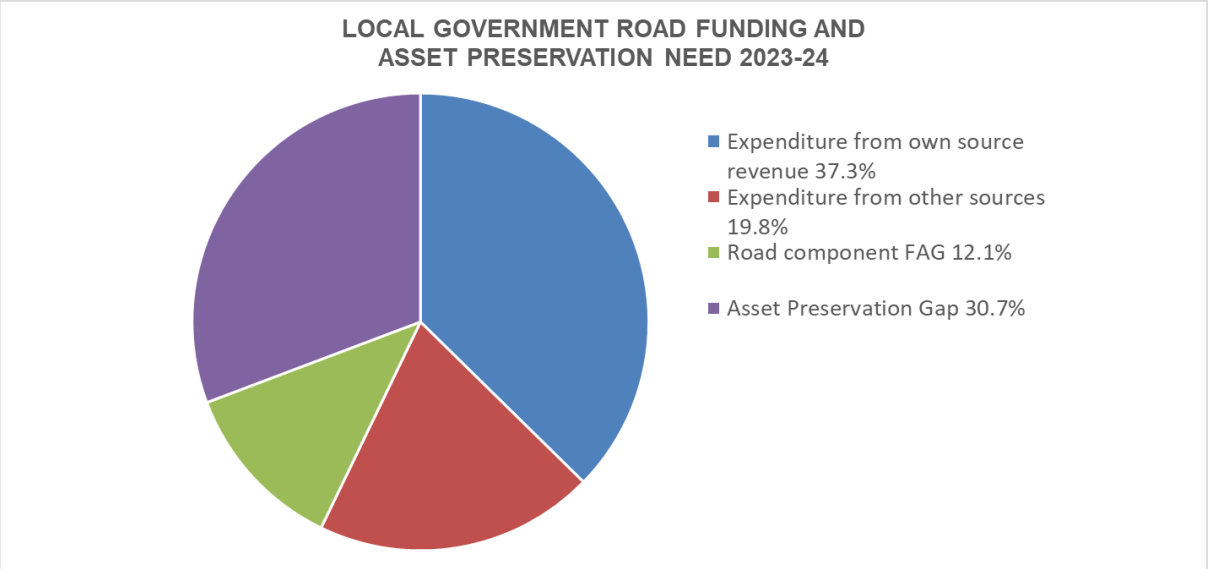
The Grants Commission is conscious of the subjective nature of the minimum standards for roads outside built up areas. A more objective method of defining minimum standards would be based on traffic volume, except for very lightly trafficked roads where soil conditions, and not traffic volumes, dictate standards. However, little progress can be made until comprehensive information on traffic volumes becomes available.

In 2005 a limit was imposed on the length of unformed roads that would be used in calculating the percentage of unformed roads in the minimum standards. This was necessary to prevent thousands of kilometres of unformed roads in the pastoral areas of the State from distorting road grants. The limit was set at 25% of each council's total road length outside built up areas.

The only changes that will be accepted to these limits in the future are:

- Decreases in the length of unformed roads below the datum; and
- Increases where new unformed roads to Aboriginal communities are accepted for Special Project funding.

A topical example of the latter is the access road to the Tjuntjuntjarra Community. While this 190 km access road was initially unformed, it has been included in setting minimum standards because it receives Special Project grants and is progressively being upgraded to a formed standard.



DISTIBUTION OF FUNDS

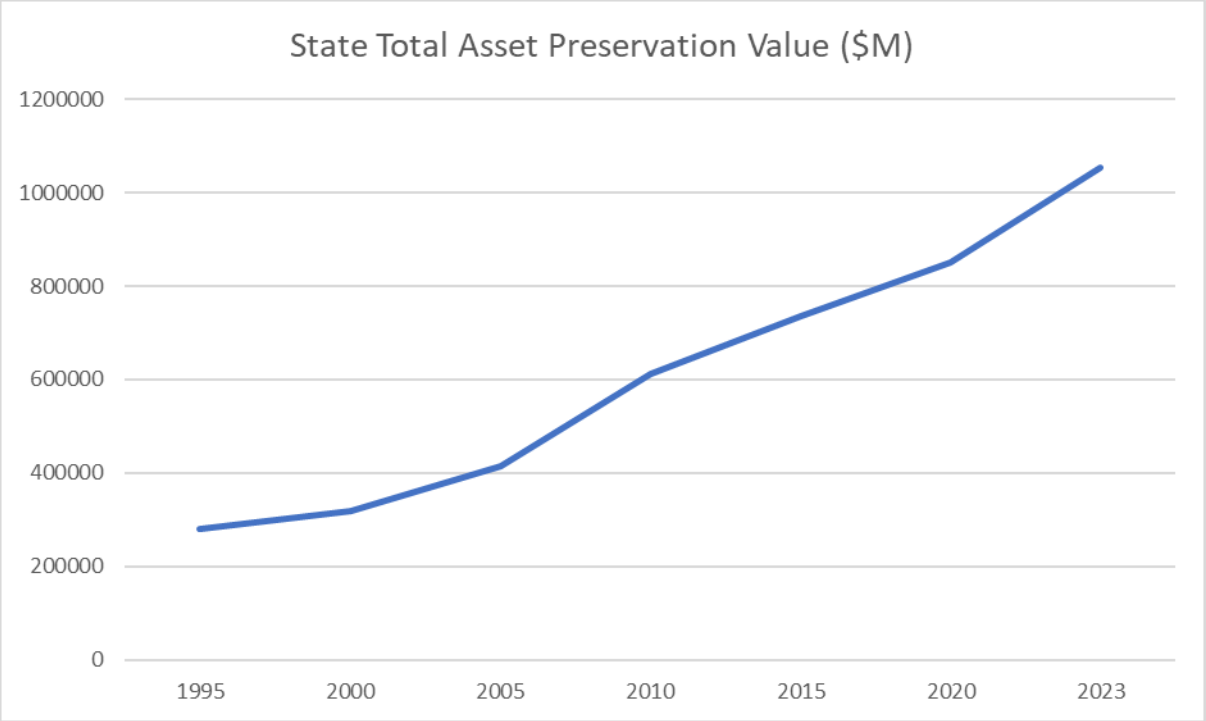
The Commonwealth road funds are distributed among local governments in proportion to their asset preservation needs.

In 2023-24, for example, the state total of asset preservation need was $1055.2m. Commonwealth road funding amounting to $136.0m was available for allocation, so each local government received approximately 12.9% of their assessed preservation need.

The remaining asset preservation need is part funded by Councils' own source revenue, and from other State and Commonwealth grants, but for most councils there remains an unfunded asset preservation gap. This suggests that the overall condition of the network is deteriorating.

The asset preservation need determined by the Commission is also used in the assessment of transport expenditure requirement for the allocation of general-purpose grants by the Local Government Grants Commission. Several other non-roads components are added to this asset preservation assessment, including aerodromes, lanes, and street lighting.

The asset preservation need determined by the Commission has also been used as the basis for allocating various other Commonwealth and State funding programs, further highlighting the need for local governments to ensure that their road inventory is accurate and up to date.



TRANSPARENCY

One of the Commonwealth Government's requirements was that the method of distributing the funds should be 'transparent' to local government. This requirement is met by providing every council with a simple statement showing how its asset preservation needs were calculated.

This statement allows local governments to work through the assessments for their council and make submissions to the Grants Commission if they feel that their needs have not been correctly assessed.

FUTURE REFINEMENT OF THE MODEL

The Local Government Grants Commission believes there is scope for further improvement to be made to the Asset Preservation Model, as additional data and improvements to the current data become available. The updating and review of the model is an ongoing process.

APPENDIX 1
Definition of built up areas

Built up areas are identified because roads within them generally involve greater expenditure than roads in non built up areas. This is because roads in built up areas:

- have high traffic volumes
- have large numbers of intersections, necessitating intersection treatments, pavement markings, signs, etc
- require kerbing for traffic control and or drainage
- require an asphalt surface where traffic volumes are high, or where noise reduction is important
- require underground drainage because surface drainage is impractical
- involve high cost of service alterations during reconstruction
- involve high costs because road works have to be carried out under heavy traffic, including a need for some works to be undertaken at night.

The following definition is intended to limit built up areas to localities where the above conditions prevail.

Residential localities, which have lots with areas less than 0.45 ha, and commercial and industrial areas that meet the following criteria are classed as built up:

- at least half the blocks are developed
- existing roads have a minimum standard of a gravel road for old subdivisions and a sealed road for new subdivisions.

Areas serving sporting complexes, schools and caravan parks are classed as built up where:

- they are located in an area which is developed as residential; or
- the existing roads serving these facilities are already sealed and kerbed.

A road connecting two built up areas is classed as a road in a built up area where the connecting road is less than 300m in length.

Appendix 2
Cost regions

Appendix 3
Minimum standard regions

Appendix 4
Variables used in the asset preservation model

Appendix 5
Equations used in the asset preservation model

REFERENCES

[1] Australian Road Research Board, 'Study into Assessment of Inherent L.G.A. Cost Disabilities for Roads', P J Mulholland, ARRB, 1989, Melbourne.

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[9] Engineering Road Note No. 9, 'Procedure for Thickness Design of Flexible Pavements' 1988, Main Roads Western Australia, Perth.

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[11] Task Force on Road Funding, 1991, 'Report on Road Funding Needs and Issues in Western Australia' Main Roads Western Australia, Perth.