Cobar
Local Infrastructure Contributions Plan 2012

Prepared by

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1.1 Overview of this Plan

Cobar Shire is likely to receive development in the future that impacts on the quality and standard of Local Infrastructure provided by Cobar Shire Council (**Council**). Local Infrastructure includes recreation facilities, roads and community facilities.

Council wishes to promote economic development of the Shire, but also considers that it is important for new developments to make a reasonable contribution toward the provision of new and / or augmented Local Infrastructure to meet the demands of those developments.

Subdivision 3 of Division 6 of Part 4 of the Environmental Planning and Assessment Act 1979 (**EP&A Act**) authorises a Consent Authority to grant consent to a proposed development subject to a condition requiring a (section 94) contribution or a (section 94A) levy for:

- the provision, extension or augmentation of Local Infrastructure in the area; or
- the recoupment of the cost of existing Local Infrastructure in the area.

Where the Consent Authority is a council or an Accredited Certifier, a Local Infrastructure contribution may be imposed on a development only if it is of a kind allowed by and determined in accordance with a contributions plan, such as this Plan.

This Plan identifies the projected demands for Local Infrastructure arising from expected development in Cobar Shire. The Plan authorises Council or an Accredited Certifier to impose conditions on Development Consents or Complying Development Certificates requiring:

- section 94 contributions from Heavy Haulage Developments;
- section 94 contributions from residential accommodation developments on land that was the subject of a section 94 condition on the approval for the earlier subdivision of that land; and
- section 94A levies for other types of development described in Table 1.2 of this Plan.

This Plan has been prepared in accordance with the EP&A Act and Environmental Planning and Assessment Regulation 2000 (**EP&A Regulation**); and having regard to the latest Practice Notes issued by the NSW Department of Planning and Infrastructure.

This Plan sets out:

- the anticipated demands for Local Infrastructure arising from expected development in Cobar Shire and the relationship or nexus between that development and the Local Infrastructure that is required to meet those demands;
- the formulas used to determine section 94 contributions;
- the section 94 contribution rates and section 94A levy rates for the anticipated types of development in the area;
- maps showing the location of the Local Infrastructure items proposed to be provided by Council supported by a works schedule setting out an estimate of their cost and staging; and
- the administrative and accounting arrangements applying to contributions that are required by this Plan.

1.2 Summary of contribution and levy rates

Table 1.1 Monetary contribution rates for development

Contribution type / Development type	Levy rate
Section 94 contributions	
A. Residential Accommodation development (excluding subdivision) on land where an earlier subdivision approval of that land contained a condition requiring contributions under section 94 of the EP&A Act	$2,196 per dwelling
B. Heavy haulage development	$0.15 per ESA per kilometre of sealed road $0.55 per ESA per kilometre of gravel road
Section 94A levies	
C. Development that is not Type A or B, and which has a proposed cost of carrying out the development:	
▪ is more than $100,000 and up to and including $200,000	0.5% of that cost
▪ is more than $200,000	1% of that cost

Notes:

(1) Also refer to development exclusions identified in clause 2.8

(2) ESA means Equivalent Standard Axle

1.3 Calculating a contribution under this Plan

Contribution rates for different development types are shown in the tables in clause 1.2 of this Plan.

A development can only be the subject of either a section 94 contribution or a section 94A levy, not both.

1.3.1 Type A development

Under this Plan, section 94 contributions shall apply to Residential Accommodation development (excluding subdivision):

- on a lot created in accordance with an earlier subdivision approval that contained a condition requiring contributions under section 94 of the EP&A Act; and
- that will or is likely to require the provision of or increase the demand for Local Infrastructure within the Cobar Shire.

The total section 94 contribution levied for any individual development is the contribution calculated using the rates shown in Table 1.1, less any allowance for assumed Local Infrastructure demand arising from existing Residential Accommodation developments on the land.

The allowance, if any, will be the contribution amount (using the rates shown in Table 1.1) for 1 dwelling for each developable lot or dwelling that was existing at the time of the Residential Accommodation development application.

The section 94 contribution rates shown in Table 1.1 reflect the contribution rates at the date that the Plan commenced. These rates are regularly adjusted for inflation in accordance with the provisions of clause 2.17 of this Plan. Applicants should inquire at the Council for information on the latest contribution rates.

1.3.2 Type B development

Section 94 contributions for Heavy Haulage Development are levied on the basis of:

- the location of the development site;
- the anticipated cost of upgrading and maintaining regional and rural roads;
- the periodic laden heavy vehicle movements generated by the development; and
- the length of sealed and gravel rural roads used by laden heavy vehicles generated by the development.

The formula for calculating a contribution under this Plan is included in clause 3.6.5 of this Plan.

The contribution rates values used in the examples reflect the contribution rates at the time that the Plan commenced. Rates are regularly adjusted for inflation in accordance with the provisions of clause 2.17 of this Plan. Applicants should inquire at the Council for information on the latest contribution rates.

1.3.3 Type C development

Under this Plan, section 94A levies apply to development that is not Type A or B development, and which also has a proposed cost of development in excess of $100,000.

The total section 94A levy for any individual development is the monetary contribution determined by applying the applicable levy rate in Table 1.1 to the proposed cost of the development.

There is no allowance for assumed existing infrastructure demand in the calculation of any section 94A levy.

Further details on the calculation of section 94A levies are included in clause 2.15 of this Plan.

2. Administration and operation of this Plan

2.1 Definitions used in this Plan

In this Plan, the following words and phrases have the following meanings:

Accredited Certifier has the same meaning as in the EP&A Act.

Affordable Housing has the same meaning as in the EP&A Act.

CEP means Council's Community Enhancement Program.

Complying Development has the same meaning as in the EP&A Act.

Complying Development Certificate has the same meaning as in the EP&A Act.

Consent Authority has the same meaning as in the EP&A Act but also includes an Accredited Certifier responsible for issuing a Complying Development Certificate.

Council means Cobar Shire Council.

CSP means Council's Community Strategic Plan

Development has the same meaning as in the EP&A Act.

> **development** means:
> (a) the use of land, and
> (b) the subdivision of land, and
> (c) the erection of a building, and
> (d) the carrying out of a work, and
> (e) the demolition of a building or work, and
> (f) any other act, matter or thing referred to in section 26 that is controlled by an environmental planning instrument,
> but does not include any development of a class or description prescribed by the regulations for the purposes of this definition.

Development Application has the same meaning as in the EP&A Act.

Development Consent has the same meaning as in the EP&A Act.

Dwelling has the same meaning as in the Standard Instrument.

EP&A Act means the Environmental Planning and Assessment Act 1979.

EP&A Regulation means the Environmental Planning and Assessment Regulation 2000.

ESA means the Equivalent Standard Axles, which is a measure used to describe the life of a section of road.

Heavy Haulage Development means any of the following developments that are defined in the Standard Instrument:

(a) extractive industry,

(b) forestry,

(c) landscape and garden supplies,

(d) industry,

(e) mining,

(f) rural industry,

(g) timber and building supplies, and

any other development that involves the movement of laden heavy vehicles.

LGA means local government area.

Local Infrastructure means public amenities and public services that are traditionally the responsibility of local government, excluding water supply or sewerage services.

Local Infrastructure Contribution includes a contribution imposed on a Development Consent by a Consent Authority under section 94 or section 94A of the EP&A Act.

Minister means the Minister for Planning.

Residential Accommodation has the same meaning as in the Standard Instrument.

> **residential accommodation** means a building or place used predominantly as a place of residence, and includes any of the following:
>
> (a) attached dwellings,
>
> (b) boarding houses,
>
> (c) dual occupancies,
>
> (d) dwelling houses,
>
> (e) group homes,
>
> (f) hostels,
>
> (g) multi dwelling housing,
>
> (h) residential flat buildings,
>
> (i) rural workers' dwellings,
>
> (j) secondary dwellings,
>
> (k) semi-detached dwellings,
>
> (l) seniors housing,
>
> (m) shop top housing,
>
> but does not include tourist and visitor accommodation or caravan parks.

Self-contained Dwelling has the same meaning as in State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

Seniors Housing has the same meaning as in the Standard Instrument.

Standard Instrument means the Standard Instrument – Principal Local Environmental Plan referred to in clause 3 of the Standard Instrument (Local Environmental Plans) Order 2006 amended from time to time in accordance with section 33A of the EP&A Act.

2.2 Local Infrastructure addressed by this Plan

The types of Local Infrastructure which are covered by this Plan are as follows:

- Roads and traffic facilities, including the upgrade and maintenance of existing roads and intersections.
- Social infrastructure, including upgraded parks, sportsfields and other recreation areas; and community facilities, including youth services, a regional events centre, and hall upgrades.

2.3 Name of this Plan

This Plan is called the Cobar Local Infrastructure Contributions Plan 2012.

2.4 Purposes of this Plan

The primary purpose of the Plan is to authorise:

- the Council, when granting consent to an application to carry out development to which this Plan applies; or
- an Accredited Certifier, when issuing a Complying Development Certificate for development to which this Plan applies,

to require a Local Infrastructure Contribution to be made towards:

- the provision, extension or augmentation of Local Infrastructure;
- the recoupment of the previous costs incurred in providing existing Local Infrastructure,

within the Shire of Cobar.

Other purposes of the Plan are:

- to provide the framework for the efficient and equitable determination, collection and management of Local Infrastructure Contributions;
- to ensure that development makes a reasonable contribution toward the provision of Local Infrastructure that is required to meet the demands of that development;
- to ensure that the existing community is not unreasonably burdened by the provision of Local Infrastructure required (either partly or fully) as a result of development in the area; and
- to ensure Council's management of Local Infrastructure Contributions complies with relevant legislation and practice notes, and achieves best practice in plan format and management.

2.5 Commencement of this Plan

This Plan commenced on 6 March 2013.

2.6 Land to which this Plan applies

This Plan applies to all land within the Cobar LGA.

2.7 Development to which this Plan applies

Except as provided for by clause 2.8, this Plan applies to both:

- Type A development, being Residential Accommodation development (excluding subdivision) on land where an earlier subdivision approval of that land contained a condition requiring contributions under section 94 of the EP&A Act; and that development will or is likely to require the provision of or increase the demand for Local Infrastructure within the Cobar Shire; and
- Type B development, being Heavy Haulage Development,

insofar as the Plan authorises the imposition of a requirement for a section 94 contribution.

This Plan also applies to Type C development - being other development that has a proposed cost of $100,000 or more - insofar as the Plan authorises the imposition of a requirement for a section 94A levy.

2.8 Development exempted from contributions under this Plan

This Plan does not apply to:

- Seniors Housing development (other than Self-contained Dwellings forming part of Seniors Housing development);
- development exempted from Local Infrastructure Contributions by way of a Direction made by the Minister for Planning under section 94E of the EP&A Act;

2.9 Relationship to other contributions plans

This Plan repeals Cobar Shire Council Developer Contributions Plan adopted by Council on 26 October 2000.

This Plan has no effect on any other contributions plan prepared and adopted by the Council under the EP&A Act.

Clause 2.26 of this Plan contains a transitional provision consequent upon the making of this Plan.

2.10 Formulas used for determining section 94 contribution rates applicable under this Plan

Under this Plan, section 94 contributions apply to Type A and B developments described in clause 2.7.

The section 94 contribution rates for these developments have been based on the costs and demand assessments for these development types.

Formulas used to determine contribution rates are described in clauses 3.5.1 and 3.6.5 of this Plan.

2.11 Local Infrastructure Contributions may be required as a condition of Development Consent

This Plan authorises Council or an Accredited Certifier, when determining an application for development or an application for a Complying Development Certificate relating to Type A or B development, and subject to other provisions of this Plan, to impose a condition requiring a **section 94** monetary contribution on that development to enable the provision of Local Infrastructure identified in this Plan.

This Plan also authorises the Council or an Accredited Certifier, when determining an application for development or an application for a Complying Development Certificate relating to Type C development, and subject to other provisions of this Plan, to impose a condition requiring the payment of a monetary contribution that is a **section 94A** levy.

This Plan also authorises the Council or an Accredited Certifier to require monetary contributions from development towards recouping the cost of the provision of existing Local Infrastructure that has been provided by the Council for or to facilitate the carrying out of development and which the development will benefit from.

A section 94A levy cannot be required in relation to development if a section 94 contribution is required in relation to that development.

The types of development affected by **either** section 94 contributions or section 94A levies, and the contribution rates applying to different development types, are identified in clauses 1.2, 2.7 and 2.8 of this Plan.

Accredited Certifiers should also refer to clause 2.16 of this Plan as to their obligations in assessing and determining applications subject to Local Infrastructure Contributions authorised by this Plan.

Unless otherwise specified, references to monetary contributions in this Plan include both section 94 and section 94A contribution types.

2.12 Dedication of land free of cost may be required as a condition of consent

This Plan authorises the Consent Authority, other than an Accredited Certifier, when granting consent to an application to carry out development to which this Plan applies, to impose a condition under section 94(1) of the EP&A Act requiring the dedication of land free of cost to Council towards the provision, extension or augmentation of Local Infrastructure as specified in the works schedule to meet the demands of the development, or the recoupment of the cost of Local Infrastructure previously provided within the area.

Wherever land required under this Plan is situated within a development site, the Consent Authority will generally require the developer of that land to dedicate the land required under this Plan free of cost.

The value of this land will be taken into account in determining the total monetary contributions required by the development under this Plan. The value of the land to be dedicated free of cost will be the *market value* of the land determined in accordance with the Land Acquisition (Just Terms) Compensation Act 1991.

2.13 Roadworks may be required to be undertaken in addition to contributions required under this Plan

The Cobar Shire road network has been constructed and is maintained by Council as necessary to ensure an acceptable standard of service. It is possible that these roads may or may not be able to accommodate additional heavy vehicle loading generated by Heavy Haulage Development at their current standard. New roads, or upgrades to sections of the existing road network, including ongoing maintenance, may be required to accommodate the additional heavy vehicle loading. Unformed, natural material roads may also be required to be sealed in order to accommodate the extra heavy vehicles.

Where a development requires works to the road network to be undertaken, the requirement will be by way of a condition imposed on the development consent under section 80A(1)(f) of the EP&A Act.

Where such development is a Type B development described in clause 2.7 of this Plan, that development will also be subject to a condition requiring payment of road maintenance contributions under this Plan both for the section(s) of new or upgraded road, and for the other sections of the road network to be used for haulage purposes.

2.14 Planning Agreements

Nothing in this Plan prevents the Council and a developer from entering into a Planning Agreement that either/both:

- requires the developer to make monetary contributions, undertake works or provide material public benefits for Local Infrastructure identified in this Plan; and
- excludes the operation of section 94 of the EP&A Act to the development.

A Planning Agreement for Type B developments may address, for example, a situation where the vehicle loadings in a proposed heavy haulage development can be more accurately measured by audited weighbridge receipts instead of the traffic classifier method included in this Plan.

2.15 Additional provisions for section 94A levies

This clause applies only in respect to the calculation of section 94A levies for Type C developments.

2.15.1 Determining the proposed cost of carrying out development

Section 94A levies are calculated as a percentage of the cost of development.

Clause 25J of the EP&A Regulation sets out how the proposed cost of carrying out development is determined:

25J Section 94A levy—determination of proposed cost of development

(1) The proposed cost of carrying out development is to be determined by the consent authority, for the purpose of a section 94A levy, by adding up all the costs and expenses that have been or are to be incurred by the applicant in carrying out the development, including the following:

(a) if the development involves the erection of a building, or the carrying out of engineering or construction work—the costs of or incidental to erecting the building, or carrying out the work, including the costs (if any) of and incidental to demolition, excavation and site preparation, decontamination or remediation,

(b) if the development involves a change of use of land—the costs of or incidental to doing anything necessary to enable the use of the land to be changed,

(c) if the development involves the subdivision of land—the costs of or incidental to preparing, executing and registering the plan of subdivision and any related covenants, easements or other rights.

(2) For the purpose of determining the proposed cost of carrying out development, a consent authority may have regard to an estimate of the proposed cost of carrying out the development prepared by a person, or a person of a class, approved by the consent authority to provide such estimates.

(3) The following costs and expenses are not to be included in any estimate or determination of the proposed cost of carrying out development:

(a) the cost of the land on which the development is to be carried out,

(b) the costs of any repairs to any building or works on the land that are to be retained in connection with the development,

(c) the costs associated with marketing or financing the development (including interest on any loans),

(d) the costs associated with legal work carried out or to be carried out in connection with the development,

(e) project management costs associated with the development,

(f) the cost of building insurance in respect of the development,

(g) the costs of fittings and furnishings, including any refitting or refurbishing, associated with the development (except where the development involves an enlargement, expansion or intensification of a current use of land),

(h) the costs of commercial stock inventory,

(i) any taxes, levies or charges (other than GST) paid or payable in connection with the development by or under any law,

(j) the costs of enabling access by disabled persons in respect of the development,

(k) the costs of energy and water efficiency measures associated with the development,

(l) the cost of any development that is provided as affordable housing,

(m) the costs of any development that is the adaptive reuse of a heritage item.

(4) The proposed cost of carrying out development may be adjusted before payment, in accordance with a contributions plan, to reflect quarterly or annual variations to readily accessible index figures adopted by the plan (such as a Consumer Price Index) between the date the proposed cost was determined by the consent authority and the date the levy is required to be paid.

(5) To avoid doubt, nothing in this clause affects the determination of the fee payable for a development application.

2.15.2 Cost Summary Report must accompany development application

A Development Application or application for a Complying Development Certificate shall be accompanied by a Cost Summary Report, prepared at the applicant's cost, setting out an estimate of the proposed cost of carrying out the development.

The Cost Summary Report shall be in accordance with Appendix B.

Council will validate all Cost Summary Reports before they are accepted using a standard costing guide or other generally accepted costing method. Should the costing as assessed by Council be considered inaccurate, Council may, at its sole discretion and at the applicant's cost, engage a person referred to in clause 2.15.3 to review a Cost Summary Report submitted by an applicant.

2.15.3 Who may provide a Cost Summary Report?

The following persons are approved by the Council to provide an estimate of the proposed cost of carrying out development:

- where the applicant's initial estimate of the proposed cost of carrying out the development is less than $1,000,000 – any building industry professional; or
- where the applicant's initial estimate of the proposed cost of carrying out the development is $1,000,000 or more – a quantity surveyor who is a registered member of the Australian Institute of Quantity Surveyors.

2.16 Obligations of Accredited Certifiers

2.16.1 Complying Development Certificates

This Plan requires that, in relation to an application made to an Accredited Certifier for a Complying Development Certificate:

- the Accredited Certifier must, if a Complying Development Certificate is issued, impose a condition requiring a monetary contribution, if such a contribution is authorised by this Plan;
- the amount of the monetary contribution that the Accredited Certifier must so impose is the amount determined in accordance with this clause; and
- the terms of the condition be in accordance with this clause.

Procedure for Accredited Certifier to determine the amount of the section 94 monetary contribution for Type A or B development

1. If, and only if specified in writing in the application for a Complying Development Certificate, the applicant has requested a credit under section 94(6) of the EP&A Act or an exemption or part or the whole of the development under clause 2.8 of this Plan, the Accredited Certifier must:

    (a) make a request in writing to the Council for the Council's advice on whether the request is granted, or the extent to which it is granted; and

    (b) in calculating the monetary contribution, comply with the Council's written advice or if no such advice has been received prior to the granting of the Complying Development Certificate, refuse the applicant's request.

2. Determine the unadjusted section 94 contributions in accordance with the rates included in Table 1.1 of this Plan taking into account any exempt development specified in clause 2.8 and any advice issued by the Council under paragraph 1(b) above.

3. Adjust the calculated contribution in accordance with clause 2.17 to reflect the indexed cost of the provision of infrastructure.

4. Subtract any credit advised by the Council under paragraph 1(b), or any assumed Local Infrastructure demand relating to existing Type A development.

Procedure for Accredited Certifier to determine the amount of the section 94A levy for Type C development

1. Ensure that the development is not subject to a section 94 contribution under this Plan or any other section 94 contributions plan adopted by the Council and that remains in force.

2. Determine the section 94A levy in accordance with the Cost Summary Report prepared by or on behalf of the applicant under clause 2.15.2 of this Plan; the levy rates included in Table 1.1 of this Plan; and taking into account any exempt development specified in clause 2.8.

Terms of a section 94 condition or section 94A condition

The terms of the condition required by this clause are as follows:

Contribution

The developer must make a monetary contribution to Cobar Shire Council in the amount of $[insert amount] *for the purposes of the Cobar Local Infrastructure Contributions Plan 2012.*

Indexation

The monetary contribution must be indexed between the date of this certificate and the date of payment in accordance with the following formula:

$$\frac{\$C_C \quad X \quad CPI_P}{CPI_C}$$

Where:

C_C is the contribution amount shown in this certificate expressed in dollars

CPI$_P$ is the Consumer Price Index (All Groups Index) for Sydney *as published by the Australian Statistician at the time of the payment of the contribution*

CPI$_C$ is the Consumer Price Index (All Groups Index) for Sydney *as published by the Australian Statistician which applied at the time of the issue of this certificate*

Note: The contribution payable will not be less than the contribution specified in this certificate.

Time for payment

Deferred payments of contributions will only be accepted where the applicant has obtained approval from the Council under clause 2.20 of this Plan.

For development involving subdivision – the contribution must be paid prior to the release of the subdivision certificate (linen plan).

For development not involving subdivision, but where a Construction Certificate is required, the contribution must be paid prior to the release of the Construction Certificate.

For other development, the contribution must be paid prior to the commencement of the use or occupation of premises.

For development described as Type B development under Cobar Local Infrastructure Contributions Plan 2012, monetary contributions will be paid within 28 days of the developer's receipt of a quarterly notice from the Council stating the contribution amount pursuant to the previous quarter's heavy haulage vehicle activity.

Works in kind agreement

This condition does not need to be complied with to the extent specified in a works in kind agreement between the developer and the Council as allowed by clause 2.21 of Cobar Local Infrastructure Contributions Plan 2012.

2.16.2 Construction Certificates

It is the responsibility of an Accredited Certifier issuing a Construction Certificate for building work or subdivision work to ensure that each condition requiring the payment of a monetary contribution before work is carried out has been complied with in accordance with the Complying Development Certificate.

The Accredited Certifier must ensure that the applicant provides a receipt (or receipts) confirming that contributions have been fully paid and copies of such receipts must be included with copies of the certified plans provided to the Council in accordance with clause 142(2) of the EP&A Regulation. Failure to follow this procedure may render such a certificate invalid and expose the certifier to legal action.

The only exceptions to the requirement are where a work in kind, material public benefit, dedication of land and/or deferred payment arrangement has been agreed by the Council. In such cases the Council will issue a letter confirming that an alternative payment method has been agreed with the applicant.

2.17 Indexation of section 94 contribution rates included in this Plan

In accordance with clause 32(3)(b) of the EP&A Regulation, Council may, without the necessity of preparing a new or amending contributions plan, make changes to the section 94 contribution rates set out in this Plan to reflect annual variations to the Consumer Price Index (All Groups Index) for Sydney as provided by the Australian Bureau of Statistics.

2.18 Indexation of monetary contributions required by a condition imposed under this Plan

A Local Infrastructure Contribution that is a monetary contribution required by a condition of Development Consent imposed in accordance with this Plan will be indexed between the date of the grant of the Development Consent and the date on which the contribution is paid in accordance with the Consumer Price Index (All Groups Index) for Sydney as provided by the Australian Bureau of Statistics.

2.19 Timing of payment of monetary contributions required under this Plan

A monetary contribution required to be paid by a condition imposed in accordance with this Plan is to be paid at the time specified in the condition.

Generally, the condition will provide for payment as follows:

- For development involving subdivision – the contribution must be paid prior to the release of the subdivision certificate (linen plan).

- For development not involving subdivision, but where a Construction Certificate is required, the contribution must be paid prior to the release of the Construction Certificate.
- For other development, the contribution must be paid prior to the commencement of the use or occupation of premises.
- For Type B development, monetary contributions will be paid within 28 days of the developer's receipt of a quarterly notice from the Council stating the contribution amount pursuant to the previous quarter's heavy haulage vehicle activity.

2.20 Policy on deferred or periodic payments

The applicant or any other person entitled to act upon a Development Consent containing a monetary contribution condition imposed in accordance with this Plan may apply in writing to the Consent Authority, other than an Accredited Certifier, under section 96 of the EP&A Act to modify the condition to provide for the deferred or periodic payment of the contribution.

If it agrees to a deferred or periodic payment request, Council will require the applicant to provide a bank guarantee by a bank or a financial institution for the full amount of the contribution or the outstanding balance.

2.21 Material public benefits and dedication of land offered in part or full satisfaction of contributions

A person may make an offer to the Council to carry out works or provide another kind of material public benefit or dedicate land, in lieu of making a contribution in accordance with a condition imposed under this Plan.

Any offer shall be made in writing to the Council.

If the offer is made prior to the issue of a development consent then the offer must be made by way of a planning agreement, and the Council will consider the request as part of its assessment of the development application.

The Council will take into account the following matters in deciding whether to accept an offer of material public benefit:

- the overall benefit of the proposal; and
- the financial implications for cash flow and the continued implementation of Council's road maintenance program (including whether the council would need to make up for any shortfall in contributions by its acceptance of the offer).

If Council approves the offer then it will require the applicant to enter into a written agreement for the provision of the works in a suitable time period. If the offer is made by way of a draft planning agreement under the EP&A Act, the council will require the agreement to be entered into and performed via a condition in the development consent.

The value of any land or material public benefit offered by the applicant may, at Council's discretion, be used to offset monetary contributions applicable to the development under this Plan. The value of any land or material public benefit will be determined by a process agreed to between the Council and the applicant.

2.22 Policy on timing of provision of road infrastructure identified in this Plan

This Plan addresses the provision, upgrading and maintenance of the Shire's road network that is required as a result of Type B development.

Type B developments can be located anywhere within the Shire. Similarly, Council is responsible for the provision and maintenance of the vast majority of roads existing in the Shire.

Council will therefore expend contributions collected, and deliver roads infrastructure, under this Plan in a manner that fairly takes account of:

- the location of the contributing Type B developments;
- the likely impact of heavy haulage movements from those developments on specific sections of the Shire road network; and
- the requirement to provide the public amenities and services within a reasonable time.

Council will therefore plan the expenditure of funds collected under this Plan on an annual basis in response to these factors.

The planned expenditure program will be published in Council's draft Management Plan, which will allow for public input into proposed spending priorities.

2.23 Pooling of monetary contributions

This Plan authorises monetary contributions paid for different purposes in accordance with the conditions of various Development Consents authorised by this Plan and any other contributions plan approved by the Council from time to time (whether or not such a plan is one that is repealed by this Plan) to be pooled and applied progressively for those purposes.

The priorities for the expenditure of pooled monetary contributions under this Plan are the priorities for works as set out in the works schedule to this Plan.

2.24 Accountability and access to information

Council is responsible for the maintenance of an accurate and up-to-date register of all Local Infrastructure Contributions. This register details:

- each Development Consent which contains a Local Infrastructure Contribution condition;
- the nature and extent of the contribution required by the condition; and
- the date on which a Local Infrastructure Contribution required by any such condition was received, and its nature and extent.

The register is available for inspection by any person at Council's offices free of charge at any time during normal office hours.

The Council must also maintain accounting records that indicate:

- the various kinds of Local Infrastructure for which expenditure is authorised by the Plan;
- the monetary contributions received under the Plan, by reference to the various kinds of Local Infrastructure for which they have been received;
- in respect of monetary contributions paid for different purposes, the pooling or progressive application of the contributions for those purposes, in accordance with any requirements of the Plan or any Ministerial direction under the EP&A Act; and

- the amounts spent in accordance with this Plan, by reference to the various kinds of Local Infrastructure for which they have been spent.

2.25 Review of Plan without the need for public exhibition

Pursuant to clause 32(3) of the EP&A Regulation, Council may make certain minor adjustments or amendments to the Plan without prior public exhibition and adoption by Council. Minor adjustments could include minor typographical corrections, amendments to rates resulting from changes in the published indexes adopted by this Plan (see clause 2.17).

2.26 Savings and transitional arrangements

This Plan applies to both:

- a Development Application or application for a Complying Development Certificate submitted after the date on which this Plan took effect; and
- a Development Application or application for a Complying Development Certificate submitted, but not yet determined, on or before the date on which this Plan took effect.

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3. Local Infrastructure demands

Local Infrastructure Contributions are requirements imposed on the developers of land in a council area.

Contributions of land, money or works by developers are required by Council to meet the extra demand on Local Infrastructure resulting from new development.

Council has designed its development contributions system (including this Plan) in a way that responds to the locations, types, and scale of expected development in the Cobar LGA in the future.

This Part discusses the existing and future context for development in Cobar LGA, and describes the relationship between anticipated development and future infrastructure needs in Cobar LGA.

3.1 Cobar's expected development

Settlement pattern

The Shire of Cobar (that is, Cobar LGA) is situated about 700kms north-west of Sydney and 650kms north of Canberra and covers an area of around 45,600 square kilometres.

Cobar LGA had a population of approximately 5,200 residents in 2011, the majority of whom lived in the town of Cobar. Other communities in the LGA include Euabalong and Euabalong West, Murrin Bridge, Mount Hope, Nymagee and Murrin Bridge.[1]

Development profile

Economic development in Cobar LGA is built on mining – copper, lead, silver, zinc, gold – and pastoral industries. Over a third of the workforce is employed in the mining and manufacturing industries, 9.5 percent are employed in agriculture and retail is the next largest employer in the Shire. Tourism is an important contributor to the local economy that the community has expressed a desire to expand this industry.[2]

In the five years to February 2012, more jobs were generated in mining in the Western NSW region than any other industry. During the same period, agriculture, forestry and fishing jobs fell significantly. High growth industries over the next 5 years are expected to be in service industries and construction. In Cobar, mining is still expected to be the primary growth sector, however this will be highly dependent on the prices of the commodities mined in the region and the world economy generally.[3]

Assuming economic conditions remain favourable, new and expanded mines and related industrial and supplier enterprises may be expected to establish in Cobar LGA in the future.

Housing and other development that serves or otherwise responds to local economic growth is also expected to occur in Cobar LGA in the future. Potentially this will include:

- Various types of worker accommodation including new dwellings and extensions to existing dwellings.
- New and expanded tourism and visitor accommodation, including motels, serviced apartments and caravan parks.

[1] Community Strategic Plan – Cobar Shire 2025, page 5
[2] Ibid., pages 6, 7
[3] Economic Development Strategy – Cobar Shire Council 2012-2016, page 9

- Retail and commercial services to support the extra workers' and local businesses' needs

Household occupancy rates

This Plan authorises the levying of section 94 contributions on certain Residential Accommodation development, being Type A development (refer clause 2.7).

The formula for the calculation of the contribution for Type A developments requires the per person contribution rate to be converted to a per dwelling rate.

This conversion will be based on an assumed occupancy rate for the dwellings that are to be levied a section 94 contribution. The assumed occupancy rate is the gross household occupancy rate recorded for private occupied dwellings at the 2011 Census – being 2.4 persons per dwelling.[4]

3.2 Local Infrastructure demands generated by expected development

The Cobar Shire LGA has been experiencing development and has a vibrant local economy.

Future development will impact on the need and demand for Local Infrastructure provided by the Council.

Council has identified that expected future development will generate increased demand on, and therefore a need to upgrade, the following Local Infrastructure addressed by this Plan; namely:

- Roads and traffic facilities as a result of Type B developments (refer clause 2.7), specifically the accelerated depreciation costs of roads assets generated by laden heavy haulage vehicles.

- Social infrastructure.

More detail on the demand for Local Infrastructure, the relationship of the Local Infrastructure with the expected development, and the strategies for the delivery of the Local Infrastructure are discussed in the remainder of Part 3 of this Plan.

3.3 How will the Local Infrastructure that is generated by development be delivered?

Council and Accredited Certifiers will require section 94 contributions or section 94A levies from developers toward provision of the Local Infrastructure identified in this Plan.

The requirements will generally be in the form of monetary contributions, although where the Consent Authority is the Council, contributions of land may be required instead of or in addition to monetary contributions.

Developers may choose to provide, subject to the agreement of the Council, one or more Local Infrastructure items identified in this Plan as works-in-kind or provide another type of material public benefit as means of satisfying Local Infrastructure Contributions required under the Plan. If so, the developer must comply with the other relevant provisions of this Plan, particularly clause 2.21.

[4] 2011 Census QuickStats, accessed on 17 July 2012 at http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/LGA11750?opendocument&navpos=220

3.4 Council's strategic infrastructure issues, values and priorities

Council in 2011 prepared a Community Strategic Plan (**CSP**). CSPs are part of the Integrated Planning and Reporting framework being rolled out throughout all NSW councils. Other key documents in the framework are the Community Engagement Strategy, the 4 Year Delivery Program, the Annual Operational Plan and the Resourcing Strategy.

The CSP is central to the framework – it both informs and is informed by the other documents. The purpose of the CSP is to identify the community's main priorities and aspirations for the future and to plan strategies for achieving these goals. In doing this, the planning process will consider the issues and pressures that may affect the community and the level of resources that will realistically be available to achieve its aims and aspirations.[5]

The contents of a council's Local Infrastructure Contributions plan should be informed by the values and aspirations expressed in its CSP. The anticipated revenue from this Plan informs the Resourcing Strategy. This Plan therefore integrates development funding matters into the Council's CSP and associated documents.

The CSP identified that 'access to quality and well maintained infrastructure' as one of four community values underpinning that plan.

The CSP also identified that a key challenge was the ability of Council and the community to maintain existing infrastructure and services, whilst making improvements or expand them, given limited financial resources. Cobar experiences both the drift of people leaving the area to other regional and metropolitan centres, as well as the phenomenon of fly-in-fly-out (FIFO) and drive-in-drive-out workers; and quality infrastructure and service provision is required to attract and retain residents.[6]

Key related issues include the following:

- The need to provide well-coordinated and adequate community services and facilities to service and assist families who are here and to encourage new residents to the LGA.
- Providing the necessary infrastructure to sustain and strengthen the area's key business sectors of mining, agriculture and tourism; such as adequate road and water networks.[7]

The CSP articulates a set of strategies and outcomes that respond to these issues, including several relating to infrastructure planning and provision, and to local governance. They include the following:

Outcomes:

- A healthy and active community
- A safe and clean community
- A well-funded Council that is well managed and well governed
- A clean and reliable water supply
- Good transport networks that increase the accessibility of Cobar and markets

Strategies:

- Develop a modern Section 94 Plan and Section 64 Plan to fund future infrastructure through developer contributions

[5] Planning and Reporting Guidelines for Local Government in NSW, prepared by The Division of Local Government, Department of Premier and Cabinet, January 2010, page 7
[6] Community Strategic Plan – Cobar Shire 2025, page 10
[7] Ibid.

- Investigate how to reduce the cost of Council's community facilities through partnerships with other organisations
- Minimise [financial] risk for Council and the community
- Provide and maintain safe and serviceable public facilities and infrastructure
- Increase the use of Council owned and other sporting and recreational facilities across the community
- Provide adequate infrastructure to care for older residents locally
- Improved water infrastructure across the Shire
- Seek ways to expand the sealed road network and improve and maintain the unsealed road network
- Provide and maintain safe and serviceable transport infrastructure including roads, footpaths, bike paths and airport
- Develop well designed and expanded playgrounds catering for all age groups
- Increase the range of community facilities and maintain those that we have to an appropriate standard
- Improve recreational facilities at the water reserves
- Maintain and expand where necessary, the stormwater and sewer networks
- Maintain and service villages[8]

This Plan seeks to implement the CSP in the following ways:

- By authorising contributions to be imposed on development that, when received, will be directed towards the strategic infrastructure priorities of the Council.
- By ensuring that developments contribute their fair share toward the cost of providing Local Infrastructure that is demanded by Cobar's communities.
- By assisting Council in achieving its Resourcing Strategy and Long Term Financial Plan targets.

Asset Management Plans

Asset Management Plans have been prepared for all Council's physical assets to outline the management of assets in the most cost effective manner, to monitor performance and to ensure that there is a link between the plans and Council's long term financial plans.

Council's goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers.[9]

Council has prepared the following Asset Management Plans that are relevant Local Infrastructure assets:

- Transport assets (mainly roads)
- Open space and recreation assets
- Buildings assets

[8] Community Strategic Plan – Cobar Shire 2025, pages 13-17
[9] Cobar Shire Council – Recreation Asset Management Plan, Version 2.0 April 2012, page 3

All of the plans show that, over the ten year plan period, the life cycle cost to provide the service category is in excess of the Council's planned life cycle expenditure for the service category. In some cases the difference between the cost and planned expenditure over the life cycle is significant. For example, for transport assets, the required spend is an average of $11.4 million per annum whereas the planned spend in year 1 of the asset management plan is $4.3 million. This reflects a '10 year sustainability index' of 0.39.[10]

Without funding from other areas, including Government grants and subsidies and development contributions, service levels will deteriorate.

This Plan supports Council's Asset Management Plans by securing a relatively minor stream of funding to ensure there is no worsening of the gap between life cycle projected costs and planned expenditure of Local Infrastructure as a consequence of future development.

3.5 Social infrastructure program for Type A and C developments

Council has prepared a Community Enhancement Program of works (or **CEP**).

The CEP was publicly exhibited and adopted by the Council on 28 June 2012. Its purposes are to:

- identify current and future social infrastructure needs of the Cobar LGA community; and
- assist in Council's negotiations with proponents of new mining developments for those proponents to make cash or in-kind contributions toward social infrastructure in the Cobar LGA.

The CEP represents Council's most up-to-date thinking on the priorities for new and augmented social infrastructure required to meet the need of the current and future Cobar community. The CEP works list shows the projects in the Shire that Council would like to invest in with the assistance of development contributions. Council's will also use contributions made to the CEP to leverage further grant funding.

The CEP works program, including location maps, is included in Part 4 of this Plan.

3.5.1 Calculation of the section 94 contribution rate

Section 94 contributions for social infrastructure will be levied on Type A developments only and applied to works identified in Part 4. Section 94A levies that are collected from Type C developments will also be directed toward the works program in Part 4.

Section 94 monetary contributions for Type A development are calculated on a per person or per resident basis, then factored up to a per lot or per dwelling amount.

The monetary contribution per person in a development containing residential dwellings or lots is calculated as follows:

$$\text{Contribution per resident (\$)} = \frac{\$INF}{P}$$

Where:

[10] Cobar Shire Council – Transport Asset Management Plan, Version 2.0 April 2012, page 1

$INF = the estimated total $ cost of all of the Cobar LGA social infrastructure items included in Part 4 ($4,749,220)

P = the estimated resident population (in persons) that will demand the social infrastructure - that is, the expected total future population of the Cobar LGA (5,200)

The per dwelling amount is determined by multiplying the per person contribution by the estimated increase in population as a result of the development (i.e. the assumed occupancy rate of 2.4 persons per dwelling discussed in clause 3.1 of this Plan).

The following workings show the calculation of the section 94 contribution rate:

$$\text{Contribution per resident (\$)} = \frac{\$INF}{P}$$

$$= \frac{\$4,749,220}{5,200}$$

$$= \$913.31$$

$$\text{Contribution per dwelling (\$)} = \$913.31 \times 2.4$$

$$= \$2,192 \text{ rounded}$$

3.6 Roads contributions rationale and infrastructure program for Type B developments

3.6.1 Basis for imposing contribution requirements on heavy haulage developments

The Shire of Cobar from time to time receives applications for developments that involve the haulage of material using heavy vehicles. These developments can be located anywhere within the rural areas of the Shire.

Concentrated heavy vehicle movements generated by these developments are known to accelerate deterioration of road pavements that were designed to meet demands of rural rather than industrial development.

Councils are not generally able to impose additional fees, charges or rates to meet the extra costs associated with accelerated deterioration of roads caused by heavy vehicle movements from developments, except for development contributions imposed under the EP&A Act.

Council therefore will require contributions from developments that generate significant heavy vehicle movements to meet the additional cost burden of providing and maintaining the affected roads in the Shire.

3.6.2 Public amenities and services that will be required as a result of expected Type B development

The local road network in Cobar LGA comprises regional and shire roads that are identified in Table 3.1 below.

Table 3.1 Cobar Shire Roads

Road type category	Road surface
Regional Roads	
R1	Sealed
R2	Gravel
R3	Natural earth
Shire Roads	
R4	Sealed
R5	Gravel
R6	Natural earth

For the purposes of this Plan:

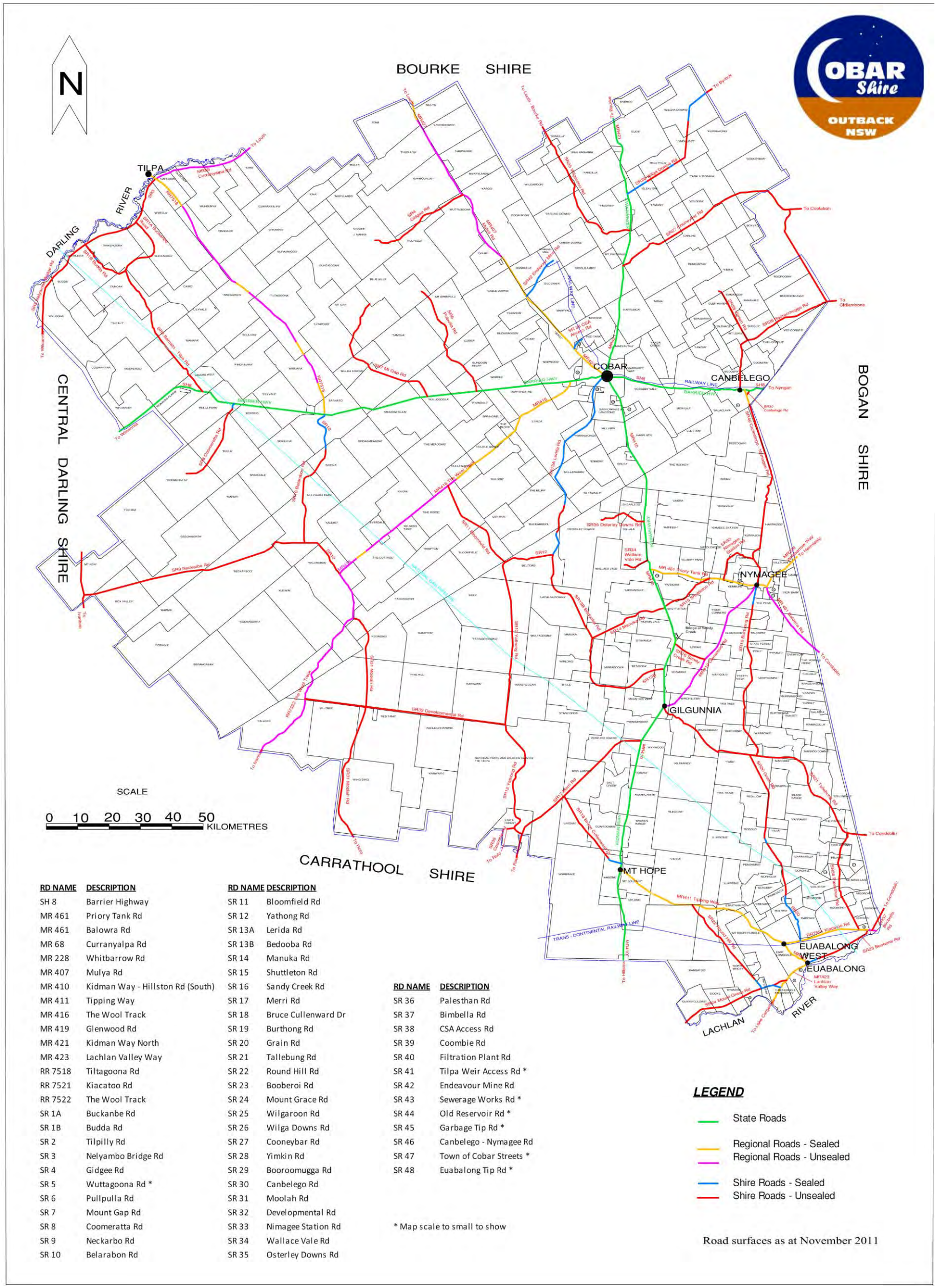
- Type R1 and R4 'sealed' roads may be suitable for haulage without being upgraded;
- Type R2 and R5 'gravel' roads may be suitable for haulage without being upgraded; and
- Natural earth roads are not to be used for haulage and should they be required for haulage developments will be subject to the conditions under section 80A(1)(f)of the EP&A Act requiring ongoing works to the road network during the life of the development. Therefore there are no contribution rates for R3 and R6 road types in this Plan.

The existing Shire road network is shown in Figure 1.

Cobar Shire may accommodate development in the future that will result in accelerated deterioration of the Shire road network. It is generally accepted that road surface deterioration is caused by heavy vehicles. This is further discussed in clauses below.

Consequently, higher numbers of heavy vehicles on roads means Council will need to find additional funds to meet the extra demands placed on the Shire's roads. These funds will be required to maintain the Shire's roads to an acceptable standard.

Future development of the area for the purposes of heavy haulage development can only be sustained by investment in the provision, extension and augmentation of road infrastructure. Council considers it appropriate that Heavy Haulage Developments make a reasonable contribution toward this infrastructure.



RD NAME	DESCRIPTION
SH 8	Barrier Highway
MR 461	Priory Tank Rd
MR 461	Balowra Rd
MR 68	Curranyalpa Rd
MR 228	Whitbarrow Rd
MR 407	Mulya Rd
MR 410	Kidman Way - Hillston Rd (South)
MR 411	Tipping Way
MR 416	The Wool Track
MR 419	Glenwood Rd
MR 421	Kidman Way North
MR 423	Lachlan Valley Way
RR 7518	Tiltagoona Rd
RR 7521	Kiacatoo Rd
RR 7522	The Wool Track
SR 1A	Buckanbe Rd
SR 1B	Budda Rd
SR 2	Tilpilly Rd
SR 3	Nelyambo Bridge Rd
SR 4	Gidgee Rd
SR 5	Wuttagoona Rd *
SR 6	Pullpulla Rd
SR 7	Mount Gap Rd
SR 8	Coomeratta Rd
SR 9	Neckarbo Rd
SR 10	Belarabon Rd

RD NAME	DESCRIPTION
SR 11	Bloomfield Rd
SR 12	Yathong Rd
SR 13A	Lerida Rd
SR 13B	Bedooba Rd
SR 14	Manuka Rd
SR 15	Shuttleton Rd
SR 16	Sandy Creek Rd
SR 17	Merri Rd
SR 18	Bruce Cullenward Dr
SR 19	Burthong Rd
SR 20	Grain Rd
SR 21	Tallebung Rd
SR 22	Round Hill Rd
SR 23	Booberoi Rd
SR 24	Mount Grace Rd
SR 25	Wilgaroon Rd
SR 26	Wilga Downs Rd
SR 27	Cooneybar Rd
SR 28	Yimkin Rd
SR 29	Booroomugga Rd
SR 30	Canbelego Rd
SR 31	Moolah Rd
SR 32	Developmental Rd
SR 33	Nimagee Station Rd
SR 34	Wallace Vale Rd
SR 35	Osterley Downs Rd

RD NAME	DESCRIPTION
SR 36	Palesthan Rd
SR 37	Bimbella Rd
SR 38	CSA Access Rd
SR 39	Coombie Rd
SR 40	Filtration Plant Rd
SR 41	Tilpa Weir Access Rd *
SR 42	Endeavour Mine Rd
SR 43	Sewerage Works Rd *
SR 44	Old Reservoir Rd *
SR 45	Garbage Tip Rd *
SR 46	Canbelego - Nymagee Rd
SR 47	Town of Cobar Streets *
SR 48	Euabalong Tip Rd *

* Map scale to small to show

LEGEND

- State Roads
- Regional Roads - Sealed
- Regional Roads - Unsealed
- Shire Roads - Sealed
- Shire Roads - Unsealed

Road surfaces as at November 2011

Figure 1 Shire Road Network

3.6.3 The impact of expected development on road infrastructure

Heavy vehicle use occasions greater road maintenance expenditure

As stated above, Council has a responsibility to maintain the Shire's road infrastructure to an acceptable standard. The standard is such to ensure the roads:

- are kept to an appropriate level of safety for the road user; and
- remain trafficable for the duration of their design life.

The Austroads publication *Guide to Pavement Technology: Part 2 Pavement Structural Design* (2010) documents that the performance of road pavements is "influenced significantly by the heavy end of the traffic spectrum". This means that generally, there is no requirement to account for cars or light commercial traffic as far as pavement loadings is concerned. The only effect light vehicles have on the road is in terms of capacity. The performance and subsequent failure of pavements is determinate on heavy vehicle axle passes, the axle loading and the configuration of these axles.

Consequently, any additional heavy vehicle loadings on a public road that may occur due to heavy haulage development will accelerate the deterioration of that road's pavement. The consequence of this additional heavy traffic is that in order for the roads authority (e.g. Council) to maintain the road pavement at its existing level of service, additional maintenance spending will be required due to the extra heavy traffic causing damage sooner.

This Plan is premised on the principle that it is reasonable to expect that additional heavy vehicle users of the road infrastructure should contribute their share of the additional upkeep.

A review of contribution plans from other NSW councils confirmed that there are various methodologies used to derive a reasonable monetary contribution from Heavy Haulage Developments towards road maintenance costs. The most common methods found are for the purposes of extractive industries and, derive a contribution that is based on the amount of material hauled per kilometre of haul route. This method works well for uses where the heavy vehicles have access to a weighbridge. A method based on heavy vehicle movements is used in this Plan. This is to enable Council to capture objective data on vehicles that may not require or have access to weighbridges.

Design life of a standard road

In pavement design, the damage caused by different axle groups is dependent on the axle spacing, the number of tyres / wheels per axle, the load on the group and the suspension of the vehicle (Austroads 1992, 2010). Generally, for design purposes axle groups are broken into 4 types namely:

- single axle with single wheels;
- single axle with dual wheels;
- tandem axels both with dual wheels; and
- tri-axels all with dual wheels.

For simplicity, the damage to the pavement associated with any particular axle load has been expressed as a 'standard axle'. The standard axle is a single axle with dual wheels that carries a load of 8.2 tonnes. Loads that cause similar damage to a pavement as a standard axle are shown in Table 3.2.

Table 3.2 Axle Load Configurations

Axle Configuration	Load (Kilo Newton)
Single axle, single tyre	53
Single axle, dual tyre	80
Tandem axle, dual tyre	135
Tri-axle, dual tyre	181
Quad-axle, dual tyre	221

For the purposes of design, all vehicle class configurations are converted to equivalent standard axles (**ESA**). The design life of a road pavement can also be expressed in ESA.

Appendix E of the Austroads Pavement Design Guide (2009) provides a methodology for the adoption of ESAs for axle group types in accordance with NSW conditions and road functional classes (A copy of the relevant sections of Austroads is provided in Appendix A of this Plan).

In order to use Austroads design tables, roads are provided with a functional class, Cobar Shire will assume a functional class 3 road that is defined as:

"A road whose main function is to form an avenue of communication for movements:

- between important centres and the Class 1 and Class 2 roads and /or key towns; or
- between important centres; or
- of an arterial nature within a town in a rural area."

Council uses the Austroads vehicle classification system to identify heavy vehicle traffic numbers from traffic counters. A copy of the vehicle classification system information used in this Plan is in provided in Appendix A. From this classification system, ESAs for each vehicle class can be calculated using Table E4 in *Appendix E of Austroads Design Guide (1992)*. The resulting total vehicle ESA for each class is provided in Table 3.3.

Table 3.3 Total Vehicle ESA per Vehicle Class

Vehicle class	Vehicle type (Austroads classification)	ESA per vehicle
1	Car	0
2	Light vehicle with towing/ commercial van	0
3	Two axle truck	1.2
4	Three axle truck	1.6
5	Four axle truck	2.2
6	Three axle articulated truck	1.8
7	Four axle articulated truck	2.2
8	Five axle articulated truck	2.8
9	Six axle articulated truck	2.8 (average)
10	Seven + axle articulated truck	3.4

For clarity, the above vehicles are assumed to be loaded. If higher order vehicle classes are used by the developer, those vehicles will be assumed to be class 10.

Using the information in Table 3.3 it can be seen that a loaded class 10 vehicle has almost three times the impact of a class 3 vehicle on a road pavement.

As mentioned above, the conversions in Table 3.3 are for the purposes of road design. Austroads Pavement Design Guide (1992 and 2010) provide methodologies for the design of both rigid and flexible pavements. Cobar Shire sealed roads are primarily flexible pavements with a sub-base, base and wearing surface of asphalt or bitumen. The wearing surface is generally due for replacement every 10 -12 years at current traffic use.

Austroads Pavement Design Guides contain design tables where pavement design life can be expressed in accordance with design traffic loadings. Thus a standard life of pavement can be expressed as ESAs. This means that the life of a pavement can be expressed as the total number of equivalent axles that should pass over it prior to replacement.

The standard life for the haul road types in Cobar expressed as ESA are:

- R1 and R4 (sealed) roads: approximately 2,000,000 ESA over 20 years
- R2 and R5 (unsealed) roads: approximately 500,000 ESA over 10 years

It is considered that all laden heavy vehicles on Cobar roads contribute to the deterioration of the road pavement. It is also understood from the above design methodology that a road pavement has a finite life in terms of ESA. Due to the geographical location of Cobar Shire, there are limited heavy vehicles on the road at present. Growth of heavy vehicle use on the local roads is limited to growth in the transportation of goods and haulage. Significant increases of heavy vehicles on Shire roads would only likely result from new or expanded heavy haulage development within or adjacent to the Cobar LGA.

Consequently, it is considered reasonable to expect heavy haulage development make a contribution per additional loaded vehicle on Shire roads.

3.6.4 Costs of maintaining rural roads over the design life

Council maintains the entire local road network as described in section 3.6.1. The local sealed road network is approximately 426 km. The gravel network is 289 km and the natural material network 1530 km.

The State roads (namely Kidman Way and Barrier Highway) are funded by the NSW Roads and Maritime Services and are therefore not covered by this Plan.

Council's current maintenance expenditure on the rural sealed road network (that is, R1 and R4 roads) is approximately $6,000 per kilometre. The maintenance costs for gravel (that is R2 and R5) roads is $4,100 per kilometre.

In addition to general maintenance, it is assumed that sealed roads will need to be resealed once during their design life. Reseals are necessary every 10 to 12 years to keep the level of service at an acceptable standard. The existing average cost to reseal the sealed roads is in the order of $36,000 per kilometre. Similarly, the cost to replace the surface of gravel roads is approximately $120,00 per kilometre.

Reconstruction of the road is required at the end of the design life and this work involves the total excavation and relaying of the sub-grade layers. The current approximate cost for reconstruction of sealed roads is $160,000 per km and gravel roads $120,000 per km. Reconstruction is usually required after 20 years for sealed and 10 years for gravel.

From this information the total cost of local sealed roads and gravel roads over their respective design lives can be approximated.

The total cost per kilometre of a sealed road is:

$maintenance x 18 yr + $reseal (@ 10th year) + $reconstruction (@20th year)

= $304,000 per km

The total cost per kilometre of a gravel road is:

$maintenance x 8 yr + $replace gravel (@ 5th year) + $reconstruction (@10th year)

= $272,800 per km

3.6.5 Calculation of a reasonable contribution

This Plan authorises that the monetary contribution from Type B developments should be made on a periodic (quarterly) basis and should be per ESA for the total distance of sealed and gravel roads anticipated to be travelled by the development's laden heavy vehicles.

It has been shown that the life of a road can be expressed in total ESA loads that can pass over the pavement until the pavement deteriorates to the point of needing reconstruction. As mentioned previously the life of a typical sealed road in Cobar is approximately 20 years and equivalent to 2,000,000 ESA. The life of a gravel road is approximately 10 years and equivalent to 500,000 ESA.

Total contribution amount for any Type B development

The calculation of the periodic contribution relating to any heavy haulage development is as follows:

$$\$C_{Period} = \frac{(\$RS_{Life}) \times ESA \times RS_{Length}}{RS_{Life}} + \frac{(\$RG_{Life}) \times ESA \times RG_{Length}}{RG_{Life}}$$

Where:

$\$C_{Period}$ is the monetary contribution payable by the development for the preceding period (i.e. preceding quarter) in dollars

$\$RS_{Life}$ is the standard cost of sealed road per kilometre over the design life in dollars, being $304,000

$\$RG_{Life}$ is the standard cost of rural gravel road per kilometre over the design life in dollars, being $272,800

ESA is the number of ESAs generated by the development in the preceding period (as recorded by the traffic classifier at the development exit)

RS_{Life} is the assumed design life of a sealed road, being 2,000,000 ESA

RG_{Life} is the assumed design life of a gravel road, being 500,000 ESA

RS_{Length} is the total length of sealed road that will be travelled by the development's laden heavy vehicles estimated at the time of the development application, in kilometres

RG_{Length} is the total length of gravel road that will be travelled by the development's laden heavy vehicles estimated at the time of the development application, in kilometres

Contribution rate for Type B development

The contribution rate - that is the contribution per ESA per kilometre of road used - can be expressed as follows.

The contributions for each road type per ESA can be expressed as:

$$\$R_{Rate} = \frac{\$R_{Life}}{R_{Life}}$$

Where

$\$R_{Rate}$ is the monetary contribution rate for each road type (sealed or gravel) per ESA per kilometre of road type in dollars

$\$R_{Life}$ is the standard cost of each road type (sealed or gravel) regional road per kilometre in dollars, being $304,000 for sealed and $272,800 for gravel

R_{Life} is the assumed design life of a standard road, being 2 million or 500,000 ESA

Using the above formula and values:

$\$RS_{Rate}$ = $0.15 per ESA per kilometre

$\$RG_{Rate}$ = $0.55 per ESA per kilometre

3.6.6 Worked examples

Worked example for Quarry 'A'

It is proposed to extract of sandstone from a quarry (Quarry 'A') located within Cobar Shire. The development application states that the quarry will be operational for approximately 20 years. The distance travelled on Cobar roads as shown from the quarry to the nearest State road is approximately 20 km of sealed road (RS) and 12 km of gravel road (RG).

A condition requiring a section 94 contribution per ESA exiting the site consistent with the rates shown in clause 1.2 is imposed on the development consent.

A traffic classifier has been installed at a location in the vicinity of the quarry exit. This classifier is to be reviewed on a quarterly basis. The first quarter results have been extracted and are shown in Table 3.4.

Table 3.4 Quarry 'A' traffic classifier results for 1st quarter of operation

	Vehicle class				
	6	**7**	**8**	**9**	**10**
Standard ESA per vehicle	1.1	2.2	2.8	2.8	3.4
Number of vehicles for the period	0	25	35	20	0

The monetary contribution required for the quarter is calculated as follows:

$$\$RS = \frac{304{,}000 \times \{(2.2 \times 25) + (2.8 \times 35) + (2.8 \times 20)\} \times 20}{2{,}000{,}000}$$

$$= 0.15 \times 209 \times 20$$

$$= \$627$$

$$\$RG = \frac{272{,}800 \times \{(2.2 \times 25) + (2.8 \times 35) + (2.8 \times 20)\} \times 12}{500{,}000}$$

$$= 0.55 \times 209 \times 12$$

$$= \$1379.40$$

Total contribution for 1st quarter = $627.00 + $1379.40

= $2006.40

Worked example for Quarry 'B'

Quarry 'B' is proposed near 'Yarroma', west of Nymagee. The developer has advised that the extracted material is to be hauled in two directions. Half the material is to go west along (MR461) Priory Tank Rd to Kidman Way and half is to go east along Priory Tank Road and (MR228) Whitbarrow Way out of the Shire.

A condition requiring a section 94 contribution per ESA exiting the site consistent with the rates shown in clause 1.2 is imposed on the development consent.

A traffic classifier is again located in the vicinity of the quarry gate and shows the same result for the quarter as shown in the previous example.

In the simplest case there are two distinct routes to be used by the development. One heads west the other east. The total of road length and type used to haul west and east can be identified and traffic allocated on a 50% basis in each direction.

Thus if west, RS = 20km along Priory Tank Rd ; RG = 0 km, then

$West = (0.15 x 104.5 x 20) + (0.55 x 104.5 x 0)

= $313.50

Where 104.5 is half the number of ESA

And similarly a calculation is possible for loads hauled east.

This proportional allocation can be used in any configuration that may arise.

3.6.7 Measures to ensure contributions are reasonable

To ensure section 94 contributions on Type B developments are reasonable, the following will be undertaken:

- The heavy haulage travel route(s) from the site will be identified at the time of development application and nominated as the total distance in kilometres that laden heavy vehicles will likely travel along RS and RG routes within Cobar Shire.
- The following will be required to be appropriately worded as conditions of consent for Type B developments:
  - A traffic classifier to be installed (at the applicant's cost) at a suitable location to classify and count the number of loaded heavy vehicles that enter or exit the development site over a set period. The Plan assumes quarterly notices to the operators of developments. The classifier will be used to determine the number of ESAs that are subject to contributions.
  - Responsibility for keeping the traffic classifier in good working order throughout the life of the development will rest with the operator of the development.
  - Council officers are to be provided access to the traffic classifier data on a regular (i.e. at least quarterly) basis.
  - In the event of the traffic data being corrupted, then the Council at its discretion may determine the levy for the preceding period.
- There may be circumstances where the likely length or lengths of roads to be used by laden heavy vehicles related to a Type B development is difficult to quantify. In such cases Council will determine the length or lengths of road to be levied based on the information submitted with the development application. It is the duty of the applicant to provide sufficient and accurate information on likely laden heavy vehicle use at the application stage.

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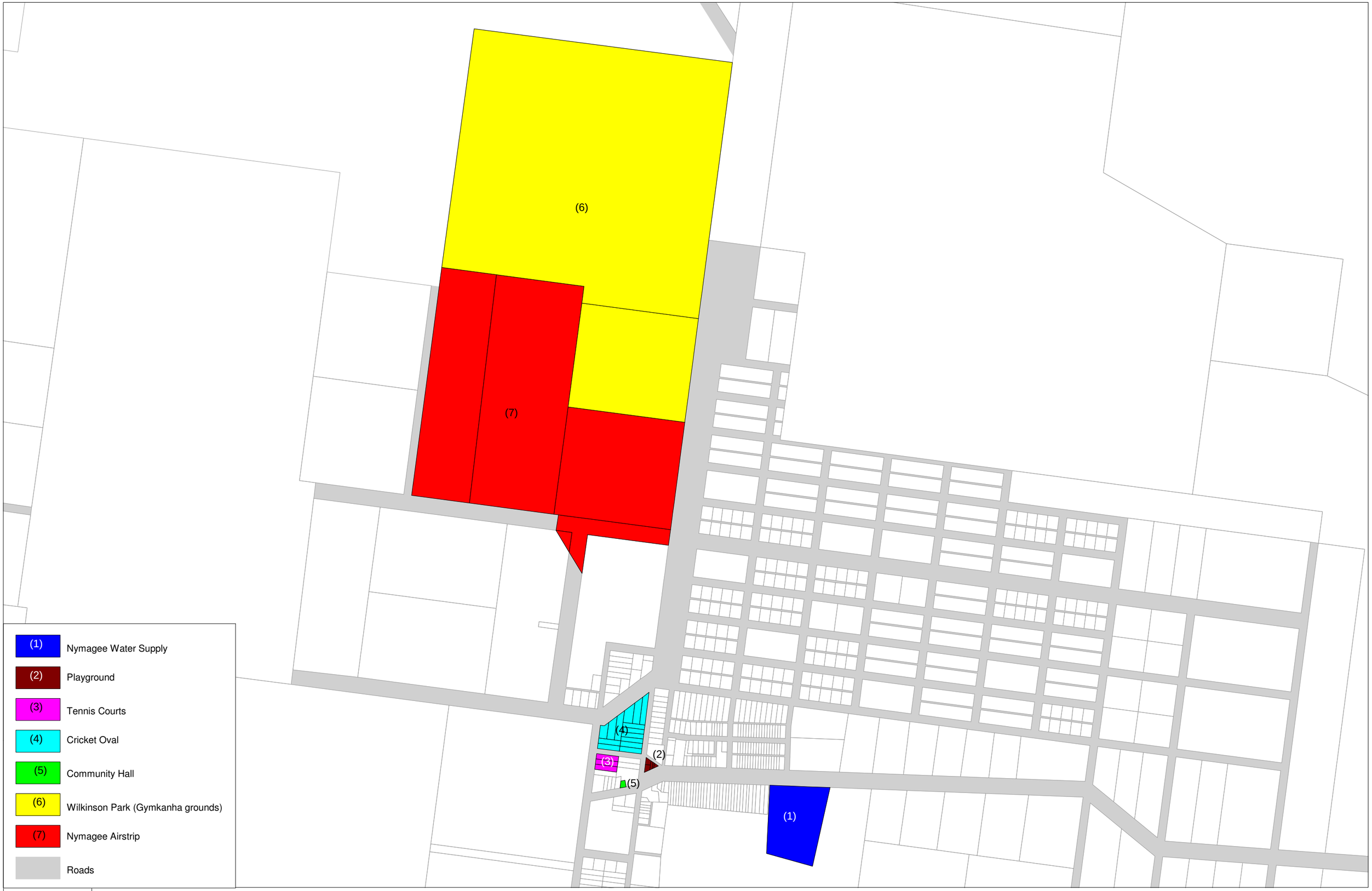
4. Works program for social infrastructure

Ref.	Project	Estimated Total Cost
	COBAR	
1	Develop plans for a major upgrade to skate park including investigation of potential half pipe and scooter facilities.	$30,000
2	Construct new skate park facility	$160,000
3	Construct a new toilet block at Dalton Park Race Course.	$80,000
4	Upgrade Newey Reserve including boat ramp	$15,000
5	Undertake weeding and replanting project at Newey Reserve with endemic species in recognition of those community members past and present who are significant in the Cobar community.	$10,000
6	Construct BMX track at Morelli Park.	$90,000
7	Employment of a Youth Development Officer	$100,000
8	Sponsor youth holiday activities	$7,000
9	Redevelopment of the stage at the town hall cinema	$25,000
10	Design/building/acquisition of New Men's Shed	$140,000
11	Regional Events Centre at Ward Oval	$2,800,000
12	Upgrade the runway for the long jump area at Ward Oval	$6,560
13	Renew concrete pitch and synthetic turf on Ward Oval No.2	$10,000
14	Install additional turf pitch section on Ward Oval No.1	$10,000
15	New shot put pad/circle	$1,160
16	Digital scoreboard for Ward Oval	$110,000
17	Purchase and install a PA system for Ward Oval	$10,000
18	Playground for Ward Oval	$50,000
19	Resurface netball courts	$50,000
20	Storage sheds for Ward Oval	$81,000
21	Develop a masterplan and designs for a new cultural centre in Cobar	$40,000
22	Develop plans for the extension of the Great Cobar Heritage Centre	$40,000
23	Installation water bubblers in Drummond Park	$10,000
24	Extend the signage along the Heritage walkway denoting endemic flora and fauna, history of the area	$20,000
25	Improve the promotion and protection of Devils Rock as a sacred Aboriginal Site.	$40,000
		$3,935,720
	MOUNT HOPE	
1	Development of an RTA approved rest area, including shade and picnic area and toilet amenities in Village.	$60,000
2	Erect historical plaque in remembrance of Tipping's bullock wagon at Round Hill.	$2,000
4	Development of a village email database, website and regular newsletter	$5,000
5	Install water system for outside of hall.	$10,000
		$77,000

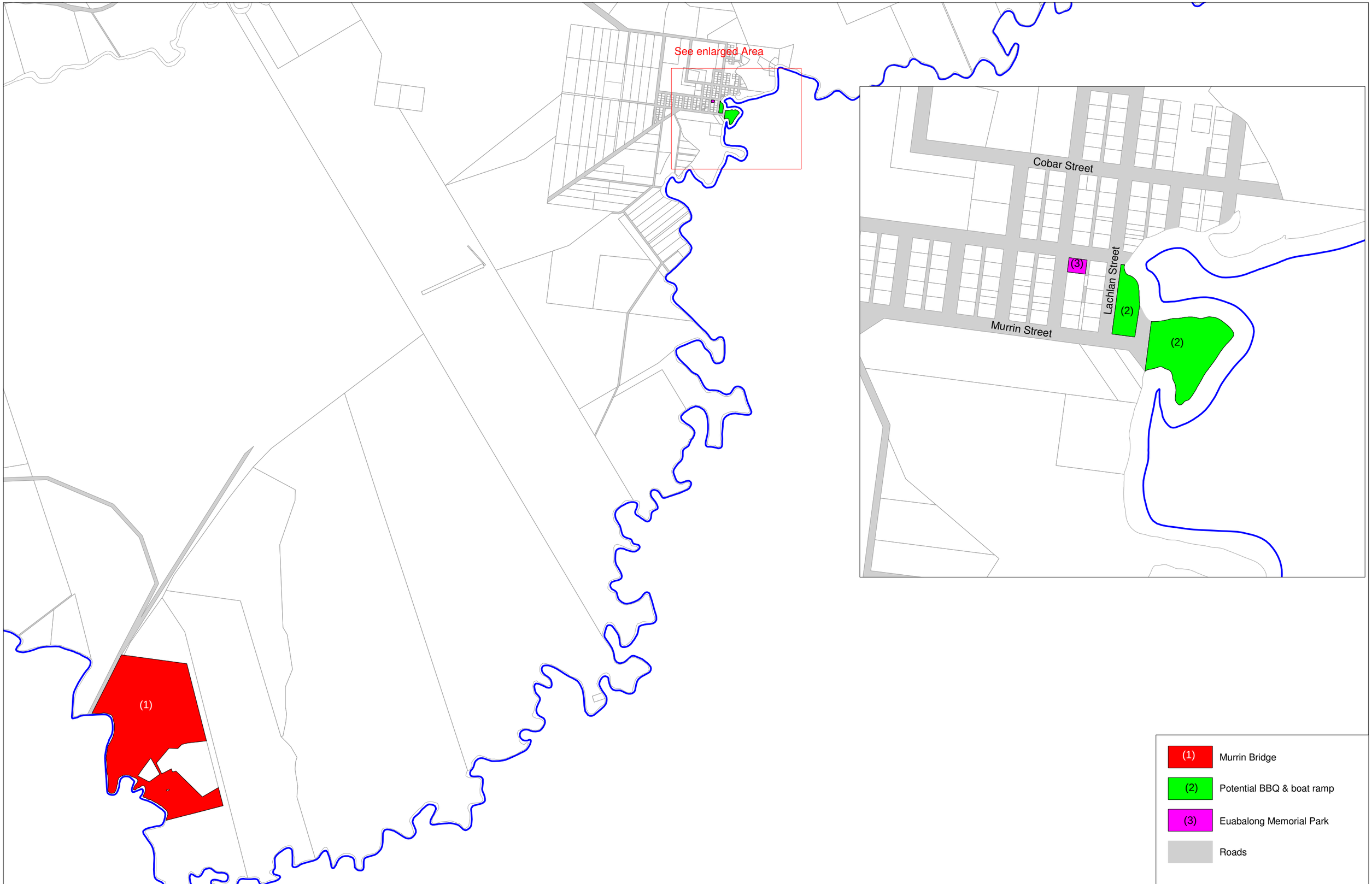
Ref.	Project	Estimated Total Cost
	NYMAGEE	
1	Upgrades to the community hall	$100,000
a)	Upgrade to community hall kitchen to meet building code and health standards	$30,000
b)	New disability toilet and sewerage pump	$20,000
c)	Landscaping	$25,000
d)	other	$25,000
2	Resealing and sealing of the tennis courts	$30,000
3	Installation of new fence around cricket oval	$20,000
4	Installation of a shade sail for playground	$25,000
5	Surfacing of Village Streets	$110,000
6	Assist with upgrade of Gymkanha grounds	$20,000
7	New lighting for Nymagee air strip	$20,000
8	Undertake report into the impacts of mining on the village and surrounds	$10,000
9	Provision of garden maintenance equipment to the Progress Association, e.g. lawn mower, whipper snipper etc.	$7,000
		$442,000
	EUABALONG/MURRIN BRIDGE AREA	
1	Development of a BBQ area and facilities at a suitable location near the river.	$25,000
2	Sponsorship of a community garden at Murrin Bridge	$10,000
3	Sponsorship of one annual aboriginal art exhibition/show (all arts included)	$20,000
4	Installation of a boat ramp at suitable location along the river	$20,000
5	Sponsorship of youth programs for school holidays	$7,000
6	Provision of new infrastructure and gardens at the Euabalong Memorial Park	$15,000
		$97,000
	KULWIN AREA	
1	Acquire parcel of land for community facilities	$7,500
2	Install two tennis courts	$50,000
3	Design and construct community hall	$140,000
		$197,500
	TOTAL COMMUNITY ENHANCEMENT PROGRAM	**$4,749,220**

Works Program for Social Infrastructure - Cobar

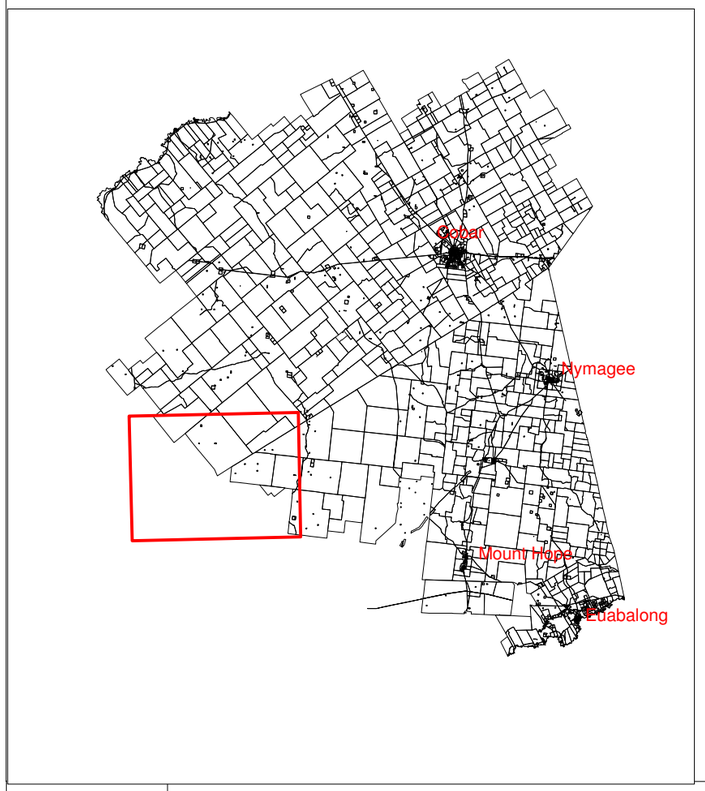
Works Program for Social Infrastructure - Mount Hope



Works Program for Social Infrastructure - Nymagee



Works Program for Social Infrastructure - Euabalong & Murrin Bridge



Potential Community Hall & Tennis Courts

Roads

Works Program for Social Infrastructure - Kulwin Area

Appendix A

Extracts from Austroads - Pavement Design: A Guide to the Structural Design of Road Pavements (1992)

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7 DESIGN TRAFFIC

7.1 GENERAL

This section contains procedures for assessing traffic loadings for the design of flexible and rigid pavements and for the design of overlays.

The general procedure used is shown in Figure 7.1. Detailed procedures depend on the type of traffic data available, the pavement type being designed and the design method adopted.

Features of traffic that largely determine performance are:

- The number of axle passes
- The axle loadings
- The axle configurations.

For all pavements, performance is influenced only by the heavy end of the traffic spectrum. No account need be taken of cars and light commercial vehicles as far as loadings are concerned though their existence may affect road capacity (Section 7.3).

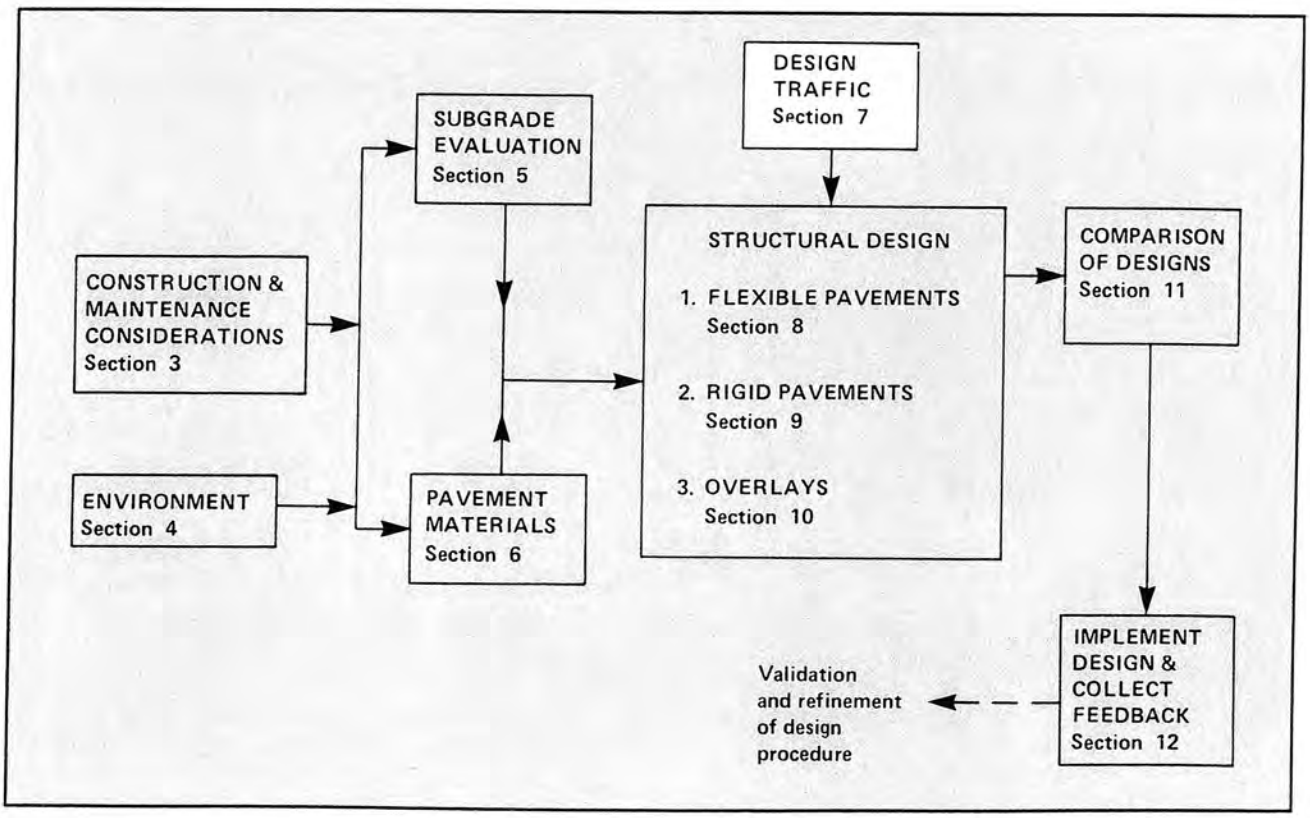
7.1.1 Axle Configurations and Equivalencies

The damage due to different axle groups is dependent on the axle spacing, the number of tyres per axle, the load on the group and the suspension. For design purposes, it is generally appropriate to consider axle groups in terms of the following four types:

- single axle with single wheels
- single axle with dual wheels
- tandem axles both with dual wheels
- tri-axles all with dual wheels

The relative damage associated with any particular axle load can be expressed in terms of relationship as shown in Table 7.1.

The standard axle is defined as a single axle with dual wheels that carries a load of 8.2 t. Loads on the axle configurations given above that cause the same amount of damage as the standard axle are given in Table 7.1.



For axle group loads other than those in Table 7.1, the damage caused is expressed as the number of standard axles which produce the same damage and is calculated as follows:

$$\text{No of standard axles for same damage} = \left[\frac{\text{Load on Axle Group}}{\text{Appropriate Load from Table 7.1}}\right]^{EXP}$$

Where the exponent EXP may vary depending on the type of pavement. Commonly a value of 4 is adopted for the exponent in which case the number of standard axles for the same damage is termed the number of equivalent standard axles (ESAs).

Tandem axles which have dual wheels on one axle and single wheels on the other may be considered to be equivalent to tandem axles (both with dual wheels), which are loaded to 1.2 times the load on the six-wheeled tandem.

Spread Tandem axles, because of their wide axle spacings, (more than 2.4m) can be regarded as two single axles with the total load on the spread tandem configuration being divided equally between the two single axles.

For the design of flexible pavements, twin steer axles may be considered to be equivalent to tandem axles (both with dual wheels) which are loaded to 1.5 times the load on the twin steer axles. For the design of rigid pavements they may be considered to be equivalent to tandem axles (both with dual wheels) which have the same load as the twin steer axles.

7.1.2 Design Lanes

Construction of new pavements and overlaying of existing pavements usually affects two or more traffic lanes. It is usual practice to adopt the same pavement design for all lanes. The design traffic should be that in the lane which carries the most commercial vehicular traffic and it is designated the design lane.

TABLE 7.1
AXLE LOADS WHICH CAUSE EQUAL DAMAGE

Axle Configuration	Single Single	Single Dual	Tandem Dual	Triaxle Dual
Load (kN)	53	80	135	181

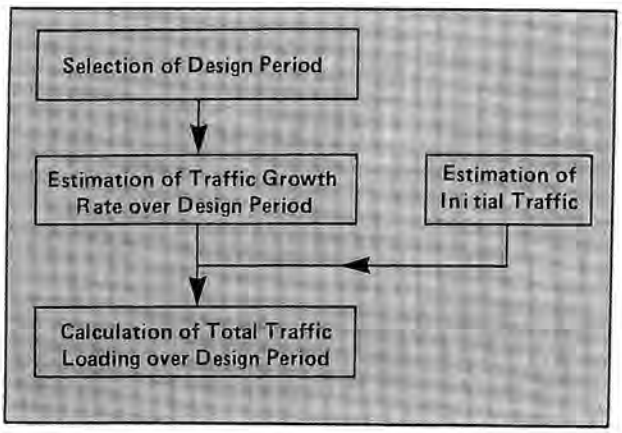


FIGURE 7.1
PROCEDURE FOR DETERMINING DESIGN TRAFFIC

7.2 DESIGN PERIOD

The design period is the length of time expressed in years before it is anticipated that rehabilitation of the pavement will be necessary to restore shape, repair other forms of distress, or to provide additional pavement strength.

Rehabilitation, which may consist of granular or asphalt overlay, major patching or improvements or removal of selected areas of pavement materials, initiates a new design period.

In this regard, resurfacing a pavement with a sprayed seal or a very thin asphalt overlay does not in itself constitute rehabilitation in the pavement design sense.

Some typical design periods are outlined below:

- New granular pavements = 20 - 25 years
- New rigid pavements = 20 - 40 years
- Asphalt overlays = 10 - 15 years
- Granular overlays = 10 - 20 years

Various factors will influence the choice of design period. They include:

- Maintenance strategies. Highly trafficked facilities will demand long periods of low maintenance.
- Funding considerations.
- Other factors, such as inadequate geometry or traffic capacity, may limit the life of the roadway and necessitate early reconstruction.

7.3 TRAFFIC GROWTH

Based on road traffic survey information, it is reasonable, in most circumstances, to assume that traffic volumes will increase geometrically either for the entire design period or up to a stage where "road capacity" is reached (in which case traffic volumes are assumed to remain constant for the remainder of the design period.

If there is an indication that "road capacity" is likely to be reached within the design period, it is recommended that the designer establish that there is no planned upgrading of the road geometry within the design period before he adopts "no growth" traffic volume for the period of "full capacity". Adoption of "no-growth" traffic volumes for a period of "saturation" will entail modification of the approach used below to aggregate daily traffic volumes for total design traffic.

For geometric traffic growth throughout the design period, total traffic over the design period is determined by multiplying the total traffic in the first year by the appropriate Cumulative Growth Factor from Table 7.2.

7.4 METHODS OF CALCULATION OF DESIGN TRAFFIC

The method to be used depends on the traffic data that are available and the design procedure to be adopted.

Ideally the traffic data should include the numbers of and loading on each axle type in the traffic stream.

TABLE 7.2 CUMULATIVE GROWTH FACTORS (GF)

Design Period (Years)	Growth Rate (% pa)					
	0	2	4	6	8	10
5	5	5.2	5.4	5.6	5.9	6.1
10	10	10.9	12.0	13.2	14.5	15.9
15	15	17.3	20.0	23.3	27.2	31.8
20	20	24.3	29.8	36.8	45.8	57.3
25	25	32.0	41.6	54.9	73.1	98.3
30	30	40.6	56.1	79.1	113.3	164.5
35	35	50.0	73.7	111.4	172.3	271.0
40	40	60.4	95.0	154.8	259.1	442.6

In many cases information at this level of detail is not available and recourse will have to be made to survey information.

This guide caters for three levels of traffic data:

(i) initial annual average daily number of axles by type and by load
(ii) initial annual average daily number of axles by type
(iii) initial annual average daily traffic (AADT) plus percent commercial vehicles.

The application of these data to the design procedures is shown in Table 7.3.

7.5 DESIGN TRAFFIC FOR FLEXIBLE PAVEMENTS CONTAINING ONE OR MORE BOUND LAYERS

7.5.1 For Traffic in Terms of Annual Average Daily Number of Axles by Type and by Load

Because asphalt, cemented materials and subgrades each have different performance relationships (allowable number of strain repetitions vs level of strain), it is necessary to determine separately for each material the number of standard axles which will cause the same level of accumulated damage as the actual traffic load spectrum. Hence the following three distinct parameters may be required:

- Number of standard axles that produce the same cumulative damage in asphalt as the design traffic (N_{SA})
- Number of standard axles that produce the same cumulative damage in the subgrade as the design traffic (N_{SS})
- Number of standard axles that produce the same cumulative damage in cemented materials as the design traffic (N_{SC}).

Initial annual average daily values of these parameters N_{SA}, N_{SS}, N_{SC} are calculated using method 1 of Appendix E.

TABLE 7.3 APPLICATION OF TRAFFIC DATA TO DESIGN PROCEDURES

Design Procedure	Traffic Data Available			
	Annual Average daily number of axles by type & load	Annual Average daily number of axles by type	AADT and percent Commercial Vehicles	Specialised Loading
Flexible pavements containing one or more bound layers	Sec 7.5.1 & Appendix E method 1	Sec 7.5.2 & Appendix E method 2	Sec 7.5.3 & Appendix E method 3	Sec 7.5.4
Flexible pavements consisting of unbound granular materials	Sec 7.6.1 & Appendix E method 4	Sec 7.6.2 & Appendix E method 2	Sec 7.6.3 & Appendix E method 3	Sec 7.6.4
Rigid Pavements	Sec 7.7.1	Sec 7.7.1	N/A	N/A
Overlays for flexible pavements	Sec 7.6.1 & Appendix E method 4	Sec 7.6.2 & Appendix E method 2	Sec 7.6.3 & Appendix E method 3	N/A

The design loading is then calculated as follows. Design number of standard axles for:

$$\text{asphalt} = N_{SA} \times 365 \times GF$$
$$\text{subgrade} = N_{SS} \times 365 \times GF$$
$$\text{cemented materials} = N_{SC} \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2. These values are used as input to steps 10, 15 and 16 of the design procedure outlined in Table 8.1.

7.5.2 For Traffic in Terms of Annual Average Daily Number of Axles by Type.

The three required design parameters are as defined in Section 7.5.1. Annual average daily number of ESAs, N is calculated using method 2 of Appendix E.

N_{SA} N_{SS} and N_{SC}, as defined in Section 7.5.1, are then calculated as:

$$N_{SA} = 1.1\, N_E$$
$$N_{SS} = 1.1\, N_E$$
$$N_{SC} = 20.0\, N_E$$

These constants have been calculated using the procedure described in method 1 of Appendix E using the traffic distribution given in Table 8.3. If a different traffic distribution is to be used the method described in Section 7.5.1 should be used.

The design loading is then calculated as follows. Design number of standard axles for:

$$\text{asphalt} = N_{SA} \times 365 \times GF$$
$$\text{subgrade} = N_{SS} \times 365 \times GF$$
$$\text{cemented materials} = N_{SC} \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2. These values are used as input to steps 10, 15 and 16 of the design procedure outlined in Table 8.1(a).

7.5.3 For Traffic in Terms of Annual Average Daily Traffic (AADT) and Percentage of Commercial Vehicles.

The three required design parameters are as defined in Section 7.5.1. Annual average daily number of ESAs, N_E is calculated using method 3 of Appendix E.

N_{SA}, N_{SS} and N_{SC} as defined in Section 7.5.1, are then calculated as follows:

$$N_{SA} = 1.1\, N_E$$
$$N_{SS} = 1.1\, N_E$$
$$N_{SC} = 20.0\, N_E$$

These constants have been calculated using the procedure described in method 1 of Appendix E using the traffic distrubution given in Table 8.3. If a different traffic distribution is to be used the method described in Section 7.5.1 should be used.

The design loading is then calculated as follows. Design number of standard axles for:

$$\text{asphalt} = N_{SA} \times 365 \times GF$$
$$\text{subgrade} = N_{SS} \times 365 \times GF$$
$$\text{cemented materials} = N_{SC} \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2. These values are used as input to steps 10, 15 and 16 of the design procedure outlined in Table 8.1.

7.5.4 Specialised Loading

The aim is to analyse the damage caused by each axle/load configuration and to determine the total damage using Miner's Law.

7.5.4.1 Current Traffic Spectrum

For each of the axle types which will use the pavement, estimate from the available data the daily number with loads within specific load ranges. Designate these as N_{Cij} where i refers to axle configuration type and j refers to the load magnitudes for configuration i.

7.5.4.2 Growth Factors

Either

(a) Assume that the growth of numbers of all axle configurations and load magnitude will be equal, and select the appropriate factor from Table 7.2, or

(b) Adopt different growth factors for the numbers of different axle configuration and/or load magnitudes depending on the assumed change in the traffic spectra during the design period, selecting appropriate values from Table 7.2.

7.5.4.3 Calculation of Design Traffic

Determine the total number of each load configuration and magnitude which will be applied to the pavement during the design period N_{ij} using the formula:

$$N_{ij} = 365.\, N_{Cij} \times GF_j$$

where GF is the adopted growth factor from Table 7.2 for load configuration i and load magnitude j.

The values of N_{ij} are then used in steps 10, 15, 16 of the mechanistic design procedure described in Table 8.1.

The load magnitudes and configurations themselves are used in steps 11a and 13a of the mechanistic design procedure described in Table 8.1.

7.6 DESIGN TRAFFIC FOR FLEXIBLE PAVEMENTS CONSISTING OF UNBOUND GRANULAR MATERIALS AND OVERLAYS FOR FLEXIBLE PAVEMENTS

7.6.1 For Traffic in Terms of Annual Average Daily Number of Axles by Type and by Load

The design parameter required is the number of ESAs. Annual average daily number of ESAs, N_E, is calculated from method 4 of Appendix E.

The design number of ESAs is then calculated as:

$$N_E \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2.

This value is used as input to the design procedure

outlined in Section 8.3 for flexible pavements and Section 10.4.5 for overlays.

7.6.2 For Traffic in Terms of Annual Average Daily Number of Axles by Type

The design parameter required is the number of ESAs. Annual average daily number of ESAs, N_E, is calculated from method 2 of Appendix E.

The design number of ESAs is then calculated as:

$$N_E \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2.

This value is used as input to the design procedure outlined in Section 8.3 for flexible pavements and Section 10.4.5 for overlays.

7.6.3 For Traffic in Terms of Annual Average Daily Traffic (AADT) and Percentage Commercial Vehicles

The design parameter required is the number of ESAs. Annual average daily number of ESAs, N_E, is calculated from method 3 of Appendix E.

The design number of ESAs is then calculated as:

$$N_E \times 365 \times GF$$

where GF is the cumulative growth factor from Table 7.2.

This value is used as input to the design procedure outlined in Section 8.3 for flexible pavements and Section 10.4.5 for overlays.

7.6.4 Specialised Loading

For the design of flexible pavements consisting of unbound granular materials for the case of specialised traffic loading, the design procedure in Section 8.3 is not appropriate. It is necessary to use the Mechanistic Procedure (Section 8.2) and hence adopt the traffic characterisations in Section 7.5.4.

7.7 DESIGN TRAFFIC FOR RIGID PAVEMENTS

7.7.1 Traffic Estimation for Thickness Design Procedure

The design traffic is characterised by the cumulative number of commercial vehicle axle groups expected in the design lane during the design period, together with the proportions of each type of axle group and the distribution of loads on each type of axle group.

Loads on an axle group type are typically grouped into 10 kN intervals. Appendix I contains examples of load distributions.

The design number of commercial vehicle axle groups over the design life of the pavement is given by:

$$C_{ag} = C_d \times 365 \times GF$$

where

C_{ag} = design number of commercial vehicle axle groups.

C_d = initial number of commercial vehicle axle groups per day.

GF = the cumulative growth factor from Table 7.2.

The design procedure in Chapter 9 caters for each of the following axle types:

- single axles with single wheels;
- single axles with dual wheels;
- tandem axles with dual wheels; and
- triaxles with dual wheels.

Other axle types are to be converted to one of the above as follows:

(i) Convert spread tandem axle loads to dual-tyred single axle loads on the basis that a spread tandem axle is equivalent to two dual tyred single axles, each of which has half of the spread tandem axle load.

(ii) Convert twin steer axles to single axles with single wheels on the basis that a twin steer axle is equivalent to two single axles with single wheels, each with half the load.

7.8 INITIAL AND TERMINAL PAVEMENT CONDITIONS

The design procedure for new flexible pavements presented in Section 8.1 is based on the premise that pavement roughness at the end of the design period will be approximately 150 counts/km, assuming that the initial roughness is approximatly 50 counts/km.

A suitable initial roughness value can be determined by measurements of recently constructed pavements. To allow flexibility in the choice of the terminal condition of the pavement, and also to allow for variations in the initial pavement condition the designer may modify the value of design traffic determined above before undertaking the pavement design.

To determine the modified value, the designer enters Figure 7.2 with the already determined design traffic and also the desired ratio of initial/final roughness. The modified design traffic is then read from the vertical axis. For example, if the design traffic as determined above is 10^6 and the designer seeks a pavement design which will result in terminal roughness being four times initial roughness, the value of the modified design traffic is 4×10^5.

This modification applies only to cases where the subgrade strain criterion governs. As a guide, suggested terminal roughnesss values for different classes of road are in Table 7.4.

7.9 MODIFICATION OF DESIGN TRAFFIC TO IMPROVE RELIABILITY OF DESIGN

While the design procedure endeavours to take cognisance of usual variabilities associated with materials and the construction process, there will always be a risk that the pavement will reach the end of its service life before the design period has elapsed. This risk is attributed to, among other things, the uncertainty associated with predictions of the traffic volume and the magnitude of axle group loads over the design period, and uncertainties associated with estimations of average values and variabilities in material properties, layer thicknesses, etc.

Situations arise where the designer may wish to reduce this risk. Examples include high traffic volume facilities where lane closures to effect repairs would cause serious disruptions to traffic flows.

Such risk can be reduced by adopting a more conservative pavement configuration.

A simple method of achieving this is to adopt in the design procedure a value for total traffic over the design period higher than that which is anticipated.

It is suggested that use of a value of up to four times anticipated traffic may be warranted in some situations.

It is to be noted that, with the adoption of conservative designs, their service lives will usually extend beyond the design period.

Often, in the design process, one significant source of uncertainty is associated with prediction of loads on axle groups. If relevant information from weigh-in-motion installations is available to the designer, that portion of risk attributable to this uncertainty is considerably reduced.

In the case of rigid pavements, specific guidance is provided in Section 9.3.6. ❑

TABLE 7.4 VALUES OF TERMINAL ROUGHNESS

NAASRA Road Functional Class[1]	Terminal Roughness NAASRA counts per km
1 and 2	110
3 and 6	150
4, 5, 7, 8 and 9	175

1 For definition of Classes see Appendix A

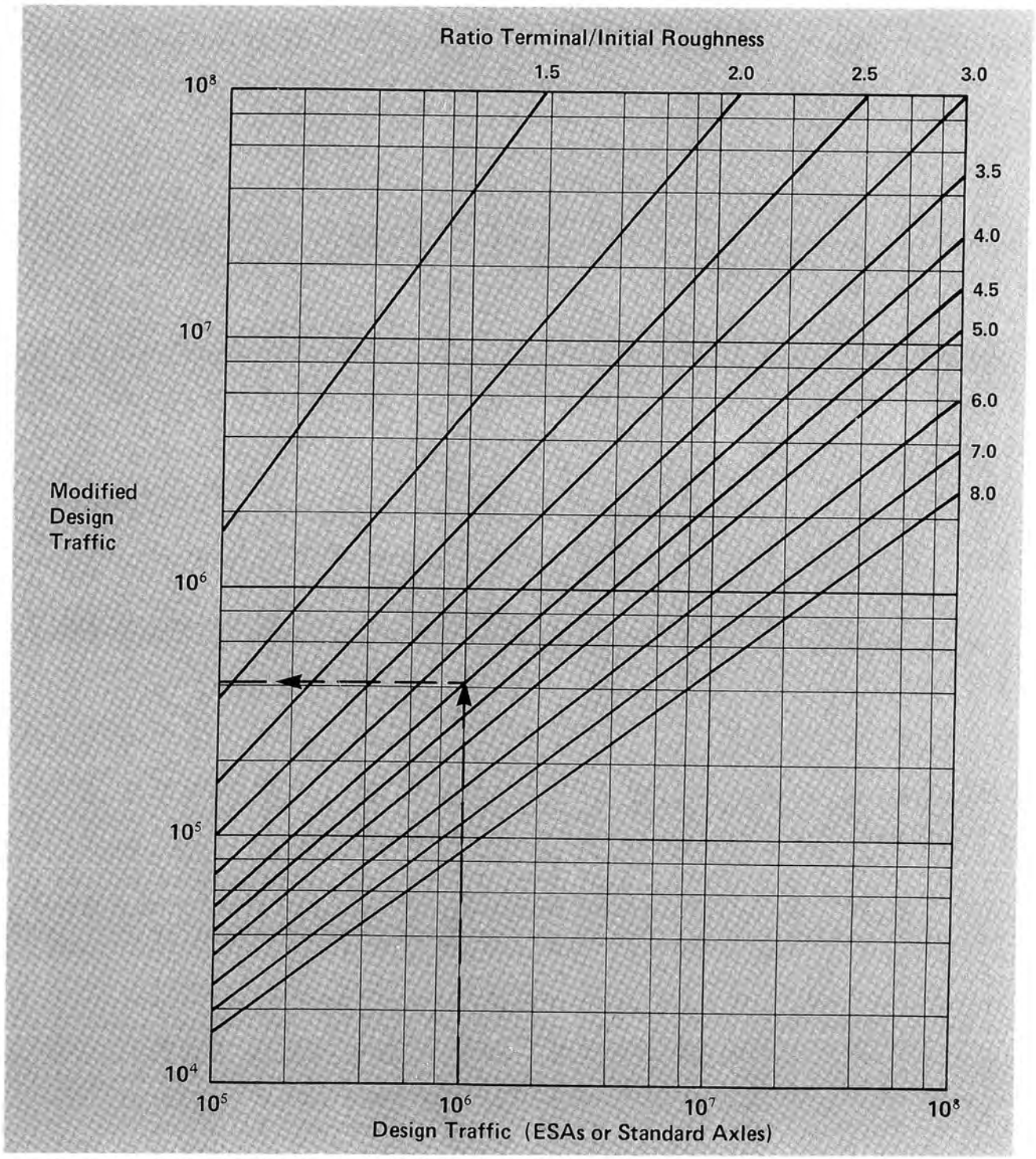


FIGURE 7.2 MODIFIED DESIGN TRAFFIC VS DESIGN TRAFFIC AND RATIO FINAL / INITIAL ROUGHNESS (FOR USE IN DESIGN OF NEW FLEXIBLE PAVEMENTS)

APPENDIX A
TERMINOLOGY

The terminology used in the Guide is basically in accordance with Australian Standard 1348.1 (1986), *Road and Traffic Engineering - Glossary of Terms, Part 1 - Road Design and Construction*. This Appendix lists and defines terms used which do not appear or differ in definition from that shown in AS 1348.1, or accord with AS 1348.1, but which are considered so important within the context of this document to warrant having them reproduced.

DEFINITION OF TERMS

Annual Average Daily Traffic (AADT)

The total yearly traffic volume divided by 365.

California Bearing Ratio (CBR)

The ratio expressed as a percentage between a test load and an arbitrarily defined standard load. This test load is that required to cause a plunger of standard dimensions to penetrate at a specified rate into a specifically prepared soil specimen.

Commercial Vehicle

A vehicle having at least one axle with dual wheels and/or having more than two axles.

Course

One or more layers of the same material within a pavement structure.

Curvature Function

Of a deflection bowl is the difference in maximum deflection at a test site and the deflection at a point 200 mm from the point at which the maximum deflection was produced (in the direction of travel).

Cemented Materials

Those produced by addition of cement, lime or other hydraulically binding agent to granular materials in sufficient quantities to produce a bound layer with significant tensile strength.

Deflection

The vertical elastic (recoverable) deformation of a pavement surface between the tyres of a standard axle.

Design Period

A period considered appropriate to the function of the road. It is used to determine the total traffic for which the pavement is designed.

Design Subgrade Level (DSL)

The level of the prepared formation after completion of stripping and excavation or filling and upon which the pavement is to be constructed. (Design Subgrade Level = Finished Surface Level-Nominated Pavement Thickness).

Layer

The portion of a pavement course placed and compacted as an entity.

Modified Materials

Granular materials to which small amounts of stabilising agent have been added to improve their performance (eg. by reducing plasticity) without causing a significant increase in structural stiffness. Modified materials are considered to behave as unbound materials.

Modulus of Subgrade Reaction

The slope of the straight line drawn from the origin to a given point on the stress deflection curve obtained from a plate bearing test.

Pavement (Structure)

The portion of the road, excluding shoulders, placed above the design subgrade level for the support of, and to form a running surface for, vehicular traffic.

Permeability Reversal

Occurs at a pavement layer interface when the coefficient of saturated permeability of the upper layer is at least 100 times greater than that of the layer below it.

Roughness

The roughness of the pavement surface in counts/km as measured by a NAASRA Roughness Meter.

Shoulder

The portion of the road contiguous and flush with the pavement.

Stabilisation

The treatment of a road pavement material to improve it or to correct a known deficiency and thus enhance its ability to perform its function in the pavement.

Standard Axle

Single axle with dual wheels loaded to a total mass of 8.2t.

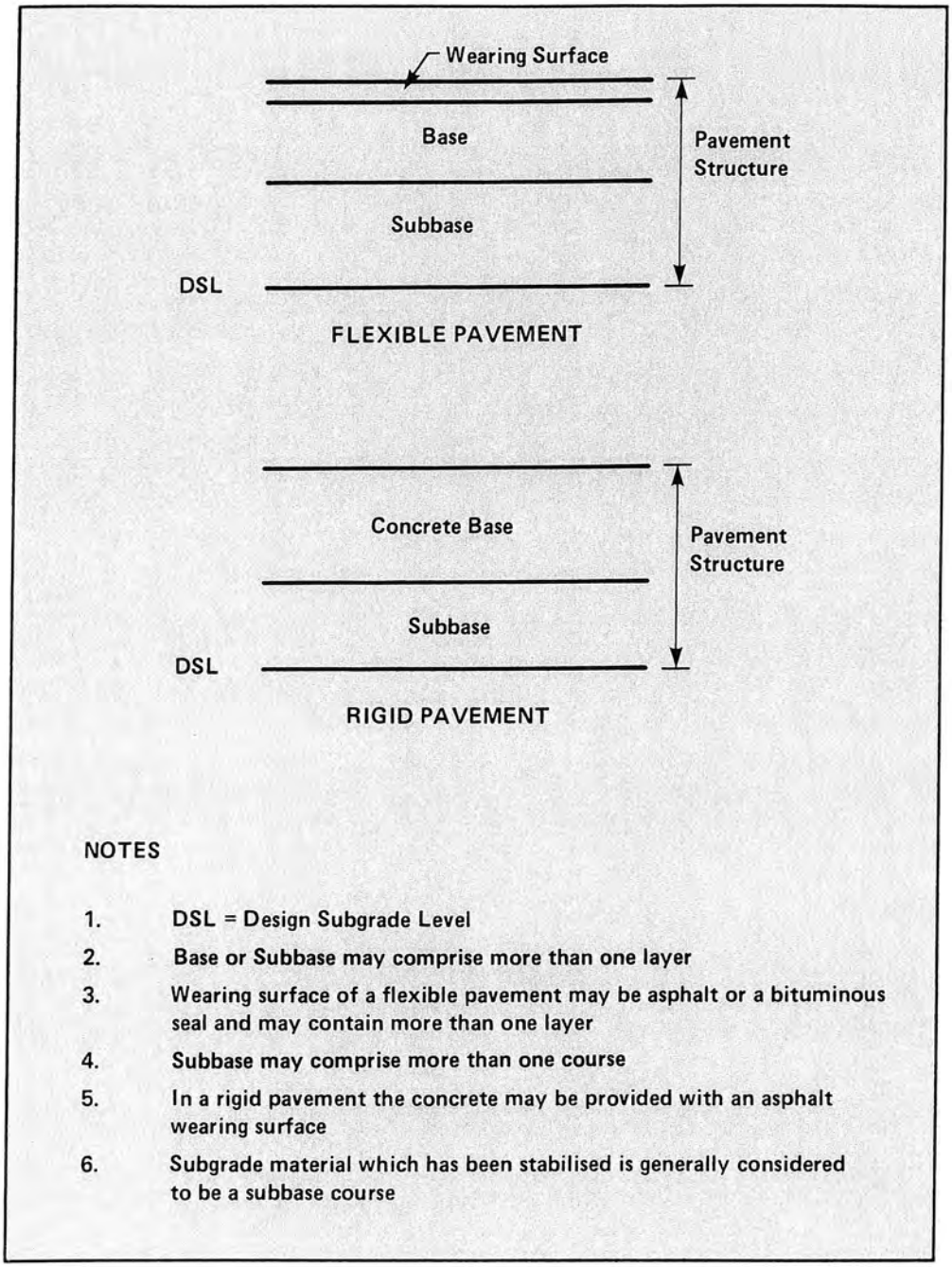
Traffic Lane

The portion of a carriageway alloted for use of a single lane of vehicles.

The components of flexible and rigid road pavement structures are shown in Figure A.1. ❑

TABLE A.1 DEFINITION OF ROAD CLASSES

RURAL AREAS	
Class 1	Those roads which form the principal avenue for communications between major regions of Australia, including direct connections between capital cities.
Class 2	Those roads, not being Class 1, whose main function is to form the principal avenue of communication for movements : • between a capital city and adjoining states and their capital cities; or • between a capital city and key towns; or • between key towns.
Class 3	Those roads, not being Class 1 or 2, whose main function is to form an avenue of communication for movements : • between important centres and the Class 1 and Class 2 roads and/or key towns; or • between important centres; or • of an arterial nature within a town in a rural area.
Class 4	Those roads, not being Class 1, 2 or 3, whose main function is to provide access to abutting property (including property within a town in a rural area).
Class 5	Those roads which provide almost exclusively for one activity or function which cannot be assigned to Classes 1, 2, 3 or 4.
URBAN AREAS	
Class 6	Those roads whose main function is to perform the principal avenue of communication for massive traffic movements.
Class 7	Those roads, not being Class 6, whose main function is to supplement the Class 6 roads in providing for traffic movements or which distribute traffic to local street systems.
Class 8	Those roads not being Class 6 or 7, whose main function is to provide access to abutting property.
Class 9	Those roads which provide almost exclusively for one activity or function and which cannot be assigned to Classes 6, 7 or 8.



NOTES

1. DSL = Design Subgrade Level
2. Base or Subbase may comprise more than one layer
3. Wearing surface of a flexible pavement may be asphalt or a bituminous seal and may contain more than one layer
4. Subbase may comprise more than one course
5. In a rigid pavement the concrete may be provided with an asphalt wearing surface
6. Subgrade material which has been stabilised is generally considered to be a subbase course

FIGURE A.1 COMPONENTS OF FLEXIBLE AND RIGID ROAD PAVEMENT STRUCTURES

APPENDIX E
METHODS FOR CHARACTERISING INITIAL DAILY TRAFFIC

Method 1

Determine, for each load range for each type of axle group, the number of Standard Axles which produce the same damage as one pass of the axle group, using the following formula :

$$F_{Aij} \text{ (or } F_{Cij} \text{ or } F_{Sij}) = \left[\frac{L_{ij}}{L_{Si}}\right]^{EXP}$$

where

L_{ij} = jth load magnitude on axle type i

L_{Si} = magnitude of Standard Load on axle type i (Table 7.1)

EXP = exponent contained in the relation between limiting strain and strain repetitions which defines the performance of asphalt, cemented material or subgrade as applicable.

The values of F_{Aij}, F_{Cij} and F_{Sij} contained in Tables E1, E2, E3 respectively were derived using the above formula and the exponents 5, 18 and 7.14. These exponents are derived from the performance criteria in Figure 6.8, Figure 6.1 and equation 5.1 (Section 5.9).

If the designer wishes to use other performance criteria, the above formulas should be used to recalculate the entries in Tables E1, E2, and E3.

Calculate for each relevant damage mode, the number of Standard Axles (N_S) which is equivalent to the initial daily traffic, using the following equations:

For asphalt distress

$$N_{SA} = \sum_j N_{A1j} F_{A1j} + \sum_j N_{A2j} F_{A2j} + \sum_j N_{A3j} F_{A3j} + \sum_j N_{A4j} F_{A4j}$$

Where N_{Aij} is the average daily number of axles (in the first year of type i carrying a load of magnitude j.

For damage of cemented materials

$$N_{SC} = \sum_j N_{A1j} F_{C1j} + \sum_j N_{A2j} F_{C2j} + \sum_j N_{A3j} F_{C3j} + \sum_j N_{A4j} F_{C4j}$$

For subgrade damage

$$N_{SS} = \sum_j N_{A1j} F_{S1j} + \sum_j N_{A2j} F_{S2j} + \sum_j N_{A3j} F_{S3j} + \sum_j N_{A4j} F_{S4j}$$

with the summations being taken over the appropriate load ranges.

These three quantities characterise the initial daily traffic for the mechanistic procedure.

TABLE E1
NUMBER OF STANDARD AXLES PER AXLE GROUP FOR EQUIVALENT ASPHALT DAMAGE ACCORDING TO TYPE OF AXLE GROUP AND AXLE GROUP LOAD (FACTOR F_{Aij})

Load on Axle Group (kN)	Number of Standard Axles for equivalent asphalt distress axle / tyres			
	Single single	Single dual	Tandem dual	Triaxle dual
20	0.01	0	0	0
30	0.06	0.01	0	0
40	0.25	0.03	0	0
50	0.75	0.10	0.01	0
60	1.9	0.24	0.02	0
70	4.0	0.51	0.04	0.01
80	7.8	1.0	0.07	0.02
90		1.8	0.13	0.03
100		3.1	0.22	0.05
110		4.9	0.36	0.08
120		7.6	0.56	0.13
130			0.83	0.19
140			1.2	0.28
150			1.7	0.39
160			2.3	0.54
170			3.2	0.73
180			4.2	0.97
190			5.5	1.3
200			7.1	1.6
210			9.1	2.1
220				2.7
230				3.3
240				4.1
250				5.0
260				6.1
270				7.4
280				8.9

TABLE E2
NUMBER OF STANDARD AXLES PER AXLE GROUP FOR EQUIVALENT DAMAGE TO CEMENTED MATERIALS, ACCORDING TO TYPE OF AXLE GROUP AND AXLE GROUP LOAD (FACTOR F_{Cij})

Load on Axle Group (kN)	Number of Standard Axles for equivalent damage of cemented materials axle / tyres			
	Single single	Single dual	Tandem dual	Triaxle dual
20	0	0	0	0
30	0	0	0	0
40	0.01	0	0	0
50	0.35	0	0	0
60	9.3	0.01	0	0
70	150	0.09	0	0
80	1654	1	0	0
90		8.3	0	0
100		55.5	0.01	0
110		309	0.03	0
120		1478	0.12	0
130			0.51	0
140			1.9	0.01
150			6.7	0.03
160			21.3	0.11
170			63.4	0.32
180			177	0.91
190			469	2.4
200			1182	6.0
210			2884	14.5
220				33.5
230				74.6
240				161
250				335
260				678
270				1338
280				2574
290				4841

TABLE E3
NUMBER OF STANDARD AXLES PER AXLE GROUP FOR EQUIVALENT SUBGRADE DAMAGE ACCORDING TO TYPE OF AXLE GROUP AND AXLE GROUP LOAD (FACTOR F_{Sij})

Load on Axle Group (kN)	Number of Standard Axles for equivalent subgrade damage axle / tyres			
	Single single	Single dual	Tandem dual	Triaxle dual
20	0	0	0	0
30	0.02	0	0	0
40	0.13	0.01	0	0
50	0.66	0.04	0	0
60	2.4	0.13	0	0
70	7.3	0.39	0.01	0
80	18.9	1.0	0.02	0
90		2.3	0.06	0.01
100		4.9	0.12	0.01
110		9.7	0.23	0.03
120		18.1	0.43	0.05
130			0.76	0.09
140			1.3	0.16
150			2.1	0.26
160			3.4	0.42
170			5.2	0.64
180			7.8	0.96
190			11.5	1.4
200			16.5	2.0
210			23.5	2.9
220				4.0
230				5.5
240				7.5
250				10.0
260				13.3
270				17.4
280				22.5
290				29.0

Method 2

(i) Estimate the daily number of each of the 4 types of axle groups listed in Table E4. Designate these as $N_{A1}, N_{A2}, N_{A3}, N_{A4}$

(ii) Estimate the number of ESAs for each type of axle group (F_1, F_2, F_3, F_4) from Table E4 or other relevant information

(iii) Calculate initial daily ESAs (N) as follows:

$$N_E = N_{A1} F_1 + N_{A2} F_2 + N_{A3} F_3 + N_{A4} F_4$$

Method 3

(i) Estimate AADT for the design lane and percent commercial vehicles (C%) from traffic census information

(ii) Estimate the number of ESAs per commercial vehicle (F) from Table E5 or other relevant information

(iii) Calculate initial daily ESAs (N) as follows:

$$N_E = AADT \; F \; C / 100$$

Method 4

Calculate initial daily ESAs (N_E) as follows:

$$N_E = \sum_j N_{A1j} F_{E1j} + \sum_j N_{A2j} F_{E2j} + \sum_j N_{A3j} F_{E3j} + \sum_j N_{A4j} F_{E4j}$$

where N_{Aij} is the average daily number of axles (in the first year) of type i, carrying a load of magnitude j and F_{Eij} is the number ESAs for each pass of the axle group i carrying load j with the summations being taken over the appropriate load ranges. Values for F_{Eij} are contained in Table E6.

TABLE E4
NUMBER OF ESAs PER AXLE GROUP TYPE ACCORDING TO STATE AND ROAD FUNCTIONAL CLASS (FACTOR F_i)

Road Functional Class [1]	Axle Group Type	State/Territory NSW	VIC	QLD	WA	SA	TAS	ACT	NT
1	SAST	0.6	0.6	0.4	0.5	0.7	0.4	-	0.4
	SADT	0.4	0.5	0.3	0.4	0.4	0.3	-	0.2
	TADT	0.9	0.9	0.7	0.7	0.9	0.6	-	0.7
	TRDT	0.8	0.7	0.6	0.7[2]	0.6	0.4[2]	-	0.6
2	SAST	0.6	0.4	0.4	0.5	0.5	0.4	-	-
	SADT	0.5	0.3	0.3	0.4	0.3	0.3	-	-
	TADT	1.0	0.7	0.7	1.0	0.9	0.9	-	-
	TRDT	0.7	0.4	0.6	0.5	0.6[2]	0.5[2]	-	-
3	SAST	0.6	0.4	0.4	0.5	0.5	0.4	-	0.5
	SADT	0.6[2]	0.4	0.2	0.3	0.3	0.3	-	0.5
	TADT	1.0	0.7	0.7	0.8	0.7	1.1	-	0.8
	TRDT	0.8[2]	0.4[2]	0.5[2]	0.9[2]E	0.7	0.8[2]E	-	0.6
6	SAST	0.6	0.4	0.3	0.4	0.5	0.3	0.3	-
	SADT	0.4	0.3	0.2	0.3	0.2	0.2	0.2[2]	-
	TADT	1.0	0.6	0.7	1.2	0.8	0.7	0.8	-
	TRDT	0.8	0.4	0.6[2]	0.8[2]	0.6	0.5[2]	-	-
7	SAST	0.6	0.3	0.3	0.3	0.2E	0.1E	-	-
	SADT	0.6[2]	0.2	0.2	0.2	0.3E	0.4E	-	-
	TADT	1.6	0.7	0.6	1.2	0.3[2]E	1.2[2]E	-	-
	TRDT	-	-	-	-	-	-	-	-

1 Road Functional Classes are defined in Appendix A
2 Average based on a sample of between 50 and 100 axle groups
E Extrapolated from 1973 survey data

TABLE E5
NUMBER OF ESAs PER COMMERCIAL VEHICLE ACCORDING TO STATE AND ROAD FUNCTIONAL CLASS (FACTOR F)

Road Functional Class [1]	State/Territory							
	NSW	VIC	QLD	WA	SA	TAS	ACT	NT
1	1.8	1.9	1.5	1.5	2.0	1.1	-	1.9
2	2.1	1.2	1.1	2.2	1.6	1.4	-	-
3	1.9	1.2	1.2	1.6	1.5	1.6	-	2.5
6	1.9	1.0	1.1	1.5	1.5	0.9	-	-
7	2.7	0.9	0.9	1.2	0.5E	0.7E	-	-

1 Road Functional Classes are defined in Appendix A
E: Extrapolated from 1973 survey data

TABLE E6
NUMBER OF ESAs PER AXLE GROUP ACCORDING TO TYPE OF AXLE GROUP AND AXLE GROUP LOAD (FACTOR F_{Eij})

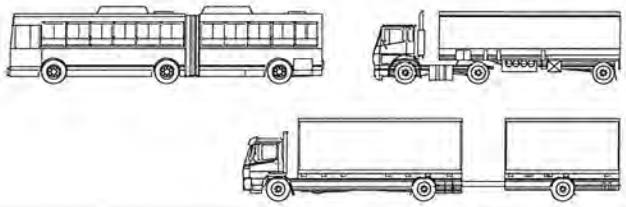
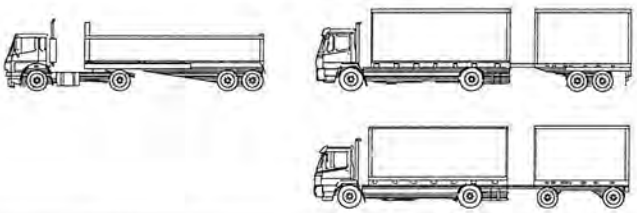
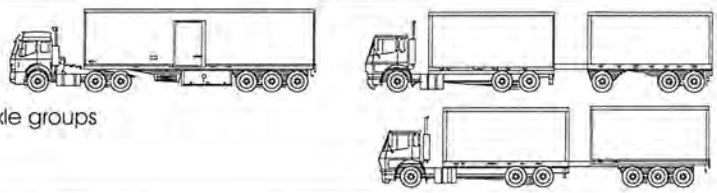
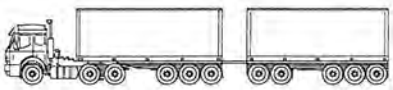
Load on Axle Group (kN)	Number of ESAs			
	axle / tyres			
	Single single	Single dual	Tandem dual	Triaxle dual
20	0.02	0	0	0
30	0.10	0.02	0	0
40	0.32	0.06	0.01	0
50	0.79	0.15	0.02	0.01
60	1.6	0.32	0.04	0.01
70	3.0	0.59	0.07	0.02
80	5.2	1.0	0.12	0.04
90		1.6	0.20	0.06
100		2.4	0.30	0.09
110		3.6	0.44	0.14
120		5.1	0.62	0.19
130			0.86	0.27
140			1.2	0.36
150			1.5	0.47
160			2.0	0.61
170			2.5	0.78
180			3.2	0.98
190			3.9	1.2
200			4.8	1.5
210			5.9	1.8
220				2.2
230				2.6
240				3.1
250				3.6
260				4.3
270				5.0
280				5.7
290				6.6

TABLE E2
NUMBER OF STANDARD AXLES PER AXLE GROUP FOR EQUIVALENT DAMAGE TO CEMENTED MATERIALS, ACCORDING TO TYPE OF AXLE GROUP AND AXLE GROUP LOAD, (FACTOR F_{CU})

Load on Axle Group (kN)	Number of Standard Axles for equivalent damage of cemented materials axle/tyres			
	Single Single	Single Dual	Tandem Dual	Triaxle Dual
20	0	0	0	0
30	0	0	0	0
40	0.03	0	0	0
50	0.50	0	0	0
60	4.43	0.03	0	0
70	28.2	0.20	0	0
80	139.9	1.00	0	0
90		4.11	0.01	0
100		14.6	0.03	0
110		45.7	0.09	0
120		129.7	0.24	0.01
130			0.64	0.02
140			1.55	0.05
150			3.54	0.10
160			7.68	0.23
170			15.9	0.47
180			31.6	0.94
190			60.4	1.79
200			111.8	3.31
210			200.7	5.95
220				10.4
230				17.7
240				29.5
250				48.2
260				77.2
270				121.4
280				187.8
290				286.2

VEHICLE CLASSIFICATION SYSTEM

AUSTROADS

CLASS	LIGHT VEHICLES
1	SHORT Car, Van, Wagon, 4WD, Utility, Bicycle, Motorcycle 
2	SHORT - TOWING Trailer, Caravan, Boat 
	HEAVY VEHICLES
3	TWO AXLE TRUCK OR BUS *2 axles 
4	THREE AXLE TRUCK OR BUS *3 axles, 2 axle groups 
5	FOUR (or FIVE) AXLE TRUCK *4 (5) axles, 2 axle groups 
6	THREE AXLE ARTICULATED *3 axles, 3 axle groups 
7	FOUR AXLE ARTICULATED *4 axles, 3 or 4 axle groups 
8	FIVE AXLE ARTICULATED *5 axles, 3+ axle groups 
9	SIX AXLE ARTICULATED *6 axles, 3+ axle groups or 7+ axles, 3 axle groups 
	LONG VEHICLES AND ROAD TRAINS
10	B DOUBLE or HEAVY TRUCK and TRAILER *7+ axles, 4 axle groups 
11	DOUBLE ROAD TRAIN *7+ axles, 5 or 6 axle groups 
12	TRIPLE ROAD TRAIN *7+ axles, 7+ axle groups 

Dwg No: 0293-009

Asset and Network Information - January 2002

Appendix B

Cost Summary Report

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COST SUMMARY REPORT

DEVELOPMENT APPLICATION / COMPLYING DEVELOPMENT CERTIFICATE NO.

APPLICANT'S NAME: _____

APPLICANT'S ADDRESS: _____

_____

LOCATION OF PROPOSED DEVELOPMENT: _____

_____

ANALYSIS OF DEVELOPMENT COSTS:

Demolition and excavation	$
Decontamination and remediation	$
Site preparation	$
Building construction	$
Hydraulic, mechanical or fire services	$
External works and services	$
Sub-total carried forward	$
Preliminaries and margin	$
Sub-total	$
Consultant fees	$
Other related development costs	$
Sub-total	$
Good and Services Tax	$
TOTAL PROPOSED COST OF DEVELOPMENT	$

I CERTIFY THAT I HAVE:

- ⇨ inspected the plans the subject of the application for development consent or complying development certificate;
- ⇨ calculated the development costs in accordance with the definition of proposed cost of development in clause 25J of the Environmental Planning and Assessment Regulation 2000 at current prices; and
- ⇨ included GST in the calculation of proposed cost of development.

Signed: _____

Name: _____

Position and Qualifications: _____

Date: _____