# Gladstone City Council Transport Infrastructure Policy

Adopted by Council 17 June 2002

This is to certify that this is a true and correct copy of the Gladstone Regional Council's (former Gladstone City area) Planning Scheme Policy.

Graham Kanofski
Chief Executive Officer

Adopted: 6 October 2009
Took Effect: 12 October 2009

# Executive Summary

This document details the Transport Infrastructure Policy methodology and calculations for contributions towards the sub-arterial and major collector road network in Gladstone. The objective of the report is to detail an equitable and reasonable basis for calculation of funding for roads based on the generation of additional traffic from new residential developments.

The sub arterial and major collector network provides a major strategic function in Gladstone City interconnecting the QMRD arterial roads and collecting and distributing the resident population and outside users through the Gladstone area.

The charge is calculated based on the following formula:

$$\text{Infrastructure Charge (\$/ERL)} = \frac{\text{Current Replacement Cost of existing network assets} + \text{Value of future assets to be constructed within the design horizon (NPV)}}{\text{Total existing Equivalent Residential Lots plus Future Residential Lots (NPV) to be developed in the design horizon}} \times \text{\% City Residential Traffic}$$

Where

- *"ERL"* is an Equivalent Residential Lot calculated on the traffic generation equivalency of a single dwelling in Gladstone.
- *"Current Replacement Cost of existing network assets"* is the current day cost of constructing the existing sub-arterial and major collector road network.
- *"Design Horizon"* is a 20 year planning horizon on which the road network upgrading requirements are calculated.
- *"Sum of all assets to be constructed in the design horizon (NPV)"* is the Net Present Value of the road assets to be developed as part of the sub-arterial, major collector road network over the design horizon.
- *"Total Equivalent Residential Lots"* is the sum of the existing equivalent residential dwellings in the City plus the discounted (NPV) sum of future residential developments.
- *"% City Residential Traffic"* is the ratio of internal residential (Gladstone City) traffic to total traffic on the road network.

The calculated road infrastructure contribution for the various types of accommodation units for which the infrastructure charge would be levied and as calculated based on this policy are listed below:-

| Use | Unit | Peak Hr Vehicle Trips | ERL Eq. | Charge |
|---|---|---|---|---|
| New Residential lot | Lot | 0.85 | 1.00 | $6,404 |
| Detached Dwelling | Lot | 0.85 | 1.00 | $6,404 |
| 3 bedroom multi unit | Unit | 0.6 | 0.71 | $4,547 |
| Dual Occupancy (Duplex) | Unit | 0.5 | 0.59 | $3,778 |
| 2 bedroom multi unit | Unit | 0.45 | 0.53 | $3,394 |
| Cluster house development | Unit | 0.42 | 0.49 | $3,138 |
| Mobile home park | Unit | 0.42 | 0.49 | $3,138 |
| 1 bedroom multi unit | Unit | 0.4 | 0.47 | $3,010 |
| Motel Room [1] | Room | 0.4 | 0.47 | $3,010 |
| Bed & Breakfast | Room | 0.38 | 0.45 | $2,882 |
| Caravan Park [2] | Site | 0.38 | 0.45 | $2,882 |
| Hotel Room (Accommodation) [1] | Room | 0.3 | 0.35 | $2,241 |
| Backpackers Accommodation | Bed | 0.12 | 0.14 | $896 |
| Industrial Development | 100m$^2$ / GFA | 0.14 | 0.165 | $1,056 |
| Commercial Development | To be determined on application | | | |

The methodology detailed in this report follows the general methodology for Priority Infrastructure Plans (PIP) under the Integrated Planning Act provisions in the form of:

- identification of the area,
- identifying existing infrastructure,
- identifying future infrastructure,
- listing of assumptions and
- designed standards and calculation of charges.

The policy is a transparent, fair and equitable means of collecting infrastructure funding in the interim period and until a transport infrastructure charge schedule under the IPA can be implemented.

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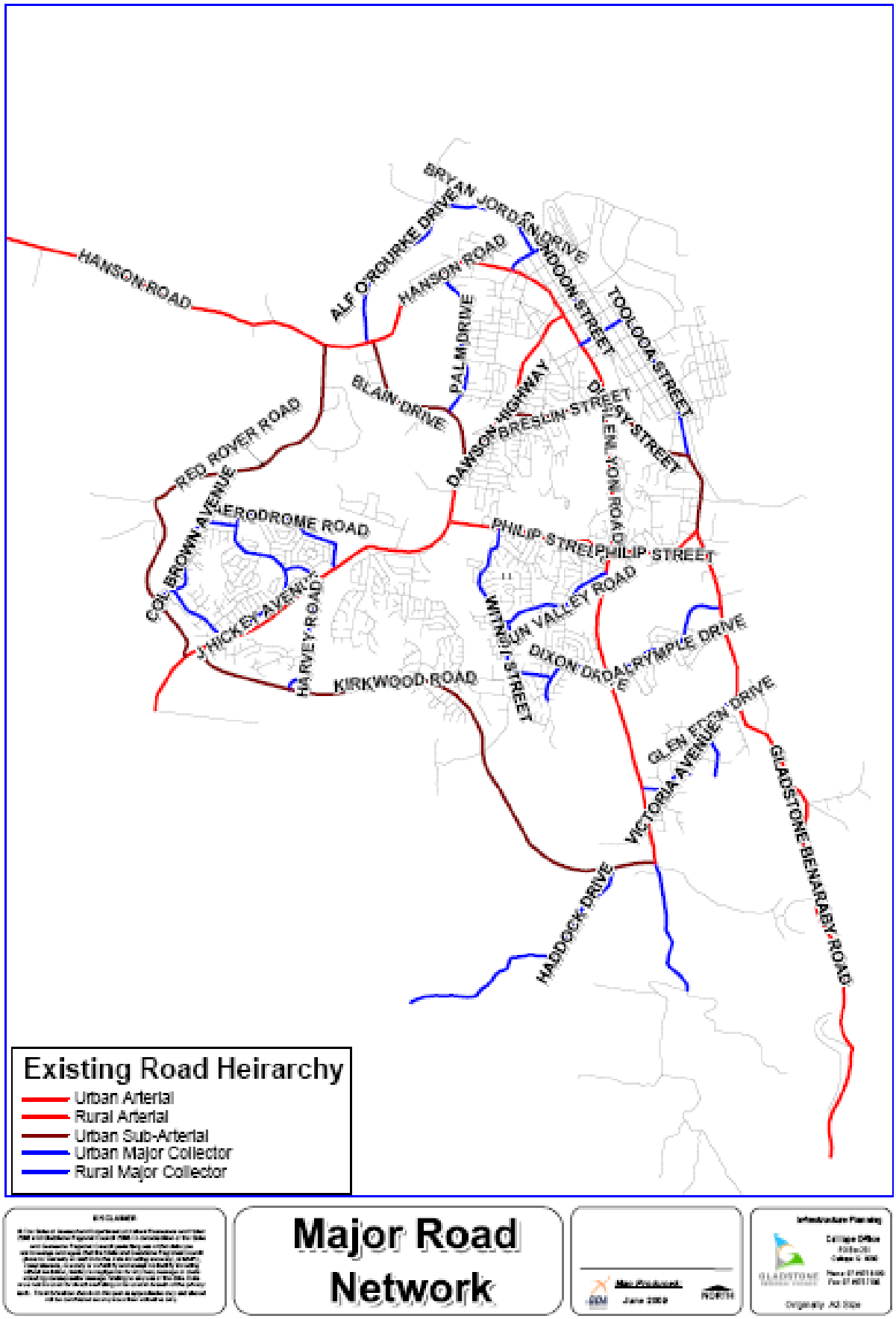
# 1. Introduction

This report provides the methodology and basis for the calculation of transport infrastructure charges to be applied to new residential type development within the City of Gladstone. The report details the methods used to calculate the charges and the assumptions made as part of the process.

The objective of this report is the provision of a reasonable and equitable method for calculation of infrastructure charges for the sub-arterial and major collector road network in Gladstone City. The method is to be transparent, as simple as possible and capable of being easily updated to manage changes in planning, development and other aspects that may affect growth and development of residential areas in the City.

Sub-arterial and collector roads described in this report as “Network Roads”, have been identified in previous traffic and transport studies and include those roads that perform a strategic function within the City in the collection and transportation of the majority of population through the Gladstone City area. This does not include the major arterial roads controlled by Queensland Department of Main Roads that are funding from other sources. The network roads as defined are detailed on Figure 1 Major Road Network. These roads include sub-arterial roads and major collectors, both urban and rural.

**Figure 1 Major Road Network**



# 2. Road Infrastructure Contribution Charges Calculation Methodology

## *2.1 General*

The method of calculation of infrastructure charges for residential type development in the City of Gladstone has followed the process outlined below:

1) Identification of the existing sub-arterial and major collector road network. (Refer Figure 1 Major Road Network);
2) Valuation of the current replacement value of the assets contained in the existing network roads. (Refer Table 2 - Scope of Existing Roads);
3) Identification of the strategic network construction requirements to meet traffic demands at the adopted design horizon. (Refer Figure 2 - Future Road Network Infrastructure);
4) Valuation of the net present value of the future road construction costs identified in step 3 above. (Refer Table 3 - Summary of Costs and NPV of New Works);
5) Deduction from overall costs of the external traffic component of the total traffic volumes on the network. (Refer Table 4 - Network Traffic Flow Summary);
6) Calculation of the existing residential population and future residential population (Net Present Value [NPV]) at the design horizon and conversion of this to a common form in this case equivalent residential lots. (Refer Table 5 - Equivalent Residential Lots);
7) Calculation of a transport charge per equivalent residential lot based on total existing and future (NPV) road costs divided by the total current and future (NPV) equivalent residential lots and discounted to allow for use by external traffic. (Refer Table 7 - Transport Infrastructure Charge Calculation)

The charge calculated through the above process is to be levied against new development in the City. This method apportions a representative proportion of the total network costs over new developments and is considered to represent a reasonable estimate of the cost of the urban sub-arterial and major collector road infrastructure network that is attributable to new development within the City. The remaining portion of cost is assumed to have been paid for from other revenue and covered by rates and / or other recovery methods in the past.

The contribution applies to all code and impact assessable development.

## *2.2 Network Roads*

A total of 35 network roads have been identified as strategic routes by function as arterial, sub-arterial, and major collectors for residential areas.

The network roads major functions include the collection and transport of the residential population of Gladstone between various areas within Gladstone. These network roads are detailed in Figure 1 Major Road Network and listed in Table 1 - Major Road Network List:

**Table 1 - Major Road Network List**

| Arterial | Sub Arterial | Major Collector | |
|---|---|---|---|
| DAWSON HIGHWAY | BLAIN DRIVE | AERODROME ROAD | HADDOCK DRIVE |
| GLADSTONE BENARABY ROAD | BRESLIN STREET | ALF O'ROURKE DRIVE | HARVEY ROAD |
| GLADSTONE MOUNT LARCOM ROAD | DERBY STREET | BRYAN JORDAN DRIVE | J HICKEY AVENUE |
| GLENLYON ROAD | DON YOUNG DRIVE | CHAPMAN DRIVE | LORD STREET |
| HANSON ROAD | FRENCH STREET | COL BROWN AVENUE | PALM DRIVE |
| PHILIP STREET | GLADSTONE BENARABY ROAD | DALRYMPLE DRIVE | SUN VALLEY ROAD |
| | KIRKWOOD ROAD | DIXON DRIVE | TANK STREET |
| | RED ROVER ROAD | GLEN EDEN DRIVE | TOOLOOA STREET |
| | TOOLOOA STREET | GLENLYON ROAD | VICTORIA AVENUE |
| | | GOONDOON STREET | WITNEY STREET |
| | | | |

## *2.3 Current Replacement Value of Existing Network Road Assets*

The Current Replacement Cost (CRC) of the road network based on Council's assets register has been calculated. This includes roads, intersections, bridges and associated works such as lighting, local drainage (not major trunk drainage), footpaths, bus stops, etc.

Table 2 - Scope of Existing Roads provides a copy of the details of the Current Replacement Cost of assets and lists the results and assumptions used. The current replacement value of roads is provided along with bridge and intersection infrastructure valuations.

## Table 2 - Scope of Existing Roads

| Trunk Assets | | | | | | | GLADSTONE |
|---|---|---|---|---|---|---|---|
| Asset Type | Description | Length | Width | External us | Unit rate | Adj CRC | |
| GLADSTONE BENARABY ROAD | Rural Arterial | 3526 | 0 | 15% | $ 133 | $ - | |
| GLADSTONE MOUNT LARCOM ROAD | Rural Arterial | 2848 | 5 | 15% | $ 133 | $ 1,501,380 | |
| GLENLYON ROAD | Rural Major Collecto | 1798 | 14 | 15% | $ 133 | $ 2,843,555 | |
| HADDOCK DRIVE | Rural Major Collecto | 3534 | 14 | 15% | $ 133 | $ 5,589,056 | |
| DAWSON HIGHWAY | Urban Arterial | 6643 | 6 | 15% | $ 133 | $ 4,856,331 | |
| DAWSON ROAD | Urban Arterial | 1607 | 14 | 15% | $ 133 | $ 2,450,719 | |
| GLADSTONE BENARABY ROAD | Urban Arterial | 5332 | 5 | 15% | $ 133 | $ 3,218,698 | |
| GLENLYON ROAD | Urban Arterial | 6174 | 14 | 15% | $ 133 | $ 9,764,243 | |
| GLENLYON STREET | Urban Arterial | 1765 | 13 | 15% | $ 133 | $ 2,558,751 | |
| HANSON ROAD | Urban Arterial | 6773 | 4 | 15% | $ 133 | $ 2,794,322 | |
| PHILIP STREET | Urban Arterial | 3567 | 13 | 15% | $ 133 | $ 5,073,458 | |
| AERODROME ROAD | Urban Major Collect | 1769 | 14 | 15% | $ 133 | $ 2,797,691 | |
| ALF O'ROURKE DRIVE | Urban Major Collect | 2226 | 0 | 15% | $ 133 | $ - | |
| BRYAN JORDAN DRIVE | Urban Major Collect | 1631 | 0 | 15% | $ 133 | $ - | |
| CHAPMAN DRIVE | Urban Major Collect | 520 | 14 | 15% | $ 133 | $ 822,385 | |
| COL BROWN AVENUE | Urban Major Collect | 1876 | 14 | 15% | $ 133 | $ 2,966,913 | |
| DALRYMPLE DRIVE | Urban Major Collect | 2087 | 14 | 15% | $ 133 | $ 3,300,611 | |
| DIXON DRIVE | Urban Major Collect | 1298 | 14 | 15% | $ 133 | $ 2,052,800 | |
| GLEN EDEN DRIVE | Urban Major Collect | 1259 | 14 | 15% | $ 133 | $ 1,991,121 | |
| GOONDOON STREET | Urban Major Collect | 1413 | 14 | 15% | $ 133 | $ 2,234,674 | |
| HARVEY ROAD | Urban Major Collect | 1503 | 14 | 15% | $ 133 | $ 2,377,010 | |
| J HICKEY AVENUE | Urban Major Collect | 3515 | 14 | 15% | $ 133 | $ 5,559,008 | |
| LORD STREET | Urban Major Collect | 567 | 14 | 15% | $ 133 | $ 896,716 | |
| PALM DRIVE | Urban Major Collect | 2102 | 14 | 15% | $ 133 | $ 3,324,334 | |
| SUN VALLEY ROAD | Urban Major Collect | 3238 | 14 | 15% | $ 133 | $ 5,120,929 | |
| TANK STREET | Urban Major Collect | 724 | 14 | 15% | $ 133 | $ 1,145,013 | |
| TOOLOOA STREET | Urban Major Collect | 2095 | 14 | 15% | $ 133 | $ 3,313,263 | |
| VICTORIA AVENUE | Urban Major Collect | 739 | 14 | 15% | $ 133 | $ 1,168,736 | |
| WITNEY STREET | Urban Major Collect | 1229 | 14 | 15% | $ 133 | $ 1,943,676 | |
| BLAIN DRIVE | Urban Sub-Arterial | 2323 | 14 | 15% | $ 133 | $ 3,673,848 | |
| BRESLIN STREET | Urban Sub-Arterial | 1389 | 14 | 15% | $ 133 | $ 2,196,717 | |
| DERBY STREET | Urban Sub-Arterial | 1341 | 14 | 15% | $ 133 | $ 2,120,805 | |
| DON YOUNG DRIVE | Urban Sub-Arterial | 1915 | 14 | 15% | $ 133 | $ 3,028,592 | |
| FRENCH STREET | Urban Sub-Arterial | 647 | 14 | 15% | $ 133 | $ 1,023,237 | |
| GLADSTONE BENARABY ROAD | Urban Sub-Arterial | 25 | 14 | 15% | $ 133 | $ 39,538 | |
| KIRKWOOD ROAD | Urban Sub-Arterial | 9976 | 11.66666667 | 15% | $ 133 | $ 13,147,620 | |
| RED ROVER ROAD | Urban Sub-Arterial | 3830 | 14 | 15% | $ 133 | $ 6,057,183 | |
| TOOLOOA STREET | Urban Sub-Arterial | 418 | 14 | 15% | $ 133 | $ 661,071 | |
| | | | | | | $ - | |

## *2.4 Future Road Network Construction*

### General

This item includes construction works timed to meet the traffic demand requirements and necessary to meet the standards as set out in Council's Roads and Transport Standard 2005. This includes for sub-arterial roads a 14m wide sealed pavement with pedestrian and cycle paths, street lighting, bridges, intersection upgrades and local drainage and for a major collector, 14m wide pavement, street lighting, pedestrian footpath, bridge, intersections and local drainage.

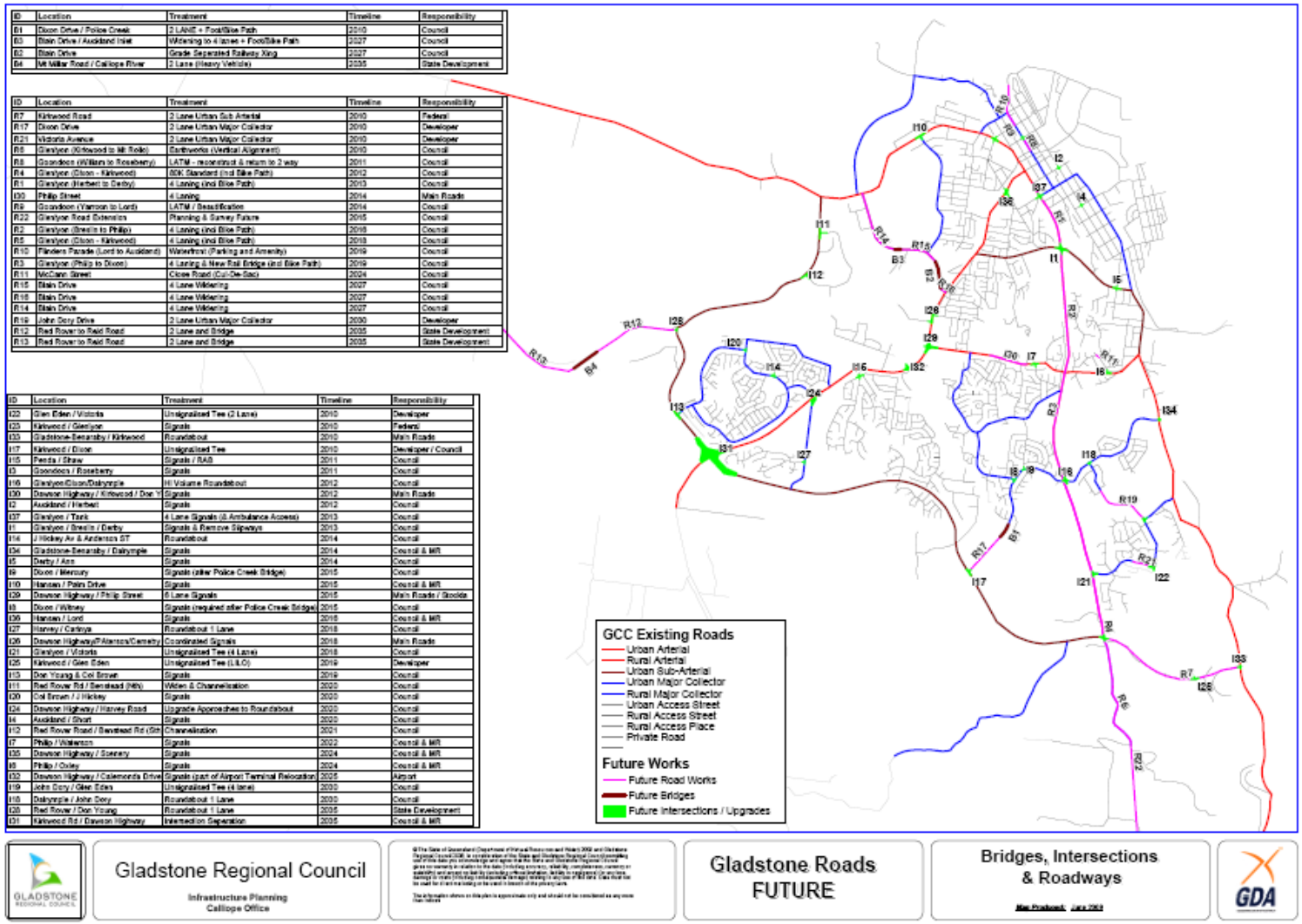
### Timing

Evaluation of current and future traffic demands and a review of proposed development areas and planning strategies for the City have been used to determine estimates for the year of construction for new infrastructure. In order to maintain this in a reasonable state it will be required to be upgraded on a regular basis to reflect changes in development pressures and areas of new residential construction.

The timing of works is used as a basis for calculation of the net present value of works to be completed in the future and although it will affect the overall cost of the final charge slight variations from actual construction will have little relative effect.

Figure 2 - Future Road Network Infrastructure provides a plan detailing estimated dates of development for the road network, intersections and bridge structures.

**Figure 2 - Future Road Network Infrastructure**



| ID | Location | Treatment | Timeline | Responsibility |
|---|---|---|---|---|
| I31 | Dixon Drive / Police Creek | 2 LANE + Foot/Bike Path | 2010 | Council |
| I33 | Blain Drive / Auckland Inlet | Widening to 4 lanes + Foot/Bike Path | 2027 | Council |
| I32 | Blain Drive | Grade Separated Railway Xing | 2027 | Council |
| I34 | Mt Miller Road / Calliope River | 2 Lane (Heavy Vehicle) | 2035 | State Development |

| ID | Location | Treatment | Timeline | Responsibility |
|---|---|---|---|---|
| R7 | Kirkwood Road | 2 Lane Urban Sub Arterial | 2010 | Federal |
| R17 | Dixon Drive | 2 Lane Urban Major Collector | 2010 | Developer |
| R21 | Victoria Avenue | 2 Lane Urban Major Collector | 2010 | Developer |
| R6 | Glenlyon (Kirkwood to Mt Rolle) | Earthworks (Vertical Alignment) | 2010 | Council |
| R8 | Goondoon (William to Roseberry) | LATM - reconstruct & return to 2 way | 2011 | Council |
| R4 | Glenlyon (Dixon - Kirkwood) | 80K Standard (incl Bike Path) | 2012 | Council |
| R1 | Glenlyon (Herbert to Derby) | 4 Laning (incl Bike Path) | 2013 | Council |
| I30 | Philip Street | 4 Laning | 2014 | Main Roads |
| R9 | Goondoon (Yarroon to Lord) | LATM / Beautification | 2014 | Council |
| R22 | Glenlyon Road Extension | Planning & Survey Future | 2015 | Council |
| R2 | Glenlyon (Breslin to Philip) | 4 Laning (incl Bike Path) | 2016 | Council |
| R5 | Glenlyon (Dixon - Kirkwood) | 4 Laning (incl Bike Path) | 2018 | Council |
| R10 | Flinders Parade (Lord to Auckland) | Waterfront (Parking and Amenity) | 2019 | Council |
| R3 | Glenlyon (Philip to Dixon) | 4 Laning & New Rail Bridge (incl Bike Path) | 2019 | Council |
| R11 | McCann Street | Close Road (Cul-De-Sac) | 2024 | Council |
| R15 | Blain Drive | 4 Lane Widening | 2027 | Council |
| R16 | Blain Drive | 4 Lane Widening | 2027 | Council |
| R14 | Blain Drive | 4 Lane Widening | 2027 | Council |
| R19 | John Dory Drive | 2 Lane Urban Major Collector | 2030 | Developer |
| R12 | Red Rover to Reid Road | 2 Lane and Bridge | 2035 | State Development |
| R13 | Red Rover to Reid Road | 2 Lane and Bridge | 2035 | State Development |

| ID | Location | Treatment | Timeline | Responsibility |
|---|---|---|---|---|
| I22 | Glen Eden / Victoria | Unsignalised Tee (2 Lane) | 2010 | Developer |
| I23 | Kirkwood / Glenlyon | Signals | 2010 | Federal |
| I35 | Gladstone-Benaraby / Kirkwood | Roundabout | 2010 | Main Roads |
| I17 | Kirkwood / Dixon | Unsignalised Tee | 2010 | Developer / Council |
| I15 | Reids / Shaw | Signals / RAB | 2011 | Council |
| I3 | Goondoon / Roseberry | Signals | 2011 | Council |
| I16 | Glenlyon/Dixon/Dalrymple | HI Volume Roundabout | 2012 | Council |
| I30 | Dawson Highway / Kirkwood / Doe Y | Signals | 2012 | Main Roads |
| I2 | Auckland / Herbert | Signals | 2012 | Council |
| I37 | Glenlyon / Tank | 4 Lane Signals (& Ambulance Access) | 2013 | Council |
| I1 | Glenlyon / Breslin / Derby | Signals & Remove Slipways | 2013 | Council |
| I14 | J Hickey Av & Anderson ST | Roundabout | 2014 | Council |
| I34 | Gladstone-Benaraby / Dalrymple | Signals | 2014 | Council & MR |
| I5 | Derby / Ann | Signals | 2014 | Council |
| I9 | Dixon / Mercury | Signals (after Police Creek Bridge) | 2015 | Council |
| I10 | Hanlan / Palm Drive | Signals | 2015 | Council & MR |
| I29 | Dawson Highway / Philip Street | 6 Lane Signals | 2015 | Main Roads / Boolda |
| I8 | Dixon / Witney | Signals (required after Police Creek Bridge) | 2015 | Council |
| I36 | Hanlan / Lord | Signals | 2016 | Council & MR |
| I27 | Harvey / Carioya | Roundabout 1 Lane | 2018 | Council |
| I26 | Dawson Highway/Flanson/Cemetry | Coordinated Signals | 2018 | Main Roads |
| I21 | Glenlyon / Victoria | Unsignalised Tee (4 Lane) | 2018 | Council |
| I25 | Kirkwood / Glen Eden | Unsignalised Tee (LILO) | 2019 | Developer |
| I13 | Doe Young & Col Brown | Signals | 2019 | Council |
| I11 | Red Rover Rd / Beresford (Nth) | Widen & Channelisation | 2020 | Council |
| I20 | Col Brown / J Hickey | Signals | 2020 | Council |
| I24 | Dawson Highway / Harvey Road | Upgrade Approaches to Roundabout | 2020 | Council |
| I4 | Auckland / Short | Signals | 2020 | Council |
| I12 | Red Rover Road / Beresford Rd (Sth | Channelisation | 2021 | Council |
| I7 | Philip / Waterson | Signals | 2022 | Council & MR |
| I35 | Dawson Highway / Sheerry | Signals | 2024 | Council & MR |
| I6 | Philip / Oxley | Signals | 2024 | Council & MR |
| I32 | Dawson Highway / Calemonds Drive | Signals (part of Airport Terminal Relocation) | 2025 | Airport |
| I19 | John Dory / Glen Eden | Unsignalised Tee (4 lane) | 2030 | Council |
| I18 | Dalrymple / John Dory | Roundabout 1 Lane | 2030 | Council |
| I28 | Red Rover / Don Young | Roundabout 1 Lane | 2035 | State Development |
| I31 | Kirkwood Rd / Dawson Highway | Intersection Separation | 2035 | Council & MR |

GCC Existing Roads
- Urban Arterial
- Rural Arterial
- Urban Sub-Arterial
- Urban Major Collector
- Rural Major Collector
- Urban Access Street
- Rural Access Street
- Rural Access Place
- Private Road

Future Works
- Future Road Works
- Future Bridges
- Future Intersections / Upgrades

Gladstone Regional Council
Infrastructure Planning
Calliope Office

Gladstone Roads
FUTURE

Bridges, Intersections
& Roadways

### Planning Horizon

A planning horizon of 20 years has been adopted in this report. All future works that are listed with construction dates beyond this horizon are excluded from the cost calculations. The 20 year horizon has been used as a reasonable figure for future prediction of development and traffic growth.

### Developer Constructed Roads

Historically developers have constructed major collectors within their subdivisions as part of the construction works and under conditions imposed by Council. The introduction of this policy will require a change to this previous individual agreement method. Council will allow for provision of funding contributions toward the construction of major collectors directly fronted by residential development and to be developed as part of developer constructed roads. The Council contribution will be based on the works necessary to increase the width and strength of network roads to 14.0 metres from the 8.0 metre minimum requirement for a residential collector.

### Developer Credits

Construction of a major collector road by a developer in accordance with the identified road network will require the developer to apply to Council for approval to construct the road. On approval the developer may be entitled to a credit for the works completed on behalf of the Council. In general for roadworks this will include additional width of road, additional pavement and seal depth. The value of the developer credit may be determined prior to the commencement of works and may be able to be offset against the cost of infrastructure charges for the development.

In the instance where the developer credit exceeds contributions these credits can be used for infrastructure charges in other areas. The cost of the road construction shall be derived from actual tenders for the work and Council will have the right to review the tender information prior to acceptance of the calculation for developer credits. Where there is any dispute regarding the validity of any of the tender prices submitted or calculation method this will be subject to review from an independent source agreed by both parties. No credit or payment for any work will be entered into until agreement between the two parties to the valuation of the works is made.

## *2.5 Net Present Value of Future Asset*

## Principle

The net present value provides the 2009 funding level necessary to build the asset at the nominated future date. A discount rate of 5.56% is applied and reflects the real opportunity cost of capital. This rate is based on a margin of 2.4% applied to the 10 year Treasury bond in the manner prescribed under Local Government Bulletin 06/01. This is the appropriate discount rate to use when considering investment of public funds and represents the bond rate at June 2009.

## Prioritisation of Work

The actual timing of works is dependant on many factors which include the take-up rate of residences, funding availability, development approvals, where development occurs, traffic density and preferred flow directions. These and a number of other factors have been considered and included in the program.

## Estimate of Net Present Value of Future Works

The net present value of the estimated costs developed in Table 3 - Summary of Costs and NPV of New Works are calculated in 2009 terms based on a 5.56% (real) discount rate. This is calculated using a proposed development program as detailed in Figure 2 - Future Road Network Infrastructure. The estimated time for construction of the asset is used as the date of expenditure and discounted back to present day terms. Regular review of this program will be required to ensure that it is maintained in a relevant state.

## Table 3 - Summary of Costs and NPV of New Works

**Active Assets**

GLADSTONE

| Proj No | Description | Subsidy | Proposed Date | CRC | Adj CRC | Present Value |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Roads** | | | | | $ - | |
| Asset Id - R17- Dixon Drive | 2 Lane Urban Major Collector | 100% | 2010 | $ 1,318,368 | $ - | $ - |
| Asset Id - R21- Victoria Avenue | 2 Lane Urban Major Collector | 100% | 2010 | $ 732,279 | $ - | $ - |
| Asset Id - R6- Glenlyon (Kirkwood to Mt Rollo) | Earthworks (Vertical Alignment) | 0% | 2010 | $ 500,000 | $ 500,000 | $ 448,716 |
| Asset Id - R7- Kirkwood Road | 2 Lane Urban Sub Arterial | 100% | 2010 | $ 4,234,194 | $ - | $ - |
| Asset Id - R8- Goondoon (William to Roseberry) | LATM - reconstruct & return to 2 way | 0% | 2011 | $ 560,838 | $ 560,838 | $ 476,803 |
| Asset Id - R4- Glenlyon (Dixon - Kirkwood) | 80K Standard (incl Bike Path) | 0% | 2012 | $ 3,996,303 | $ 3,996,303 | $ 3,218,555 |
| Asset Id - R1- Glenlyon (Herbert to Derby) | 4 Laning (incl Bike Path) | 0% | 2013 | $ 2,329,737 | $ 2,329,737 | $ 1,777,502 |
| Asset Id - R30- Philip Street | 4 Laning | 100% | 2014 | $ 1,067,187 | $ - | $ - |
| Asset Id - R9- Goondoon (Yarroon to Lord) | LATM / Beautification | 0% | 2014 | $ 568,812 | $ 568,812 | $ 411,124 |
| Asset Id - R22- Glenlyon Road Extension | Planning & Survey Future | 0% | 2015 | $ 9,550,194 | $ 9,550,194 | $ 6,539,078 |
| Asset Id - R2- Glenlyon (Breslin to Philip) | 4 Laning (incl Bike Path) | 0% | 2016 | $ 4,054,779 | $ 4,054,779 | $ 2,630,099 |
| Asset Id - R5- Glenlyon (Dixon - Kirkwood) | 4 Laning (incl Bike Path) | 0% | 2018 | $ 5,327,961 | $ 5,327,961 | $ 3,101,467 |
| Asset Id - R10- Flinders Parade (Lord to Auckland) | Waterfront (Parking and Amenity) | 0% | 2019 | $ 1,152,243 | $ 1,152,243 | $ 635,405 |
| Asset Id - R3- Glenlyon (Philip to Dixon) | 4 Laning & New Rail Bridge (incl Bike Path) | 0% | 2019 | $ 3,601,590 | $ 3,601,590 | $ 1,986,100 |
| Asset Id - R11- McCann Street | Close Road (Cul-De-Sac) | 0% | 2024 | $ 182,073 | $ 182,073 | $ 76,605 |
| Asset Id - R14- Blain Drive | 4 Lane Widening | 0% | 2027 | $ 2,238,036 | $ 2,238,036 | $ 800,532 |
| Asset Id - R15- Blain Drive | 4 Lane Widening | 0% | 2027 | $ 1,251,918 | $ 1,251,918 | $ 447,804 |
| Asset Id - R16- Blain Drive | 4 Lane Widening | 0% | 2027 | $ 221,943 | $ 221,943 | $ 79,388 |
| Asset Id - R19- John Dory Drive | 2 Lane Urban Major Collector | 100% | 2030 | $ 1,618,722 | $ - | $ - |
| Asset Id - R12- Red Rover to Reid Road | 2 Lane and Bridge | 100% | 2035 | $ 2,471,940 | $ - | $ - |
| Asset Id - R13- Red Rover to Reid Road | 2 Lane and Bridge | 100% | 2035 | $ 3,095,241 | $ - | $ - |
| | | | | | $ - | $ - |
| **Bridges** | | | | | $ - | $ - |
| Asset Id - B1 - Dixon Drive / Police Creek | 2 LANE + Foot/Bike Path | 0% | 2010 | $ 2,872,000 | $ 2,872,000 | $ 2,577,423 |
| Asset Id - B2 - Blain Drive | Grade Seperated Railway Xing | 0% | 2027 | $ 49,403,000 | $ 49,403,000 | $ 17,671,161 |
| Asset Id - B3 - Blain Drive / Auckland Inlet | Widening to 4 lanes + Foot/Bike Path | 0% | 2027 | $ 7,123,000 | $ 7,123,000 | $ 2,547,855 |
| Asset Id - B4 - Mt Millar Road / Calliope River | 2 Lane (Heavy Vehicle) | 100% | 2035 | $ 62,234,000 | $ - | $ - |
| | | | | | $ - | $ - |
| **Intersections** | | | | | $ - | $ - |
| Asset Id - I17 - Kirkwood / Dixon | Unsignalised Tee | 80% | 2010 | $ 553,000 | $ 110,600 | $ 99,256 |
| Asset Id - I22 - Glen Eden / Victoria | Unsignalised Tee (2 Lane) | 100% | 2010 | $ 690,000 | $ - | $ - |
| Asset Id - I23 - Kirkwood / Glenlyon | Signals | 100% | 2010 | $ 930,123 | $ - | $ - |
| Asset Id - I33 - Gladstone-Benaraby / Kirkwood | Roundabout | 100% | 2010 | $ 466,000 | $ - | $ - |
| Asset Id - I15 - Penda / Shaw | Signals / RAB | 0% | 2011 | $ 1,006,000 | $ 1,006,000 | $ 855,263 |
| Asset Id - I3 - Goondoon / Roseberry | Signals | 0% | 2011 | $ 393,000 | $ 393,000 | $ 334,114 |
| Asset Id - I16 - Glenlyon/Dixon/Dalrymple | Hi Volume Roundabout | 0% | 2012 | $ 1,078,000 | $ 1,078,000 | $ 868,203 |
| Asset Id - I2 - Auckland / Herbert | Signals | 0% | 2012 | $ 359,000 | $ 359,000 | $ 289,133 |
| Asset Id - I30 - Dawson Highway / Kirkwood / Don Young | Signals | 100% | 2012 | $ 2,597,000 | $ - | $ - |
| Asset Id - I1 - Glenlyon / Breslin / Derby | Signals & Remove Slipways | 0% | 2013 | $ 1,459,000 | $ 1,459,000 | $ 1,113,162 |
| Asset Id - I37 - Glenlyon / Tank | 4 Lane Signals (& Ambulance Access) | 0% | 2013 | $ 929,000 | $ 929,000 | $ 708,792 |
| Asset Id - I14 - J Hickey Av & Anderson ST | Roundabout | 0% | 2014 | $ 546,000 | $ 546,000 | $ 394,636 |
| Asset Id - I34 - Gladstone-Benaraby / Dalrymple | Signals | 50% | 2014 | $ 348,000 | $ 174,000 | $ 125,763 |
| Asset Id - I5 - Derby / Ann | Signals | 0% | 2014 | $ 571,000 | $ 571,000 | $ 412,705 |
| Asset Id - I10 - Hansen / Palm Drive | Signals | 50% | 2015 | $ 857,000 | $ 428,500 | $ 293,397 |
| Asset Id - I29 - Dawson Highway / Philip Street | 6 Lane Signals | 100% | 2015 | $ 2,535,000 | $ - | $ - |
| Asset Id - I8 - Dixon / Witney | Signals (required after Police Creek Bridge) | 0% | 2015 | $ 375,000 | $ 375,000 | $ 256,765 |
| Asset Id - I9 - Dixon / Mercury | Signals (after Police Creek Bridge) | 0% | 2015 | $ 373,000 | $ 373,000 | $ 255,395 |
| Asset Id - I36 - Hansen / Lord | Signals | 50% | 2016 | $ 751,000 | $ 375,500 | $ 243,565 |
| Asset Id - I21 - Glenlyon / Victoria | Unsignalised Tee (4 Lane) | 0% | 2018 | $ 589,000 | $ 589,000 | $ 342,864 |
| Asset Id - I26 - Dawson Highway/PAterson/Cemetry | Coordinated Signals | 100% | 2018 | $ 1,153,000 | $ - | $ - |
| Asset Id - I27 - Harvey / Carinya | Roundabout 1 Lane | 0% | 2018 | $ 343,000 | $ 343,000 | $ 199,664 |
| Asset Id - I13 - Don Young & Col Brown | Signals | 0% | 2019 | $ 736,000 | $ 736,000 | $ 405,868 |
| Asset Id - I25 - Kirkwood / Glen Eden | Unsignalised Tee (LILO) | 100% | 2019 | $ 549,000 | $ - | $ - |
| Asset Id - I11 - Red Rover Rd / Benstead (Nth) | Widen & Channelisation | 0% | 2020 | $ 773,000 | $ 773,000 | $ 403,819 |
| Asset Id - I20 - Col Brown / J Hickey | Signals | 0% | 2020 | $ 359,000 | $ 359,000 | $ 187,543 |
| Asset Id - I24 - Dawson Highway / Harvey Road | Upgrade Approaches to Roundabout | 0% | 2020 | $ 928,000 | $ 928,000 | $ 484,792 |
| Asset Id - I4 - Auckland / Short | Signals | 0% | 2020 | $ 345,000 | $ 345,000 | $ 180,230 |
| Asset Id - I12 - Red Rover Road / Benstead Rd (Sth) | Channelisation | 0% | 2021 | $ 613,000 | $ 613,000 | $ 303,367 |
| Asset Id - I7 - Philip / Waterson | Signals | 50% | 2022 | $ 666,000 | $ 333,000 | $ 156,118 |
| Asset Id - I35 - Dawson Highway / Scenery | Signals | 50% | 2024 | $ 933,000 | $ 466,500 | $ 196,273 |
| Asset Id - I6 - Philip / Oxley | Signals | 50% | 2024 | $ 792,000 | $ 396,000 | $ 166,612 |
| Asset Id - I32 - Dawson Highway / Calemonda Drive | Signals (part of Airport Terminal Relocation) | 100% | 2025 | $ 1,135,000 | $ - | $ - |
| Asset Id - I18 - Dalrymple / John Dory | Roundabout 1 Lane | 0% | 2030 | $ 313,000 | $ 313,000 | $ - |
| Asset Id - I19 - John Dory / Glen Eden | Unsignalised Tee (4 lane) | 0% | 2030 | $ 416,000 | $ 416,000 | $ - |
| Asset Id - I28 - Red Rover / Don Young | Roundabout 1 Lane | 100% | 2035 | $ 269,000 | $ - | $ - |
| Asset Id - I31 - Kirkwood Rd / Dawson Highway | Intersection Seperation | 50% | 2035 | $ 28,954,000 | $ 14,477,000 | $ - |
| | | | | | $ - | |

## *2.6 External Traffic*

External Traffic is defined as traffic that does not originate or end within the City boundary. The total traffic flow on the sub-arterial and major collector road network has been calculated from existing traffic counts, previous traffic counts with added growth, by estimation from adjacent residence number and by estimation. The total traffic movements on the network roads calculated by this method total 132,774 vehicle movements per day (2008).

External traffic has been identified as vehicle movements that commence or end outside of the city boundary and traffic movements for this have been obtained from Queensland Department of Main Roads traffic counters located approximately at the city boundaries on Dawson Highway, Mt Larcom Road and Gladstone-Benaraby Road. Previous studies identified the scope of external traffic to be in the order of 15%.

Table 4 - Network Traffic Flow Summary outlines the traffic flow assumed in the calculation of the charges. These figures include both the existing and predicted internal traffic and external traffic.

**Table 4 - Network Traffic Flow Summary**

| CatchmentName | Catchment Demand Projections (vpd) | | | | |
|---|---|---|---|---|---|
| | 2008 | 2013 | 2018 | 2023 | 2028 |
| | | | | | |
| GLADSTONE | 132,774 | 143,878 | 160,886 | 181,673 | 204,146 |
| | | | | | |
| | | | | | |

## *2.7 Residential Population in Terms of Equivalent Residential Lots*

### Existing Population

The existing population of 29,535 in the City (June 2008) has been estimated using information prepared by the Planning Information and Forecasting Unit. The average household dwelling in Gladstone was 2.6 persons per occupied dwelling providing an estimated 11,289 equivalent residential dwellings.

An equivalent resident lot (ERL) is assumed to represent a single detached residential dwelling and represents a traffic generation figure of around 10 vehicle trips per day.

Table 5 - Equivalent Residential Lots below details equivalencies for alternative type of residential accommodation. Peak hour vehicle trip generation figures are adopted to estimate equivalent ERL's as they form the critical parameter in the decision to upgrade road infrastructure.

**Table 5 - Equivalent Residential Lots**

| Use | Unit | Peak Hr Vehicle Trips | ERL Eq. |
|---|---|---|---|
| New Residential lot | Lot | 0.85 | 1.00 |
| Detached Dwelling | Lot | 0.85 | 1.00 |
| 3 bedroom multi unit | Unit | 0.6 | 0.71 |
| Dual Occupancy (Duplex) | Unit | 0.5 | 0.59 |
| 2 bedroom multi unit | Unit | 0.45 | 0.53 |
| Cluster house development | Unit | 0.42 | 0.49 |
| Mobile home park | Unit | 0.42 | 0.49 |
| 1 bedroom multi unit | Unit | 0.4 | 0.47 |
| Motel Room [1] | Room | 0.4 | 0.47 |
| Bed & Breakfast | Room | 0.38 | 0.45 |
| Caravan Park [2] | Site | 0.38 | 0.45 |
| Hotel Room (Accommodation) [1] | Room | 0.3 | 0.35 |
| Backpackers Accommodation | Bed | 0.12 | 0.14 |
| Industrial Development | $100m^2$ / GFA | 0.14 | 0.165 |
| Commercial Development | To be determined on application | | |

1. Hotel and motel rooms includes self contained and non self contained units
2. Mobile homes sited semi-permanently are based in number of bedrooms as per units above.

## Future Equivalent Residential Lots

The ultimate population level in terms of ERL's for the City has been calculated based on the area of residential land allocated on the City Strategic Plan. The total area of land allocated to residential uses under the strategic plan is 4,032Ha. Residential densities of 10 residences per hectare have been identified as typical for detached dwellings and up to 35 units per hectare for the more dense unit developments.

## *2.8 Charge Calculation*

The charge is calculated based on the following formula:

$$\text{Infrastructure Charge (\$/ERL)} = \frac{\text{Current Replacement Cost of existing network assets} + \text{Value of future assets to be constructed within the design horizon (NPV)}}{\text{Total existing Equivalent Residential Lots plus Future Residential Lots (NPV) to be developed in the design horizon}} \times \text{\% City Residential Traffic}$$

# 3. Road Infrastructure Contribution

## *3.1 General*

Table 7 - Transport Infrastructure Charge Calculation below details the calculation of the infrastructure charge per Equivalent Residential Lot based on the assumptions for planning horizon, growth rate and other data as shown above and listed below the table. Table 3 - Summary of Costs and NPV of New Works previously detailed the summary of costs and depreciated and NPV's for existing and future construction along with proposed development dates.

QDMR controlled roads are omitted from all calculation based on their funding from State Government reserves. The Gladstone City area has been treated as a single traffic area under the infrastructure charges policy.

The infrastructure charge for various residential type uses is listed in Table 6 - Infrastructure Charge for Various Residential Type Uses below based on the calculated charge from the spreadsheets:-

**Table 6 - Infrastructure Charge for Various Residential Type Uses**

| Use | Unit | Peak Hr Vehicle Trips | ERL Eq. | Charge |
|---|---|---|---|---|
| New Residential lot | Lot | 0.85 | 1.00 | $6,404 |
| Detached Dwelling | Lot | 0.85 | 1.00 | $6,404 |
| 3 bedroom multi unit | Unit | 0.6 | 0.71 | $4,547 |
| Dual Occupancy (Duplex) | Unit | 0.5 | 0.59 | $3,778 |
| 2 bedroom multi unit | Unit | 0.45 | 0.53 | $3,394 |
| Cluster house development | Unit | 0.42 | 0.49 | $3,138 |
| Mobile home park | Unit | 0.42 | 0.49 | $3,138 |
| 1 bedroom multi unit | Unit | 0.4 | 0.47 | $3,010 |
| Motel Room [1] | Room | 0.4 | 0.47 | $3,010 |
| Bed & Breakfast | Room | 0.38 | 0.45 | $2,882 |
| Caravan Park [2] | Site | 0.38 | 0.45 | $2,882 |
| Hotel Room (Accommodation) [1] | Room | 0.3 | 0.35 | $2,241 |
| Backpackers Accommodation | Bed | 0.12 | 0.14 | $896 |
| Industrial Development | 100m$^2$ / GFA | 0.14 | 0.165 | $1,056 |
| Commercial Development | To be determined on application | | | |

## *3.2 Time for Payment*

The time for payment of charges is to be at reconfiguring of a lot; prior to approval and dating of the Plan of survey and on Material Change of Use; prior to commencement of use.

**Table 7 - Transport Infrastructure Charge Calculation**

| | |
|---|---|
| Current Replacement cost of existing network assets | $113,614,005 |

| | |
|---|---|
| Nominal Value of Future Road Cap X | $108,993,527 |
| Value of Future assets to be constructed within the design horizon | $54,702,914 |
| Assumed external usage[1] | 15% |
| Total existing Demand (vpd) | 132,774 |
| Estimated Future Demand (vpd) | 204,146 |
| Present Value of Future Demand (vpd) | 38071 |
| Cost per unit of use (per vpd) | $985.20 |
| **Cost per ERL (6.5vpd per lot)** | **$6,404** |

***Variables Used in This Calculation***

| | |
|---|---|
| Discount Rate | 5.56% |
| ERA Growth Rate | Range of 1.3% - 2.5% annually |
| Design Horizon | 20 Years |

[1] External usage already factored into above estimates

# 4. Council Contributions

The estimated total current value of the new future road network to be developed in Gladstone to meet the needs of traffic over a planning horizon of 20 years is $109M. Infrastructure charges can be expected to return $60.0M over the same period.

The shortfall of around $40M between collection from infrastructure charges and the estimated upgrading cost will need to be made up from Council funds and represents use by external traffic and existing traffic diversion to the new roads.

# 5. Document Amendments

Adopted by Council 17 June 2002

| AMENDMENT DESCRIPTION | DATE |
|---|---|
| Adopted in conjunction with IPA Planning Scheme | 12 December 2006 |
| Amended to incorporate revision of Capital works requirements | 6 October 2009 |

## References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   Statistics http://www.rba.gov.au/hartPack/interest_rates_australia.pdf
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4. Combined Planning Study Gladstone City / Calliope Shire 2001, SKM March 2001
5. Gladstone Area Transport Study – Queensland Department of Transport 1993
6. Gladstone Integrated Regional Transport Plan - Queensland Department of Transport 2001
7. Demographic and Housing Profile Gladstone City – Queensland Government, Department of Local Government and Planning, December 2001
8. Cairns City Council Traffic Management Plans – Maunsell McIntyre, January 2001
9. Guidelines for Infrastructure Charging under the Integrated Planning Act – Queensland Department of Local Government and Planning