

Funding mechanisms for cycling infrastructure

Purpose

This note aims to assist local councils in understanding different mechanisms for the financing of cycling infrastructure and presents simplified guidelines for determining infrastructure charges.

For the purpose of this note, 'cycling infrastructure' includes shared and dedicated off-road paths, on-road bike lanes, end-of-trip facilities and network planning/administration support.

This note is designed to complement Cycle Note A4 – *Developing a local cycle strategy and local cycle network plan*.

Introduction

Attaining appropriate funding levels is a critical component of planning for cycling infrastructure. As community expectations of public infrastructure continue to mount, it is becoming increasingly necessary for local governments to consider alternative funding opportunities. This is particularly true for cycling infrastructure, which is often not a high priority. Infrastructure charging and the 'user pays' principle established by the *Integrated Planning Act 1997* (IPA) is the latest response to this challenge.

This Cycle Note presents alternative methods of funding cycling infrastructure and provides a step-by-step guideline for preparing an Infrastructure Charges Schedule (ICS).

Funding cycling infrastructure outside of an Infrastructure Charges Schedule

There are several methods for the funding of cycling infrastructure outside of an ICS. These are:

1. Funding from a dedicated local government cycling infrastructure budget – this source may, in some cases, be insufficient to meet the community's infrastructure expectations.
2. Incorporating cycling infrastructure into other works programs. Cycling infrastructure, relative to other infrastructure items, is not necessarily expensive and can often be readily incorporated into other works. This is particularly true for:
 - road upgrades: where practical and possible, the prospect of an integrated transport solution should be pursued
 - open space and recreation projects: opportunities exist for the inclusion of bicycle end-of-trip facilities (refer Cycle Note C4 – *End-of-trip facilities for bicycle riders*), consideration of cyclists in planning of trail networks or acquisition of additional land for provision of cycling infrastructure
 - drainage corridors: the planning or retrofitting of drainage corridors may present an opportunity to incorporate an off-road cycle link, and
 - provision of cycling infrastructure through urban design and developer consent (see Cycle Note A4 – *Developing a local cycle strategy and local cycle network plan*).

Aim

This series of notes aims to assist planners and engineers to provide for cycling in their local area. The Cycle Notes should be read in conjunction with:

- Guide to Traffic Engineering Practice, Part 14 – Bicycles (Austroads, 1999)
- Queensland Manual of Uniform Traffic Control Devices, Part 9 Bicycle Facilities
- Road Planning and Design Manual (Queensland Department of Main Roads).

Contents

- Funding cycling infrastructure outside of an Infrastructure Charges Schedule
- Priority infrastructure planning and Infrastructure charging under the *Integrated Planning Act 1997*
- Development of infrastructure charges for cycling infrastructure
- Options for levying the infrastructure charge.

Funding mechanisms for cycling infrastructure

3. Attaining State or Federal government subsidisation for the provision of cycling infrastructure: funding programs are available to assist local governments in the design and implementation of cycling infrastructure. The key funding programs include:
- The *Transport Infrastructure Development Scheme* (TIDS) administered by the Queensland Department of Main Roads (Main Roads). TIDS will fund nominated/agreed dedicated bikeways and shared paths on a 50/50 subsidy basis with local governments. On-road bike lanes will also be funded on a 50/50 basis. Main Roads' *Cycling on State-Controlled Roads* policy commits the department to support TIDS funding with preference given to priority cycling routes
 - *Safe Walking and Pedalling Program*: Grants of up to \$10,000 are available to assist schools in the development of Safe Walking and Pedalling applications which address the safety of children walking and cycling to and from school. Funding will also be given for behavioural, educational and engineering road safety interventions
 - *Safe School Travel (SafeST) Subsidy Scheme*: The scheme is funded from the *Roads Implementation Program* (RIP) and provides 50/50 subsidy to Queensland local governments for approved school transport related infrastructure works. This may include provision of school zones, crossing facilities, pedestrian refuge islands, bike facilities and other traffic management devices
 - *Local Government Development Program*: This scheme is funded through Sport and Recreation Queensland and focuses on planning, participation and places for increased community involvement in sport and recreation activities. The planning category of this program supports local governments to conduct recreation planning projects which could include the recreation-oriented aspects of both local cycle strategies and local cycle network plans (see Cycle Note A4 – *Developing a local cycle strategy and local cycle network plan*). The funding is offered at a 50/50 subsidy with up to \$75,000 available under the program. The places category of the program focuses on physical activity spaces in public places and supports the construction or upgrading of cycleways, walkways and walking trails. The program offers up to \$75,000 to local governments on a 50/50 subsidy basis to fund dedicated cycleways and shared paths as well as end-of-trip facilities that are associated with a new path.
 - *Major Facilities Program*: This scheme, also funded through Sport and Recreation Queensland, offers a 50/50 subsidy of eligible project costs up to \$750,000 for cycleways and shared paths.

For more details of these and other funding programs, visit Queensland Transport's cycling website at www.transport.qld.gov.au/cycling.

The importance of forward planning

Irrespective of how the project is funded, forward planning is a critical activity that will assist local governments in achieving their aspirations for improved cycle infrastructure. In order to effectively target government subsidisation and/or incorporate cycling infrastructure into civil works programs, planning schemes or local area plans, cycling infrastructure needs must be identified well in advance (e.g. 10 to 20 years) and prioritised. This is best achieved through the development of a local and regional cycle network plan that is made publicly available (see Cycle Note A4 – *Developing a local cycle strategy and local cycle network plan*). It may also be cost-effective to provide for cycling via an overall transport ICS.

Priority infrastructure planning and infrastructure charging under the Integrated Planning Act 1997

The IPA introduced a charging regime that on one hand acts as a growth management tool, and on the other, enables an efficient infrastructure funding tool for planned growth.

Priority Infrastructure Plans identify the existing and future infrastructure necessary to cater for estimated population growth. These plans are then linked to the ICS which enable local governments to obtain funds towards the provision of infrastructure through developer contributions. Transport infrastructure capable of being fully or partially funded through an ICS includes roads, vehicle lay-bys, traffic control devices, dedicated public transport corridors, public parking predominantly serving a local area, cycleways, pathways and ferry terminals.

Sport and Recreation Queensland has developed statutory guidelines setting out the process for developing Priority Infrastructure Plans and associated ICS. The website for accessing these guidelines is www.ipa.qld.gov.au/infra/infraGuides.asp.

Local governments are therefore able to obtain funding towards cycling infrastructure if planned appropriately through Priority Infrastructure Plans and then charged through their ICS. It is recommended that local governments pursue this funding mechanism during ICS development for localities within their local government area. As these schedules are unlikely to cover cycling infrastructure only, it might be more appropriate to construct a transport ICS which includes cycling. The planning and costing for cycling infrastructure should be undertaken at the same time local governments are considering other development infrastructure necessary to support predicted growth.

Development of infrastructure charges for cycling infrastructure

Following is a simplified step-by-step explanation of the process for developing a cycling infrastructure component of an ICS. For more detail it is recommended the guidelines be consulted (<http://www.ipa.qld.gov.au/infra/infraGuides.asp>). The principles and process explained may be applied to a small local precinct or across a local government area. The first two steps form part of the Local Cycle Network Plan (see Cycle Note A4 – *Developing a local cycle strategy and local cycle network plan*).

Required inputs into this process include the following:

- population data (including current population), estimated ultimate populations (if available) and time series data for estimated annual population growth. This data will need to be made available at the suburb/planning district level. This data is available from the Department of Local Government, Planning, Sport and Recreation website (<http://www.lgp.qld.gov.au/>)
- planning scheme information, specifically the planning intent for the area(s) under investigation, and
- a Local and/or Regional Cycle Network Plan complete with route prioritisation, timing of construction and estimated current value of each link in the network.

Steps 1 and 2: Demonstrate community need for cycling infrastructure and development of cycle network plan

These steps are not carried out as part of developing the ICS. However, two key products necessary to the ICS come out of these tasks. These are:

- an explanation of community need for the proposed infrastructure, and
- a cycle network plan complete with route prioritisation, timing of construction, estimated cost of construction and estimated current value of each link in the network.

The cycle network plan will typically identify a hierarchy of cycle paths, such as:

- local links, servicing local neighbourhoods (or local planning areas)
- district links, linking several neighbourhoods, and
- regional links, linking several districts.

Other 'special' links can also be provided, such as through popular tourist areas. It is important that the cycle network plan achieves a desired level of service. This is the standard of infrastructure performance defined within the IPA in terms of both environmental effects and user benefits.

Reference to *Austroroads Part 14* and to the user and environmental benefits provided by increasing mode choice and network connectivity are usually sufficient.

Step 3: Determine cost of infrastructure

In Step 3, the estimated cost to construct each link in the proposed cycle network must be calculated. For the purposes of developing infrastructure charges, it is also prudent to include the costs of providing end-of-trip facilities.



Funding mechanisms for cycling infrastructure

Step 4: Determining catchment areas and development to be charged

In Step 4, the catchment area of each cycle link is determined (note: the catchment area of a link is the area serviced by that link). To enable a development to be charged for cycle infrastructure, it is important that a direct nexus is established between the proposed infrastructure and the development to be charged. Typically, charges may be levied based on the catchment areas as follows:

- local cycleway links – charged across benefiting neighbourhood or designated local planning area
- district cycleway links – charged across neighbourhoods/planning areas serviced (note: this could be an entire suburb)
- regional cycleway links – charged across suburbs served, or in some circumstances, the entire local government area.

Where a route is shared between catchment areas, the proportion charged against each catchment is based on the proportion of demand (expressed in percentage of trip units) that the area attracts.

Following the determination of catchments for cycling infrastructure, the nature of development to be charged must be determined. Chargeable development is development that contributes cycle traffic to the cycle or road network and is benefited by the proposed infrastructure. Typically, this includes all forms of urban residential and commercial development. Industrial or non-urban development may also be included if they are considered to generate cycle traffic. However, it is prudent to exclude development in these land use zones from the charges unless the generation of cycle trips by these uses can be demonstrated.

Step 5: Determine ultimate development potential and total charging units

This step is completed so that the cost of cycling infrastructure may be fairly apportioned between different catchments. This requires the determination of current and ultimate levels of development within the areas to be serviced by the cycling infrastructure and which fall within council's priority infrastructure area.

Ultimate development is defined as the “*maximum level of development that would be permissible under the planning intent for the subject area*”. Based on council's planning scheme development requirements, a number of assumptions can be made regarding the nature of development likely to occur within any given area.

Assumptions must be made for each land use area for the following aspects:

- occupancy rate per residential dwelling
- number of residential dwelling units per hectare, and
- likely Gross Floor Area (GFA) achievable in non-residential areas.

In addition, land area measurements (in hectares) are required for each land use area.

From this, it is possible to calculate the total number of **charging units**. Charging units are expressed as:

- **dwelling**s in residential areas
- **100m² GFA units** in non-residential areas, and
- **combined dwelling and 100m² GFA units** in mixed-use areas.

Table 1 shows how the above information is used to determine the total charging units for each planning area or catchment.

Table 1: Example of calculating charging units

Zoning (chargeable development)	Occupancy rate per dwelling	Dwellings or 100m ² GFA units per hectare	Population per hectare	Land area within zoning (ha)	Estimated ultimate charging units
Low density residential	2.8	10	28	150	1,500
Local centre	N/A	50	-	30	1,500

Step 6: Convert ultimate development (charging units) to demand for cycle trips (trip units)

The proposed development must be expressed in terms of cycling demand, represented as trip units. Different forms of development (e.g. residential, commercial, industrial etc) exert different levels of demand on cycling infrastructure. This must be represented in the development of charges. Trip units reflecting the differing levels of cycle demand across different land uses provide a way to ensure that various forms of development do not incur the same charge without regard to levels of demand generated by each use. For example, research has indicated that on average, each dwelling generates 0.28 cycle trips per day.

This step essentially calls for research into the cycle trip generating potential of different land uses. While not intended to be a definitive guide, Table 2 approximates the number of daily cycle trips generated by different forms of development/land uses.

Table 2: Indicative daily cycle trips generated by development/land use (Source: GHD, 2002)

Form of development	Indicative daily cycle trips generated	Trip units per land use type
RESIDENTIAL DEVELOPMENT (dwelling units)		
Low density residential	0.28	1
Medium density residential	0.21	0.75
High density residential	0.182	0.65
Rural residential	0.028	0.1
RESIDENTIAL/COMMERCIAL MIXED USE DEVELOPMENT (combined dwelling/100m² GFA unit)		
Commercial uses/medium density housing	0.35	1.25
COMMERCIAL/INDUSTRIAL DEVELOPMENT (100m² GFA units)		
Commercial/retail development (e.g. local centre)	0.42	1.5
Mixed industry/business areas	0.168	0.6
Core industrial areas	0.112	0.4

The cycling trips generated are then converted into a number of trip units for each land use. The low density residential daily trip generation rate (in this case, 0.28 cycle trips) is treated as the standard unit and is expressed as 1 trip unit. All daily trip generation rates for other uses are expressed relative to this, as also shown in Table 2.

These trip units are then applied to the charging units for each catchment (Table 1) and the total number of cycle trips for each planning area determined. This is shown in Table 3.

Table 3: Trip unit generation for planning areas

Land use zone	Number of charging units	Trip units per land use type	Ultimate number of trip units (demand)
Low density residential	1,500	1	1,500
Local centre	1,500	1.5	2,250



Funding mechanisms for cycling infrastructure

Step 7: Determine net present value (NPV) of forecast infrastructure and net present value of forecast demand

Present value of forecast infrastructure (Supply)

This step would not be necessary if all cycling infrastructure were to be constructed immediately, or if there were no opportunity costs associated with the use of money. However, in planning for cycling infrastructure, dealing with long lag times prior to implementation of bikeways (as well as inflation) is a reality.

In order to take this into account, it is necessary to express the costs of all infrastructure in present value terms (i.e. the amount required to be invested today at a designated interest rate in order to construct the bikeway at a proposed later date). This clearly requires an implementation program for cycle infrastructure to be prepared and costed over time.

Forecast development (Demand)

It is also necessary to forecast the future demand (e.g. development). By calculating the future demand in conjunction with the present value of the cost to meet the ultimate demand, a greater alignment is achieved between charges and network costs. In addition, a buffer is created ensuring that the costs of infrastructure are recovered even if the estimated ultimate population is not reached.

Step 8: Establish value of each trip unit

The purpose of this step is to determine the standard value or unit cost for each trip unit. The standard unit cost is calculated by dividing the total present value of the forecast cost of the network by the forecast demand due to development, expressed as trip units.

For example:

Total present value of forecast network costs	=	\$11,885
Total demand from development	=	3,647 trip units
Present value cost of network per trip unit	=	\$11,885 / 3,647 trip units
	=	\$3.26 per trip unit

Step 9: Determining charge for different types of land use

The previous step produced a standard present value cost per trip unit. As each land use type is deemed to contribute differing levels of cycle traffic to the system (and therefore a different number of trip units), the charge per land use varies accordingly. Calculation of the charge per land use type simply involves multiplying the charge per trip unit by the number of trip units generated by land use type. An example is demonstrated in Table 4.

Table 4: Determining charge for different land use types

Land use zone	Trip units per land use type	Base present value charge per trip unit charge	Present value charge per land use type to be applied to development	Total units for development	Total charge to development by land use type
Low density residential	1	\$3.26	\$3.26	X	= X x \$3.26
Local centre	1.5	\$3.26	\$4.89	Y	= Y x \$4.89

In this way appropriate charges for cycling infrastructure for each catchment or planning area can be determined and included in an ICS or Infrastructure Payment Schedule.

Options for levying the infrastructure charge

Infrastructure charges may be levied on incoming development (at the time of approval) or existing development (through a charge notice, which may coincide with rates notices). They may also be combined with other funding mechanisms, as detailed earlier. For details on levying the infrastructure charge or other aspects of infrastructure charging, please consult the *Infrastructure Charges Planning Guideline* published by the Department of Local Government and Planning, Sport and Recreation.

Production of an infrastructure charges schedule

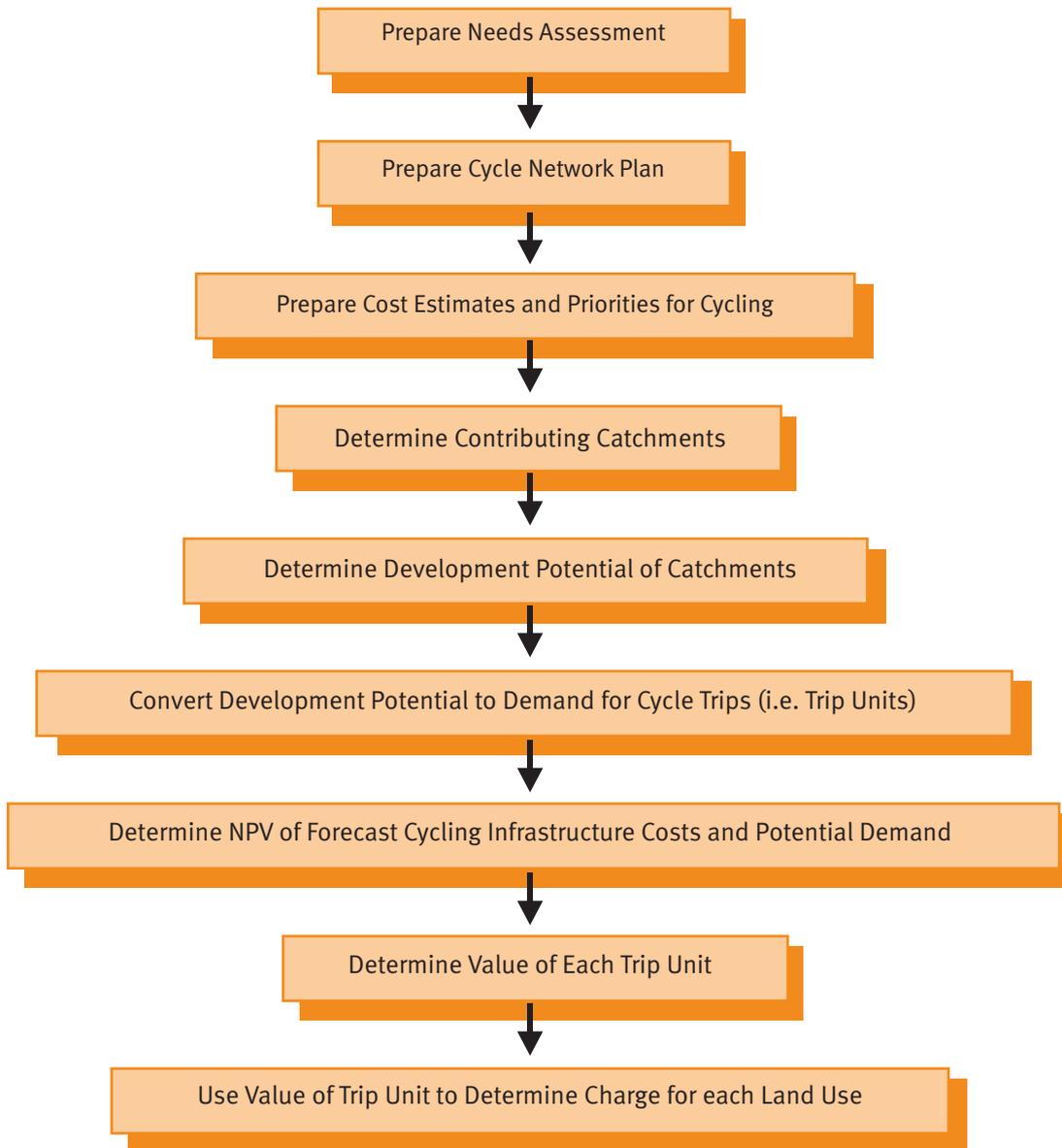


Figure 1: Steps to producing an Infrastructure Charges Schedule



Funding mechanisms for cycling infrastructure

Other references

1. Queensland Government, *Integrated Planning Act 1997* section 5.1.1(1)(b).
2. DLGSR *Infrastructure Charges Planning Guideline*.

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