



Kingaroy to Kilkivan Rail Trail: Economic Assessment



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CONTENTS

INTRODUCTION..... 1

PROJECT METHODOLOGY 2

 Project Overview 2

 Evaluation Framework..... 4

 Key Inputs and Assumptions..... 4

 Costs 5

 Benefits 6

Value Added from Construction Phase..... 6

Consumer Surplus 7

Indirect Visitor Expenditure..... 8

 Evaluation Period..... 9

 Discount Rate..... 9

COST BENEFIT ASSESSMENT..... 10

APPENDIX A: KINGAROY TO KILKIVAN RAIL TRAIL PROJECT PLAN..... 11

INTRODUCTION

Lawrence Consulting was commissioned by South Burnett Regional Council (BRC) to undertake an economic assessment of the proposed Kingaroy to Kilkivan Rail Trail Project, the aim of which is to demonstrate the economic benefit of the Project and subsequently ensure the efficient allocation of public and private funding.

The scope of the economic assessment included:

- Evaluation of the direct costs and benefits to the community resulting from the Project; and
- Evaluation of the potential wider economic impacts as a result of the Project.

This report details the following key components of the economic assessment undertaken:

- Evaluation framework and guidelines;
- Cost benefit analysis (including approach, key inputs and assumptions and scenarios modelled);
- Results of analysis, including Net Present Value (NPV) and Benefit Cost-Ratio (BCR);
- Sensitivity analysis; and
- Wider economic impact analysis.

The following sections of this report present the results of the economic impact analysis.

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PO Box 2567, Toowoomba Q 4350

P +61 7 4613 0206 M 0437 180 566

E reuben@lawrenceconsulting.com.au W www.lawrenceconsulting.com.au

PROJECT METHODOLOGY

Project Overview

As part of its strategic vision to revitalise the South Burnett region, South Burnett Council proposes the development of a rail trail between Kingaroy and Murgon as part of a full Kingaroy to Kilkivan Rail Trail. South Burnett Regional Council is keen to build on their successful development and management of the Brisbane Valley Rail Trail from Linville to Nukku, which has been a significant driver of economic development in the Blackbutt district.

A rail trail is a closed railway line that has been converted to a recreation trail, usually for non-motorised activities such as walking, cycling and horse riding. In and near urban areas, rail trails are also redeveloped for walking and cycling commuters, wheel chair access and other forms of (physically) “active” (non-motorised) transport. Typically, any rail infrastructure that cannot be modified for recreation trail purposes is removed and the remaining structures are converted for the intended recreational uses.

The Kingaroy to Kilkivan Rail Trail is approximately 87km long, traversing three local government areas (LGAs):

- Approximately 47km of trail are located in the South Burnett LGA. The line commences at former Kingaroy railway station in the CBD and runs north through the rural townships of Crawford, Memerambi, Wooroolin, Tingoora, Wondai and Murgon
- Approximately 40km of trail are within the Gympie LGA, from Manyung through Goomeri ending at Kilkivan
- Part of the rail corridor between Wondai and Murgon forms the western boundary between South Burnett LGA and the Cherbourg Aboriginal Shire Council area.

A map of the proposed rail trail is provided at Appendix A.

To achieve the intended economic outcomes, sequential development of rail trail sections, providing for a mix trail uses, is proposed. These uses include half-day to full-day options for cycling, walking or horse riding, supported by hotel, motel, bed and breakfast or camping options at the start and finish of each section. It is recommended that sequential development of the rail trail proceed from Kingaroy toward Kilkivan with Kingaroy to Wooroolin as the first section for conversion to rail trail.

A feasibility study and business case, jointly completed in 2012 by South Burnett Regional Council, the Department of State Development, Infrastructure and Planning and the Department of Transport and Main Roads, confirmed the technical and economic feasibility for redeveloping the closed Kingaroy to Theebine railway line as a recreation trail for walking, cycling and horse riding, whilst also demonstrating that the proposed rail trail would provide a number of key outcomes:

- Recreation
 - Recreational cycling, walking and horse riding for residents and regional visitors
- Tourism
 - Access to heritage, adventure/outdoor and eco-tourism activities
 - Value-added packaging of tourism and recreational activities to strengthen linkages between existing tourism assets and experiences related to the rail trail
 - Business expansion and creation pertaining to value-added services that support the rail trail, e.g. accommodation, food, transport links, tourism service etc. Business generation may involve town-based and landholder enterprises
- Community transport and mobility
 - Adult commuter walking and cycling for local residents

- School commuter links for safe walking and cycling for local students
- Community and social health
 - Improvements in community health (physical and mental), by reducing health intervention expenditure through regular access to diverse physical activities and outdoor recreations. Rail trails can provide an outlet for regular physical exercise, entertainment and recreation in small, rural communities where such options can otherwise be limited
- Community connectivity and social capital
 - Community events such as fun runs, picnics, etc.

The Kingaroy to Kilkivan Rail Trail will be developed as a sealed, dual-use pathway to a Class 1 standard trail (AS 2156) and has been determined as the most suitable solution to address the identified need for:

- A community walk/ cycle pathway suitable for recreation, training and event use;
- A pathway suitable for national standard triathlons; and
- A commuter pathway servicing the towns between Wooroolin and Kingaroy.

The primary objectives of the Kingaroy to Kilkivan Rail Trail project include:

- Enable Triathlon Queensland to hold an annual National Triathlon event, which would promote the South Burnett Region to Australia and provide significant social, tourism and economic benefit to the region;
- Enable the South Burnett region to attract junior triathlon camp events to the region in conjunction with Triathlon Queensland, thus promoting the South Burnett to other areas of Queensland and Australia and providing significant tourism, social and economic benefits;
- Provide a safe training area away from busy, congested roads for triathletes from other regions, thereby providing tourism and economic benefits for the South Burnett;
- Attract tourism across a number of sectors including sport (i.e. triathlon, running, cycling), outdoor recreation, family recreation and trail tourism while also providing potential for mobile business opportunities during peak trail usage and during events on trails (e.g. coffee/ refreshment vans);
- Provide much needed walk/ cycle facilities to enable development and/ or further growth of local sport and recreation clubs, for example, triathlon, mountain biking, cycling, running;
- Enhance opportunities for healthy lifestyle, recreation and social activities in the South Burnett by providing a much needed major walk/ cycle path and smaller pathway connections that deliver enhanced and safe physical activity opportunities for South Burnett residents;
- Provide opportunities for safe connectivity between towns for elderly residents; and
- Connect Crawford and Memerambi to Kingaroy for residents and provide a safe route for locals, particularly youth and the elderly to access commercial and social opportunities in Kingaroy.

Evaluation Framework

The economic assessment is based on a generalised Cost Benefit Analysis (CBA) framework which quantifies and compares the direct infrastructure cost (capital and recurrent) of a project with the change in economic value (benefits /cost savings) generated with the project.

The assessment has been undertaken in accordance with the relevant guidelines for CBA, specifically, the Queensland Government's *Project Assurance Framework: Cost Benefit Analysis*. Where these guidelines do not cover specific methodologies required to estimate benefits of the project (e.g. estimating wider impacts), other benefit guidance has been sought from domestic and international literature and guidelines.

The overall appraisal framework is based on welfare economic theory. This framework defines the change in economic value in terms of the following theoretical concepts:

- User consumer surplus;
- Producer surplus;
- Resource cost corrections; and
- Externalities.

The purpose of the CBA was to determine whether the community will enjoy a net benefit as a result of the Kingaroy to Kilkivan Rail Trail Project and to ensure efficient allocation of public resources. The CBA takes into account:

- The potential direct benefits and costs that would not otherwise occur in the absence of the Project; and
- The costs of construction and ongoing maintenance of the Project.

The CBA framework is based on an annual discounted cash flow model. The model develops 'streamed' infrastructure costs and benefits over an evaluation period extending 25 years from the first full year of operation of the Projects (inclusive).

Future costs and benefits are converted to a common time dimension; the present value (PV). Present values are calculated by discounting future values using a recommended discount rate (which reflects the time value of money). The discounted costs and benefits are then combined using specific equations to produce conventional measures of economic performance.

The CBA model produces the following key measures of economic performance:

- Net Present Value (NPV) – the difference between the PV of total incremental benefits and the PV of the total incremental costs, which allows the project options to be compared on the same basis to allow determination of the greatest net benefit to the community or the most efficient use of resources. Project options that yield a positive NPV indicate that the (discounted) incremental benefits of a scenario exceed the incremental costs over the evaluation period.
- Benefit Cost Ratio (BCR) – ratio of the PV of total incremental benefits to the PV of total incremental costs. A BCR greater than 1.0 indicates that project benefits exceed project costs. However, generally, a project with a higher BCR may be preferred to protect against unexpected project delays, optimism bias or cost overruns.

Key Inputs and Assumptions

The streamed costs and benefits are based on underlying profiles of costs and demand that have been developed by the project's technical advisors and Lawrence Consulting. For the Kingaroy to Kilkivan Rail Trail Project, infrastructure and maintenance cost estimates were developed jointly by South Burnett Regional Council, the Department of State Development, Infrastructure and Planning and the Department of Transport and Main Roads as part of a feasibility study completed in 2012.

Costs

The CBA incorporates the following economic costs relevant to the construction and ongoing maintenance of the Project:

- Fixed infrastructure costs, including earthworks, drainage and other infrastructure;
- Systems infrastructure;
- Other construction costs such as investigation, design and project management costs;
- Planned construction and operation risk;
- Land acquisition costs; and
- Recurrent costs, such as scheduled maintenance and operating costs.

Specifically, the proposed Kingaroy to Kilkivan Rail Trail has a capital expenditure component of approximately \$2.0 million during the construction phase and maintenance costs of approximately \$200,000 per annum. The full schedule of construction costs is outlined in the following table.

Table 1: Estimated Construction Costs for Proposed Kingaroy to Kilkivan Rail Trail

Stage	Proposed development	Indicative cost (excl. GST)
Kingaroy to Murgon		
Kingaroy	Concrete path connections, interpretation, trail to Crawford, incl. minor crossings	\$300,000
Crawford	Recreation facilities, furniture, interpretation, connection to township, trail to Memerambi, incl. minor crossings	\$80,000
Memerambi	Floodway, recreation facilities, interpretation, possible toilet facilities, trail to Wooroolin, incl. minor crossings	\$130,000
Wooroolin	Connection to wetlands, interpretation, trail to Tingoora, incl. minor crossings	\$80,000
Tingoora	Connection to township, interpretation, trail to Wondai, incl. minor crossings	\$60,000
Wondai	Concrete pathway connections, interpretation, trail to Murgon, incl. minor crossings	\$180,000
Murgon	Concrete pathway connections, interpretation	\$240,000
Additional works:		
	Access gates	\$50,000
	Trail markers containing emergency point numbers, distance to/from townships, etc.	\$30,000
Barambah Creek	Significant water crossing as almost continuous flow of water present, future toilet/rest area	\$200,000
Murgon Creek	Wet crossing	\$50,000
	Planning and design	\$100,000
Sub-total		\$1,500,000
Murgon to Kingaroy		
Goomeri	Connection to township, interpretation, trail to Goomeri, incl. minor crossings	\$250,000
Kilkivan	Connection to township, interpretation, trail to Kilkivan, incl. minor crossings	\$250,000
Sub-total		\$500,000
Project total		\$2,000,000

Benefits

Direct and indirect incremental benefits of the proposed Kingaroy to Kilkivan Rail Trail which have been considered as part of the CBA include:

- Increase in value added to regional economy (i.e. supply chain and consumption effects) associated with the construction of the proposed Kingaroy to Kilkivan Rail Trail;
- Net economic benefits flowing from visitation and spending impacts associated with visitors attending the Kingaroy to Kilkivan Rail Trail, including community, sporting and cultural events; and
- Consumer surplus associated with community users of the Kingaroy to Kilkivan Rail Trail, particularly where there are either no direct fee or reduced/subsidised charges involved with personal use or participation or attendance in organised events or programs.

Value Added from Construction Phase

The proposed Kingaroy to Kilkivan Rail Trail project is expected to cost approximately \$2.0 million in development and construction costs. The regional economic impact – i.e. direct, indirect and consumption-induced – associated with the construction phase of the proposed Kingaroy to Kilkivan Rail Trail on the economy of the South Burnett LGA include:

- An estimated direct output of \$2.0 million and additional flow on increases in output of \$0.6 million through other industries, for a total industry impact of \$2.6 million. A further \$0.6 million in output in the region can be associated with consumption-induced effects;
- Estimated direct income (wages and salaries) of \$0.3 million, with \$0.2 million in additional income generated through flow on effects in other industries and a further \$0.1 million from household spending;
- Approximately 8.0 direct full-time equivalent (FTE) employment positions, with an estimated additional 9.1 employment positions supported indirectly through other industries and household consumption for a total employment impact of 17.1 FTEs; and
- An estimated contribution to GRP of \$0.7 million from direct effects, with a further flow on impact of \$0.3 million through other industries for a total industry value added of \$1.0 million. An additional \$0.3 million in gross regional product can be attributed to consumption-induced effects. The total value added impact of \$1.3 million would constitute an increase of 0.08% to the GRP for the South Burnett LGA (\$1.7 billion).

Table 2: Economic Impact of Proposed Kingaroy to Kilkivan Rail Trail – Construction Phase

	South Burnett LGA	Wide Bay Burnett	Queensland	Australia
Output (\$ million)				
Direct	2.0	2.0	2.0	2.0
Indirect	0.6	0.8	1.2	2.5
Consumption	0.6	0.8	1.2	2.1
Total	3.3	3.6	4.4	6.6
Income (\$ million)				
Direct	0.3	0.3	0.3	0.3
Indirect	0.2	0.2	0.3	0.6
Consumption	0.1	0.3	0.4	0.6
Total	0.6	0.8	1.0	1.5
Employment (fte persons)				
Direct	8.0	8.0	8.0	8.0
Indirect	5.5	6.5	7.8	12.1
Consumption	3.6	8.2	9.3	12.2
Total	17.1	22.7	25.1	32.2
Value added (\$ million)				
Direct	0.7	0.7	0.7	0.7
Indirect	0.3	0.4	0.5	1.1
Consumption	0.3	0.7	0.9	1.4
Total	1.3	1.7	2.2	3.2
% change in baseline GRP	0.08%	0.01%	0.00%	0.00%

Consumer Surplus

The travel cost method is used to estimate economic use values associated with sites such as the proposed Kingaroy to Kilkivan Rail Trail that are used for recreation and leisure activities, especially where there is either no direct fee or reduced / subsidised charges for participants. The basic premise of the travel cost method is that the time and travel cost expenses that people incur to visit a site represent the “price” of access to the site. Thus, peoples’ willingness to pay to visit the site can be estimated based on the number of trips that they make at different travel costs. This is analogous to estimating peoples’ willingness to pay for a marketed good based on the quantity demanded at different prices.

Application of the travel cost method varies with respect to whether an individual or zonal approach is used. The zonal travel cost method, which is applied by collecting information on the number of visits to the site from different distances, has been adopted for this analysis. Because the travel and time costs will increase with distance, this information allows calculation of the number of visits “purchased” at different “prices,” which is then used to construct the demand function for the site, and estimate the consumer surplus, or economic benefits, for the recreational services of the site.

Using the mean distance, time to the sites and estimated number of visits presented in Table 3 along with average vehicle operating costs of \$0.75 per kilometre for a medium car (RACQ) and a value of travel time of approximately one-half the average ordinary earnings in Queensland, or \$0.63 per minute (Australian Bureau of Statistics), the total consumer surplus associated with future initial use – assuming total local visits to be approximately 21,000 per annum initially, based on conservative projections as outlined in the project plan – of the proposed rail trail is estimated at \$0.3 million per annum.

Table 3: Recreational Benefits of Proposed Kingaroy to Kilkivan Rail Trail

Zone	Estimated total local visits per annum	Mean round trip (RT) travel distance (km)	Mean RT travel time (minutes)	Driving cost per visit (\$0.75/km)	Trip time cost per visit (\$0.63/min.)	Annual consumer surplus
1 (0-10km)	16,970	6	10	39,455	106,909	146,364
2 (11-30km)	3,182	29	36	34,602	72,164	106,766
3 (31-50km)	848	72	59	22,909	31,538	54,447
Total	21,000	-	-	96,966	210,611	307,577

Source: South Burnett Regional Council, ABS 6302.0, RACQ, Lawrence Consulting

Other indirect incremental benefits of the Kingaroy to Kilkivan Rail Trail which were not considered as part of the CBA due to the level of difficulty in quantifying include:

- Public health cost savings from an elevated level of participation in active sport by a community;
- Non use benefits derived from non-users of cultural, environmental and recreational facilities who are often willing to pay for the facilities because they value the option to use the facility in future; the fact that other members of the community can use it; and the fact that future generations will enjoy the endowment left to them in the facility; and
- Social capital enhancement via volunteering benefits which is valued by volunteers' opportunity cost of time (i.e. the value they could have generated to society doing the next best alternative).

Indirect Visitor Expenditure

Kingaroy to Kilkivan Rail Trail is also expected to a significant cultural and tourism attraction for both local residents and visitors to the region. Approximately 6,500 visitors are conservatively expected to use the Kingaroy to Kilkivan Rail Trail annually upon completion based on similar estimates from daily usage of the Brisbane Valley Rail Trail as well as the forecast schedule of events provided by South Burnett Regional Council – including sporting, cultural and community events – and comparison with benchmarks for other similar rail trails across Australia.

Taking into account regional length of stay, visitor origin and expenditure patterns, the gross annual stimulus to the South Burnett economy associated with the expected total visitor numbers to the Kingaroy to Kilkivan Rail Trail is estimated at \$1.2 million. A summary of the indirect tourism expenditure is provided in the following table.

Table 4: Estimated Annual Indirect Tourism Expenditure by Type, Kingaroy to Kilkivan Rail Trail

Expenditure type	Expenditure (\$)
Accommodation	98,912
Food & beverage	376,447
Transport	83,016
Retail shopping	589,846
Attractions	34,774
Other	33,005
Total off-site expenditure	1,216,000

The economic impacts of the indirect tourism expenditure associated with visitors to the Kingaroy to Kilkivan Rail Trail for the South Burnett LGA include (refer table below):

- An estimated direct output of \$1.2 million and additional flow on increases in output of \$0.5 million through other industries and a further \$0.7 million associated with consumption-induced effects;

- Estimated direct income (wages and salaries) of \$0.4 million, with \$0.1 million in additional income generated through flow on effects in other industries and a further \$0.1 million from household spending;
- Approximately 11.9 direct full-time equivalent (FTE) employment positions, with an estimated additional 7.6 employment positions supported indirectly through other industries and household consumption for a total employment impact of 19.5 FTEs; and
- An estimated contribution to GRP of \$0.6 million from direct effects, with a further flow on impact of \$0.2 million through other industries for a total industry value added of \$0.9 million. An additional \$0.3 million in gross regional product can be attributed to consumption-induced effects.

Table 5: Economic Impact of Proposed Kingaroy to Kilkivan Rail Trail – Indirect Tourism Expenditure

	South Burnett LGA	Wide Bay Burnett	Queensland	Australia
Output (\$ million)				
Direct	1.2	1.2	1.2	1.2
Indirect	0.5	0.7	0.8	1.0
Consumption	0.7	0.8	1.1	1.4
Total	2.4	2.6	3.1	3.6
Income (\$ million)				
Direct	0.4	0.4	0.4	0.4
Indirect	0.1	0.1	0.2	0.2
Consumption	0.1	0.3	0.4	0.5
Total	0.6	0.8	0.9	1.0
Employment (fte persons)				
Direct	11.9	11.9	11.9	11.9
Indirect	3.6	4.5	5.0	5.6
Consumption	3.9	8.4	9.2	10.2
Total	19.5	24.8	26.1	27.7
Value added (\$ million)				
Direct	0.6	0.6	0.6	0.6
Indirect	0.2	0.3	0.4	0.4
Consumption	0.3	0.7	0.9	1.1
Total	1.2	1.6	1.9	2.2
% change in baseline GRP	0.07%	0.01%	0.00%	0.00%

Evaluation Period

The base price year adopted is 2016, whilst the assumed construction period is June 2016 to December 2016. The appraisal period for the economic assessment is 2016 up to and including 25 years from the first year of operation (i.e. 2040).

Discount Rate

Consistent with relevant guidelines, a real discount rate of 6% has been adopted for the CBA. For the purposes of sensitivity testing, real discount rates of 4% and 8% have also been applied.

COST BENEFIT ASSESSMENT

The results of the CBA for the Kingaroy to Kilkivan Rail Trail Project are summarised in the following table, including the total (discounted) present value incremental costs and benefits and resulting NPV and BCR. Also included are sensitivity results for lower and upper range discount rates (4% and 8%).

As expected for this type of project, costs are dominated by capital expenditures, whereas benefits are more broadly distributed across different categories, with consumer surplus and direct and indirect increases in regional value added providing significant contributions.

Table 6: Present Value Incremental Costs and Benefits (\$ million), NPV and BCR

	Real discount rate		
	4%	6%	8%
Direct Infrastructure Costs			
Capital	1.92	1.89	1.85
Operating and maintenance (depreciation)	3.81	3.07	2.53
Total Infrastructure Costs	5.58	4.79	4.20
Cost Savings and External Benefits			
Increased value added from construction phase	0.95	0.94	0.92
Consumer surplus	7.94	6.26	5.04
Increased visitor expenditure	43.18	33.50	26.54
Total Benefits	50.11	38.45	30.16
NPV	44.52	33.66	25.96
IRR	140%	140%	140%
BCR	8.97	8.03	7.18

In aggregate, the NPV analysis suggests substantial net benefits of approximately \$33.7 million flowing from the proposed Kingaroy to Kilkivan Rail Trail Project, with a BCR of 8.03 and internal rate of return (IRR) of 140%, indicating that the project offers significant societal benefits well in excess of costs. This also takes into account timing differences between the earlier incurrence of costs and ongoing receipt of facility users and other benefits over the evaluation period.

Given the large volume of upfront costs and the (in general) stream of ongoing benefits, the CBA moves as expected insofar as the lower discount rate (4%) increases the NPV and BCR for the project, whilst the higher rate (8%) decreases the NPV and BCR relative to the base case, although all BCR's recorded are significantly higher than break-even.

