CHAPTER SEVEN

ECONOMIC ANALYSIS

CHAPTER 7
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CHAPTER SUMMARY AND CONCLUSIONS:

- Mass transport solutions such as rail will remain critical to meeting the regional transport task as the economic contribution of SEQ's major centres continues to grow.
- Investing in the CRR Project will:
  - improve the competitiveness of rail services to the CBD
  - eliminate rail capacity constraints that cap service frequencies and make rail unattractive, particularly through the congested urban core
  - alleviate pressure on overcrowded bus and road networks
  - provide an integral enhancement to connect the region's labour markets in growth areas to jobs.
- Timely investment in inner-city rail capacity will not only benefit the wider transport network but also improve SEQ's liveability and economic prosperity.
- A cost benefit analysis (CBA) of the CRR Project was initially undertaken in mid-2016, which resulted in a positive Benefit Cost Ratio (BCR) of 1.21.
- In July 2017, the CBA was updated to reflect the latest available information, new funding commitments and improvements to the transport system delivered over the past year. Assumptions used in the updated CBA include:
  - Current SEQ demographics: The latest demographics published by Queensland Treasury have been adopted, including population and employment estimates.
  - Delivery of Fairer Fares: The current fare structure and pricing scheme, which became effective in December 2016 through the Fairer Fares package, have been adopted.
  - Funding for new generation signalling: Modelling scenarios assume the delivery of a new generation signalling system through the European Train Control System (ETCS) – Inner City Project.
- The updated CBA shows a BCR of 1.41. This represents $1.41 of benefits generated per dollar invested. This is a positive result, with sensitivity testing demonstrating that the CRR Project is viable under a range of potential scenarios.

7.1 Purpose and Overview of this Chapter

The purpose of this chapter is to outline the economic impacts of the CRR Project. A detailed economic analysis was undertaken to determine the economic viability of the CRR Project, using three core methods:

- comprehensive cost benefit analysis (CBA)
- wider economic benefits (WEBs) appraisal
- macroeconomic impact assessment.

This chapter outlines:

- the economic need for future investment in SEQ's transport network
- the approach and key results of the economic analysis, including:
  - the Benefit Cost Ratio (BCR), Net Present Value (NPV) and Internal Rate of Return (IRR)
  - key implications for wider economic benefits, including agglomeration economies and increased labour supply
- the approach and key results of the macroeconomic impact assessment, particularly:
  - the expected boost to gross state product (GSP)
  - the number of jobs that will be created
- a summary of the economic findings for the CRR Project.

7.2 The Economic Case for Investment

Transport infrastructure is an essential economic asset that shapes land use and drives productivity, growth and prosperity. It provides easy access for people seeking connections between places of residence, employment, recreation and public and private institutions. Improving transport infrastructure and services can allow individuals, firms and industries to operate more efficiently, raising both the standard of living and productivity.

Queensland is one of Australia's most strategically important economic regions. Its modern, diverse economy and proximity to Asia mean it is well-placed to transition into a key international trading partner. Brisbane City, in particular, can become a major link between the Australian and Asian economies by growing export volumes and supplying Queensland's portfolio of sector, technical and knowledge expertise to meet international demands.

Improving rail capacity will be central to meeting SEQ's future transport demand; rail offers an efficient alternative to congested road corridors, particularly during peak periods. Investing in rail infrastructure not only presents the opportunity to address the public transport capacity constraint at the core of the network but also provides a platform for wider land-use transformation.

The CRR Project offers significant advantages, including:

- mass transit capability, with the ability to move more commuters, more rapidly, than other forms of transport (a six-car train has capacity to move up to 750 people)
- the ability to efficiently service longer trips, which is of particular importance to SEQ's dispersed residential population

- the capacity to avoid congestion, as passenger rail is not exposed to the same network constraints as the road network
- the opportunity to increase access to the rail network, supporting future land-use and transport development.

Without significant investment in new rail infrastructure, SEQ's growth will hamper the efficiency of the transport network. Remaining road and rail capacity will be exhausted, adding to growing congestion costs, obstructing supply chains and ultimately constraining regional economic output. Improving the rail network is critical to avoiding future economic constraints caused by poor accessibility.

7.3 Cost Benefit Analysis

7.3.1 Approach and Methodology

A CBA framework was utilised as part of the detailed economic appraisal to build an understanding of the relative merits of the CRR Project. This analysis compared project benefits against up-front and ongoing investment requirements.

CBA is universally accepted as the preferred economic analysis technique to assess the relative priority of competing infrastructure investment. The application of CBA, uniformly and consistently, allows for the effective comparison of projects across Australia. The frameworks used to develop the CBA are based on guidance documents that are nationally endorsed for transport appraisal. These guidelines include:

- Cost Benefit Analysis Guide: Supporting Business Case Development, Building Queensland, April 2016: While not prescriptive, this guideline provides a framework for the development of a detailed CBA.
- The Australian Transport Assessment and Planning Guidelines (ATAP), 2016: Guidance contained within the ATAP guidelines has been utilised as the preferred source of contemporary economic unit values.
- Infrastructure Australia, Reform and Investment Framework, 2013: While this guideline does not provide specific monetary unit values and parameters for use in the economic appraisal, the economic appraisal has been developed in accordance with the principles identified in the framework.

A CBA for the CRR Project was developed in mid-2016, as required for Infrastructure Australia's submission process. This detailed analysis resulted in a positive BCR of 1.21. The Queensland Government has continued work on the CRR Project since then and the CBA was recently updated to reflect more current information, new funding commitments and improvements to the transport system delivered over the past year.

Assumptions used in the updated CBA include:

- Current SEQ demographics: The latest demographics published by Queensland Treasury have been adopted, including population and employment estimates.
- Delivery of Fairer Fares: The current fare structure and pricing scheme, which became effective in December 2016 through the Fairer Fares package, have been adopted.
- Funding for new generation signalling: Modelling scenarios assume the delivery of a new generation signalling system through the ETCS – Inner City Project. The Queensland Government committed $634 million over eight years to fund the ETCS – Inner City Project in June 2016.

Scenarios have been modelled to measure the relative economic performance of investing in the CRR Project. These scenarios are typically defined as either a 'project' or 'base' case, representing network performance 'with' the project and 'without' it. The difference between them is described as the 'net benefit'. The base and project cases for the 'central case' (most likely scenario) are outlined below:

- The base case is defined as the transport network without investment in the CRR Project and is inclusive of the typical level of investment in the transport network. This represents works required to maintain the existing service levels (status quo) and includes funded, planned or required investment.
- The project case is defined as the CRR Project and includes works that sit within the geographic scope of the CRR Project.
- Both the base case and project case include the ETCS – Inner City Project.

7.3.1.1 Key Assumptions and Parameters

Key assumptions and parameters adopted for use in the economic appraisal for the CRR Project are presented in Table 7.1.

PARAMETER	ASSUMPTION	SOURCE
Discount rate	A headline rate of seven per cent real Sensitivities provided at four per cent	Infrastructure Australia
Price year	December 2015	Adopted from Project Cost Estimates
Evaluation period	30 years of benefits post construction (a sensitivity of 50 years has been conducted)	ATAP (2016)
Indexation	Unit costs and parameter values indexed from the price year by the Consumer Price Index (including sub-categories as appropriate) and Average Weekly Earnings which have been utilised to escalate the real value of time (1.5%[46] per annum).	Australian Bureau of Statistics (ABS) (2016)
Unit costs and parameter values	Adopted from ATAP and other sources. Vehicle operating costs have been derived specifically through ATAP guidelines as endorsed by COAG.	ATAP (2016), WEBTag (United Kingdom) and Austroads (2012)
Modelled years	Demand model outputs have been provided for 2021, 2026 and 2036 as appropriate. Linear interpolation has been utilised to estimate benefits between these years while benefits have been extrapolated and capped at 2050 to the end of the evaluation period (2054) based on advice from the rail operations modelling[47].	CRR Transport Modelling Advisor and CRR Economic Advisor analysis

Table 7.1: Cost Benefit Analysis Key Assumptions and Parameters

[46] Value of time escalation of 1.5% has been determined as an appropriate value to estimate real wage growth by assessing historical values from 2002-2013. Sensitivity analysis has also been undertaken at 0.75% real wage growth.

[47] Further work undertaken on the reference design post the June 2016 business case to understand the capacity of the CRR system, in regards to station and network capacity. The analysis indicated that prior to the introduction of 9 car trains, the CRR system has the capacity to continue to grow and accrue benefits until the end of the 30-year assessment period.

7.3.2 Costs

CBA considers the cost of infrastructure delivery by including whole-of-life costs for a project (both capital and operating costs). For the CRR Project, probabilistic, risk-based modelling has been applied to the raw construction estimates to develop risk-adjusted project costs at the P50 level of confidence, representing the most likely project cost. P50 capital costs are provided in Table 7.2.

Project costs have been adjusted to account for real price escalation above inflation. In this instance, real wage growth of 1.5 per cent per annum has been applied to the labour components of the cost elements to derive a total real capital cost.

COST ELEMENT	PRESENT VALUE (7% RATE) $ MILLION
TOTAL – Capital Costs	3,492.2

Table 7.2: Capital Cost

For the purposes of the CBA, the total real capital costs for the CRR Project have been estimated at approximately $3.49 billion in present value terms.

Operating costs for the first year of operation (2023) are presented in Table 7.3. Operating costs presented are representative of the net incremental costs compared against the base case. In this instance, positive figures are considered a net cost increase to the rail operator. P50 operating costs have also been developed for the CRR Project.

As per the approach adopted for capital costs, real wage growth of 1.5 per cent per annum has been applied to the labour elements contained within each cost element to derive a total real operating cost.

COST ELEMENT	PRESENT VALUE (7% RATE) $ MILLION
TOTAL – Operating Costs (2023)	30.1

Table 7.3: First Year (2023) Operating Cost

In accordance with the CBA guideline, all costs associated with the project required to fully realise future benefits must be considered. As such, while not required for day one operations, additional rollingstock will be required to support enhanced level of service enabled by the project into the future. In line with the above, rollingstock capital costs are reported separately in Table 7.4 below:

COST ELEMENT	PRESENT VALUE (7% RATE) $ MILLION
TOTAL – Rollingstock Capital Costs	182.3

Table 7.4: Rollingstock Capital Cost

7.3.3 Benefits

Quantifiable project benefits were estimated for the purpose of the CBA utilising conventional appraisal techniques. These were derived from guidance materials outlined in Section 7.3.1 and are reflective of the benefits identified in Chapter 6: Project Benefits. Key benefit streams associated with the CRR Project captured in the CBA are outlined in Table 7.5.

CATEGORY	ECONOMIC BENEFIT
User benefits	Public transport time and generalised cost savings (work and non-work)
	Improved reliability for public transport
	Car transport time savings (work and non-work)
	Car vehicle operating cost (VOC) savings (work and non-work)
	Commercial vehicles (trucks) – road freight savings (travel time and VOC)
	Network resilience
	Station amenity
Crash savings	Crash cost savings (including fatal, hospitalisation, minor injury and property damage only)
Environmental externalities	Environmental externality cost savings (including greenhouse gas emissions and noise)
Residual value	Residual value (including transport infrastructure and rollingstock)
Farebox revenue	Incremental farebox revenue

Table 7.5: Economic Benefit Summary

It is noted that there are also a number of additional potential economic benefits which were not quantified as part of the CBA which would likely increase the economic return. These include for instance the consideration of freight benefits, road reliability benefits, active transport benefits, station crowding benefits and an improved customer environment.

A summary of each benefit category is provided below.

7.3.3.1 User Benefits

Improved travel choices for commuters on the rail and road networks account for the vast majority of benefits generated by the CRR Project. Additional rail services and new stations will improve travel times for rail patrons and attract more car drivers to public transport. This, in turn, will ease congestion and improve travel times for remaining road users.

Benefits for public transport users are estimated by considering the total journey cost with and without the project, as perceived by commuters. In deciding to undertake a journey, a transport user considers how to get to their destination by factoring in convenience factors such as waiting time, crowding, access, in-vehicle time, reliability and transfers between different services.

Improved rail services due to the CRR Project reduces a user's perceived journey cost, generating a user benefit. If the total journey cost is less for public transport than a motor vehicle, the user may be encouraged to change from driving to public transport. Shifting users to public transport frees up road space, reduces congestion and improves travel times for remaining drivers. Given the low occupancy rate of private vehicles, even a small shift can bring significant congestion relief. Reduced road use also reduces vehicle operation costs.

Increasing the capacity of the rail network also improves its resilience, with resulting benefits for both public transport and road users. The remaining benefit that accrues to transport users is the benefit derived from improved amenity at rail stations.

7.3.3.2 Crash Savings

A decrease in road use reduces the likelihood of crashes occurring on the road network. The value of crash cost savings is based on a willingness to pay approach for different levels of crash severity (fatal, hospitalisation, minor injury and property damage only), consistent with ATAP guidelines.

7.3.3.3 Environmental Externalities

Externalities are defined as the costs incurred by a third party as a result of the transport market, such as car pollution to nearby residential areas. They typically relate to environmental and social costs, including greenhouse gas emissions, noise and amenity costs.

7.3.3.4 Residual Value

Residual value is also a significant benefit, representing the capacity of planned investment to continue to accrue benefits beyond the appraisal period. It includes the tunnel, surface and station works, as well as additional rollingstock purchased in the latter years of the appraisal, which are then discounted to present value.

7.3.3.5 Farebox Revenue

The remaining economic benefit captured within the CBA is farebox revenue, which is added back into the evaluation as public transport fares that are not incorporated into the perceived cost of a journey.

7.3.3.6 Summary of Benefits

A summary of the estimated economic benefits is shown in Table 7.6 below. Road user benefits account for around 58 per cent (48 per cent for private car users including car passengers and 10 per cent for commercial vehicles) of the estimated benefits through reduced congestion and the resultant reduced travel time and vehicle operating costs. Benefits to public transport users account for around 32 per cent of total benefits.

BENEFITS	PRESENT VALUE[48] (7%) $ MILLION	PERCENTAGE OF TOTAL BENEFITS
Public transport – crowding	1,174.2	18.1%
Public transport – generalised cost (exc crowding)	648.4	10.0%
Public transport – reliability	118.2	1.8%
Public transport – station amenity	84.3	1.3%
Public transport – resilience	6.2	0.1%
Road users – car travel time savings	2,023.4	31.2%
Road users – car vehicle operating cost savings	1,085.7	16.8%

[48] Any errors in addition are due to rounding.

BENEFITS	PRESENT VALUE[48] (7%) $ MILLION	PERCENTAGE OF TOTAL BENEFITS
Road users – commercial vehicle travel time savings	349.0	5.4%
Road users – commercial vehicle operating costs	328.9	5.1%
Crashes	137.1	2.1%
Externalities	116.5	1.8%
Farebox	136.9	2.1%
Residual value	268.7	4.1%
Total	**6,477.5**	**100.0%**

Table 7.6: CBA benefits summary

While road user benefits make up a high percentage of benefits, this is primarily a result of the number of trips that have been forecast in the transport model. The demand profile and benefits derived from the transport model are consistent with the expectations of the independent peer reviewer. As shown in Table 7.7, when the benefit per trip is calculated over the 30 year evaluation period it shows that, on average, public transport users will benefit by 87 cents per trip compared to 19 cents for private car users (drivers and passengers), a difference of around 346 per cent. Likewise, public transport users will benefit by more than 57 per cent when compared to commercial vehicles (87 cents compare to 55 cents per trip). This shows that while public transport users will benefit more on a per trip basis, the significant number of road user trips compared to public transport user trips results in a higher proportion of total benefits for road users.

TRIP TYPE	PRESENT VALUE TRIPS	PRESENT VALUE BENEFITS ($)	PRESENT VALUE BENEFITS $ / TRIP
PT trips	2,339.2	2,031.3	**$0.87**
Car trips	15,954.5	3,109.1	**$0.19**
CV trips	1,228.6	677.8	**$0.55**
Total/average	19,522.3	5,818.2	**$0.30**

Table 7.7: Benefit per trip

The discounted benefit per trip for public transport users, car trips and commercial vehicles is also presented in Figure 7.1 below. The figure illustrates that the economic benefit on a per trip basis is greatest for public transport users.

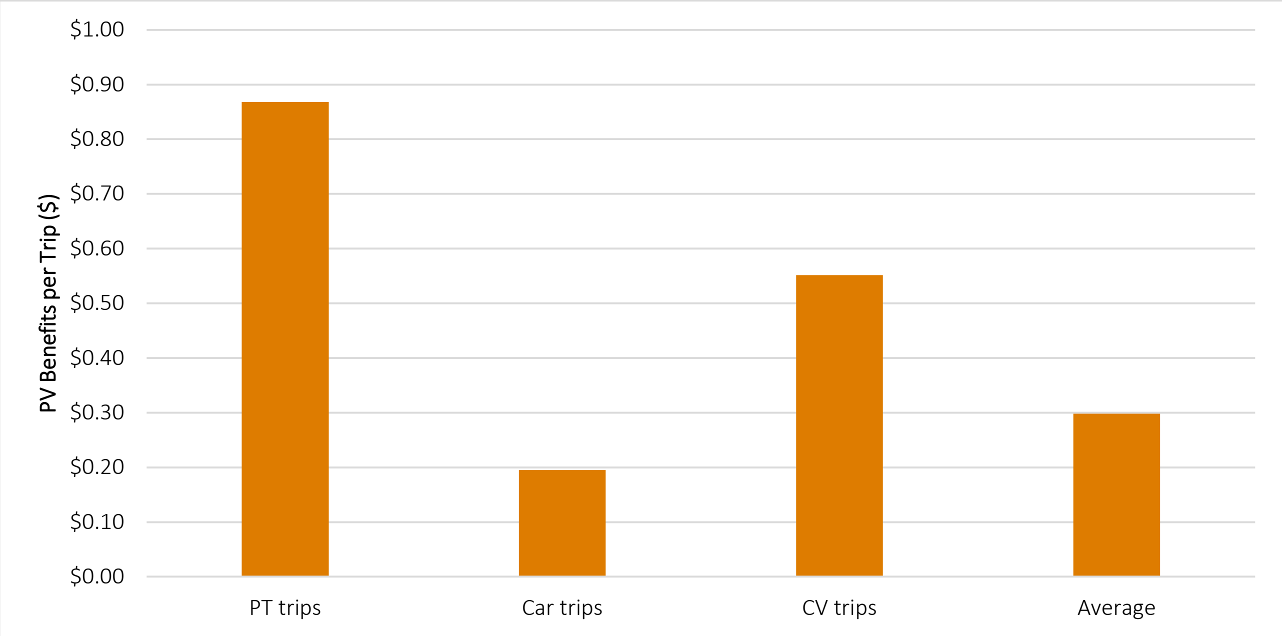

Figure 7.1: Benefit per Trip, Present Value, $

7.3.4 Cost Benefit Analysis Results

The summary results of the CBA for the CRR Project's central case are presented in Table 7.8 using capital costs with the P50 level of risk. All economic performance measures demonstrate an economic return for the community in excess of the net whole-of-life costs for the project.

CBA DECISION CRITERIA	RESULTS
BCR	1.41
NPV ($m)	1,877.2
IRR	9.3%

Table 7.8: CBA Results Summary – Central Case

The disaggregated CBA results for the project are presented in Figure 7.2 below.

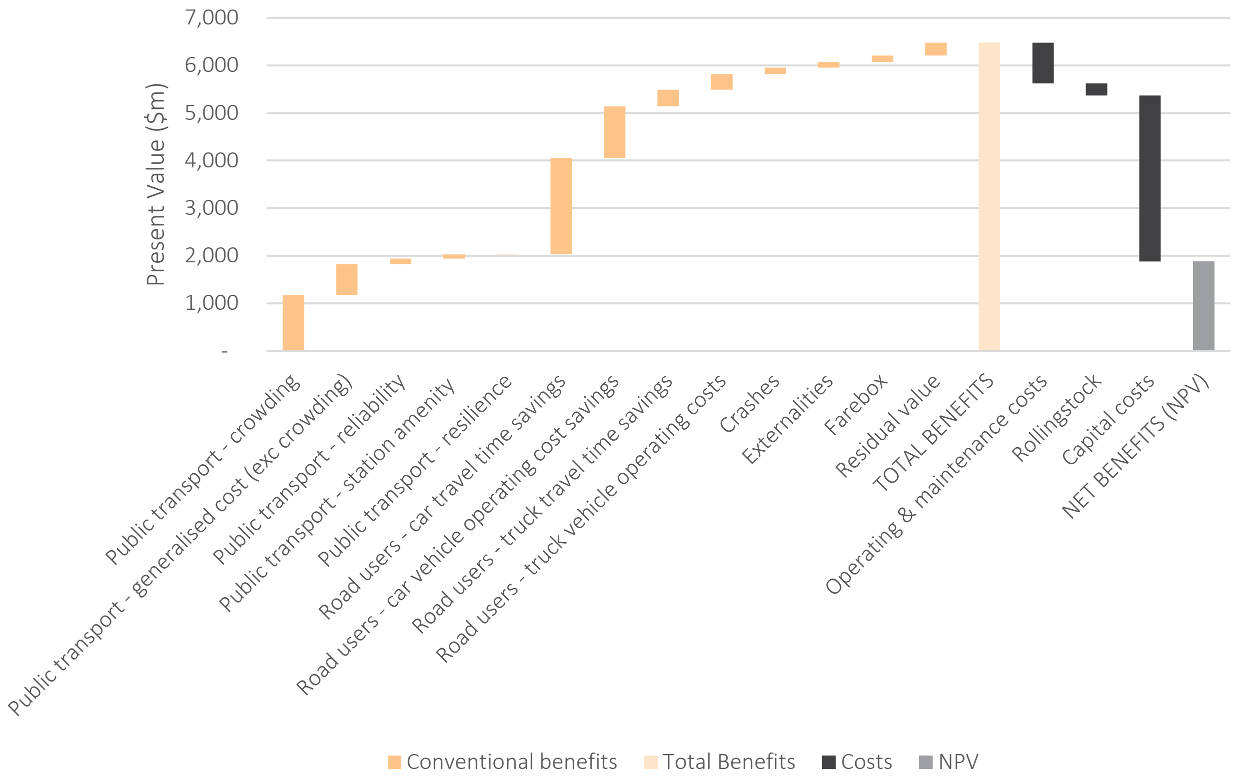

Figure 7.2: Disaggregated CBA Results for CRR Project

The CRR Project is expected to deliver benefits to public transport and road users along with the wider community. These are validated by a BCR of 1.41 for the P50 case. The NPV also shows positive results at $1,877.2 million. The IRR shows results higher than the discount rate, which is expected for a positive NPV.

As the economic contribution of Australia's major centres to regional and domestic output continues to grow, mass transport solutions such as rail will remain critical to meeting the transport task. Delaying investment in the CRR Project would have significant negative impacts across SEQ including:

- rail being unable to perform its role due to the uncompetitive nature of rail services to the CBD, with over-reliance on existing crowded station infrastructure

- rail capacity limiting service frequencies, making rail less attractive than other modes, even for existing journeys on the inner-city rail network
- greater pressure on the already overcrowded bus and road network, causing failure in these transport systems as they approach the CBD
- exacerbation of the ongoing, avoidable costs of congestion prior to construction.

Network constraints within the inner city, including river crossings, must be addressed if the rail network is to cater for future growth. Without investment, the network will be unable to expand into new growth areas or to increase service frequencies.

As identified in Chapter 3: Problem, an urgent solution is required to address the transport challenges facing SEQ. Timely investment in inner-city rail capacity will not only benefit the wider transport network but also improve regional liveability and economic prosperity.

7.3.5 Sensitivity Analysis

A detailed sensitivity analysis was undertaken for the CRR Project's CBA. Sensitivity analysis measures the uncertainty associated with estimating costs and benefits. It measures the change in key economic decision criteria (the NPV and BCR) through a change in single or multiple parameter values.

This test is particularly important where decision-makers wish to understand the effects of a significant change in economic conditions. The CBA for the CRR Project considered a number of sensitivity tests designed to test the veracity of the economic results.

A break-even analysis was undertaken (i.e. BCR = 1) of the benefits and costs. It identified that there would need to be a significant increase in costs (41 per cent) or a decrease of 29 per cent in total benefits to return a BCR equal to or less than one.

An alternative benefit estimation approach to value of time did not reduce the BCR below 1 while the change to a 50 year appraisal period also had a significant positive impact on the economic results.

The results of the sensitivity analysis are presented in Table 7.9 below.

	SENSITIVITY TEST	BCR	NPV $ MILLION
	CENTRAL CASE	**1.41**	**1,877.2**
1	Discount rate four per cent	2.22	7,069.9
2	P90 costs	1.31	1,512.4
3	Value of Time (VoT) – 0.75% per annum escalation	1.29	1,294.8
4	50-year appraisal period	1.71	3,374.8

Table 7.9: Sensitivity Analysis Results

7.4 Wider Economic Benefits Appraisal

A wider economic benefits (WEBs) analysis of the CRR Project was undertaken in June 2016. This analysis has not been updated to reflect recent transport improvements or policy changes outlined in Section 7.3.1.

Best practice methodologies – as set out within state, national and international guidelines including the ATAP guidelines and Building Queensland's Cost Benefit Analysis Guide – were used to identify the wider economic impacts of the CRR Project.

WEBs were identified for the following three categories:

- WB1: Agglomeration economies
- WB2: Labour market deepening
- WB3: Output change in imperfectly competitive markets.

The WEBs analysis undertaken for the CRR Project is consistent with the approach applied to other major Australian infrastructure projects including Melbourne Metro and Westconnex in Sydney.

7.4.1 WB1: Agglomeration Economies

Agglomeration economies (WB1) make up the majority of WEBs for the CRR Project. Agglomeration economies result from increased density of economic activity. This leads to firms being able to increase productivity through input sharing, knowledge spillovers and output sharing. Agglomeration economies include 'cluster effects', which arise from increased physical density of employment enabled by enhancements in transport network capacity. Also included are 'proximity effects', which arise from reduced travel times between employment clusters. Both cluster effects and proximity effects contribute to increases in 'effective density' enabled by a transport intervention.

Land-use impacts must be estimated in order to consider cluster effects. For this reason, only proximity effects have been considered for the CRR Project.

The process for estimating agglomeration economies includes the following steps:

- Estimate 'business to business' effective density' (B2BEd) in Brisbane using an appropriate decay curve. The decay curve represents the characteristics of business travel in Brisbane, specifically how the propensity to undertake business travel declines as travel times increase.
- Estimate the elasticities of productivity with respect to effective density for Brisbane by industry (agglomeration elasticities).
- Estimate the percentage change in B2BEd for Brisbane between base and project cases for forecast years (2026 and 2036).
- Apply the agglomeration elasticities to the changes in B2BEd to estimate the total value of increases in labour productivity enables by the project.

7.4.2 WB2: Labour Market Deepening

Transport projects have the potential to enable labour market deepening (WB2) by reducing the barriers for new and existing workers to either take up new work or increase participation in the workforce.

Increased labour supply benefits result from reduced commuting costs encouraging unemployed or underemployed individuals to enter or increase participation in the workforce.

7.4.3 WB3: Output Change in Imperfectly Competitive Markets

Transportation costs act as a barrier to competition and therefore introduce market imperfections. Imperfectly competitive markets mean businesses sell products at a higher price and at a lower quantity than would be the case in a perfectly competitive market. A reduction in transport costs results in the optimal quantity of production for businesses in imperfectly competitive markets. This benefit is known as output change in imperfectly competitive markets (WB3).

7.4.4 Summary of WEBs Analysis

As at June 2016, the CRR Project is projected to generated total wider economic benefits of $1,209 million in present value, real terms.

7.5 Economic Impact Assessment – Computable General Equilibrium (CGE)

An economic impact assessment of the CRR Project was undertaken using a CGE model in June 2016. This CGE model has not been updated to reflect recent transport improvements and policy changes outlined in Section 7.3.1.

The CGE model was utilised to estimate the CRR Project's impact on key macroeconomic measures, specifically GSP, consumption expenditure, investment expenditure, exports and imports. The primary benefit of CGE modelling is the ability to measure indirect economic impacts through capturing the upstream and downstream linkages between the CRR Project and the rest of the economy[49].

A dynamic regional CGE model of the Australian economy was utilised for this assessment. The model was configured to model two regions: Queensland and the rest of Australia.

7.5.1 Simulation Results

7.5.1.1 GSP Generated

As at June 2016, the CRR Project is expected to contribute $1.03 billion present value to Queensland's GSP during the project's construction phase from 2015–16 to 2023–24 in real terms at a seven per cent discount rate. The CRR Project is projected to contribute $2.251 billion to GSP during its operation phase from 2024-25 to 2053–54. The total projected contribution of the CRR Project to GSP is $3.282 billion present value in real terms.

7.5.1.2 Jobs Created

As at June 2016, the CRR Project is expected to generate, directly and indirectly, an average of 1,547 full-time equivalent (FTE) jobs per annum during the construction phase, with the peak year recording 2,932 supported jobs. During the operational phase, the CRR Project is expected to generate an average of 576 supported FTEs per annum, with the peak year during this phase recording 1,255 supported jobs.

[49] The direct benefits of the CRR Project can be identified from key project financial parameters.

7.6 Economic Analysis Outcomes

In summary, a detailed economic analysis was undertaken for the CRR Project, which incorporated:

- A detailed CBA, which measured the direct benefits associated with the CRR Project against a 'without' base case. The CBA considered a detailed sensitivity analysis designed to test any uncertainty in the parameters utilised in the appraisal.
- A WEBs appraisal, which considered agglomeration, increased labour supply and changed output in imperfectly competitive markets.
- An economic impact assessment utilising CGE modelling to measure the macroeconomic impacts resulting from economy-wide productivity shocks following delivery of the CRR Project.

The results of the appraisal demonstrate significant gains to the Queensland economy from the delivery of the CRR Project. These outcomes are summarised in Table 7.10.

	RESULTS – 4% DISCOUNT RATE	RESULTS – 7% DISCOUNT RATE
BCR	2.22	1.41
NPV ($ million)	7,069.9	1,877.2
IRR	9.3%	9.3%

Table 7.10: Economic Appraisal Summary Results

7.6.1 Productivity Benefits

Productivity gains anticipated from the CRR Project have also been identified.

Well-targeted transport investment results in significant, long-term productivity benefits for local, regional and national economies. Productivity is the efficiency of transforming inputs (including capital and labour) into outputs (goods and services).

Reduced transport costs reduce the costs of doing business, lowering the costs of production and increasing the efficiency of business interactions.

Productivity gains for the CRR Project have been estimated from the CBA. Productivity gains derived from the CBA include work-related benefits as a subset of the benefits identified in the CBA. Each anticipated productivity gain is provided in Table 7.11.

ANALYSIS	CATEGORY	TOTAL $ MILLION	PV (7%), $ MILLION
CBA	BUSINESS TRAVEL TIME SAVINGS		
	Total cashflow – travel time savings	3,767.3	710.6
	VEHICLE OPERATING COST SAVINGS		
	Total cashflow – VOC	2,169.7	391.5
	Total productivity (CBA)	**5,937.0**	**1,102.1**

Table 7.11: Anticipated Productivity Gains