

PUBLIC SAFETY REGIONAL RADIO COMMUNICATIONS
PROJECT DETAILED BUSINESS CASE 2017

BUSINESS CASE/COST BENEFIT ANALYSIS SUMMARY



Purpose of this document	This document provides an overview of the Public Safety Regional Radio Communications Project Detailed Business Case. The primary objective of this document is to outline the economic analysis and the key outcomes.
Status	This summary was prepared based on the contents of the detailed business case presented to the Building Queensland Board in Q3 2017.



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1 Summary information

Project name	Public Safety Regional Radio Communications Project
Location	Regional Queensland
Proposal owner	Department of Housing and Public Works (formerly Department of Science, Information Technology and Innovation)
Proposed delivery agency	Department of Housing and Public Works (formerly Department of Science, Information Technology and Innovation)
Capital cost ¹ (P90)	\$411 million
Incremental ongoing cost ² (P90)	\$186 million
Discount rate	7%
Net present value (NPV)	-\$225 million
Benefit cost ratio (BCR)	0.45

¹ Nominal capital cost estimates are undiscounted 2017 dollars and rounded to the nearest million.

² Nominal ongoing operating and maintenance costs, undiscounted 2017 dollars and rounded to the nearest million.



2 Proposal overview

The Public Safety Agencies, which consist of the Queensland Police Services (QPS), Queensland Ambulance Services (QAS) and Queensland Fire and Emergency Services (QFES), operate five separate analogue networks that have been in place for over 25 years in the rest of Queensland—outside the Government Wireless Network (GWN) in South East Queensland. Operating on the existing ageing analogue networks presents a range of operational issues for Public Safety Agencies.

The purpose of the Public Safety Regional Radio Communications (PSRRC) project is to provide:

- more resilient and available systems to deliver mission critical public safety grade communications
- agency interoperability
- encryption of data
- duress alerting for officer and community safety
- global positioning system (GPS) location tracking for effective and efficient use of resources
- interoperability of networks across regions
- future long-term evolution to ensure mission critical narrowband radio communication has a pathway to mission critical broadband
- Australian Communications and Media Authority compliance for QFES.

3 Service need

Operating on the existing ageing analogue networks presents a range of operational issues for Public Safety Agencies which are evident in areas such as: interoperability limitations between Ambulance, Fire and Police; lower levels of secure communications; lower levels of personnel safety support; and lower visibility of the location of officers.

There is a need for a compliance project which would address QFES ACMA radio spectrum requirements, through reprogramming and replacing non-compliant equipment including terminals and base stations.

4 Base case

The base case is the benchmark against which the reference project³ is assessed. The base case was modelled on a whole-of-life basis and includes all expected impacts, costs and benefits of the situation that would exist without the project.

The base case refers to QPS, QAS and QFES communication systems without the PSRRC project. The base case includes ongoing radio communication and usage costs for the existing network through to the end of the evaluation period but excludes any unfunded projects in the future communications network. The base case includes ongoing maintenance costs and the cost of Australian Communications and Media Authority (ACMA) compliance⁴.

³ In the context of an economic analysis, a reference project represents an indicative investment proposal which addresses the identified service need. While the reference project may be subject to change during the detailed design process, it provides a reference point to assess the potential costs and benefits of the infrastructure proposal.

⁴ There is a legal requirement to comply with the *Radiocommunications Act 1992* (Cth), administered by ACMA. Due to changes to the ACMA spectrum designations within the 400 Megahertz (MHz) band, QFES is now operating UHF systems in spectrum allocations



Under the base case there is a need for a compliance project which would address QFES ACMA radio spectrum requirements, through reprogramming and replacing non-compliant equipment including terminals and base stations.

5 Reference project

The scope of the reference project includes a digital radio technology solution incorporating coverage across the various geographical areas shown in Figure 1. The solution includes QPS, QAS, QFES (including RFS and SES) as users of the PSRRC and ACMA compliance costs for QFES legacy networks.

Figure 1 - PSRRC reference project geographic area coverage



Geo areas 1, 2 and 3 provide coverage to:

- approximately 79 per cent of Queensland's population outside of GWN in South East Queensland (2016 Census)
- approximately 83 per cent of QAS incidents (2011–2016 inclusive) in rest of Queensland
- approximately 70 per cent of QFES (Fire) incidents (Nov 2009–Mar 2016) in rest of Queensland
- approximately 89 per cent of QFES (State Emergency Services) incidents (2010–2016 inclusive) in rest of Queensland.

Geo area 4 consists of the remainder of the areas not already covered by 1, 2, 3 and the existing GWN.

reserved for commercial users. Changes to the 400MHz band plan were to be implemented by 31 December 2015 for high and medium density areas and by 31 December 2018 outside of these areas.



6 Economic analysis

The economic analysis has been undertaken using a cost benefit analysis framework. The framework is based on an annual discounted cash flow model and was completed using the following steps:

- definition of the base case against which the project is compared
- identification of the costs and benefits that are expected in moving from the base case (without the PSRRC) to the project case (with the PSRRC)
- identification of the core parameters of the appraisal (e.g. time scale, base year for prices to calculate present dollar values, discount rate)
- quantification of the costs and benefits over the appraisal period
- estimation of the net present value and benefit cost ratio using discounted cash flow techniques
- testing the sensitivity of cost benefit analysis results to changes in the underlying assumptions.

A number of parameters have been applied to the cost benefit analysis and are outlined in Table 1.

Table 1 Key cost benefit analysis parameters and assumptions

PARAMETER	DESCRIPTION
Discount rate discount rate	7 per cent per annum real discount rate is adopted in the analysis to calculate present values. Sensitivity tests are undertaken at the discount rates of 4 per cent and 10 per cent.
Costs and benefits	All costs and benefits in the economic analysis are presented in 2017 real constant prices. The economic analysis excludes inflation and all prices are in real constant terms.
Evaluation period on period	An evaluation period of 6.75 years from the end of the capital investment is adopted. The first year of benefits is measured from 2022. Therefore, the PSRRC benefits will be measured from 1 January 2022 to 30 September 2028.
Economic evaluation	The economic evaluation considers the PSRRC from a Queensland community (social) perspective and considers the costs and benefits which are both internal and external to the agencies, including government organisations, individuals and the environment.
Base case	Refers to the QPS, QAS and QFES communication systems without the PSRRC. The base case includes: ongoing radio communication and usage costs for existing network through to the evaluation period but excludes any unfunded projects in the future network. It includes ongoing maintenance costs and the cost of ACMA compliance which is a legal requirement independent of the project.
Project case	The project case includes a digital radio technology solution incorporating coverage across four geographical areas for QPS, QAS, QFES (including RFS and SES) as users of the PSRRC and ACMA compliance costs for QFES legacy networks



7 Cost benefit analysis results

An economic cost benefit analysis of the reference project was conducted. All costs and monetisable benefits were discounted to present value terms using a real discount rates. Results of the cost benefit analysis are presented in Table 2.

Table 2 Cost benefit analysis results

COST BENEFIT ANALYSIS RESULTS (P90)			
ITEM	4%	7%	10%
PROJECT BENEFITS			
Cost savings	\$36.6m	\$31.6m	\$27.6m
Communications staff productivity	\$25.1m	\$19.9m	\$15.9m
Duress alarm	\$39.5m	\$31.2m	\$24.9m
Operational staff productivity	\$127.6m	\$100.9m	\$80.6m
Reduction in lost radios	\$3.5m	\$2.8m	\$2.2m
Total benefits	\$232.3m	\$186.4m	\$151.3m
PROJECT COSTS			
Capital costs	\$346.4m	\$307.6m	\$274.2m
Operating costs	\$130.8m	\$103.7m	\$83.0m
Total costs	\$477.2m	\$411.3m	\$357.2m
Net present value	-\$244.9m	-\$224.9m	-\$206.0m
Benefit cost ratio	0.49	0.45	0.42

With a discount rate of seven per cent applied, the results for the central case is a net present value of *negative* \$224.9 million, and a benefit cost ratio of 0.45, highlighting the economic costs outweigh the measured economic benefits.

8 Sensitivity analysis

The headline results have been tested for variation in the underlying cost benefit analysis assumptions, with changes to capital costs and productivity improvements to QPS leading to the largest deviations in project results (Table 3).



Table 3 Sensitivity analysis

SENSITIVITY	BENEFIT COST RATIO
MAIN CASE	0.45
Discount rate: 4%	0.49
Discount rate: 10%	0.42
Capital costs: +20%	0.39
Capital costs: -20%	0.53
Capital costs: P50	0.46
Productivity improvement (QPS): +50%	0.54
Productivity improvement (QPS): -50%	0.36
Evaluation period: + 2 years	0.51
Evaluation period: 15 years total	0.66

A number of other sensitivities were also conducted upon results including: changes in operating costs, communications improvement, productivity improvement in other PSAs (QAS and QFES) and avoided cost savings. None were found to have significant impact upon results.