Validation Report
July 2017

Papua New Guinea: Civil Aviation Development Investment Program (Tranche 1)

Reference Number: PVR-496
Project Number: 43141–023
Loan Number: 2588, 2589, and 2590

Independent Evaluation ADB

Raising development impact through evaluation

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
CAA	–	Civil Aviation Authority
CADIP	–	Civil Aviation Development Investment Program
DSC	–	design and supervision consultant
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
ICAO	–	International Civil Aviation Organization
ILS	–	instrument landing system
MFF	–	multitranche financing facility
MTDS	–	Medium Term Development Strategy
PCR	–	project completion report
PIU	–	project implementation unit
PNG	–	Papua New Guinea
PNGASL	–	Papua New Guinea Air Services Limited
RRP	–	report and recommendation of the President

NOTE

In this report, "$" refers to US dollars.

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PROJECT BASIC DATA

Project Number	43141–023	**PCR Circulation Date**	23 Sep 2016	
Loan Numbers	2588, 2589, and 2590	**PCR Validation Date**	Jul 2017	
Project Name	**Civil Aviation Development Investment Program (Tranche 1)**			
Sector and subsector	Transport	Air transport		
Strategic Agenda	Inclusive economic growth			
Safeguard categories	Environment		B	
	Involuntary Resettlement		B	
	Indigenous Peoples		B	
Country	Papua New Guinea		**Approved** ($ million)	**Actual** ($ million)
ADB Financing ($ million)	**ADF:** 50.00 (Loan 2589) 20.00 (Loan 2590)	**Total Project Costs**	112.00	113.30
	OCR: 25.00 (Loan 2588)	**Loan**	95.00	
		2588	25.00	89.70
		2589	50.00	
		(SDR equivalent, million)	(35.52)	
		2590	20.00	
		(SDR equivalent, million)	(12.61)	
		Borrower	17.00	23.60
		Beneficiaries	0.00	0.00
		Others	0.00	0.00
Cofinancier		**Total Cofinancing**	0.00	0.00
Approval Date	1 Dec 2009	**Effectiveness Date**	28 Apr 2010	22 Mar 2010
Signing Date	28 Jan 2010	**Closing Date**	30 Jun 2013	15 Jul 2016
Project Officers		**Location**	**From**	**To**
	A. Lee	PNRM	Dec 2009	Sep 2011
	J. Peththawadu	PNRM	Sep 2011	Dec 2013
	M. Ingratubun	PNRM	Jan 2014	Feb 2016
	H. Haider	PNRM	Mar 2016	Jun 2016
	D. Hill	PNRM	Jun 2016	Jul 2016
IED Review				
Director	N. Subramaniam, IESP			
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ADB = Asian Development Bank; ADF = Asian Development Fund; IED = Independent Evaluation Department; IESP = Sector and Project Division; IETC = Thematic and Country Division, OCR = ordinary capital resources; PCR = project completion report; PNRM = Papua New Guinea Resident Mission; SDR = special drawing right

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I. PROJECT DESCRIPTION

A. Rationale

1. Civil aviation is a major mode of transport in Papua New Guinea (PNG) because of the country's difficult geography. PNG is an archipelago consisting of rugged mountain ranges, fertile upland valleys, coastal plains, and extensive swamps. It has a coastline of over 17,000 kilometers and 17 million hectares of reef-covered coastal waters. Of the 19 mainland provinces, 13 are coastal provinces. Mountainous terrain makes it difficult to connect distant communities through a safe road transport system. Coastal and inter-island shipping services are infrequent and involve long travel times. Thus, safe, efficient, reliable, sustainable, and affordable aviation services play a vital role in trade, tourism, business, mobility of communities, and the overall socioeconomic development of the country.

2. There are more than 450 airports, airfields, and airstrips in PNG with 21 designated national airports. Most major airports and terminal facilities are owned and operated by the government's Civil Aviation Authority (CAA). The CAA is financed through airport and airspace fees, licensing and regulatory fees, and annual appropriations from the government, through its community service obligation policy, to provide aviation services even to destinations that are not commercially viable. Minor airports are owned by provincial governments, with some remote and district airfields and related privately owned and operated facilities. Three major airlines and more than 20 other operators provide international and domestic aviation services. In 2009, passenger traffic was estimated to grow by 3% yearly on average and freight demand by about 1%.

3. While aviation infrastructure facilities were extensive, capital investment remained inadequate. Recurrent expenditure failed to keep up with maintenance requirements resulting in deterioration of airside pavements, terminal buildings, equipment, and utilities. National airport facilities lacked safety and security compliance. Air navigation systems were unreliable and deteriorating due to old and obsolete equipment, lack of spare parts, theft and vandalism, unreliable power and communications, and logistics problems.

4. The poor infrastructure and air navigation services had resulted in canceled flights, restricted operations, and higher costs to airlines due to reduced payload and the need to divert flights. Public and private business costs also increased due to flight cancellations, rescheduling, and diversions. Weak and deteriorating infrastructure discouraged the airlines from investing in new aircraft types, potentially reducing their capacity to operate in regions of touristic and economic importance, with adverse implications for economic and social development.

5. Two key institutions administered, regulated, and managed the civil aviation sector. The Department of Works, Transport and Civil Aviation was in-charge of transport strategy and planning, monitoring of international obligations, negotiation of air service agreements, economic regulation, investigation of air accidents, and sector policy formulation and planning.[1] The CAA is responsible for airports, air traffic management, and regulatory oversight.[2] The National Transport Development Plan 2006–2010 sought to improve the aviation sector operations and to reform the CAA, which experienced difficulties in executing maintenance and investments needed for compliance with safety and security standards. The CAA had a well-articulated sector development plan to address the risks, but needed help in carrying out the plan. External funding to rehabilitate and upgrade the national airports was expected to support the government's Medium-Term Development Strategy (MTDS) 2005–2010 objectives of (i) good governance, (ii) export-driven economic growth, (iii) rural development, poverty reduction, and empowerment through human resource development.

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[1] The Department of Works, Transport and Civil Aviation, after its reorganization, is now the Department of Transport and Infrastructure (DOT) that provides ministerial advisory services and policy and planning input to the air transport sector.

[2] The CAA has been reorganized into the following: PNG Air Services Ltd is the state-owned enterprise responsible for providing, maintaining, and developing air navigation and airways services infrastructure, comprising ground and satellite-based navigation systems and management of the upper, middle, and lower airspace, including overflights. It also coordinates aviation search and rescue. The National Airports Corporation (NAC) is responsible for the provision, maintenance, and development of the 21 national government–owned airports, including aviation security, airport fire crash, and rescue services and control of ground movements of aircraft and other airport vehicles and equipment. The Transport Security Unit within DOT is responsible for developing security policy and ensuring that PNG complies with international conventions and agreements relating to aircraft, air service, air passenger, and air cargo security both externally and internally. The recently formed Civil Aviation Safety Authority is the principal regulatory agency in the sector and is responsible for safety certification of air operators, aircraft, aircrew, air traffic controllers, and airports. It ensures that PNG complies with international air safety conventions under ICAO. The Accident Investigation Commission is a recently formed body responsible for investigation of the circumstances of air accidents on a "no fault" basis with a view to future prevention.

6. In December 2009, the Board of Directors of the Asian Development Bank (ADB) approved a $480 million multitranche financing facility (MFF) to support a planned $640 million investment program for PNG's aviation sector.[3] The MFF was considered highly suitable for financing the investment program because of low commitment charges that would be levied on PNG and physical implementation would be slow based on previous experience in PNG projects. This financing facility would support the government's long-term vision for the civil aviation sector and sustain long-term partnership with ADB, which is needed for institutional capacity building.[4] It would also provide long-term opportunities to private companies interested in PNG's civil aviation sector. A project completion report for the first tranche was prepared in September 2016 and is the subject of this validation report.[5]

B. Expected Impacts, Outcomes, and Outputs

7. The Civil Aviation Development Investment Program's (CADIP) expected impact was economic growth and poverty reduction in project areas. The program's outcome was expected to be safer, more efficient, and more accessible all-weather air transport services in the project areas. Its outputs were reformed institutions, improved infrastructure, and improved operations.

8. Tranche 1's financing plan and intended results were approved with the investment program. The impact indicators, to be achieved in the project areas by 2015, were (i) 5% average annual economic growth; (ii) 10% decrease in the number of people below the poverty line; and (iii) increased income of formal and non-formal vendors derived from visitors by 10%. The expected outcome was safer, more efficient, and more accessible all-weather air transport services in the project areas. The outcome indicators, to be achieved in the project areas by 2013, were (i) five national airports (Gurney, Hoskins, Mount Hagen, Port Moresby, Wewak) certified to meet International Civil Aviation Organization's (ICAO) safety and security standards; (ii) growth in passenger demand increased from 3% to 5% annually, and in freight demand increased from 1% to 3% annually; and (iii) airport incidents (delays, diversions, and closures) due to safety or security decreased from an average of 4 to 2 per month (PCR, Appendix Table A1.2).

9. By 2013, Tranche 1's expected outputs were:

(i) Reformed institutions: CAA restructuring completed, CAA strategy updated, and ICAO audit findings of safety and security noncompliance reduced;

(ii) Improved infrastructure: Runways, taxiways, and aprons certified at five national airports, safety and security improvements met ICAO standards at four national airports, new airport terminal at Mount Hagen with sufficient facilities for international processing, flight times reduced by an average of 10%, and long-term performance-based maintenance contracts awarded for five national airports; and

(iii) Improved operations: Instrument landing system purchased and commissioned at Port Moresby and three rescue or fire tenders commissioned at Port Moresby airport by 2012.

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[3] ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to Papua New Guinea for the Civil Aviation Development Investment Program.* Manila.

[4] The MFF allows ADB to strengthen and improve CAA's long-term strategic plans and actively pursue policy dialogue throughout the investment program life cycle, and provides the opportunity to apply lessons from early tranches to guide subsequent tranches and include incentives for reforms and implementation efficiency.

[5] ADB. 2016. *Project Completion Report: Civil Aviation Development Investment Program (Tranche 1) in Papua New Guinea.* Manila.

C. Provision of Inputs

10. Tranche 1 was approved on 1 December 2009 with expected loan effectiveness on 28 April 2010. The loans were effective on 22 March 2010. The expected closing date of the loans was 30 June 2013, but with delays in project implementation the loans were closed on 15 July 2016. While the appraisal estimated an implementation period of 3.5 years, the project was completed after 6.5 years, a delay of 3 years from the original schedule. The establishment of project implementation unit (PIU) was completed during loan processing, but PIU staff had to be familiar with ADB procedures leading to a 15-month delay in recruitment of the design and supervision consultant (DSC). Engagement of a DSC firm strengthened PIU's capacity to expedite the progress of civil works and procurement of equipment for onward tranches. The preparation of tranche 2 provided opportunity for on-the-job training of PIU staff. Delegation of works associated with design and supervision to young counterpart engineers increased their sense of responsibility and skills, which is reflected in under implementation tranche 2.

11. Completion of security fencing for Goroka, Gurney, Hoskins, Kavieng, and Wewak airports was delayed 18–42 months while the consultant was appointed and materials procured. In the case of Hoskins airport redevelopment, implementation delays were due to wet weather and the lack of counterpart funding from the government adversely affecting procurement of materials. In the Kavieng fencing project, the project completion report (PCR) noted delays were caused due to landowner protest and sub-contractor's stand down due to non-payment (footnote 5). Costs for planned civil works exceeded project budgets, therefore, runway, taxiway, and apron rehabilitation was only completed for Port Moresby and Hoskins airports. The increased scope of work for Port Moresby and Hoskins caused cancellation of runway, taxiway, and apron works for Mount Hagen, Wewak, and Gurney airports. The Port Moresby domestic apron extension plan was delayed until the contract was awarded in May 2012 after a difficult process to identify a qualified bidder.

12. The Mount Hagen airport completed construction of a new terminal and associated airside and landside works. The Hoskins airport terminal was upgraded to a larger terminal. Both projects were delayed because the tender was not advertised until February 2012, and the contractor was not mobilized until June 2013.

13. Procurement of the Port Moresby instrument landing system was completed promptly. The procurement of the firefighting equipment for Port Moresby, however, was delayed due to late recruitment of the firefighting specialist in 2011. Tenders were advertised in late 2011, the contract was awarded April 2012, and delivery was in March 2013.

14. The maintenance programs, incorporated in the 10-year maintenance contracts that define performance standards, did not materialize. The costs for these were included in the civil works estimates at appraisal.

15. At appraisal, Tranche 1's project cost was estimated at $112.0 million equivalent funded by three ADB loans: (i) an ordinary capital resources loan of $25 million; (ii) a "hard-term" Asian Development Fund (ADF) loan of $20 million equivalent; (iii) a "soft-term" ADF loan of $50 million equivalent; and (iv) government funds of $17.0 million equivalent. At completion, actual project cost was $113.3 million. Delays in implementation escalated some project costs, other project costs were higher than planned, and foreign exchange impact from devaluation of the kina and civil works costs escalated as resource sector projects caused a shortage of contractor capacity. The budget impact of the absence of the 10-year maintenance contracts was not clear; cancelled works at some airports were replaced with the larger projects, which appear to have absorbed

the budget without achieving the maintenance contracts. Some goods were purchased at lower cost than expected: the Port Moresby instrument landing system was acquired at a saving of 34% and firefighting equipment for Port Moresby Airport at a saving of 23%. Program support and capacity development costs exceeded appraisal estimates due to the loan closing extension. ADB financing was $89.7 million and the government provided $23.6 million as counterpart funding, higher than the $17 million estimated at appraisal. Actual expenditure on civil works was $92.0 million or 80.7% of actual project costs. Actual airport improvements costs were $77.6 million compared to $81 million appraisal estimate. Actual program supports and capacity development costs were $2.8 compared to $8.8 million appraisal estimate. Provision for contingencies of $12 million was not utilized. The ADB loan component of the project costs was $89.7 million, lower than the appraised $95.0 million, because the government drew down the ADF loans in kina, which had depreciated during the loan disbursement period.

16. The project at appraisal was expected to require 1,000 person-months of consulting services, 357 international and 643 national. The PCR did not give the actual numbers of international and national consultants utilized. There was no advisory technical assistance associated with the project.

17. Tranche 1 was category B for environment, according to ADB's *Environment Policy* (2002), *Environmental Assessment Guidelines* (2003), and *Staff Instruction on the Use of Multitranche Financing Facility*; and as a level 2 activity under PNG's Environmental Act (2000) and Environment (Prescribed Activities) Regulations (2002). An initial environmental examination was undertaken for each airport rehabilitation under the project to assess the potential environmental impact. Tranche 1 was category B for involuntary resettlement in accordance with ADB's policy.[6] The number of people that may experience the incidental impact of the airports upgrading was expected to be small and well within the category of "no significant resettlement impact" under ADB's policy. The four airport sites under the project were screened to confirm the level of the impact. Tranche 1 was category B for indigenous people in accordance with ADB's *Policy on Indigenous Peoples* (1998). No ethnic minority groups were to be adversely affected by the investment program. Necessary actions favorable to indigenous peoples would be taken through the resettlement framework and resettlement plans.

18. At completion, airport-related civil works were within the airports' existing boundaries, and their environmental impact was considered temporary and reversible. The project had no significant resettlement impact nor was any ethnic minority groups adversely affected by the project.

D. Implementation Arrangements

19. At appraisal, the CAA was identified as executing agency responsible for implementing the civil aviation infrastructure works and the institutional strengthening and capacity building programs. A program steering committee (PSC) was to oversee the implementation of the investment program, monitor progress, approve the airports selected for subsequent projects, and guide the CAA and the implementing agencies. A PIU, headed by a project director and supported by the investment program consultants, was to be responsible for implementing the sector policy and infrastructure components.

[6] ADB. 1995. *Policy on Involuntary Resettlement*. Manila.

20. The actual implementation arrangements were as expected. After the restructuring of CAA in 2010, the National Airports Corporation (NAC) became the executing agency responsible for implementing the civil aviation infrastructure works and the institutional capacity building activities. The PSC and PIU were established. The PCR noted that capacity strengthening across the civil aviation sector was not advanced in the manner anticipated at appraisal. There was a strong focus on developing NAC's engineering capabilities and resources as this was needed in early implementation of the project. Less attention was given to the development of NAC's human resources and expertise in economics, finance, maintenance, and corporate social responsibility, which would be taken up in later tranches. Recently approved Tranche 3 also included the capacity development of Accident Investigation Commission along with other three sector agencies.

21. The PCR noted that the institutional restructuring led to staff movements during implementation process, which may have adversely affected various implementation activities. For example, PNG Air Services Limited (PNGASL) was responsible for providing, maintaining, and developing air navigation and airways services infrastructure, comprising ground and satellite-based navigation systems among others, while NAC, the executing agency, was responsible for the provision, maintenance, and development of the 21 national government–owned airports, including aviation security, airport fire crash and rescue services, among others. The PCR expected subsequent tranches of the MFF to address these matters.

22. Of the 42 loan covenants, the PCR noted that the government fully complied with 22, partially complied with 19, and failed to comply with 1.[7] The covenant that was not complied with required the CAA to put in place specific performance measures satisfactory to ADB and monitor reduction in expenditure and increase in cash flow, including target operating and accounts receivable ratios. The PCR reported that implementation was delayed and the ratios not in compliance at June 2016.

23. The covenants partially complied with are:
- (i) the project to be carried out with due diligence and efficiency—PCR concluded financial efficiency requires improvement;
- (ii) compliance with the environmental monitoring plan—the plans were updated during procurement, but progress reports were intermittent and no PCR was prepared, and training and support was not provided to the environment officer;
- (iii) maintain separate accounts and prepare audited financial statements—a full accounting system was not established until 2014, and accounts were submitted for audits which resulted in qualified audits and ADB commissioning a forensic audit in June 2016;
- (iv) provision of counterpart funds and resources for the projects—adequate funds were provided in all years except 2016;
- (v) gender development to encourage employment of women at equal pay and in safe conditions for all workers—bidding documents included these requirements but no review of results was prepared;
- (vi) grievance redress mechanism to be established within 3 months—did not comply with the use of a neutral agency and establishment of website, and evidence was not provided on regular conduct of stakeholder meetings;

[7] The PCR classified partial compliance under multiple categories: partially, limited, mostly, or not-fully compliant. The validation interpreted these categories as partial compliance.

(vii) PSC meetings with stated committee members and oversight roles—the steering committee only met twice, and only the NAC chief executive officer provided active ongoing guidance to the PIU;
(viii) government to enable CAA to perform its obligations—lack of funding for CAA and NAC hampered effectiveness in project deliver;
(ix) CAA to maintain plants, equipment, and property promptly as needed—regular maintenance is performed as needed, but long-term performance-based maintenance contracts are yet to be implemented.

24. The 10 remaining partially complied covenants are generally the same as those detailed here, as duplicated in different parts of the documents or directly linked aspects of the same topic already discussed. It was not clear what mitigation measures were instituted by ADB to address compliance with covenants. ADB's Papua New Guinea Resident Mission (PNRM) is taking proactive measures to improve compliance with covenants including hiring an international financial management specialist to manage finances and improve the capacity of PIU staff. Audited accounts for 2015 were submitted to ADB whereas the executing agency has submitted the unaudited project financial statements for year ending 2016 to PNG's Auditor General Office for audit and submission to ADB by June 2017. PNRM is also hiring another international financial management specialist to improve the capacity of executing agencies and to prepare and implement the financial management action plan of ADB projects in PNG, including CADIP.

25. Other covenant-compliant measures implemented include conducting PSC meetings more regularly; PNRM engaging in constant dialogue with the PNG government, which resulted in an increase of counterpart funds budgeted in 2017 to $13 million from $1.7 million in 2016; improving implementation where, as of December 2016, Tranche 2 awarded $90 million of contracts (68% of the tranche allocation) and disbursed $54 million (41% of the tranche allocation), over 77% of the elapsed loan period; enhancing social and environmental safeguard monitoring, thus 100% compliance was attained in 2016; and achieving maximum project readiness at time of Tranche 3 approval in December 2016 by advance contracting approximately 35% of the cost estimate for goods and works contracts.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

26. The PCR rated the project *highly relevant* as it was aligned to government's and ADB's policies and strategies. It noted that the project was consistent with government priorities in the MTDS 2005–2010 such as the rehabilitation and maintenance of transport infrastructure. The National Transport Development Plan had proposed major airport investments at Gurney, Madang, Mount Hagen, Nadzab, Tokua, and Wewak to facilitate growth and eventual competition on domestic routes. Institutional reform of the CAA to become self-sufficient and fund much of the remedial maintenance of airports and airways was a government priority (PCR, para. 47).

27. The validation notes that the project was indeed in alignment with government's development priorities and ADB's strategies and priorities. Among other things, the MTDS aimed to achieve its goal of improving living standards through transport infrastructure rehabilitation and maintenance with airports as a priority.

28. In response to the government's request for ADB to scale up its support for infrastructure development and management, ADB's Country Partnership Strategy (CPS) 2011–2015 included a strong portfolio and forward pipeline for civil aviation.

29. The project, however, had some design issues. The design and monitoring framework set optimistic output targets, overlooking CAA's capacity limitations in project design and implementation and government's weak financial situation to meet counterpart-financing obligations. Project impact indicators, such as average annual economic growth, decrease in the number of people below the poverty line, and increase in the income of formal and non-formal vendors from visitors, are not measurable on a project-area level unless surveys are undertaken on a regular basis by the government institutions. Performance indicators for the capacity development component of the project were also not included in the framework.

30. The institutional and staff issues arising from the restructuring of CAA should have been anticipated. Staff movements were occurring simultaneously at both NAC and PNGASL, offshoots of CAA restructuring which affected the implementation process. There were delays in the approval of procurement contracts and less than desired frequency of PSC meetings. Institutional restructuring should have been undertaken earlier and separately from the loan through a technical assistance so that institutional and staff capacity would be in place before implementation. The validation thus rates the project *relevant,* lower than the PCR rating.

B. Effectiveness in Achieving Project Outcomes and Outputs

31. The PCR assessed the project *less effective*, noting that civil works for the rehabilitation of airport infrastructure fell short of expectations, e.g., aprons, navigational aids, runways, and taxiways, aprons, and navigational aids for Gurney, Mount Hagen, and Wewak were not completed. Many of the airports were only issued limited period safety and security certification. There was no reduction in flight times since airport upgrades were not completed. Long-term performance-based maintenance contracts were not yet in place as of June 2016.

32. This validation notes the following in terms of project achievements. Hoskins airport and Mount Hagen airport terminals and the security fencing for Hoskins, Wewak, Kavieng, Gurney and Goroka airports were all completed. Hoskins and Port Moresby airports' aprons, runways, and taxiways were rehabilitated. Airport improvements in Port Moresby were limited to a new terminal, which was upgraded to include a separate area for processing international passengers, and associated airside and landside works. However, Hoskins terminal was poorly designed, had inadequate baggage handling and storage areas, and lacked cargo storage and handling facilities.

33. Procurement of navigation, communication, and surveillance equipment were completed including the instrument landing system and three firefighting equipment tenders at Port Moresby airport, and the precision approach path indicator landing aid system at Hoskins.

34. Passenger traffic in the project airports was expected to increase from 3% to 5% per year by 2013. This validation finds that using either 2005 or 2008 as baseline, total aircraft movements at all the project airports increased by 3.9% per year from 2005 to 2013 and by 5.3% from 2008 to 2013. Aircraft movement grew annually more than 4% in Gurney, Kavieng, Mount Hagen, and Port Moresby airports, while other project airports' growth was less than 3%. Annual growth of passenger movements in all project airports was 4.7% for 2005–2013 and 1.7% for 2008–2013. For 2005–2013, Gurney and Mount Hagen airports showed annual increase in passenger movements greater than 5% per year. For 2008–2013, except for Port Moresby airport, all other project airports showed traffic growth higher than 5%.

35. Growth in freight traffic was forecast to expand from 1% to 3% annually by 2013 in all project airports. Freight traffic grew 6.8% annually for 2005–2013 and 4.4% for 2008–2013. For

2005–2013, Goroka, Gurney, Mount Hagen, and Port Moresby airports had more than 3% annual growth, while for 2008–2013, only Mount Hagen and Port Moresby airports had traffic growth of higher than 3%.

36. Airport incidents such as delays, diversions, and closures due to safety or security concerns, were expected to decrease from an average of 4 to 2 incidents per month. However, the PCR did not provide any data on these trends. Since the project did not achieve all the expected outputs and the increase in airport traffic growth cannot be entirely attributed to the project, this validation rates the project *less than effective*, the same as the PCR rating.

C. Efficiency of Resource Use

37. The PCR assessed the project *less efficient.* At appraisal, the estimated economic internal rate of return (EIRR) values were between 17.7% and 507.2% for the subprojects, with the consolidated EIRR at 45.3%. At completion, the recomputed consolidated EIRR estimate was 8.8%, while the EIRR for each of the seven airports and PNGASL were between 6.0% and 23.4%, considering incremental traffic, airline operating cost savings, passenger time savings, safety improvements, and regional benefits.

38. Quantification of safety improvement benefits for the security fencing subproject in Goroka, Gurney, Hoskins, Kavieng, and Wewak was based on consultation with Air Niugini and PNG Air. For the benefits derived from security fencing, a proxy value was used based on aircraft operating cost savings equivalent to 15 minutes for each landing. When airport boundary was unsecured, the aircraft had to make overflight inspection before landing to check if runway was clear of any hazards, or the aircraft had to wait for ground confirmation. Since the time taken for these checks usually varied from 20 to 30 minutes depending on weather conditions and time of day, 15 minutes was considered a conservative figure (PCR, Appendix 7).

39. This validation finds it difficult to confirm the EIRR. The PCR provided actual airport traffic data from 2005 to 2015 (aircraft, freight, and passenger movements) and appears to have been forecast based on historic trends. The PCR’s estimate of regional benefits was computed based on increased business passenger spending of 30% and tourist passenger spending of 20% per visit. The PCR did not provide the methodology and the resulting forecast of the volume of business passengers and tourists, or the basis for the assumed 30% and 20% increase in business passenger and tourist spending. It is difficult to determine the merit of the assumptions made and the validity of the resulting benefit estimates. However, this validation also notes the sensitivity calculation in the PCR, which assumed total benefits are reduced by 20%, to result in a consolidated EIRR of 5.7%.

40. The estimated benefits for the Port Moresby domestic apron and fire trucks did not consider the safety improvement benefits of the fire trucks procured. In this case, total estimated benefits seemed to have been understated.

41. Given these findings this validation rates the project *less than efficient*, the same as the PCR rating.

D. Preliminary Assessment of Sustainability

42. The PCR assessed project sustainability as *less likely.* It based this assessment on NAC’s failure to enter the required 10-year performance-based maintenance contracts as planned. Even the alternative proposal to set up a sinking fund to finance future maintenance work was not implemented. This validation notes that this finding is applicable to the instrument landing system,

precision approach path indicator and airport fire trucks procurement, which will not be sustainable without maintenance.

43. The PCR's recalculation of the financial internal rates of return (FIRRs) showed huge decline for all project airports (PCR, Supplementary Appendix A). This implied that substantial increases in fees and charges and identification and implementation of new revenue sources were required to sustain the Tranche 1 project. The PCR did not disclose how each airport's incremental revenues were estimated in the computation of FIRR. Since the FIRRs were low, the PCR should have prepared the financial and cash-flow statement forecast for each airport and NAC as a whole to determine whether net revenues are sufficient to finance at least the operations and maintenance of project outputs. The PCR did not conduct the financial evaluation of PNGASL operations, as was done in the report and recommendation of the President (RRP). While Port Moresby airport could generate an FIRR of 12%, higher than the weighted average cost of capital of 2.4%, all other project airports had negative FIRRs.

44. Based on the deficiency in airport revenue streams to adequately finance operations and maintenance requirements and the absence of long-term performance-based maintenance contracts for the infrastructure and equipment provided, this validation rates the project *less than likely sustainable*, the same as the PCR assessment.

III. OTHER PERFORMANCE ASSESSMENTS

A. Preliminary Assessment of Development Impact

45. The expected development impact was economic growth and poverty reduction in the project areas. However, no survey was undertaken at baseline and at completion to monitor development impacts, and no report was provided. The government and NAC did not comply with the specific undertakings on implementing, monitoring, and evaluating the facility in the context of the design and monitoring framework. The government did not ensure that a project performance monitoring system was developed and reports prepared for each tranche.

46. The PCR's discussion on impacts was limited to environment, resettlement, ethnic minorities and social impacts. As expected at appraisal, airport-related civil works were within the airports' existing boundaries, and their environmental impact was considered temporary and reversible. The project had no significant resettlement impact nor was any ethnic minority groups adversely affected by the project. The PCR did not provide a rating for each impact.

47. This validation considers that the improvements made through the Tranche 1 works have had some benefits, such as safety improvements from security fencing and procurement of fire trucks and from increased business and tourist passenger spending. There are concerns, however, regarding the sustainability of these benefits due to the financial deficits and the lack of long-term maintenance programs. The works do not appear to have been associated with any negative impacts. Therefore, this validation rates development impact at the low end of *satisfactory*.

B. Performance of the Borrower and Executing Agency

48. The PCR assessed the performance of the government *partly satisfactory*. The government could not provide counterpart funds on a timely basis. It failed to confirm the appointment of the current NAC chief executive, which caused impediments to NAC restructuring and reform initiatives. It could not solve NAC board issues, nor could it allocate government

budget funds to NAC to ensure continuing organizational reform. The progress on community service obligation support to NAC for the regional airports was poor.

49. The PCR rated the performance of NAC *partly satisfactory* as it could not ensure the holding of quarterly PSC meetings and submissions of monthly and quarterly reports to ADB. It did not comply with project financial accounts and audit report requirements. It did not provide subproject completion reports and assessment of consultant and contractor performance. The NAC did not prepare the CADIP Tranche 1 PCR and failed to ensure that the DSC prepared subproject completion reports and performance assessments. It was also unable to carry out non-engineering capacity development in the CADIP PIU.

50. This validation assesses the performance of the government and NAC *less than satisfactory* as both failed to comply with their commitments in the implementation of the Tranche 1 project. The late release of government counterpart funds resulted in long implementation delays, increased project costs, and outputs that were substantially short of expectations. This was a major commitment of the government to the project and funding should have been allocated even before start of implementation. The NAC was slow in procuring the DSC, which resulted in implementation delays and in the approval of design revisions. Even though project outputs were less than expected, project cost was higher than estimated at appraisal. The failure to comply with project financial accounts and audit requirements has continued. Most of the loan covenants had only been complied with partially (see para. 22). The NAC was unable to prepare and submit the government's PCR nor conduct the required surveys for said report.

C. Performance of the Asian Development Bank

51. The PCR rated the ADB performance *partly satisfactory*. ADB's PNRM processed the program loan and was responsible for project monitoring. While the project's concept and design were relevant, the plans were ambitious and did not take adequate account of endemic project implementation difficulties experienced in PNG under previous ADB loans. The complexity of restructuring CAA was underestimated. PNRM's project review and monitoring task would have benefited from more experienced staff being deployed. There was a 12-month gap between ADB review missions from February 2012 to January 2013. The need for direct support was not acknowledged until mid-2013 and, from this period, PNRM took steps to improve the performance of the project and suspended the effectiveness of Tranche 2 until outstanding issues relating to Tranche 1 were resolved. This improved the performance to a satisfactory level until project closing. At completion of Tranche 1 several areas remain inadequate.

52. This validation agrees that PNRM, with its knowledge of the country's situation and experience in the implementation of previous ADB loans, should have considered the endemic project implementation difficulties in PNG. Project review and monitoring should have been undertaken on a more frequent basis. Fielding ADB review missions with a 1-year gap is a critical oversight, given the need for direct support and remedial action, particularly in the financial management area. PNRM actions between 2011 and early 2013 was ineffective in improving the disbursement flow, with remedial actions limited to monthly project review meetings with PIU to set progress targets that were repeatedly missed (PCR, para. 23).

53. Given the presence of the PNRM on site, strict project monitoring could have raised the serious implementation issues, avoided costly delays, and exposed partial compliance to loan covenants. This validation rates ADB performance *less than satisfactory,* same as the PCR's assessment.

D. Others

54. Advance procurement action was available, but significant delays still occurred. Procuring the DSC began on 30 March 2010, but was only completed 15 months later than assumed at appraisal. While all procurement conformed to ADB's Procurement Guidelines, NAC's capacity to implement the procedures was inadequate. In procuring for Port Moresby's domestic apron extension, for example, an independent review by ADB later in the process concluded that none of the contractors listed in NAC's prequalification report qualified. This resulted in the change in procurement from prequalification to post qualification due to delays that had already occurred. Procurement of the civil works contract packages for airport improvements was also prolonged, resulting in the cancellation of procurement of the airport improvement works (upgrade of runways, taxiways, and aprons) for Gurney, Mount Hagen, and Wewak.

55. Government counterpart funds were delayed and project implementation was subject to stoppage as contractors and subcontractors demanded payments. The government and the NAC did not prepare a PCR as required under the loan covenant and their assessment of the project could not be determined.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

56. This validation and the PCR rate the project *less than successful*. There was conformity on the assessment for effectiveness, efficiency, and sustainability. The validation assessed the project *relevant*, lower than the PCR's assessment. The project was aligned to PNG's development plans and transport strategies, and to ADB's CPS. Project design, however, failed to consider possible implementation issues that were apparent during the appraisal stage. The design should have foreseen the issues arising from the restructuring of the CAA during the project implementation. The project was considered *less than efficient* based on the low EIRRs and the implementation delays. It was considered *less than effective* as it fell short of achieving targeted outputs and was considered *less than likely sustainable* as there were no mechanisms in place to ensure adequate finances for operations and maintenance and the long-term performance-based maintenance contracts were not yet in place.

Overall Ratings

Validation Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Relevance	Highly relevant	Relevant	The project design at formulation should have considered the endemic project implementation difficulties experienced in PNG such as staff capacity, government's financial capacity, and the potential difficulties arising from concurrent implementation of the civil works and the institutional restructuring. Institutional restructuring would have been better if undertaken prior to the loan through a technical assistance so that institutional and staff capacity would be in place before implementing the project.

Validation Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Effectiveness	Less effective	Less than effective	
Efficiency	Less efficient	Less than efficient	
Sustainability	Less likely	Less than likely sustainable	
Overall Assessment	**Less than successful**	**Less than successful**	
Preliminary assessment of impact	No assessment	Satisfactory	The impact rating is at the low end of *satisfactory* based on the project outcome achievements and the threats to financial sustainability. The PCR did not conduct the appropriate surveys to measure the project's impacts in each project area.
Borrower and executing agency	Partly satisfactory	Less than satisfactory	
Performance of ADB	Partly satisfactory	Less than satisfactory	
Quality of PCR		**Satisfactory**	

ADB = Asian Development Bank, IED = Independent Evaluation Department, PCR = project completion report.
Note: From May 2012, IED views the PCR rating terminology of "partly" or "less" as equivalent to "less than" and uses this terminology for its own rating categories to improve clarity.

B. Lessons

57. The PCR identified as a project lesson the early attention needed in establishing project financial management systems, including civil works budgeting and performance monitoring, to accurately measure monthly civil works performance as compared to budgets and contract values. This validation notes that the PNG government was already aware of these requirements, which were part of the loan covenants and given that the government had ADB loans in the past. It is also ADB's practice to provide capacity development in project accounting and finance, and monitoring and reporting requirements early in the implementation stage.

58. This validation identifies the need for more frequent monitoring and coordination meetings with the executing agency by ADB in the early stages of project implementation to resolve issues before they worsen. Strict compliance with loan covenants pertaining to financial management systems, reporting, and project coordination meetings should have been the priority concern after loan effectiveness.

59. Further, this validation identifies the incompatibility of undertaking project implementation and institutional restructuring at the same time. Staff movements to the newly created state-owned enterprises affected the implementation process. NAC had to recruit new supervisors for the civil works contracts due to the institutional changes, which required some period for the new staff to familiarize themselves with their new responsibilities in the PIU.

C. Recommendations for Follow-Up

60. This validation supports the PCR's recommendation that the executing agency should set up a project benefit monitoring system in the remaining tranches of the program with baseline and

completion surveys to assess socioeconomic impacts. The government did not establish the project performance management system and should be a prerequisite even before a second tranche is implemented. ADB should follow up with the government regarding the submission of its PCR, which was not complied with.

61. This validation further supports the PCR's recommendation that NAC should enter long-term performance-based maintenance contracts, a loan covenant, for airport maintenance. NAC had not complied with this loan covenant at the time of the completion of the PCR.

62. The PCR recommends supporting NAC with capacity building in financial management, project benefit monitoring, project impact assessment, and strategic management to enhance the overall program's performance and sustainability. However, this validation is of the view that this should have already been undertaken and completed during the first tranche, which is purportedly one of the advantages of the MFF mode. The amount of $10.5 million had been spent for program support and capacity development under the project, which should have been adequate for building capacity in the areas recommended by the PCR.

63. From the auditor's remarks, NAC seemed to have repeatedly committed acts that had resulted in the auditor's "qualified" or "no" opinions. During 2010–2014, the auditor had issued three "qualified opinions" and two "no opinions." ADB should follow up on whether the auditor's remarks had already been adequately and satisfactorily answered by NAC.[8]

64. The government appears to have ongoing difficulties to cover the financial deficits of NAC and PNGASL. The two agencies, in particular NAC, should explore revenue-generating measures, such as increased fees and charges for services to meet airports' operating and maintenance requirements.[9]

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Comments on Project Completion Report Quality

65. This validation finds the overall PCR quality *satisfactory*. The PCR candidly assessed the project performance as well as the performances of the borrower, executing agency, and ADB. It noted the implementation deficiencies such as delays in procuring civil works and mobilizing consultants; non-compliance and partial compliance of covenants; and the PIU's failure to conduct the required survey work for monitoring project performance. However, the PCR did not identify the weaknesses in the project design. It also did not provide adequate justifications for the assumptions made in the computation of project benefits and costs. For example, the PCR did not explain sufficiently the assumption behind the increase in expenditures of business travelers and tourists. For the Port Moresby airport, the safety improvement benefits of the acquisition of the airport fire trucks was not considered and quantified.

66. The validation could not compare the methodologies used in computing the FIRR by the RRP and the PCR, as the supplementary appendix for the financial evaluation in the RRP could not be located. The PCR could have prepared the financial and cash-flow statements for each

[8] PNRM indicated that it is in the final process of hiring full-time international financial management specialist to be mobilized in May 2017 to work with executing agencies on improving their capacity in this area. This is in addition to prepare and implement financial management action plan based on qualified opinion or audit reports.

[9] PNRM indicated that it is in constant dialogue with NAC on tariff adjustment. It also indicated that aeronautical tariff review will be conducted under tranche 3 and a Transaction Advisory Services mandate has been awarded to ADB's Office of Public–Private Partnership to run procurement of Jackson Airport on public–private partnership modality.

project airport to determine its financial capacity to meet operations and maintenance expenses of the project facilities and infrastructure.

B. Data Sources for Validation

67. Data sources included the RRP, PCR, back-to-office reports of loan review missions, CPS, PNG's National Transport Strategy, PNG Medium-Term Development Plan 2011–2015, PNG Vision 2050, and PNG Development Strategic Plan.

C. Recommendation for Independent Evaluation Department Follow-Up

68. The PCR recommended the appropriate time for the conduct of a project performance evaluation report would be 2 years after loan closure. This validation does not recommend the preparation of a PPER since the Project Performance Management System (PPMS) had not been established making it difficult to acquire the required data to measure project impacts and outcomes.