



Australian Government
Department of Foreign Affairs and Trade



INVESTING IN ROADS— LESSONS FROM THE EASTERN INDONESIA NATIONAL ROADS IMPROVEMENT PROJECT



COMPLETION EVALUATION

March 2017

FOREWORD

The Eastern Indonesia National Roads Improvement Project (EINRIP) was a major component of Australia's \$1 billion assistance package for Indonesia, announced only days after the devastating 2004 Indian Ocean tsunami. More than 10 years later the project has left as its legacy some of the best roads to be found anywhere in Indonesia. It has also made a modest, but significant, impact on the way Indonesian Directorate General of Highways (DGH) conducts its business. This evaluation documents a solid set of achievements that have contributed to the overall success of the project. It is interesting to note, however, that during implementation EINRIP endured a number of performance issues and the project's ultimate success was by no means guaranteed. It is a credit to both the Department of Foreign Affairs and Trade (DFAT) and the Directorate General of Highways that these challenges were ultimately overcome.

A peculiar, but effective, feature of EINRIP was the combination of both loan and grant financing to achieve both infrastructure and institutional objectives. While this approach is common to organisations such as the World Bank, my former employer, it is not typical of Australian aid. Even though somewhat inexperienced in the use of this loan/grant modality DFAT adopted a thorough and well-executed approach, which entailed a scale and depth of grant-funded support well beyond that normally provided by the multilateral development banks. This evaluation highlights the potential for reforms supported through grant financing to be continued in Australia's new infrastructure partnership with Indonesia and indeed through the infrastructure lending programs of the development banks.

Another exceptional feature of EINRIP was a particularly comprehensive and robust approach to monitoring and evaluation. Not only was a host of data collected on the condition of EINRIP roads both before and after improvement, but such data was also collected for a series of broadly comparable control roads. This work is not complete as survey teams will continue to collect information for a number of years following completion. This comprehensive time-series data set has the potential to provide rich insight into the benefits inherent in the EINRIP approach and further strengthen the case for broader adoption. However, delivering on this potential will require both DFAT and DGH to give consideration as to how the availability and use of this data can be better promoted.

Too many ODE evaluations are faced with a shortage or even the absence of reliable project data. Without pre-existing data, the methodological options available to evaluation teams are limited, and rigour somewhat compromised. Happily, in EINRIP the ODE team had a rich and robust data set available for interrogation and this evaluation makes good use of DFAT's considerable investment in monitoring and evaluation.

This evaluation captures a series of important lessons from the EINRIP experience, which could usefully inform other Australian aid investments in infrastructure. ODE is currently conducting another similar evaluation of Australia's infrastructure investment in Papua New Guinea and plans to prepare a short publication that draws together learning from across the sector.



Jim Adams

Chair, Independent Evaluation Committee

Cover: Stretch of EINRIP road between Sinjai and Tondong, South Sulawesi. All photos: DFAT / Simon Ernst

ACKNOWLEDGMENTS

This evaluation was prepared by the Office of Development Effectiveness (ODE) at the Department of Foreign Affairs and Trade (DFAT). The evaluation team comprised Simon Ernst (team leader, ODE) and Dr Hatim M Hajj (infrastructure specialist, independent consultant). Analysis of data and preparation of many of the figures contained within this report was undertaken by Sharon Lim (ODE). The team brought to this evaluation, civil engineering, economics, program management, and monitoring and evaluation expertise alongside a sound understanding of the roads sector in Indonesia and corporate knowledge of DFAT's systems. DFAT's Independent Evaluation Committee was responsible for ensuring independence, rigour and the quality of the process.

ODE approached DFAT's Jakarta post in 2015 with a proposal that it undertake an independent evaluation of EINRIP upon completion. DFAT Jakarta agreed and committed to supporting the evaluation by providing briefings to ODE, access to all EINRIP documents and records, and assistance with implementing fieldwork and liaising with Government of Indonesia counterparts. DFAT Jakarta also reviewed and provided comment on all evaluation products culminating in this report. The main body of evaluation work was undertaken from July to November with fieldwork in Indonesia conducted in September 2016.

We would like to thank the DFAT Indonesia post for their engagement and cooperation throughout the evaluation process. We would also like to express sincere thanks to the DFAT staff, Indonesian Government officials, partners and beneficiaries who openly shared their insights into the successes and challenges faced by EINRIP and the Indonesian roads sector. In addition, we wish to convey our sincere appreciation of the extensive assistance provided by Mr Sofwan Hakim, DFAT, in planning and facilitating evaluation fieldwork in Indonesia.

Office of Development Effectiveness

The Office of Development Effectiveness (ODE) is an independent branch within the Australian Government Department of Foreign Affairs and Trade (DFAT). ODE monitors the Australian aid program's performance, evaluates its impact, and contributes to international evidence and debate about aid and development effectiveness. ODE's work is overseen by the Independent Evaluation Committee (IEC), an advisory body that provides independent expert advice on ODE's evaluation strategy, work plan, analysis and reports.

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ACRONYMS, ABBREVIATIONS AND EQUIVALENTS

ACAP	Anti-corruption action plan
AIPRD	Australia Indonesia Partnership for Reconstruction and Development
ANAO	Australian National Audit Office
APBN	Anggaran Pendapatan Belanja Negara (state budget)
AQC	Aid Quality Check
AusAID	Australian Agency for International Development
Bappenas	<i>Badan Perencanaan Pembangunan Nasional</i> (National Development Planning Agency)
DFAT	Department of Foreign Affairs and Trade
DGH	Directorate General of Highways
DGLT	Directorate General of Land Transportation
EINRIP	Eastern Indonesia National Roads Improvement Project
EIRR	Economic Internal Rate of Return
EMU	EINRIP management unit
ESS	Environmental and social safeguards
FED/DED	Final engineering design / detailed engineering design
FIDIC	International Federation of Consulting Engineers
Gol	Government of Indonesia
IG	Inspectorate General
IndII	Indonesian Infrastructure Initiative
IRI	International Roughness Index
KIAT	<i>Kemitraan Indonesia Australia untuk Infrastruktur</i> (Australia-Indonesia Partnership for Infrastructure)
MC0	Mutual check zero
MDBs	Multilateral development banks
M&E	Monitoring and evaluation
MoF	Ministry of Finance

MPWH	Ministry of Public Works and Housing
NTB	<i>Nusa Tenggara Barat</i> (West Nusa Tenggara)
PAS	Procurement advisory services
PMSC	Project management support consultant
PMU	Project management unit
PPC	Project preparation consultant
PRIM	Provincial Road Improvement and Maintenance
RSC	Regional supervision consultant
TFAC	Technical and financial audit consultant

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EXECUTIVE SUMMARY

This evaluation seeks to distil and disseminate key lessons from the Eastern Indonesia National Roads Improvement Project (EINRIP) experience that can help inform the design and delivery of other Australian aid investments in infrastructure. It examines whether the project achieved its objectives, the cost effectiveness of its innovative approach, the efficacy of its safeguards and gender measures and the extent of its broader influence.

BACKGROUND

After almost 10 years in implementation, EINRIP concluded in December 2015. The project was a significant part of Australia's \$1 billion assistance package to Indonesia following the devastating 2004 Indian Ocean tsunami. EINRIP constitutes the largest loan project (up to \$300 million) in the history of the Australian aid program, and with a grant of a further \$36 million, at inception it was also the single biggest infrastructure investment provided by Australia. This evaluation finds that the mix of both loan and grant funds was used to good effect, delivering superior results to that which could be expected through the use of only one of these funding mechanisms.

Although EINRIP had a sometimes troubled history, by the time of completion the project was able to boast a string of solid achievements and could truly be considered a success. Across nine separate Indonesian provinces over 395 kilometres of roads have been improved or upgraded and a further 1.3 kilometres of bridges installed. These roads are widely considered to be among the best in the Indonesian national road network, a claim supported by data collected through the comprehensive EINRIP monitoring and evaluation (M&E) program. In 2015 the project was recognised by the International Road Federation with the Global Achievement Award for Program Management.

Beyond the provision of road and bridge infrastructure EINRIP has also had a positive, modest to moderate influence on the Indonesian roads sector. EINRIP demonstrated a new approach to the planning and management of road construction projects and there are encouraging signs that some of the elements which make up this approach are beginning to take hold in the Indonesia Directorate General of Highways.

'The Vice President of Indonesia [H. Muhammad Jusuf Kalla] went to South Sulawesi, he was riding in the car and he can feel the difference. The roads are smooth. He asked 'what kind of road is this?' and was told these are the roads which are funded by a loan from Australia. Then he called our Minister and told him that he would like this kind of road to be provided through all our government funded projects.'

Indonesian government official

ASSESSMENT OF COMPLETED ROADS

Prior to construction detailed engineering designs and bid documents were completed for all EINRIP roads. Unlike the simplified designs commonly used in Indonesia at the time, these detailed engineering designs included field surveys to ensure suitability of designs with conditions on the ground. Final specifications included a thicker layer of asphalt, a wider and higher quality road shoulder, and better drainage, signage

and road marking provisions than commonly found in Indonesia. Additional safety measures were incorporated as a result of road safety audits. EINRIP roads have a 20-year design life, twice that of most of Indonesia's national road network. Construction was overseen by a supervision consultant but also subject to technical audit. Widespread issues with construction quality were detected and, after some difficulty, rectified. At completion, data collected by the EINRIP M&E team showed that these roads were both smoother and faster than before improvement and that the growth in traffic volumes was greater than anticipated. Up to four years following completion roughness values on the EINRIP roads are yet to deteriorate, suggesting they will perform well in terms of longevity. On all these measures the EINRIP roads outperform the broadly comparable set of control roads.

Drawing heavily on the EINRIP M&E data, but also its own enquiries, this evaluation has found that EINRIP has delivered a set of high-quality roads. It should be noted that the quantum of roads delivered is well below that originally promised, and that completing these took significantly longer than originally planned. The causal factors responsible for this situation are outlined in this report. The evaluation finds that generally this was due to an overambitious initial scope rather than serious underperformance.

EINRIP'S DEMONSTRATION EFFECT

EINRIP was designed to deliver improved infrastructure but also, as argued in this report, to provide a positive influence on the Indonesian infrastructure sector. This evaluation is somewhat critical of the selection and framing of EINRIP's objective, which obscures much of the expense and effort associated with the project and is unhelpful in terms of measuring its impact or performance. Nevertheless, EINRIP has had a modest to moderate impact on the sector, most notably the Directorate General of Highways. Areas of strong influence include the use of detailed engineering designs and technical audits. Areas of moderate influence include the use of supervision consultants, procurement reforms and road safety measures. The use of data to improve road planning and management has thus far had only modest influence. This evaluation did find evidence that some of the above 'innovations' inherent in the EINRIP approach are beginning to be applied by the Directorate General of Highways. Informants cited examples of current road projects which have some EINRIP features but it would be unrealistic to expect full replication of what can be fairly described as a donor-subsidised trial.

A thorough, robust and well-executed monitoring and evaluation (M&E) system was an inherent part EINRIP. True to its design the system generated evidence of the superior outcomes delivered through the EINRIP approach. It was not intended to, nor did it, provide feedback to help identify and address the performance issues experienced during implementation. This evaluation questions whether a sufficiently well-targeted and conceived communications strategy was employed to make the robust data and analysis emerging from EINRIP accessible to key Indonesian government decision-makers.

EINRIP COSTS AND BENEFITS

EINRIP was able to extend time and cost (via a reduced scope) to deliver a relatively small number of high-quality roads. Meanwhile the Directorate General of Highways (DGH) is tasked with delivering against time, cost and quality for the entire national road network. EINRIP roads only represent about 1 per cent of the national road network. The EINRIP roads were more expensive than other national roads but given the outcomes it appears likely that the cost was justified. This evaluation set out to quantify the cost premium associated with EINRIP roads, but this task ultimately proved to be fraught and difficult to complete in a sufficiently robust way. The EINRIP approach entails a greater upfront investment but offers the promise of better value on a whole-of-asset-life basis. A more definitive judgement may be possible in 10 years' time

but there are positive signs a few years after completion of most roads. DGH officials told ODE that they accept the greater costs associated with delivering better roads but it remains to be seen whether they can afford it.

All EINRIP roads were subject to a cost–benefit analysis at the feasibility study stage and again at project completion. The EINRIP loan agreement between the governments of Australia and Indonesia specifies a threshold Economic Internal Rate of Return (EIRR) of 15 per cent to guide subproject selection. Primarily due to an increase in cost, many of the EINRIP roads do not meet this threshold, although curiously a number fell short of this mark even at the feasibility stage. It is evident that other factors influenced project selection although it is not clear exactly what these are or what weight they were accorded in decision-making. ODE agrees that it would be inappropriate to apply EIRR as the sole basis for project selection, particularly given that social surveys commissioned by the EINRIP M&E team show that the roads in Sumbawa, which perform poorly on the EIRR measure, are delivering the greatest returns of any EINRIP road in terms of social and economic development.

Irrespective of these limitations we are confident that with the passage of time it will become readily apparent that EINRIP roads represent good value for money.

SOCIAL IMPACT

Social surveys document a range of social and economic benefits which are partially attributable to the improved EINRIP roads. Better access to health clinics and schools is noted. Women report feeling safer travelling by motorcycle and travel on the roads at night has increased. Bus fares have gone down and service frequency has increased. Travel times along the roads have decreased, in some cases significantly where there are multiple contiguous EINRIP road packages. An increase in mobile vendors providing goods and services, mostly by motorcycle, is evident. An increase in business activity including small owner-operated stores and larger businesses is evident. These are the sorts of social and economic benefits envisaged in EINRIP's project development objective. These are, however, not universal. The EINRIP social surveys reveal a high degree of variability in the extent that these benefits have been realised from one location to another. In some of the poorer locations, for example where motorcycle ownership is less common, many of the above benefits have failed to materialise. This illustrates that identifying the contingent factors which are necessary for roads to deliver developmental benefits is complex, as is the process of road subproject selection.

One area where EINRIP roads are not clearly superior is in relation to road safety. The EINRIP M&E team has collected time-series data on road fatalities from police authorities. The data only shows a lower fatality rate on EINRIP roads than comparison roads in some, not all, years and the margin of difference is slim. The data also suggests an increase relative to the baseline measure. The increase in speed on EINRIP roads post improvement is clearly a factor here. International road safety studies in fact suggest that given the significant increase in speed, a much greater increase in fatalities than that experienced might have been expected. Other likely causes include the rapid growth in underage and unlicensed motorcycle riders and very low levels of road rule enforcement and road user awareness of road signs and other safety features.

This evaluation found evidence that women have benefited from EINRIP roads. However, there is no evidence that any steps were taken to identify their particular needs and no evidence that they were consulted in the planning or delivery of these roads. Many evaluation informants stated that the roads are gender neutral, but this is only an assumption. The need for expert input in this area was identified, but never acted upon. In the years that have since passed, ensuring gender is thoroughly considered within all aid investments has become a much stronger focus for the department.

Key lessons

- 1. Scope announcements need to be carefully managed.** Public announcements of the tangible results delivered through the aid program are essential. However, the EINRIP experience demonstrates the adverse effect this can have if targets are not accurate. Targets should be based on reasonable assumptions, careful analysis and ultimately viable plans. During interviews conducted by ODE it was widely acknowledged that the original targets regarding scope and completion time were prematurely set and unachievable. Although EINRIP fell short of delivering on the original 'announcements' it did ultimately deliver, with some delay, against the outcomes contained in the loan agreement.
- 2. Communicating success.** EINRIP has produced better quality roads than has been delivered by DGH using GoI funds or with financing from the multilateral development banks (MDBs). This is well recognised by those closely associated with the project but the extent of its broader demonstration effect is unclear. The EINRIP M&E team prepares high-quality annual reports that document many of the projects achievements. Although these are shared with GoI, especially DGH, and the MDBs, none of the officials we interviewed were aware of these reports. A clearer strategy and/or effort is required in order to increase awareness of the benefits associated with the EINRIP approach. This might include a short (2–4 page) annual summary, perhaps launched at a conference or workshop organised by DFAT Jakarta.
- 3. Loans combined with grants can be highly effective.** Loan financing is typically not a feature of Australian aid. While some other bilateral donors are active in this area, DFAT has considered the possibilities extensively but as yet not committed to the ongoing use of concessional loans as a form of aid. There are clearly a range of factors to be considered by the Australian Government before changing its policy position on loans and the aid program. However, in EINRIP there is a positive example of the additional benefits that can be derived when loans and grants are used together.
- 4. Cost–benefit analysis inadequate basis for project selection.** The use of cost–benefit analysis to guide the selection of infrastructure projects is necessary but not sufficient to ensure appropriate projects are supported. As outlined in Chapter 6, development benefits do vary from project to project and a selection process that is able to take fuller account of logical factors that cannot easily be monetised is desirable. The use of multicriteria analysis is one approach that facilitates the systematic consideration of economic factors alongside other important criteria to guide decision-making.
- 5. The three 'E's to road safety.** Reducing road accidents and deaths, particularly as speeds increase, is extremely unlikely to occur through the use of engineering measures alone. These measures need to be accompanied by education and enforcement elements to bring about a reduction in traffic accidents including fatalities. Doubtless, this would either complicate, or simply be beyond the scope of, many aid-funded road construction projects. As an alternative it may be appropriate to include design features that deliberately slow traffic at select locations, in recognition of the limited attention provided to road user education and enforcement in Indonesia and many other developing countries.
- 6. The potential for infrastructure to impact on men and women differently is not well understood.** All parties we interviewed supported the idea that EINRIP roads should benefit men and women equally. Many assumed this to be the case, believing that roads are generally, if not always, gender neutral. However, the absence of any detailed consideration of gender issues in EINRIP suggests the project was more likely gender blind than gender neutral. While specialist gender expertise is more often a feature of current Australian aid investments, a short case study or guidance piece that helps DFAT officers and their counterparts better appreciate why gender matters in infrastructure may also be helpful.

MANAGEMENT RESPONSE

The Office of Development Effectiveness' evaluation of the EINRIP program was a useful exercise from the Australian Embassy Jakarta's perspective and contains some helpful lessons to inform our future infrastructure program. Thanks to the team engaged by ODE (Simon Ernst and Hatim Hajj) for their constructive engagement throughout the evaluation and for a well drafted report.

The EINRIP program was one of the biggest infrastructure investments ever made by the Australian Government in Indonesia. Funding for the program was announced on 5 January 2005 – just 10 days after the Indian Ocean Tsunami and the investment commenced on 15 June 2005 – That a \$300 million program moved from inception to commencement in under 6 months is a remarkable achievement – particularly given the concessional loan financing modality was not commonly undertaken by AusAID.

The quality of the roads built and maintained under this program received high praise from Indonesian Government officials and globally - in 2015 the project was awarded the Global Achievement Award for Program Management by the International Road Federation.

We agree with all of the key lessons noted by ODE in the review except for the recommendation on the scope of program announcements. We are of the view that this is a matter for the relevant portfolio Minister and these issues were addressed commensurate with the circumstances at the time.

The review team's recommendations on gender are well taken and we are already considering ways to strengthen our existing infrastructure investments. Importantly we are also seeking to ensure that gender is a key focus of our new infrastructure program, the Indonesia Australia Infrastructure Partnership (KIAT) which commences mid-2017. We will be engaging a senior gender adviser through KIAT to focus on mainstreaming gender considerations throughout all program activities and will continue to pursue standalone gender activities that advocate for gender inclusion in infrastructure programming and generate much needed knowledge products in the sector.

As Indonesia transitions from a lower middle-income economy to a higher middle-income economy we are currently considering the most appropriate aid modalities to deliver Australia's development program. In this regard, the evaluation's focus on the appropriateness of loans coupled with grants is timely. We share the Evaluation Team's view that the grant component of the EINRIP program enabled Australia to have far greater oversight of the riskier elements of this infrastructure program. In particular, we were able to introduce much more rigorous monitoring and evaluation of the program including safety audits. We were also able to provide more technical support to Indonesia to ensure that the quality of design and oversight of the procurement and construction met international best practice. This, in Post's view, would have been very difficult to ensure had we only provided a loan.

Lesson	Agree / Disagree	Applicability of lesson to current or future investments in Indonesia
<p>Scope of announcements need to be carefully managed- Public announcements as to the tangible results delivered through the aid program are essential. However, the EINRIP experience demonstrates the adverse effect this can have if targets are not accurate. Targets should be based on reasonable assumptions, careful analysis and ultimately viable plans. During interviews conducted by the evaluation team it was widely acknowledged that the original targets regarding scope and completion time were prematurely set and unachievable. Although EINRIP fell short of delivering on the original ‘annouceables’ it did ultimately deliver, with some delay, against the outcomes contained in the loan agreement.</p>	Agree in principle, but not appropriate in this case	Although we agree that DFAT should do its utmost to provide advice to portfolio ministers to influence announcements and ensure that they are achievable, there is insufficient information within the report or supporting documents reviewed to support the assertion that the announcement made at the time was not managed appropriately.
<p>Communicating success- EINRIP has produced better quality roads than has been delivered by DGH using GoI funds or with financing from the MDBs. This is well recognised by those closely associated with the project but the extent of its broader demonstration effect is unclear. The EINRIP M&E team prepares high quality annual reports which document many of the projects achievements. Although these are shared with GoI, especially DGH, and the MDBs, none of the officials interviewed by the Evaluation Team was aware of these reports. A clearer strategy and /or effort is required in order to increase awareness of the benefits associated with the EINRIP approach. This might include a short (2-4 page) annual summary perhaps launched at a conference or workshop organized by DFAT Jakarta.</p>	Agree	Given the scale of the EINRIP program and the relatively innovative manner in which it was implemented it is important that we continue to communicate the program’s achievements. We will continue to look for opportunities to do this with regular advocacy with the Indonesian Government and also a standalone event to celebrate the completion of the program.
<p>Loans combined with grants can be highly effective- Loan financing is typically not a feature of Australian aid. Whilst some other bilateral donors are active in this area, DFAT has considered the possibilities extensively but as yet not committed to the ongoing use of concessional loans as a form of aid. There are clearly a range of factors to be considered by the Australian Government before changing its policy position on loans and the aid program. However, in EINRIP there is a positive example of the additional benefits that can be derived when loans and grants are used together.</p>	Agree	<p>The combination of loans and grants was highly effective in the delivery of this infrastructure program and welcomed by our GoI counterparts. We see value in further exploring this modality in the Indonesian context given Indonesia’s middle-income status. The use of grants with loans also provides Australia with greater opportunity to influence the upfront preparation and ongoing monitoring of infrastructure programs thereby reducing risk.</p> <p>Nonetheless, the future use of loans by DFAT is a broader policy issue for the department to consider, rather than a specific lesson for the Indonesia program.</p>

Lesson	Agree / Disagree	Applicability of lesson to current or future investments in Indonesia
<p>Cost benefit analysis is an inadequate basis for project selection- The use of cost benefit analysis to guide the selection of infrastructure projects is necessary but not sufficient to ensure appropriate projects are supported. As outlined in chapter 6, development benefits do vary from project to project and a selection process which is able to take a fuller account of logical factors which cannot easily be monetised is desirable. The use of multi-criteria analysis is one approach which facilitates the systematic consideration of economic factors alongside other important criteria to guide decision-making.</p>	Partially agree	<p>The issue here appears to be one of transparency rather than limitations of cost benefit analysis. The review acknowledges that the EIRR of 15 percent was not met in all cases, which suggests that other factors influenced the selection of projects – the real question here is whether these factors led to the correct roads being selected?</p> <p>Multi-criteria analysis would have provided greater transparency and enabled more rigorous selection of projects that did not meet the simplistic EIRR threshold. Cost-benefit analysis still has a role in lower value, less complex projects that do not warrant the research and analysis necessary for a comprehensive multi-criteria analysis.</p>
<p>The three “E’s” (engineering, education and enforcement) are critical to road safety- Reducing road accidents and deaths, particularly as speeds increase, is extremely unlikely to occur through the use of engineering measures alone. These measures need to be accompanied by education and enforcement elements to bring about a reduction in traffic accidents including fatalities. Doubtless, this would either complicate, or simply be beyond the scope of many aid funded road construction projects. As an alternative it may be appropriate to include design features that deliberately slow traffic at selection locations in recognition of the limited attention provided to road user education and enforcement in Indonesia and many other developing countries.</p>	Agree	<p>While we agree that good engineering coupled with education and enforcement is the best approach to improving road safety, this lesson also raises philosophical questions about the scope and limitations of infrastructure projects and the role of local partners as ‘owners’ of the infrastructure. Although we could (and did) engineer solutions to road safety issues on EINRIP roads, the issues of education and enforcement were not constrained just to EINRIP. The users of these roads and those enforcing safety standards extended beyond the scope of the project.</p> <p>We agree that the road safety lesson from EINRIP is really that better roads lead to more severe accidents as vehicle speeds increase and DFAT Posts supporting road investments should consider whether complementary road safety programs are appropriate. Often this will be the case and will be considered in the work of our new infrastructure program, KIAT.</p>
<p>The potential for infrastructure to impact on men and women differently is not well understood- All parties interviewed by the evaluation team supported the idea that EINRIP roads should benefit men and women equally. Many assumed this to be the case believing that roads are generally, if not always, gender neutral. However, the absence of any detailed consideration to gender issues in EINRIP suggests the project was more likely gender blind, than gender neutral. Whilst specialist gender expertise is now more often a feature of current Australian aid investments, a short case study or guidance piece which helps DFAT officers and their counterparts better appreciate why gender matters in infrastructure may also be helpful.</p>	Agree	<p>We are seeking to ensure that gender considerations are central to the work of KIAT, and the ODE Evaluation has been provided to the KIAT team as key guidance material. We are already working closely with all of our development partners to advocate for a greater focus on gender in our current and future infrastructure programs. We also understand that the Infrastructure Policy Section is currently working on a guidance note to advise on gender aspects of infrastructure programs.</p>

1. OVERVIEW OF EINRIP

1.1 PROJECT BACKGROUND AND CONTEXT

The Eastern Indonesia National Roads Improvement Project (EINRIP) was established in 2006 as part of assistance to the Government of Indonesia (GoI) under the Australia Indonesia Partnership for Reconstruction and Development (AIPRD). EINRIP provided a highly concessional loan of \$300 million alongside \$36 million in grant-financed technical assistance for the reconstruction and improvement of national roads and bridges. EINRIP helps to promote economic and social development in Eastern Indonesia through the provision of 20 major road and bridge packages across nine provinces, totalling around 395 km of roads and 1300 m of associated fabricated steel bridge structures.

EINRIP's primary objective, as stated in the loan agreement, is *to support regional economic and social development in Eastern Indonesia by improving the condition of the national road network*. This is complemented by secondary objectives associated with improving the quality and longevity of roads and building institutional capacity within partner agencies. In this manner EINRIP aimed, beyond the individual packages it financed, to make a broader contribution to Indonesian road and bridge construction practice.

To support these objectives, and maximise value from the loan funds provided, EINRIP was designed to incorporate a number of important features, summarised below:

Loan funds:

Loan financing provided funds for civil works associated with major road and bridge construction packages and the provision of implementation support. The EINRIP loan was managed through GoI systems with the Directorate General of Highways (DGH) of the Ministry of Public Works and Housing (MPWH) fully responsible for the management of all civil works contractors and engineering supervision consultants. In addition to civil works, the loan funds financed:

- **Project management support consultants (PMSC)** who assisted the project management unit (PMU) to execute project administration, coordination, monitoring and reporting functions.
- **Regional supervision consultant (RSC)** who supervised civil works consistent with the role of 'engineer' under a FIDIC*-type contract. The RSC ensured that contractors delivered work to specifications and correctly carried out quality control tests on materials and workmanship. The RSC also delivered HIV/AIDS awareness campaigns. The work of the RSC was monitored by the PMSC.
- **Procurement advisory services (PAS)** consultants who helped ensure that procurement and award decisions were undertaken in accordance with agreed procurement guidelines. (World Bank guidelines were adopted.)

* International Federation of Consulting Engineers

Grant funds:

EINRIP grant funds were administered by DFAT (formerly AusAID) who engaged the services of managing contractors to support the following functions:

- **Project preparation consultants (PPC)** were engaged by DFAT to undertake project preparation, including development of final engineering design (FED) for 24 separate road project packages. PPC also undertook some quality monitoring and evaluation.
- **Environmental and social safeguards (ESS)** were prepared and adopted by GoI, as was an anti-corruption action plan (ACAP). The ESS and ACAP mirror those applied to World Bank loan programs and were monitored throughout implementation.
- **Procurement advisory support (PAS) / procurement agent** to support selection of consultants for DGH.
- **Independent technical and financial audit consultants (TFAC)** were used to help ensure the delivery of quality infrastructure. Auditors were contracted directly to DFAT.
- **Road safety audits** were conducted for all packages to help ensure that EINRIP roads were properly designed and built to appropriate road safety standards. Audits were undertaken at both design and construction stages.
- **Monitoring and evaluation (M&E) program** included the regular collection of road and traffic data, and to a lesser degree information on social and economic variables, before, during and after road construction. Data was also collected for a number of 'comparison' roads that were not subject to EINRIP assistance.
- **EINRIP management unit (EMU)** provided ongoing internal technical and administrative support to DFAT and monitored all aspects of EINRIP.

Figure 1: Map of project locations

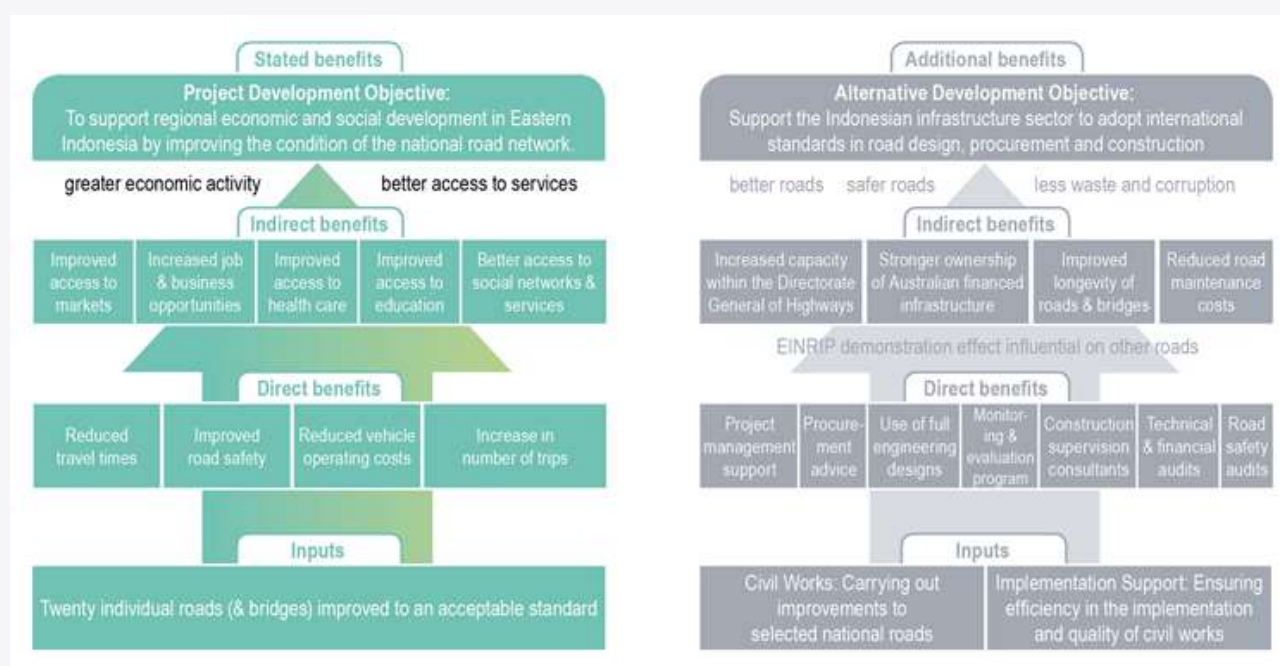


1.2 EINRIP'S THEORY OF CHANGE

Although EINRIP does have a clearly articulated project objective, a theory of change or program logic was never documented. We have prepared the following theory of change diagram as an aid to the evaluation. The diagram has been constructed using EINRIP's key elements as described in project documents. Many of the benefits captured under the project development objective (left-hand side, green) are explicitly tracked as key performance indicators. Benefits under the alternative development objective (right-hand side, grey) are rather more implicit and are based upon what intent can be inferred from the documentation. We believe that both sets of objectives and benefits are equally valid and that combined they provided a fuller description of what EINRIP was designed to achieve.

EINRIP-funded road works represent a very significant investment of Australian aid funds but address only a small proportion of infrastructure needs given a national road network spanning approximately 40 000 kilometres across Indonesia.¹ The Australian National Audit Office (ANAO) estimates that EINRIP will directly impact on about 1 per cent of the Indonesian national road network. Nevertheless, a number of EINRIP's key design features make it apparent that the project was always intended to make a much bigger contribution.

Figure 2: EINRIP theory of change (TOC)

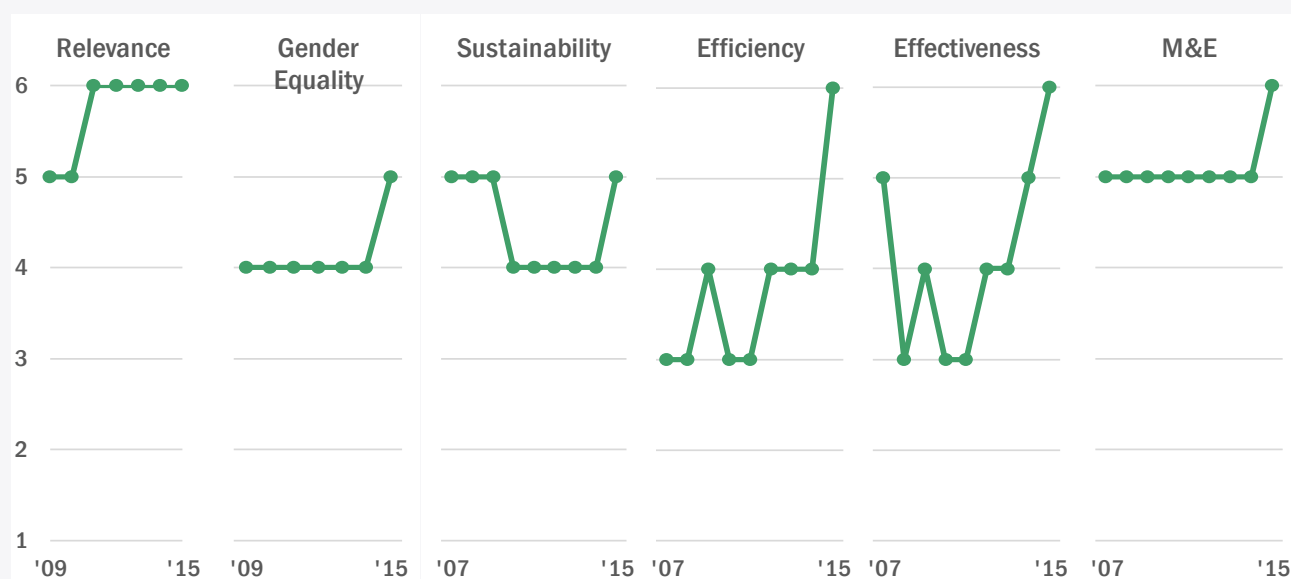


Feedback provided throughout the course of this evaluation indicated unanimous agreement with the alternative development objective put forward by ODE. Significant elements of the project and the large majority of activities funded under the grant component were clearly and deliberately targeted at facilitating EINRIP's demonstration effect and hence broader influence on the Indonesian infrastructure sector. We believe that clearly linking these activities (such as EINRIP M&E) to an explicit project objective would have served to further the overall effectiveness of the project. Furthermore, the formally adopted project development objective is essentially unmeasurable given all the other factors, in addition to roads, that influence economic and social development. This evaluation finds that the objective, as stated, was insufficient as it failed to provide a useful benchmark against which progress and performance could be measured and it largely ignored a significant body of effort and expenditure.

1.3 SUMMARY OF PAST PERFORMANCE

This evaluation helps establish that at completion EINRIP was a generally successful project. However, a review of DFAT's annual Aid Quality Check* (AQC) reports reveals that EINRIP had a somewhat troubled performance history. The AQC scores shown in Figure 3 indicate that for a number of years EINRIP received unsatisfactory ratings (3) for both efficiency and effectiveness. The consecutive poor ratings on effectiveness triggered the department's 'Initiatives Requiring Improvement' policy in 2012, whereby an improvement had to be demonstrated within 12 months in order for the project to avoid possible early termination.

Figure 3: EINRIP AQC ratings from inception to completion



In 2011 (then) AusAID commissioned an independent progress review of EINRIP. The review presented generally favourable findings in relation to the project preparation process including road designs, land acquisition and environmental planning. Findings in relation to procurement, including anti-corruption measures, were also positive as were its conclusions regarding the M&E program. The review, however, did raise concerns with the timeliness and quality of completed roads. It recommended extending the construction period of the loan agreement and revisiting construction supervision arrangements.² It also recommended a review of safety audits with a view to undertaking corrective action to address identified safety issues. Happily, this evaluation finds that the large majority of issues identified were subsequently addressed.

ANAO also examined EINRIP along with the Indonesia Infrastructure Initiative (IndII). ANAO noted the delivery of quality road infrastructure but also the substantial delays and increases in cost and a significant reduction in EINRIP's scope. ANAO also raised some concerns related to project sustainability and questioned the likelihood of design and supervision practices piloted through EINRIP having a broader impact. As has this evaluation, the ANAO review also questioned the appropriateness of EINRIP's project objective and recommended that EINRIP *explores further opportunities for working with the Government of Indonesia to promote institutional strengthening in road management*.³

* Previously known as Quality at Implementation (QAI) reports

2. ABOUT THE EVALUATION

2.1 EVALUATION PURPOSE AND OBJECTIVES

It is anticipated that this evaluation will help distil and disseminate valuable learning that can inform:

- the approach taken by other Australian aid investments in infrastructure in Indonesia and elsewhere
- current thinking within DFAT about the potential for the expanded use of loan financing.

The evaluation should help guide the ongoing implementation of DFAT's recently released 'Strategy for Australia's aid investment in economic infrastructure'. It is hoped the evaluation will also help inform inception of the new Indonesia infrastructure program (KIAT).^{*} In particular, the evaluation is expected to provide insight into focal areas such as project preparation, institutional strengthening, safeguards and leveraging of other finance as opposed to the direct funding of infrastructure.

As this is a completion evaluation the focus is upon the identification of lessons of potential broader relevance, rather than specific targeted recommendations. It is anticipated that, in equal measure, EINRIP's achievements and disappointments will prove instructive. The primary intended users of this evaluation are the DFAT infrastructure thematic group, infrastructure teams and DFAT Indonesia program staff. It is also expected that GoI partners, including the Ministry of Public Works and Housing, the Ministry of Finance, and the Ministry of Home Affairs will find the evaluation useful, as will the multilateral development banks (MDBs).

EINRIP represents a major flagship Australian aid investment. This evaluation, while also conducting its own enquiries, aims to bring together prior reviews and the large body of M&E data collected into a succinct and easily accessible form.

2.2 KEY EVALUATION QUESTIONS

1. Was EINRIP effective in the achievement of intended outcomes?
 - a. To what extent does the physical infrastructure and capacity gains established through EINRIP reflect those outlined at project inception?
 - b. What were the positive and negative, intended and unintended consequences associated with EINRIP?
2. Did EINRIP positively influence the approach the Government of Indonesia now takes to road infrastructure?
 - a. To what extent did EINRIP, either through targeted institutional strengthening actions, or by virtue of a demonstration effect influence the road construction practices employed by DGH on its general road construction activities?
 - b. How effective was the EINRIP M&E program in guiding the successful implementation of the project and demonstrating the value of the EINRIP approach to stakeholders?

^{*} Kemitraan Indonesia Australia untuk Infrastruktur (Australia Indonesia Partnership for Infrastructure)

3. Does EINRIP represent value for money, both relative to the quality of roads constructed and the institutional gains made?
 - a. Was the modality (mix of loans and grant technical assistance) relevant to intended EINRIP outcomes?
 - b. What are the early indications as to the sustainability of both EINRIP-supported institutional capacity and completed roads and bridges?
 - c. Do EINRIP roads represent value for money? Taking into account any increases in traffic volumes, have the additional costs associated with project preparation and higher quality standards been effectively offset against levels of required maintenance expenditure and other economic benefits (e.g. reduced vehicle operating cost)?
4. Did EINRIP road packages take adequate account of cross-cutting issues?
 - a. Did the design and implementation of EINRIP take adequate account of needs of women as road users and facilitate their involvement in project delivery?
 - b. Were other key safeguard and cross-cutting issues, such as resettlement, road safety, environment and HIV/AIDS, given appropriate attention?

2.3 APPROACH AND METHODOLOGY

Approach

ODE employed two somewhat distinct means of gathering and analysing data to answer the evaluation questions. With reference to the theory of change diagram provided in Section 1.2, differing approaches were used to examine the project (left) and alternative objectives (right).

Data from the EINRIP M&E program was compiled, synthesised and analysed to inform findings which relate to the direct benefits listed under the project's formally stated project development objective. This quantitative material enables a series of before and after, with and without comparisons between project and comparison roads against a range of key criterion.

The second approach relied largely on qualitative methods to assess the institutional influence of EINRIP on the infrastructure sector in Indonesia. Interviews with key informants and document review were used to assemble evidence of progress against the direct and indirect benefits outlined under the alternative development objective.

Methods

A range of evaluation methods were employed in order to gather relevant data and perspectives. The evaluation framework at Annex Three provides detail on evidence requirements, data collection methods and sources, and the analytical approach used. Themes or trends identified through document and database review, interviews, field observation and economic analysis were repeatedly tested against one another. Wherever feasible, evidence was triangulated to ensure rigour.

Document and database review

ODE undertook an extensive study of EINRIP project documents and EINRIP M&E files. These included a series of baseline studies and subsequent monitoring surveys containing a comprehensive set of data for each and every project and comparison road, generally also covering multiple time intervals. Many of the

figures appearing in this report are drawn from this data. In addition, we reviewed relevant DFAT policies and strategy papers and other relevant reviews and evaluations alongside a narrow selection of academic and grey literature pertaining to infrastructure.

Key informant interviews

Sixteen semi-structured interviews were undertaken with DFAT, DGH, the World Bank and Asian Development Bank (ADB), Ministry of Finance and National Development Planning Agency (Bappenas) staff, local police and former members of the EINRIP management unit. Interview guides were used to aid in the reliable identification of consistent themes or perspectives in the responses of different informants.

Field observation

ODE visited Sumbawa and Sulawesi and traversed the entire length (twice) of nine of EINRIP's 20 road packages. These visits enabled us to do basic verification on the condition of EINRIP roads and the extent to which improvements have been sustained. At various spots along each road we conducted informal interviews with road users, local business owners, and school and health post officials about their experience of the EINRIP roads. Because a number of comprehensive and high-quality social surveys have already been undertaken, we did not undertake an extensive program of interviews with beneficiaries.

Economic analysis

In addressing the evaluation question on value for money, we drew upon the cost–benefit analysis undertaken as part of the project feasibility study and subsequently updated in October 2016. This material was considered alongside expenditure data relating to the grant component, which forms an important part of the total project cost.

2.4 CONSTRAINTS AND LIMITATIONS

ODE was able to conduct the evaluation faithfully in accordance with the approved evaluation plan. While no major obstacles were encountered this evaluation, like any other, was subject to some constraints and limitations. These were as follows:

- **Shortage of time and resources:** The evaluation was modestly but appropriately resourced, consistent with DFAT expectations and the availability of key personnel. It utilises approximately 2 months of professional input, far less than the 5 months outlined in the EINRIP M&E manual.
- **Accuracy of data analysis:** The evaluation makes extensive use of the EINRIP M&E data, which is voluminous and at times difficult to navigate for those that are not familiar with it. Feedback on this report and the data analysis it contains was sought from the EINRIP M&E team, who checked the accuracy of figures and tables.
- **Evaluation of implicit objectives:** The alternative theory of change (Figure 2) receives little attention under EINRIP M&E arrangements and as such minimal existing data is available to support interrogation of this objective and identified benefits. Greater use of interviews was made to help examine this area.
- **Evaluation of higher-order benefits:** Achievement of EINRIP's project development objective, 'supporting regional economic and social development', is influenced by many additional factors outside the control of the project. While the evaluation identifies areas where the roads have potentially contributed to economic and social development, little attempt has been made to establish a causal link between the EINRIP roads and higher-order benefits.

- **Reliance on the perceptions of key informants:** In some cases, such as the impact of EINRIP as a demonstration project on DGH, the views of a small number of well-positioned individuals form the major source of evidence. We have treated such information with caution, particularly when it is attributable to only a single source.
- **Unreliability of key data:** Notwithstanding the generally high quality of data gathered under EINRIP M&E arrangements, ODE (and the EINRIP M&E team alike) did have cause to question the accuracy of some road safety figures. In such cases this data was not used.
- **Cost comparisons:** The evaluation plan stipulated that ODE would compare the cost of EINRIP roads against Indonesian road construction cost norms. This proved not to be feasible as the EINRIP roads were built to a different standard (e.g. 20-year design life and a minimum pavement width of 6 metres), invalidating such a comparison. We were, however, able to get estimates from well-placed officials of the cost of EINRIP roads relative to other national roads in Indonesia.

3. ASSESSMENT OF EINRIP INFRASTRUCTURE

3.1 ON TIME, ON BUDGET?

EINRIP has generally delivered what it set out to do, namely the improvement and/or upgrade of a selection of national roads. However, the final project scope and time for completion differ greatly from those outlined on 7 December 2005 when the project was announced by the Australia Indonesia Partnership for Reconstruction and Development (AIPRD) Joint Commission Ministers. The media release of the Commission stated that *the objective of EINRIP [was to] support regional economic and social development, particularly in Eastern Indonesia, by improving the condition of 2,000 km of national roads and replacing approximately 4,500 m of essential bridging. EINRIP would be funded by up to \$300 million in AIPRD loan funds, and up to \$28 million in AIPRD grant funds for project development and implementation support. The project was to be completed by mid-2009, less than 4 years following the announcement.*⁴

At project completion in September 2015, EINRIP had succeeded in improving 395 km of national roads, replacing 1300 m of bridges over a period of almost 10 years. To help explain this large deviation in scope and completion time it is important to briefly review the history and circumstances surrounding the project.

The Indian Ocean tsunami struck on December 26 2004. Ten days later Prime Minister Howard announced the \$1 billion aid package to Indonesia to be delivered over 5 years. At that time, AusAID did not have any engagement in the road sector. The National Road Improvement Program (NRIP) being prepared by the World Bank was proceeding slowly. Due to AusAID's keen interest in the project and desire to move quickly, NRIP was eventually split into two parts: East (EINRIP), to be financed by AusAID, and West (WINRIP), to be financed by the World Bank. Implementation of WINRIP did not start until 2014, as EINRIP was finishing up.

Project scope and targets

The figure of 2000 km was based on DGH practice and World Bank experience in Indonesia suggesting that only limited civil works (mostly asphalt overlays) would be required for the betterment of national roads under EINRIP. During project preparation it became apparent that more substantial (and costly) civil works would be required. Further, there was a change in standards for national roads after the AIPRD announcement. Most important were the increase in the minimum paved width of national roads from 4.5 m to 6.0 m and change in the design life of the pavement structure from 10 years to 20 years. Unit costs had also increased appreciably for both materials (especially bitumen and fuel) and labour. This resulted in higher costs for civil works.

The high level of political interest and hence pressure led to a premature announcement of scope and deliverables before undertaking the substantial work necessary to clearly establish project parameters and validate the assumptions that underpinned initial advice to governments in both Indonesia and Australia.⁵ The project preparation consultant (PPC) commenced work in March 2006 (more than 3 months after the announcement). The loan agreement for EINRIP (signed on 7 September 2007) reflected the work done by PPC and provided for improvement of about 400 km of roads. Given this it is reasonable to compare the completed works under EINRIP with the scope contained in the loan agreement and not against the scope

outlined in political announcements. Under this measure, EINRIP successfully delivered the agreed kilometres of road improvements.

Completion period

According to the announcement by AIPRD Joint Commission of Ministers, EINRIP was to be completed in about 3.5 years. ODE considers this period to be unrealistically short. No road project by the World Bank in Indonesia has been completed in less than 7 years; generally, about 2 years is needed for preparation of the project and 5 years for implementation. With World Bank projects it is not unusual for the loan closing date to be extended by 2 or more years.

The loan agreement for EINRIP specified a loan closing date of 1 June 2011, which translates to a completion period of 3 years and 9 months. Preparation alone continued for about 1.5 years after loan signature. Construction of the first subproject commenced in February 2009 and the last subproject was substantially completed in September 2015, or a total construction period of about 7 years. We consider this period to be too long and suggest this could have been managed better.

Delays encountered in project preparation and implementation were caused by an array of factors including a shortage of skilled Indonesian staff, staff turnover in the PPC, the nature of the land acquisition process, interruptions in initiating procurement actions, delays in approving variation orders and poor performance by contractors.

A major problem affecting implementation has been the very long time taken to complete land acquisition. The difficulties encountered resulted largely from institutional and administrative issues, rather than from difficulties created by affected residents, or deficiencies in legislation. This led to the exclusion of four road packages out of the 24 detailed designs and bid documents prepared by the PPC.

Experience of AusAID and delivery model

At inception EINRIP was the largest infrastructure project ever undertaken by AusAID. Its financing involved a large loan and limited grants. Under loan arrangements, the responsibility for implementation lies with the borrower (GoI). DGH (the executing agency) is responsible for selection of contractors and supervision consultants (subject to no objection letters from AusAID). The capability of AusAID to influence conformance with project implementation schedule was largely limited to persuasion and support. The issue of delivery model using a mix of loans and grants is discussed in more detail in Section 5.1 of this report.

These factors combined necessitated changes in both scope and timing of EINRIP. Three amendments to the original loan agreement signed on September 7 2007 were negotiated and agreed. These amendments (signed in June 2011, February 2013 and November 2014) called for extension of the loan closing date and revisions of allocations within loan categories. The final agreed loan closing date was September 30 2015 against an original closing date of June 2011.

This evaluation finds that in spite of these challenges the EINRIP was finally successful in meeting its revised infrastructure goals.

Key lesson: Scope announcements need to be carefully managed

Public announcements of the tangible results delivered through the aid program are essential. However, the EINRIP experience demonstrates the adverse effect this can have if targets are not accurate. Targets should be based on reasonable assumptions, careful analysis and ultimately viable plans. During interviews conducted by ODE it was widely acknowledged that the original targets regarding scope and completion time were prematurely set and unachievable. Although EINRIP fell short of delivering on the original 'announceables', it did ultimately deliver, with some delay, against the outcomes contained in the loan agreement.

3.2 DELIVERING BETTER ROADS

Despite the aforementioned challenges EINRIP has successfully delivered roads that met or exceeded original expectations. Travel speeds are much higher than before, resulting in lower travel times. Traffic volumes are higher than expected at the project preparation stage and generally increasing at higher rates than the comparison roads. Vehicle operating costs are lower than before road improvement and road maintenance costs are lower than for the comparison roads. These are all positive outcomes. Road safety figures (expressed in fatalities per 100 million vehicle kilometres) for EINRIP roads are variable relative to comparison roads. The margin by which EINRIP roads are safer is too slim, and the data too unreliable, to support a firm conclusion.

EINRIP roads are widely acknowledged as superior. Certainly the M&E data shows they are far superior to what they were before improvement and better than the comparison roads. The feedback to ODE was unanimous on this point. Officials, community members and road users were all very positive. Several people we met with (in various directorates/sections in DGH and in the Balais [Regional Offices of DGH] and police in the provinces of Nusa Tenggara Barat [NTB] and South Sulawesi) repeated the comments made by Vice President Muhammad Jusuf Kalla during his visit to South Sulawesi regarding the superiority of EINRIP roads over nearby national roads financed by national budget. Further, there was a unanimous call to produce roads similar to those achieved by EINRIP.

EINRIP's performance and reputational issues prior to 2012 have largely been overcome. The independent progress review of EINRIP commissioned in late 2011 highlighted issues with the quality of construction and problems with supervision of works by the regional supervision consultant (RSC). These have been satisfactorily resolved and the quality of the finished works is deemed good. This was confirmed through interviews conducted by ODE, interrogation of M&E data (particularly relating to roughness and maintenance) and field visits to nine subprojects in Sumbawa and South Sulawesi. We found the roads travelled to be generally in good condition with smooth riding surface with few potholes; well-finished shoulders; good drainage (both transverse and longitudinal); sidewalks in populated areas; well-placed guardrails; good road markings (centreline and edge lines), traffic signs and markers; and generally well-signed and marked school zones.

However, we also noted some deficiencies in implementation of EINRIP and its maintenance since then. Issues related to design or implementation include:

- lifting of drain covers and tiles on sidewalks
- isolated and short sections of longitudinal cracking
- insufficient backfilling and compaction behind lined ditches in several locations
- some instances of bleeding and poorly applied seals
- vandalism of signs and markers

- an ongoing problem with rock slides in one road section in Sumbawa.*

Issues related to maintenance fall into two categories: those of broader systemic and national character, which are not restricted to EINRIP, and those of an isolated individual nature.

- Broader systemic issues not restricted to EINRIP:
 - Inadequate coordination between utilities and roads agencies—ODE observed instances where the installation of utilities adjacent to the road potentially adversely impacts on road longevity.
 - Poor coordination between the Directorate General of Land Transport and DGH particularly in relation to road signs, markers, centre and edge lines.
 - The need for better procedures for the identification and implementation of routine maintenance works.
- Isolated individual issues
 - Some potholes that need to be properly filled and compacted before they get bigger.
 - Signs and pavement markings need to be maintained or replaced.
 - Branches that obscure signs need to be cut, as does grass in the area between the shoulder and ditch.

Many of these deficiencies relate to design standards and policy issues that should be addressed at a national level (and not provincial or specific road section level). The remaining issues pertain to short and isolated sections of EINRIP roads. However, field observation confirmed that overall EINRIP roads are well designed and constructed and the quality of the finished roads is good.

3.3 ROAD CONDITION

The EINRIP monitoring and evaluation surveys for the period 2012–2015 inclusive and preliminary results for 2016 confirm the above observations by ODE and the comments received from officials in Jakarta and the provinces visited. The data confirms the widely held view that EINRIP has resulted in better quality roads. The EINRIP M&E program uses the International Roughness Index (IRI) as a measure of road condition and quality. The higher the IRI, the worse the condition of the road. The IRI was measured for each of the 20 EINRIP packages and 10 comparison roads for the base year (mostly 2008) and each year since then for comparison roads and

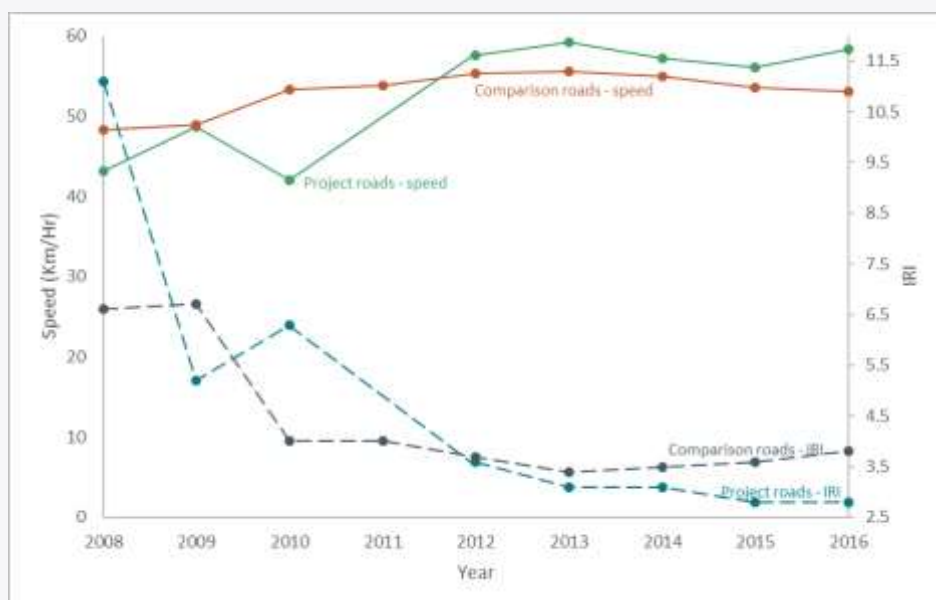


Figure 4 - Road roughness and the impact on vehicle speed

* ODE appreciates that an effective solution to help prevent rockslides is likely to be extremely expensive and technically complex and probably beyond what could be reasonably expected of EINRIP.

for the EINRIP roads that were substantially completed. Figure 4 summarises the average IRI and average spot speeds by year for the comparison and EINRIP roads. Figure 4 generally shows that as IRI is reduced (road surface becomes smoother), vehicle speeds increase. It is worth noting that not all EINRIP roads were finished at same time. In fact, the first road package was substantially completed in 2011, with subsequent packages completed in 2012, 2013, 2014, and 2015. By 2016, all EINRIP roads were fully completed.

The overall roughness of the comparison roads decreased slightly from 2008–2010 levels (around 4.3 points on the roughness index) to about 3.8 during 2011–2016, a decrease of about 12 per cent. This improvement reflects the maintenance and periodic work carried out by DGH. In contrast, the average roughness of EINRIP roads decreased from around 9.5 during 2008–2010 to 2.8 in 2015 and 2016 when EINRIP roads were completed. This is a huge reduction of about 71 per cent. It should be noted that the initial (prior to improvement) roughness of EINRIP (9.5) is much higher than the corresponding number (4.3) for comparison roads.

Although the roughness of both comparison and EINRIP roads decreased, the improvement for EINRIP roads was far greater. Presently, EINRIP roads have lower roughness than comparison roads (2.8 vs 3.6). However, IRI measures the roughness of the paved section of the road and says nothing about the condition of the shoulders and its continuation to the ditch. In this regard, evaluation field work revealed that EINRIP roads are far superior to the comparison roads. The shoulders on EINRIP roads in South Sulawesi are paved and in good condition. In Sumbawa, where the shoulders are generally not paved, their condition is also good and affords good drainage. The road base material used for EINRIP roads extends to the shoulder while lower quality material is typically used for the shoulders of other roads. The EINRIP road shoulders are generally also better graded and compacted rendering them more suitable for use by vehicles (in emergencies) and less likely to contribute to traffic accidents.

It is also clear from Figure 4 **Error! Reference source not found.** that the substantial decline in the roughness of EINRIP roads observed from 2010 to 2012 is associated with significant increases in vehicle speed for the same period.

3.4 SHORTER TRAVEL TIMES

The improvement in the quality of EINRIP roads has permitted much higher speeds. The average speed on EINRIP roads has increased from about 45 km/hr during 2008–2010 to about 58 km/hr during 2013–2016 (Figure 4). This is an increase of about 13 km/hr compared to about 2 km/hr for comparison roads. On two of the EINRIP roads in Kalimantan* the average speed for all vehicles exceeds 65 km/hr and reaches 75 km/hr for passenger cars. There is also much more variation in speed between vehicle types than on comparison roads. In 2015, the average speed of cars was 63 km/hr while the corresponding average speed for buses was about 51 km/hr; a differential of about 12 km/hr. Spot speeds on comparison roads increased slightly from about 51 km/hr during 2008–2010 to about 53 km/hr in 2016. The difference in average speed between the fastest vehicle type (cars) and the slowest (trucks and minibuses) was about 8 km/hr in 2015 and 10 km/hr in 2016.

Road officials in NTB commented to ODE that communities and road users are happy with EINRIP because of the better quality of roads, which in turn have contributed to reducing the travel time between Sumbawa Besar and Dompu (250 km of which about 165 km were improved, half via EINRIP and half via APBN† funds) from up to 6 hours to around 3 hours. Their comments are borne out by the data collected by the EINRIP M&E team, which shows that the average weighted speed on EINRIP roads increased from 40.3 km/hr in

* EKB-01 Pontianak–Tyan and EKS-01 Martapura–Tungkap

† Anggaran Pendapatan Belanja Negara (state budget)

2008 (before improvement) to 57.9 km/hr in 2016 (after improvement), an improvement of about 43 per cent.

In conclusion, the improved conditions of EINRIP roads have led to significant increases in speed and a corresponding reduction in travel times. These savings in time are moderate because the average length of an EINRIP road package is about 20 km; where there are multiple contiguous packages (e.g. South Sulawesi or Sumbawa), there is a more pronounced benefit.

3.5 TRAFFIC GROWTH

Improved roads generally also result in increased vehicle numbers (or generated traffic). EINRIP M&E surveys for the period 2008–2015 show that traffic volumes on the comparison roads (excluding roads that have been subject to major improvements) have increased by over 30 per cent, equivalent to 4.1% per annum. However, preliminary results for 2016 show that average daily traffic has increased by about 8.7% in 2016 compared to 2015 (increase from 12 869 in 2015 to 13 992 in 2016).

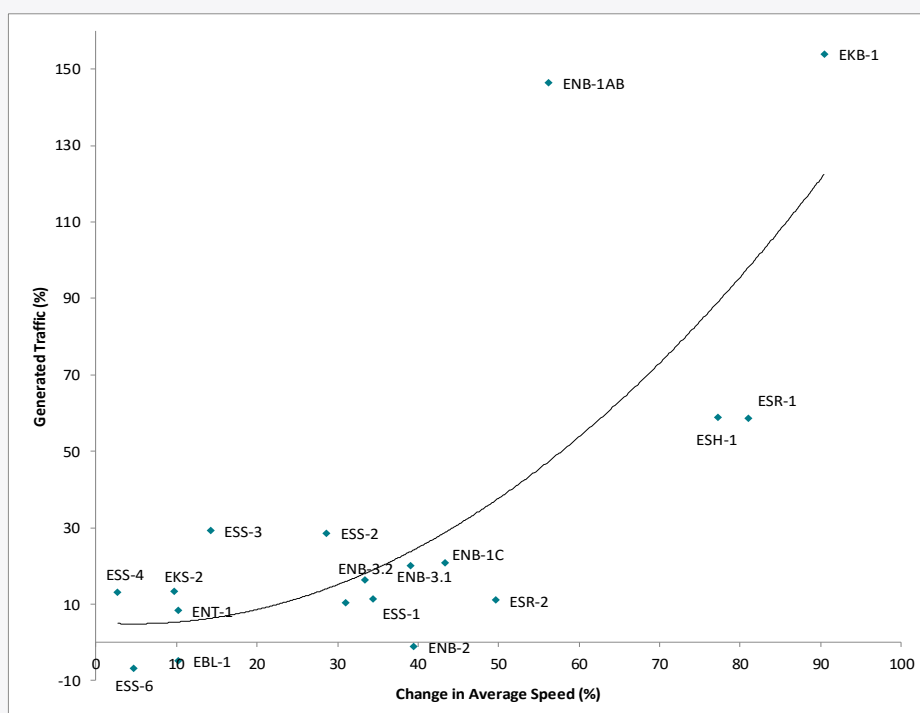
Daily traffic volumes on EINRIP roads first monitored

in 2012 grew by an average of 8.8% per annum since completion, compared to 4.1% p.a. on the comparison roads, while for those roads first monitored in 2013, the rate of growth was 15.2%, indicating a continuing traffic generation effect. It should be noted that the generation effect is closely related to the improvement in average speeds and consequent travel time savings (Figure 5). A 50 per cent increase in speeds will generate an increase in traffic of approximately 40 per cent.⁶

The EINRIP road improvements seem to have generated a substantial amount of additional traffic. On the average, there is about 34 per cent more traffic than would have been expected if it had grown at the same (normal) rate as the comparison roads.

There is, however, an apparent anomaly: neither of the two roads first monitored in 2015 show any evidence of traffic generation, possibly due to the very low increase in speeds compared to the baseline. Further, the preliminary traffic counts for both roads in 2016 reflect low to no traffic generation for both roads.*

Figure 5: Speed increases and traffic generation: baseline and first monitoring



* ENT-01 Enda–Aegela and ESS-06 Bulukumba–Tondong–Sinjai



Full 24-hour traffic counts were held at all sites in 2015 for the first time since 2009. Analysis prepared by the EINRIP M&E team shows that in *areas where substantial reductions in IRI had been achieved, the proportion of traffic travelling at night had increased.*⁷

In conclusion, it seems that EINRIP road improvements have generally resulted in higher than expected traffic generation. Ordinarily generated traffic on improved, as opposed to new, roads is modest. EINRIP figures are an exception (especially for the roads completed in 2012 and 2013, which together account for half the EINRIP road packages). However, this generation effect became less for packages completed in 2014 and almost negligible for packages completed in 2015. Traffic volumes on EINRIP roads generally exceed the corresponding forecasts at the feasibility stage (2006).

4. INFLUENCE ON THE INDONESIAN ROADS SECTOR

4.1 EINRIP'S DEMONSTRATION EFFECT

As outlined in Section 1.2, EINRIP's formal development objective was to support social and economic development in Eastern Indonesia through the improvement of national roads. This evaluation argues that an equally important additional objective was to positively influence DGH's approach to management of the Indonesian national road network. There are clear signs that EINRIP, by way of its demonstration effect, has succeeded in influencing the business practices of the Directorate General of Highways. EINRIP's areas of influence are explored in the following sections.

Innovations of EINRIP

The distinguishing features, or innovations, that define the EINRIP approach are:

- **Design:** EINRIP used final engineering designs* and bid documents based on conditions in the field, and traffic counts classified by type of vehicle. These included improved alignment and drainage and a 20-year design life of pavement. Designs and related bid documents were prepared by the PPC and financed through the grant component.
- **Safety audits and accident blackspot analyses:** These were undertaken during design and construction by international-led consultants and financed through the grant component.
- **Procurement:** EINRIP used procurement committees supported by international procurement advisers and larger packages to attract capable national contractors.
- **Supervision:** Supervision under the FIDIC system was carried out by a joint venture of foreign and national consultants and was financed through the loan.
- **Technical audits:** These were conducted by independent international consultants and financed with grant funds. Initially these audits covered technical and financial aspects, but subsequently financial audits were conducted by the Indonesian Finance and Development Supervisory Board.
- **Monitoring and evaluation:** grant funds were used to support an M&E team to collect baseline and time series data to 3 years after completion. Data was also collected for comparison roads.
- **Program management:** A fully staffed and foreign-led full-time EINRIP management unit (EMU) was funded through the grant component.

ODE used document reviews and semi-structured interviews to test the degree to which, if at all, these innovations had influenced the way in which DGH plans and manages the Indonesian national road network. In particular, interviews were used to probe for examples of non-EINRIP roads that have been improved following the project using any of the above features. Based on analysis of the documents and interview responses, we have categorised the above features into areas of *strong*, *moderate* and *modest* influence.

* Also known as detailed engineering designs, or full designs

Areas of strong influence

Areas of strong EINRIP influence on DGH include use of detailed engineering designs (DED) and technical audits.

Detailed engineering design: Following the experience of EINRIP DGH no longer allows *simplified designs* to be used for national roads and has since mandated the use of DED on all major projects. This is a very positive, although new, development within DGH and both policy and practice are not yet at their optimum. One issue is the continuing use of *mutual check zero* (MCO) or revision of the bill of quantities by the contractor, supervision consultant and the PPK (commitment officer in DGH Regional Office) before work commences. MCO was used in EINRIP. This practice causes delays in implementation and creates opportunities for corruption. It is understood that the rules governing bid documents are currently under review and that consideration is being given to removing or limiting the need for MCO. Another issue relates to the capacity of Indonesian consultants to prepare detailed designs given limited demand for this service previously. Experience on some World Bank projects and some subprojects funded under the Australian Indonesian Infrastructure Initiative (IndII) suggests that for the time being international consultant input is required to ensure good-quality designs. DGH's financial allocations for designs are relatively small and in many cases probably exclude the use of international consultants. DGH's reluctance to make widespread use of international consultants for project preparation on Indonesian-financed roads is understandable.

Technical audit: Interviews with government officials at both central and regional levels consistently highlighted enthusiasm for the use of technical audits on all major works, and not only for DGH projects but also for others carried out by the Ministry of Public Works and Housing. DGH is currently using technical audits on work financed under IndII, as is the World Bank on EINRIP's sibling project, the Western Indonesia Roads Improvement Project. DGH is, however, yet to use its own funds for technical audits, which, even when carried out by international consultants, add only 1–2 per cent to the cost of works. Technical audits have been proven effective in improving the quality of works and although DGH is yet to mandate their use, interviews revealed that the agency is keen to adopt this practice. The World Bank representative interviewed emphasised the importance of the independence of the auditors conducting technical audits.

Areas of moderate influence

The areas where EINRIP had a moderate influence on DGH include the use of FIDIC-style contracts and supervision consultants, the implementation of procurement reforms and a stronger focus on road safety.

FIDIC-style contracts and supervision consultants: Although the multilateral development banks (MDBs) have also used such contracts and supervision arrangements, EINRIP was probably the first project where this was actually applied, and with generally good results. With DGH's agreement, EINRIP adopted the FIDIC-based MDB General Conditions of Contract, which for the first time in Indonesia gave the team leader of the regional supervision consultant (RSC) the role of the engineer, with authority delegated by the Director General of Highways *for all operational decisions, including the responsibility to accept work for payment*.⁸ Previously DGH retained full responsibility for all aspects of project management with supervision consultants playing a limited advisory role. The positive experience under EINRIP demonstrated the benefits of this approach and interviews with DGH officials revealed significant support for it.

Road safety audits and accident blackspot analyses: Safety audits were undertaken during the design stage on four EINRIP packages, with IndII supporting the establishment of a road safety engineering unit within DGH, which audited the remaining 16 packages with assistance from consultants. These were supplemented by safety audits of all packages during construction. Implementation of additional works identified as necessary by the road safety audits added, on average, 7 per cent to the total construction cost. DGH informants stated that road safety audits and accident blackspot analyses is essential during design, construction and maintenance/operation stage. Further, DGH increasingly appreciates the need to improve traffic

management practices during construction. Chapter 6 includes our analysis of the impact of road safety measures. The Road Safety Section is now well established within DGH's organisational structure, with its own staff and budget and the support of two IndII-financed consultants. The Section raises awareness of road safety within DGH, provides training to DGH provincial and local government staff and carries out road safety audits and blackspot treatment.

Procurement reforms: EINRIP selected the 20 contract packages with an average length of about 20 km, which are large enough to attract the more capable national contractors. All procurement activities under EINRIP were carried out by DGH using procedures specified in the loan agreement. Procurement of contractors for civil works, regional supervision consultants, project management support consultants and truss bridges were carried out by specially appointed procurement committees assisted by procurement advisory services (PAS). A portion of the PAS consulting services were funded through the grant. These services included training and other support as well as oversight of the procurement committees' activities and decisions, which helped increase transparency and accountability. Procurement lessons learned through EINRIP included:

- the need for training of DGH procurement committees
- the practice of appointing a separate committee for each major procurement task is inefficient
- prequalification of contractors is superior to post qualification (adopted for EINRIP following World Bank practice at the time)
- pre-bid conferences* facilitate the provision of important and timely information to bidders
- unrealistically low bids† are an issue that needs to be addressed
- procurement should not proceed before land acquisition has been substantially completed.

Interviews revealed that DGH understands these issues but, in practice, other than pre-bid conferences, few of the suggested reforms have been adopted.

Areas of modest influence

The areas where EINRIP had only modest influence on DGH include collection and use of road data (M&E).

Monitoring and evaluation (M&E): EINRIP includes a comprehensive and rigorous M&E program to form the basis for both a formal economic re-evaluation of each package as well as to help determine the extent to which EINRIP roads have a superior performance to other roads. It involves comparisons of before and after performance of each of the 20 EINRIP roads and comparison with 10 representative comparison roads (which were not part of EINRIP). The *double difference* approach uses data from annual road condition and traffic surveys conducted on all project and comparison roads from before commencement of works (baseline) until up to 3 years after project completion. The focus of the \$4.9 million grant-funded EINRIP M&E program was on gathering data to help both understand and demonstrate how the various innovations adopted by EINRIP help contribute to the construction of superior roads. It was not designed to detect issues and help improve performance during implementation—rather its purpose is to make a contribution to knowledge and professional practice in the road sector. As such it is disappointing that none of the GoI officials interviewed were aware of the project's M&E activities or the frequency or content of its reports. This can be partially explained by staff turnover.

The M&E team leader, as well as DFAT Jakarta, indicated they have formally communicated M&E results annually. This involved sending a copy of the report and covering letter to DGH Director of Planning followed

* Pre-bid conferences were prohibited under EINRIP in order to decrease opportunities for bidder collusion.

† Bids for EINRIP packages were on average only 80% of DGH's detailed estimates.

by a presentation with questions and answers. Also, the summary of M&E reports and invites were sent to MDBs involved in the road sector.* The effectiveness of this approach is unclear and it appears that interest within DGH for further presentations using the EINRIP M&E data has declined. Although EINRIP is now complete, the M&E work is ongoing as it is only now that data demonstrating the sustained benefits brought about by EINRIP is becoming available.

Summation

EINRIP has generally impacted DGH and the road sector positively. However, the impacts vary from one area to another. We could not find examples of other national roads that use all elements of the EINRIP approach. It is perhaps unfair to expect all innovations of EINRIP to be adopted by GoI/DGH, particularly given the flexible budget EINRIP had and the limited resource environment that will exist in the absence of donor funding. Further, it is unrealistic to expect a huge impact from a single project, however large.

Nevertheless, there are examples of roads that have adopted discrete elements from EINRIP such as detailed engineering design, traffic safety audits and technical audits. Overall this evaluation finds that EINRIP has had a modest to moderate influence on the Indonesian roads sector, which is consistent with its design. The role of EINRIP in influencing the behaviour and practices of DGH may have been more effective if its intent in this regard was more explicit. The rationale for obscuring this objective is unclear but as a result EINRIP has largely relied on serendipity rather than strategy for demonstrating its achievements.

Key lesson: Communicating success

EINRIP has produced better quality roads than has been delivered by DGH using GoI funds or with financing from the MDBs. This is well recognised by those closely associated with the project but the extent of its broader demonstration effect is unclear. The EINRIP M&E team prepares high-quality annual reports that document many of the project's achievements. Although these are shared with GoI, especially DGH, and the MDBs, none of the officials we interviewed were aware of these reports. A clearer strategy and/or effort is required in order to increase awareness of the benefits associated with the EINRIP approach. This might include a short (2–4 page) annual summary, perhaps launched at a conference or workshop organised by DFAT Jakarta.

4.2 BUILDING BOTH SKILLS AND INFRASTRUCTURE

Training

EINRIP made some contribution to the upskilling of the Indonesian infrastructure sector through the delivery of formal and on-the-job training but also through its demonstration effect. Formal training included the following:

- **Procurement training:** Training of the procurement committees was initially provided by the project preparation consultant and subsequently by the procurement advisory services consultants.
- **Training for regional supervision consultant (RSC) and contractor staff:** The RSC provided two training workshops on quality assurance, five workshops on civil works contract administration and six internal training sessions on quality assurance plan induction / preconstruction training. The RSC also provided training on the responsibilities and exchanges between the employer, engineer and contractor.

* World Bank and Asian Development Bank representatives attend the presentation in 2012 but have not attended since.

- **Training by project management support consultant (PMSC):** The PMSC provided introductory and refresher training in the financial management information system and organised a training course for 11 DGH participants in Australia.
- **Training by Safety Section:** As previously mentioned the DGH Safety Section provided formal training in road safety engineering, road safety audits and blackspot treatment in addition to on-the-job training in these areas.

Interviews suggest that the benefits of EINRIP training generally accrued only to those who were closely associated with implementation of the project and fell well short of any institutional impact. Very few informants made any references to training under EINRIP, even when prompted.

Emerging demand for formal training

Although EINRIP appears not to have had a strong focus on the delivery of formal training, its demonstration effect has now created within DGH an appetite for such. This is an area that the new infrastructure program, KIAT, could potentially support, building on the demand and example provided by EINRIP. It is understood that training modules being developed under a current IndII subproject* could, with minor modification, be used to deliver training relevant to DGH and associated parties. Ideally, such training would be developed and delivered in cooperation with the relevant GoI agencies and the relevant national bodies representing contractors and consultants. Although such an approach is likely to be time-consuming, it also increases the ownership and likely institutionalisation of key concepts and approaches.

Increasing demand for better quality

EINRIP demanded good quality of construction consistent with the specifications and provisions of the contract documents, a requirement many contractors were not used to. The 2011 independent progress review revealed that quality was suffering and that EINRIP's requirements were generally not well understood by contractors. The need to better communicate quality expectations was acknowledged by (then) AusAID, the EMU and PMSC at the time and was subsequently addressed. One possible means of improving communication with contractors is the use of a pre-bid meeting for each civil works package where quality expectations are explained. This would likely result in higher priced, but more realistic bids.

Some leaders in Indonesia are increasingly demanding better quality of construction and higher value for money. The demonstration effect of EINRIP has led to some notable examples (e.g. Vice President Kalla) of insistence upon better quality roads. This new awareness is starting to infect some of the officials in DGH at both central and provincial levels. EINRIP has helped prepare fertile ground, which the new KIAT will hopefully take advantage of. Strengthening the commitment of DGH and other GoI agencies to quality construction is important as financial assistance by all donors' accounts for less than 2 per cent of expenditures by GoI. Any donor's project invariably operates to some degree 'in a bubble' —the challenge is how to take this bubble and infect the whole.

4.3 INHIBITORS TO ADOPTION OF THE EINRIP APPROACH

Despite the well acknowledged good quality roads produced under EINRIP and the demonstration effect it has created, DGH is not finding it easy to implement national roads projects using the EINRIP approach. Several factors inhibit this process, including legal, institutional, financial, and human resource inhibitors.

* PRIM (Provincial Road Improvement and Maintenance project)

Legal inhibitor

During interviews, DGH staff reported restrictions on undertaking multiyear projects under the GoI financial system, which essentially prohibits them from adopting the same size packages as those conducted under EINRIP. The Ministry of Finance however, indicated that multiyear financing is possible, but requires careful preparation. Apparently, the requirements are demanding and most governmental agencies are reluctant to go through the additional steps necessary in order to secure funding for multiyear contracts. Multiyear contracts are common place on projects financed by the MDBs.

Institutional inhibitors

The roles of DGH and the Directorate General of Land Transportation (DGLT) are not always well coordinated or complementary. This is especially the case regarding road signs. Current regulations and practice make DGH responsible for the initial installation of traffic signs. However, their maintenance is the responsibility of DGLT. This has led to conflicts and some duplication of signs.

The business culture in Indonesia emphasises compromise and avoids confrontation. DGH does not fully implement the conditions of contracts and it is not unknown for it to accept deficient works. Contractors do not submit claims and generally DGH does not apply liquidated damages clauses under the contract or force the cost of rejection and repair. Often, DGH extends the completion time without changing the price of the contract. This has contributed to lower quality of works. The EINRIP management unit considers that the most important lesson learned from EINRIP is, *if there is to be an improvement in project implementation and the quality of outcomes, then there is a pressing need to properly implement the contract.*⁹ DGH contract management processes need to be stronger; quality should be upheld by strictly enforcing the specifications under the contract while being fair to the contractor. Some DGH staff interviewed indicated they had learned this from EINRIP.

There are some signs that the business culture is changing, although slowly. Some of the positive changes concerning *properly implementing the contract* are highlighted above. Some contractors are starting to press DGH to uphold its end of the contract. EINRIP contractors for two packages* have lodged claims against DGH for losses caused by long delays in approving variation orders. The courts found in favour of the contractors and awarded damages. These claims should be considered a good sign and a positive impact of EINRIP.

Some attempts have been made to create technical audit capacity within the Inspectorate General (IG) in MPWH, but the results were not encouraging. IG is a governmental agency and does not yet appear to be free of governance issues, which would raise questions about the integrity of its findings. Further, staffing an audit unit in IG with technically competent and experienced professionals would be challenging.

Financial inhibitor

Under EINRIP a greater investment was made in design and preparation than is true for either ordinary GoI-funded roads or those financed by the MDBs. There is evidence that DGH accepts the benefits of a greater upfront investment in project preparation. However, this is likely to be to a lesser extent than that demonstrated under EINRIP. Budget limitations often force the use of single-year contracts and lead to a compromise on pavement thickness (staged construction whereby the pavement is constructed initially for 10 years and the necessary additional layer/s are added in the future when funds become available). A well-

* EKB01 Pontianak–Tayan and EKS02 Benjermasin–Bates

placed DGH informant remarked that EINRIP had the budget to accommodate variations, which is generally not the case for ordinary GoI-financed roads.

Human resource inhibitor

At the central and provincial levels DGH does not always have suitably skilled staff available and this can adversely impact on performance. This was not a problem under EINRIP, where the loan was augmented by generous grants to fund good project preparation and detailed engineering designs, provide technical auditors, carry out safety audits, design and implement an excellent M&E program, and provide procurement advisory services. Like many government agencies, DGH could perhaps do more to attract and retain capable, experienced and well-qualified professional technical staff.

Summation

Despite these inhibitors there is a good opportunity for KIAT to continue the work started by EINRIP. This need not be through a program similar to EINRIP. Many of the lessons learned from EINRIP are being adopted by DGH, although at times slowly. Australia can make intellectual contributions and leverage policy changes which take into consideration the lessons learned from EINRIP. DFAT is already helping DGH with a grant for improved performance of the national road program, which includes project preparation, support for the development of a high-grade highway network in Indonesia, technical audits, road safety audits and training.

Indonesia's road infrastructure needs are huge and development financing (grant or loan) can only make a small financial contribution to addressing these. EINRIP took 10 years to complete and it improved about 400 km, or about 1 per cent of the national road network (which in turn accounts for about 10 per cent of the total road network in Indonesia). The needs of the remaining roads (provincial and district and city) dwarf those of the national road network given their relatively worse condition.

4.4 THE ROLE OF EVIDENCE

Evidence has played an important, although underutilised, role in demonstrating the value of the EINRIP approach. In our judgement, and that of other key stakeholders such as the World Bank and Asian Development Bank, the EINRIP M&E program is among the best of any development project. EINRIP is the first time such a rigorous approach has been undertaken in the road sector in Indonesia. The M&E program is well designed and implemented. The data needs were identified at the beginning. The surveys to collect data are well designed and supervised, which increases their reliability. Four reports have been produced, with the fifth report to become available at the end of 2016.

The EINRIP M&E program highlights some unexpected, and otherwise invisible, outcomes. For example, EINRIP's traffic generation effect is greater than anticipated and road roughness values are being sustained despite the fact that some of the EINRIP roads were completed 4 years ago (2012).

Nevertheless, the EINRIP M&E program had some limitations. It was not designed to provide real-time feedback during implementation, which could have helped identify and correct emerging issues. This is particularly important given EINRIP's troubled performance history (especially prior to 2012). The EINRIP M&E program was augmented by:

- regular monitoring and reporting by the EINRIP management unit, RSC and TFACs
- the 2011 independent review to help address issues with supervision and the quality of works

- an ANAO performance audit in 2012 to assess the effectiveness of AusAID's management of infrastructure aid to Indonesia, with a particular focus on EINRIP and IndII
- 61 technical and financial audits during the period 2010–2015 consisting of full audits, final audits, monitoring / follow up, provisional handover / pre taking-over and start-up audits. These audits assisted in improving quality of construction
- DFAT's Audit Quality Check (AQC) reports for each year spanning the period 2007 to 2016. These reports provide DFAT's assessment of the project performance against criteria including relevance, effectiveness, efficiency, sustainability, gender and monitoring and evaluation. These reports draw on material prepared by the EINRIP M&E team but were not shared beyond DFAT.

The rationale for a strong and rather expensive M&E program is linked to EINRIP's function as a demonstration project. It showed that good-quality data is not easy to obtain but is critical for the success of M&E programs. This is important as DGH is developing the new Road Asset Management System and populating it with road condition and traffic data. This data must be of adequate quality if collecting it is to be of any use. There is also a good case for the EINRIP M&E database to be made available to DGH and others, such as the MDBs, who are supporting road projects in Indonesia. The EINRIP M&E data set potentially provides rich insight into a range of infrastructure questions, but at present there is some risk of this data being lost at the conclusion of the M&E team's tenure.

5. ASSESSMENT OF BOTH COSTS AND BENEFITS

5.1 CHOICE OF MODALITY

The modality of using a mix of loans and grants was highly effective

The final cost of EINRIP amounted to about \$346 million, of which about \$276 million was a loan from Australia (amount disbursed from the \$300 million loan), \$33 million was contributed by the Government of Indonesia, and \$37 million was in grant funds (see table). The grant package is generous by MDB standards (constituting about 12 per cent of the cost of the project), but enabled highly effective utilisation of loan funds and arguably higher quality deliverables than achieved through either Indonesian funding or MDB loans. In interviews with the Ministry of Finance, Bappenas and DGH, each indicated they considered the mix of loans and grants to be highly effective and credited it with producing the best-quality roads recently achieved in Indonesia.

The grant package helped manage major risks facing the project—particularly important given the profile and Australia’s relative inexperience with loans. The project preparation consultant (PPC) developed a well-prepared project (including full detailed engineering designs and bid documents) and addressed the environmental, social, land acquisition and corruption issues. The procurement advisory services (PAS) trained procurement committees and helped them do their work better, in addition to increasing accountability and transparency regarding procurement activities. The technical and financial audit consultant (TFAC) played a key role in improving the quality of construction and raising awareness of the issue of quality. The road safety audits and accident blackspots component increased the safety of engineering designs and identified and treated accident blackspots, which increased the overall safety of the EINRIP roads. The EMU provided the guidance required to keep the project on track, helped solve problems in a timely manner, and kept up the pressure to help ensure good-quality works. The M&E work (although not essential for implementation of EINRIP) introduced Indonesia and the highway sector to best practice M&E and provided the evidence for the benefits and impacts of EINRIP.

The use of well-qualified and experienced consultants to undertake project preparation helped ensure that detailed engineering designs were developed based on the conditions on the ground as opposed to DGH’s traditional simplified design approach. This led to high-quality designs, which is one of the key ingredients in the success of EINRIP. Project preparation cost amounts to about 5.3% (for 24 packages, although only 20 were constructed) of the construction cost

Source of Funds / Cost Item	Cost in Million Australian Dollars
<u>Loan</u>	
Civil Works	238.93
Goods: Bridge Trusses	5.01
Incremental Cost	0.61
Consulting Services	31.08
Subtotal: Loan	275.62
<u>Government of Indonesia</u>	33.24
Total Cost of Project	308.86
<u>Grant Funds</u>	
Project Preparation Consultant (PPC)	20.29
Procurement Advisory Services (PAS)	0.83
EINRIP Management Unit (EMU)	2.74
Technical and Financial Audits Consultant (TFAC)	3.57
Monitoring and Evaluation (M&E)	4.89
Road Safety Audits and Accident Blackspots	4.36
Subtotal Grants	36.68
Grand Total	345.54

of \$308.86 million. This is much higher than the 1 per cent typical for APBN-financed national roads, but comparable to corresponding costs in developed countries. Interviews suggest that although DGH considers the designs to be high quality, it finds the preparation cost to be high.

Loans appropriate for Indonesia

Indonesia is a middle-income country that has little need of grant funding in order to finance its infrastructure. However, the use of grants and loans together helped demonstrate how Indonesia could potentially deliver better infrastructure for its spend. The EINRIP loan is highly concessional; it provides a 10-year grace period, 30 years for repayment and 0 per cent interest rate. It is cheaper than any other source of finance, including concessional lending made available by the MDBs. Although it is more than 10 years since EINRIP's inception, the mix of loan and grant approach remains relevant, particularly given the reduced Australian aid budget and the stronger focus on providing intellectual, rather than fiscal, support.

Loans facilitate stronger ownership

With MDB loans, responsibility for project preparation as well as implementation rests with the borrower (i.e. the Indonesian government). Australia followed similar procedures for EINRIP, except for project preparation where grant funds were used to procure the services of the project preparation consultant using (then) AusAID procedures. DGH was responsible for procurement of consultants for project management and supervision as well as the contractors for implementation of the works, although as in the case of MDBs, procurement decisions were subject to *no objection* from the Australian Government. In interviews with DGH, Ministry of Finance and Bappenas, the clear view was expressed that, as the loan has to be repaid, government agencies generally apply greater discipline to the implementation of loan projects than they do to those funded through grants. The use of Government of Indonesia systems and application of GoI regulations also serves to strengthen Indonesian ownership.

Key lesson: Loans combined with grants can be highly effective

Loan financing is typically not a feature of Australian aid. While some other bilateral donors are active in this area, DFAT has considered the possibilities extensively but as yet has not committed to the ongoing use of concessional loans as a form of aid. There are clearly a range of factors to be considered by the Australian Government before changing its policy position on loans and the aid program. However, in EINRIP there is a positive example of the additional benefits that can be derived when loans and grants are used together.

5.2 BUILT TO LAST

EINRIP roads were built to last. The roads are well designed. The pavements were designed for a 20-year life, whereby periodic maintenance (consisting of an overlay) would not be needed on average until 15 years following completion of each road. The technical and financial audit consultants and the regional supervision consultant (especially after 2011) helped ensure that the quality of construction meets specifications. Interviewees, ranging from government officials to business owners and road users, were unanimously of the view that the EINRIP roads are well built and of better quality than other Indonesian national roads. Sustainability starts with better quality construction.

Little increase in roughness of EINRIP roads: Early indications of sustainability are fair. The fourth M&E report (December 2015) indicated that *In general, the recorded IRI of EINRIP roads has remained stable.*¹⁰ It is not yet clear whether this will hold true for a small proportion of roads constructed in the later years of EINRIP.

Routine maintenance: The importance of routine maintenance appears to be well understood by DGH officials. Routine maintenance allocations to comparison roads remained unchanged between 2013 and 2014 and averaged IDR 36 million per km, or about \$3800/km. The corresponding allocations for EINRIP roads averaged IDR 24 million per km, or \$2500/km. This reduction in routine maintenance costs reflects the better quality of EINRIP roads but also a commitment to maintaining the Australian–Indonesian investment. About 11 per cent of the comparison roads received periodic maintenance and betterment in 2014 (at an average cost of \$290 000 per km) and this partially explains why roughness levels have not deteriorated.

ODE travelled on 9 of 20 EINRIP roads (in Sumbawa and South Sulawesi). With the exception of rock slides on one section of road,^{*} we did not detect instances of major problems, failures or neglect (e.g. major cracking, large potholes). We noted major remedial works being carried out on the road section affected by rock slides.

5.3 APPRAISAL OF COSTS RELATIVE TO BENEFITS

Cost–benefit analyses were originally undertaken as part of the feasibility study in 2006 and revisited in April 2015 for all (14) packages completed by 2014, and again in September 2016 for all EINRIP roads.[†] The results of the feasibility study and 2016 reappraisal are summarised in Figure 6, with fuller detail (including that for 2015) available in Annex Two. The 2016 results are preliminary and could be subject to some minor changes. Twelve of the EINRIP road packages in 2016 (or 60 per cent of the total) had an EIRR of less than the 15 per cent, which is the threshold figure for the inclusion of individual subprojects specified in the loan agreement. Overall EINRIP has a positive net present value (NPV) (an EIRR of more than 15 per cent). But, the large number of packages that fail to meet the 15 per cent EIRR requirement is surprising. 2016 marks the first time the analyses of costs and benefits for all EINRIP packages were undertaken by the M&E consultants. Repeat cost–benefit analyses, say after 5 or 10 years since completion of EINRIP, would demonstrate whether the EIRR and NPV for each package and EINRIP as whole improved with time.

As discussed in Chapter 3, traffic on the EINRIP roads is generally growing faster than on the comparison roads. Benefits due to generated traffic are substantial and were included in the economic analysis. So far, routine maintenance costs for EINRIP roads are lower than for comparison roads due to their better quality of construction. The main reason for the low EIRRs of so many EINRIP packages is the high construction cost and the low traffic volumes on these roads. Generally, the roads with heavy traffic have an EIRR of more than 15 per cent and the roads with low traffic volumes have an EIRR of less than 15 per cent.

The construction costs (expressed in 2013 prices) of EINRIP roads are *approximately twice those assumed in the original feasibility studies, averaging IDR 5.4 billion per km compared to IDR 2.5 billion per km used in the feasibility study.*¹¹ As discussed earlier, this was caused by a number of factors, including change in design standards. Delays during construction and the unrealistic time frames assumed at the feasibility stage did not

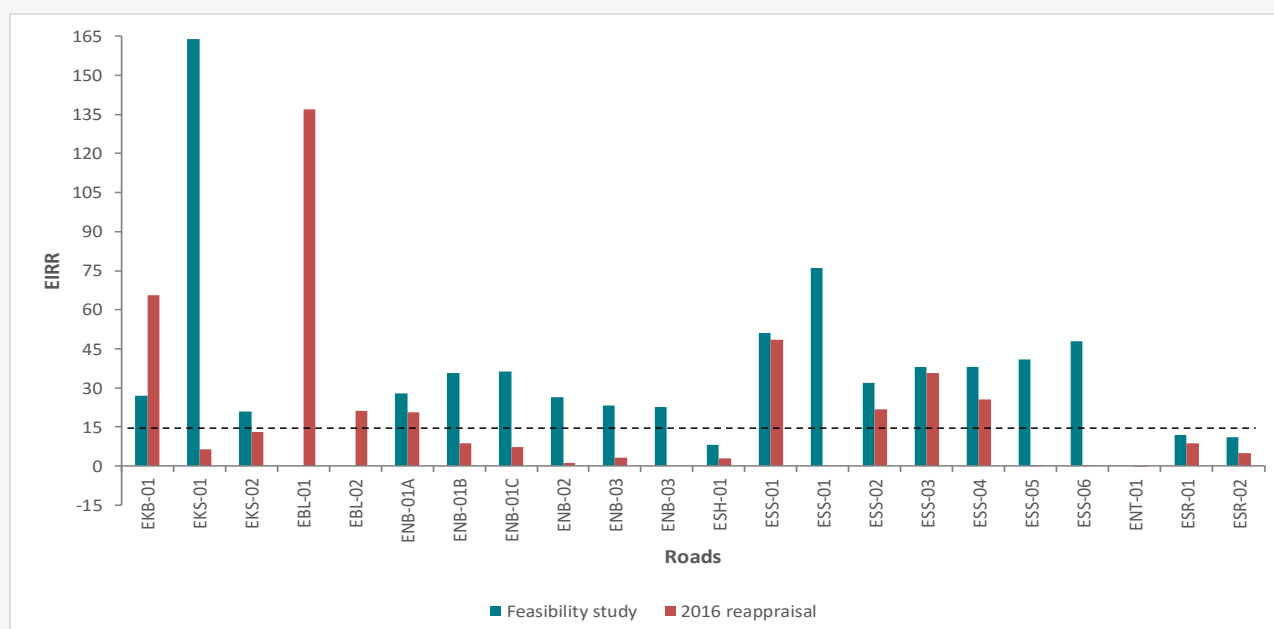
^{*} ENB03 Cabdin Dompou – Banggo

[†] These analyses compared costs and benefits for each package, assuming a discount rate of 15%, an evaluation period of 20 years and a residual value of zero. Costs consist of capital costs and routine and periodic maintenance costs. Benefits comprise those for normal traffic and generated traffic. Benefits to normal traffic were calculated in the standard way by taking the difference in unit economic costs and multiplying it by the base case traffic. Economic costs include vehicle operating costs and the value of passenger time. These were a function of the traffic volume and composition, road geometry and the roughness of the road surface, and speed. These were determined using the standard relationships within DGH's modelling software (HDM-4), calibrated for EINRIP conditions. Generated traffic benefits consist of consumer surplus to road users and increase in tax revenue to the government. The net present value (NPV) and economic internal rate of return (EIRR) were calculated using HDM-4.

lead to higher costs because contractors did not claim for delays and the bid prices were, on average, 80 per cent of the owner's estimates. However, it should be noted that the indices of economic viability (EIRR and NPV) were not re-estimated following completion of the detailed engineering design. Those designs would have reflected many of the factors contributing to increase in cost.

Besides being more expensive than originally estimated at the feasibility stage, EINRIP roads are more expensive than other national roads constructed using national funds. Comparing the cost of EINRIP roads with GoI-financed ones is not straightforward as few if any are built to the same standard. However, well-qualified DGH officials in NTB and South Sulawesi estimated that EINRIP (due to the thicker pavements, inclusion of safety features, and higher quality of supervision and insistence on quality) cost about 15–25 per cent more than other Indonesian national roads. They also indicated that maintenance costs should be less, given the better quality of build.

Figure 6: Comparison of cost–benefit analyses prior to and post construction



Given the preceding, why did the loan agreement specify that all EINRIP subprojects should have an EIRR of 15 per cent or more, especially considering that three of the packages did not meet this criterion at the feasibility stage? We could not get a satisfactory answer to this question. One explanation was that the 15 per cent was useful at the screening/prioritisation stage. Another explanation was the need to reduce the impact of political considerations on selection of subprojects to be included in EINRIP. Interviews with Bappenas, MoF, DGH and the provinces of NTB and South Sulawesi clearly indicated that economic criteria alone are not enough for selection of subprojects and other factors should be included. Factors mentioned included population density, connectivity, opening up areas for development, equity (the need to have at least one project in each of the project provinces) and the need to serve and benefit rural communities. The MoF acknowledges that projects (including roads) in remote areas are not always economically viable. This points to the need to be more realistic in setting criteria (that roads must meet for inclusion in a project) and to include other criteria besides economic ones. One way of addressing this issue is multicriteria analysis, which is used in the Provincial Road Management System, an IndII subproject.

Neither the cost–benefit analyses nor the discussion above takes into account the significant grant funds made available to support the implementation of EINRIP. The apportionment of even some of these costs across EINRIP subprojects would clearly impact negatively on the net present value returned by the project.

Key lesson: Cost–benefit analysis inadequate basis for project selection

The use of cost–benefit analysis to guide the selection of infrastructure projects is necessary but not sufficient to ensure appropriate projects are supported. As outlined in Chapter 6, development benefits do vary from project to project and a selection process that takes fuller account of logical factors that cannot easily be monetised is desirable. The use of multicriteria analysis is one approach that facilitates the systematic consideration of economic factors alongside other important criteria to guide decision-making.

5.4 VALUE FOR MONEY

The EINRIP approach entails a greater upfront investment but offers the promise of better value on a whole-of-asset-life basis. As outlined in Chapter 3 EINRIP has produced better-quality roads than those achieved by MDBs or with APBN finance. The roughness of EINRIP roads decreased, speeds increased, and some generated traffic has materialised. Chapter 4 highlights that EINRIP has also resulted in a modest to moderate positive demonstration effect on the road sector and especially DGH. As shown above, the net present value (at a discount rate of 15 per cent) for EINRIP as a whole is positive, although many individual packages returned an EIRR of less than 15 per cent. These calculations account for savings in vehicle operating costs and the value of time as well as benefits from generated traffic. They do not include the social and economic development benefits derived from EINRIP, which are discussed in Chapter 6.

ODE is unaware of any solid analyses of life cycle costs to underpin the superiority of EINRIP over APBN-financed roads. However, work completed under IndII is instructive. EINRIP pavement designs and service lives are based on the *Manual of Road Pavement Design*, which was developed under IndII and factors in the least discounted lifetime costs and practicality for construction (materials, skill and capability of contractors). An IndII study compared economically optimum intervention standards with alternative standards (including current practices) for provincial roads. They found that interventions (such as those under EINRIP), together with timely and well-executed routine maintenance practices, are superior to the traditional practices. These findings support the rationale under EINRIP for greater expenditure initially, given the reduced need for routine and periodic maintenance in the future.

An empirical proof of EINRIP's value for money is feasible only with the passage of time. Nevertheless, based upon a host of positive current indicators, we are confident that EINRIP does represent value for money.

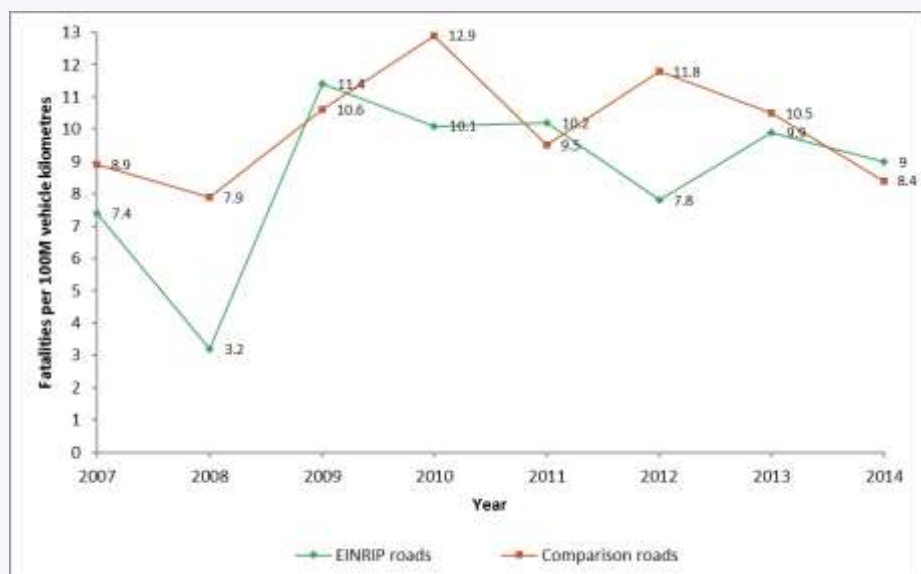
6. SOCIAL AND ECONOMIC IMPACT

6.1 SPEED KILLS

One of EINRIP's distinguishing features was the use of road safety audits on all project roads. Safety measures recommended by the audits added on average about 7 per cent to the construction cost of EINRIP roads, in addition to the cost (\$4.4 million) of undertaking the audits. The EINRIP monitoring and evaluation (M&E) program also tracks accident rates* as one of four key performance indicators. Serious consideration was given to safety under EINRIP, and interviews undertaken by ODE revealed a common expectation among many: that the better EINRIP roads would also be safer.

Figure 7 - Fatalities on EINRIP and comparison roads

Despite a comprehensive approach to monitoring road safety outcomes (including the collection of both before and after, project and comparison road data), only tentative conclusions are possible. The points plotted on the above graph (Figure 7) reveal that in some years fatality rates on EINRIP roads exceeded those on comparison roads, and in other years the reverse was true. The graph also suggests an increase in fatalities on EINRIP roads,



although the years in which the highest numbers were recorded were in fact before many of the EINRIP roads had been completed. The figures plotted represent a weighted average fatality rate across all EINRIP roads and all comparison roads. The differential between EINRIP and comparison roads is slim, and probably negligible once a margin for error is factored in. Further, one 14 km section of EINRIP road† has consistently recorded a fatality rate up to three times that of any other EINRIP or comparison road,‡ raising the question in this case of whether the comparison roads are truly comparable.

Collection of traffic accident data by the police has improved considerably in the recent past. However, there are still problems with the completeness and reliability of these data, especially regarding location. The M&E team spends considerable time helping to increase accuracy of the data provided by the police. Generally,

* Data collected is on fatalities, which is deemed to be the most reliable indicator of safety given widespread underreporting of traffic accidents.

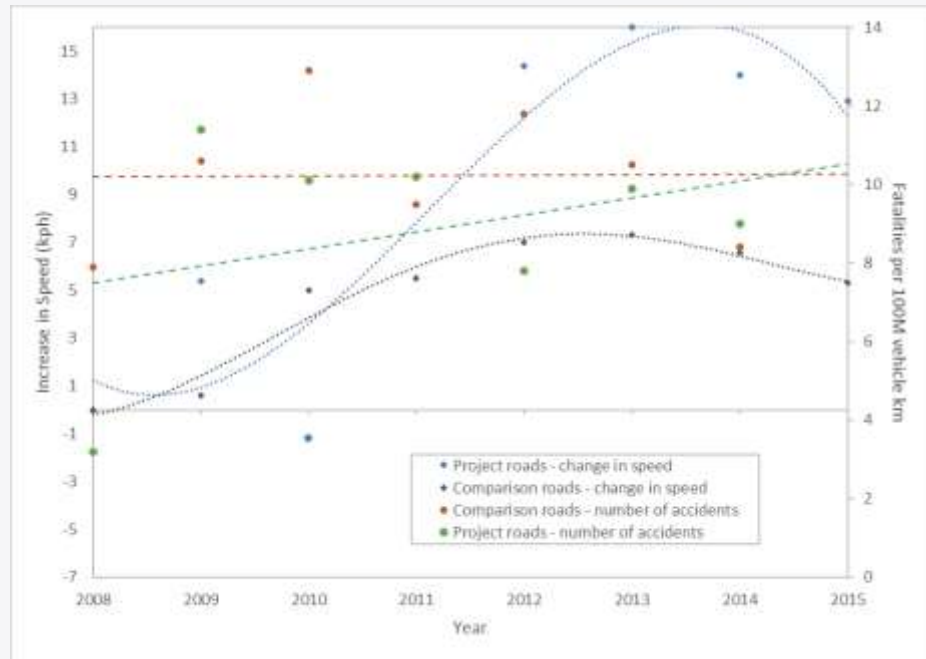
† ENB02 Km 70 – Cabdin Dompou

‡ 2015 data appears incomplete and is not yet sufficiently reliable to be used in analysis.

there is underreporting of accidents (especially property damage accidents). That is why safety comparisons are based on fatality rates—this type of accident is subject to the least underreporting. This is the case for both comparison roads and EINRIP roads, but the data is nevertheless not entirely reliable in either case.

During interviews, ODE questioned key stakeholders as to whether the fatality figures from EINRIP roads were something of a disappointment, after all the figures don't suggest a clear decline in fatalities. A common response was that, while disappointing, such an outcome was not surprising given the assumed relationship between increases in speed and increases in accidents. Figure 8 explores the relationship between speed and fatalities on EINRIP roads and shows a marked

Figure 8: The relationship between speed and fatalities



increase in speed against a lesser increase in fatalities. These graphs confirm the broad consensus in the international literature about the positive relationship between speed and fatalities.¹² That is, generally as speed increases so do fatalities. The World Health Organization estimates that for each 1 km/h increase in speed there is a 4–5 per cent increase in fatalities.¹³ Other researchers point to an exponential relationship between speed and fatalities.¹⁴ These studies are based upon increases in speed in the absence of road improvements. All EINRIP roads received major improvements and were subject to safety audits and accident blackspot treatments. This explains why EINRIP roads have a comparatively lower fatality rate than might be suggested by the average overall increase in speed across all EINRIP roads of more than 13 km/h.¹⁵ Figure 8 shows the blue line (speed on EINRIP roads) climbing sharply, while the green dotted line (fatalities on EINRIP roads) exhibits a much gentler gradient.

The available data shows that EINRIP roads are no better, but no worse than comparison roads in terms of safety. Perhaps given the substantial increases in speed on EINRIP roads this should be considered a favourable outcome. As a demonstration project it is disappointing that EINRIP has not been able deliver a less ambiguous result.

Fieldwork conducted by the ODE in Sumbawa and South Sulawesi, combined with analysis of the social surveys undertaken as part of EINRIP M&E, identified a number of safety issues. These include:

- **Lack of enforcement:** Police interviewed acknowledged that they only rarely issue fines for speeding, particularly as they do not have radar guns or other suitable means available to measure vehicle speeds.

- **Young and unlicensed road users:** In a single day ODE observed dozens of clearly unlicensed school students riding motorcycles, mostly if not all without helmets or other protective equipment.* EINRIP social surveys document this as a growing trend, which is partially attributable to EINRIP.
- **Inadequate education of drivers and the public regarding road safety:** EINRIP social surveys reveal the need for education, as many road users do not understand the signage used on EINRIP roads.
- **Poor signage:** ODE saw many examples of signs obscured by vegetation, or too close to hazards to provide an effective warning. Outside of townships we saw little evidence of posting of speed limits to provide drivers with guidance on what could be considered a safe speed.
- **Hazardous school safety zones:** School crossings are clearly marked with a red overlay and a speed limit sign of 25 km/hr. We observed that these speed limits are routinely ignored. Inquiries of local people also revealed that the red surface is especially slippery when wet and this was cited as the cause of a number of motorcycle accidents. EINRIP social surveys corroborate these observations.
- **Limited insight into accident blackspots:** Interviews with police reveal that there is limited, if any, accident data analysis undertaken in order to identify and address dangerous sections of road. The Safety Section in DGH has developed criteria for identification and treatment of accident blackspots but this is yet to be devolved to the regions or supported with appropriate training.
- **Aversion to ‘traffic calming’ measures:** While the EINRIP roads include a range of design safety features including signage, crash barriers and marker posts, there is little evidence of the use of speed humps, rumble strips or chicanes to help slow traffic. Given the apparent disregard for speed limits, the use of such measures, particularly at school safety crossings, would seem appropriate.

Key lesson: The three ‘E’s to road safety

Reducing road accidents and deaths, particularly as speeds increase, is extremely unlikely to occur through the use of engineering measures alone. These measures need to be accompanied by education and enforcement elements to bring about a reduction in traffic accidents, including fatalities. Doubtless this would either complicate or simply be beyond the scope of many aid-funded road construction projects. As an alternative it may be appropriate to include design features that deliberately slow traffic at selection locations, in recognition of the limited attention provided to road user education and enforcement in Indonesia and many other developing countries.

* Police confirmed that a licence is required to legally ride a motorbike, and the minimum age at which a licence can be obtained is 17 years.

Figure 9: Junior secondary students commuting by motorbike



Figure 10: Partially obscured speed limit sign



6.2 EINRIP'S CONTRIBUTION TO DEVELOPMENT OUTCOMES

EINRIP's high-level project development objective is to support social and economic development in Eastern Indonesia. Under the EINRIP M&E program a series of social surveys have been conducted both before and after road construction at for four different areas served by EINRIP roads. Social surveys are not conducted for any of the comparison roads as it was recognised that there were too many other factors impacting on social and economic development for such an approach to be worthwhile or reliable.

The social surveys are thorough and of a high quality. They reveal that EINRIP roads have delivered both social and economic benefits, but that the extent to which they have done so is variable.

Sumbawa

Surveys conducted in Sumbawa (where there are five EINRIP road packages) revealed a range of benefits. The roads resulted in travel time savings and a greater proportion of traffic travelling at night. This has increased the effective capacity of the roads and increased competition in the transport sector. Bus fares are lower than the permitted maximums, which is leading to a recovery in long-distance bus passenger volumes despite the competition from motorcycles. Economic activity has increased along the Sumbawa Besar–Dompus route because of the savings in vehicle operating costs and lower travel times. Officials in Sumbawa mentioned that living standards in both Dompus and Sumbawa kabupaten have increased. However, this was accompanied by *an increase in income inequality and a trend towards increasing concentration of land ownership*.¹⁶ In the Dompus area, the increase in incomes was attributable mainly to the success of a hybrid corn variety. However, the impact of the road on poverty is less clear. It is difficult to say that the improvements in economic activity and living standards are due to the improved road, but the road facilitated these improvements, although it was not necessarily the main driver.

The improved road has facilitated the provision of goods and services by mobile agents travelling the road by motorcycle. ODE interviewed a fish trader who travels on motorcycle from Lembawan village (about an hour away) to sell fresh fish. His business is 5 months old and doing well. The M&E report for 2015 confirms that the development of mobile vending activities mentioned in the 2013 study continues. The female staff at a health centre serving Ketcamatan Lape mentioned that vendors visit their area and sell to women, which is more convenient and saves them time. We also interviewed a warung* owner. She confirmed that her business

has become better since the road was improved. Further, she looks forward to an increase in business from a planned fish-processing centre nearby. This new business will be located there to take advantage of the increased traffic and access provided by the improved road.

EINRIP roads in Sumbawa have also improved health care by improving access to health facilities, making it easier to recruit staff to work in formerly less accessible areas, and facilitating ambulance services. Also, the improved road condition has made it easier for children to go to school. The improved road condition has contributed to new land use developments, especially along the Sumbawa bypass, where extensive new building can be seen.

South Sulawesi

Social surveys carried out in South Sulawesi found that EINRIP roads had a similar impact on the transport sector to that observed in Sumbawa. Transport costs and travel times have been reduced and this has benefited private vehicle drivers and motorcyclists as well as operators of other vehicles, except that some bus operators have seen reductions in passenger loads. Road accidents are perceived as having increased in both number and severity as a consequence of increased speeds. Many of those involved in accidents were students, usually riding motorcycles without licences or helmets.

The economic base of the area remains agricultural, but there is no local agricultural improvement project to change local farming practices. The living standards in the agricultural sector appear to have fallen, but this is

Figure 11: Mobile trader selling fish along a section of EINRIP road in Sumbawa



* Small store

primarily due to the drought in 2015 and some reduction in farm-gate prices (which are influenced by world market developments).

The local authorities, particularly in Bulukumba, believe that the EINRIP road improvements have influenced decisions by new companies to locate in the region. However, roads are only one of many factors affecting the location decision.

Unlike in Sumbawa, there was no indication that the road improvements had led to any significant social changes or improvements in access to social services or education.

Flores

Social surveys in Flores also revealed a decrease in travel times, but given this is a relatively short section of road, savings in transport and vehicle operating costs were not reported. The EINRIP road here has only recently been completed and the surveys reveal some residual dissatisfaction with compensation for land acquisition. Issues with inadequate drainage leading to flooding of properties adjacent to the road were also reported. Although living standards are much lower than in Sumbawa and South Sulawesi, there has been little improvement in the standard of living. Motorcycle ownership is low and there is no sign of an increase in mobile vendors or improved access to schools as reported in Sumbawa. Improved access to health care, however, is noted and *some residents said that, when the road was in poor condition, they would only go to the health centre if they thought they were dying.*¹⁷

6.3 EINRIP ROADS ADDRESSING THE NEEDS OF BOTH MEN AND WOMEN

EINRIP social surveys have routinely included focus group discussions with local women living near EINRIP roads. These surveys and interviews conducted by ODE confirm that EINRIP roads have benefited women. Benefits cited include improved access to health and education services, better access to markets and, in some areas (Sumbawa), a general increase in living standards that can be partially attributed to EINRIP. In Sumbawa and Kalimantan, motorcycle use by women has increased as they report feeling safer riding on the upgraded EINRIP roads, although the social surveys do not identify such changes in Sulawesi and Flores. The inclusion of HIV/AIDS awareness and prevention activities at the construction stage also helped protect and benefit men and women alike.

While these benefits are significant, potentially they could have been greater. In EINRIP *there was no comprehensive process of community consultation during design or construction.*¹⁸ This of course also means that there were few opportunities for women to advocate for features that reflect their needs, for example better lighting or wider shoulders for pedestrian use. Locals interviewed by ODE in Sumbawa readily agreed that if asked they would have recommended alternative, closer siting of a pedestrian crossing, which sits approximately 200 metres down the road from a junior secondary school. DFAT's new economic infrastructure performance assessment note¹⁹ and the design of Australia's new infrastructure program for Indonesia (KIAT) both emphasise the importance of involving women in the design of public infrastructure.

Interviews conducted by ODE elicited a wide range of responses to the question on how gender had been considered in the design and implementation of EINRIP. While many cited the benefits already listed, a good number also asserted that road infrastructure is gender neutral—that is, that it benefits men and women equally. One interviewee in Sulawesi reflected that he had received training on how to design better footpaths for people with disabilities but no such training on how to deliver better roads for women. Certainly, ODE agrees that it is not always obvious how the needs of men and women in relation to roads

might differ. This is also likely to be heavily context specific, influenced by factors such as remoteness, the nature of the local economy, urbanisation, prevalence of motor vehicle ownership, public transport availability and the sex breakdown of different types of road users (truck drivers, car drivers, motorcyclists, pedestrians, etc.). It is for these reasons that gender expertise and sex-disaggregated data is required. Although successive DFAT AQC reports (2009, 2011, 2012, 2013) document plans to seek the advice of a gender specialist and to explore the collection and analysis of sex-disaggregated data through the EINRIP M&E program, for reasons unknown neither occurred. Similarly, EINRIP was not guided by any type of gender strategy.

Key lesson: The potential for infrastructure to impact on men and women differently is not well understood

All parties interviewed by ODE supported the idea that EINRIP roads should benefit men and women equally. Many assumed this to be the case, believing that roads are generally if not always gender neutral. However, the absence of any detailed consideration of gender issues in EINRIP suggests the project was more likely gender blind than gender neutral. While specialist gender expertise is more often a feature of current Australian aid investments, a short case study or guidance piece that helps DFAT officers and their counterparts better appreciate why gender matters in infrastructure may also be helpful.

ANNEX ONE: KEY DATA FOR EINRIP AND COMPARISON ROADS

ID	Province	From	To	Length (km)	Year completed	Construction cost (IDR) bn	Construction cost (AUD) M	Fatalities (2014)	Fatalities per 100 M vehicle-km	Change in road condition (IRI)*	Change in vehicle speeds*	Change in traffic volumes*
EKB-01	West Kalimantan	Pontianak	Tayan	30.5	2012	160.4	15.9	6	10	90%	83%	241%
EKS-01	South Kalimantan	Martapura	Tungkap	19	2014	91.8	9.1	22	17.3	27%	29%	17%
EKS-02	South Kalimantan	Banjarmasin	Bts Kalteng	12.9	2014	117.7	11.7	17	19.7	62%	30%	44%
EBL-01	Bali	Tohpati	Kusamba	10.9	2011	200.7	19.91	6	2.4	19%	25%	67%
EBL-02	Bali	Tohpati	Kusamba	7.9	2012	198.9	19.73	2	2.4	16%	14%	67%
ENB-01A	Nusa Tenggara Barat	Sumabawa Bypass		8.9	2012	77.9	7.7	1	0	76%	49%	266%
ENB-01B	Nusa Tenggara Barat	Pal IV	Km 70 (Sec1)	2.3	2012							

ID	Province	From	To	Length (km)	Year completed	Construction cost (IDR) bn	Construction cost (AUD) M	Fatalities (2014)	Fatalities per 100 M vehicle-km	Change in road condition (IRI)*	Change in vehicle speeds*	Change in traffic volumes*
ENB-01C	Nusa Tenggara Barat	Pal IV	Km 70 (Sec2)	31.8	2013	174.5	17.3	7	9.9	73%	40%	43%
ENB-02	Nusa Tenggara Barat	Km 70	Cabdin Dompu	14.1	2013	83.0	8.2	4	59.4	63%	34%	32%
ENB-03	Nusa Tenggara Barat	Cabdin Dompu	Banggo	24	2012	144.4	14.3	3	18.7	46%	35%	69%
ESH-01	Central Sulawesi	Lakea	Buol	16.2	2013	118.1	11.7	–	–	82%	65%	129%
ESS-01	South Sulawesi	Sengkang	Tarumpakae	24.2	2012	109.3	10.9	3	7.2	53%	36%	32%
ESS-02	South Sulawesi	Bantaeng	Bulukumba	27	2012	134.9	13.4	10	10.6	48%	19%	108%
ESS-03	South Sulawesi	Jeneponto	Bantaeng	25.7	2014	110.8	11	15	15.1	48%	15%	67%
ESS-04	South Sulawesi	Bulukumba	Tondong (1)	20.7	2014	96.8	9.6	12	7.9	40%	2%	144%
ESS-05	South Sulawesi	Bulukumba	Tondong	20	2014	60.9	6.04	4	12.1	22%	5%	5%
ESS-06	South Sulawesi	Bulukumba	Tondong–Sinjai	24.3	2015	77.3	7.67	3	8.4	52%	5%	22%
ENT-01	Nusa Tenggara Timor	Ende	Aegela	15.6	2015	91.5	9.08	0	0	54%	15%	34%
ESR-01	South East Sulawesi	Tinangea	Kasipute	33.8	2012	147.2	14.6	0	0	82%	74%	141%
ESR-02	South East Sulawesi	Bambaea	Kasipute	23.9	2012	132.7	13.2	1	5.7	73%	52%	155%

ID	Province	From	To	Length (km)	Year completed	Construction cost (IDR) bn	Construction cost (AUD) M	Fatalities (2014)	Fatalities per 100 M vehicle- km	Change in road condition (IRI)*	Change in vehicle speeds*	Change in traffic volumes*
Total				394		2329.2	231.03	116	9.1			

* Baseline to 2015

Comparison roads: key facts and figures

ID	Province	From	To	Length (km)	Fatalities (2014)	Fatalities per 100 M vehicle-km	Change in road condition (IRI)*	Change in vehicle speeds*	Change in traffic volumes*
30.009.2	West Kalimantan	Sei Duri	Singkawang	49.3	12	6.5	24%	16%	36%
30.079.1	West Kalimantan	Tayan	Teraju	30.6	3	12	65%	44%	66%
30.079.2	West Kalimantan	Teraju	Bts. Balai Berkuak	28.0	–	–	88%	86%	356%
36.011.1	South Kalimantan	Sp. Liang Anggang	Liang Anggang	7.5	3	5.5	11%	14%	31%
36.034.2	South Kalimantan	Sp. Empat Haruai	Batu Babi	37.0	6	5.8	7%	124%	77%
40.002	Bali	Negara	Cekik	30.2	18	13.4	8%	0%	18%
40.005	Bali	Tabanan	Antosari	17.2	19	8.6	-14%	-7%	44%
40.039	Bali	Sidan	Klungkung	8.8	2	2.5	12%	4%	43%
54.034	South Sulawesi	Watampone	Pompanua	47.8	12	9.5	2%	18%	20%
54.043	South Sulawesi	Pangkajene Sidrap	Anabanua	34.1	12	10.7	-5%	-16%	43%
Total				290.5	87	8.4			

* Baseline to 2015

ANNEX TWO: ECONOMIC ANALYSIS OF EINRIP ROADS

Package	From	To	Length (km)	Opening year	EIRR (%)		
					Feasibility study*	2014*	2016**
EKB01	Pontianak	Tayan	30.5	2012	27.0	65.6	65.5
EKS01	Matapura	Tungkap	19.00	2014	164.0	11.9	6.3
EKS02	Banjarmasin	Bts Kalteng	12.90	2014	21.0	15.5	13.2
EBL01	Tohpati	Kusamba (1)	10.85	2012	–	–	136.9
EBL02	Tohpati	Kusamba (2)	7.87	2012	–	–	21.1
ENB01C	Pal IV	Km 70 (Sec2)	31.80	2013	36.4	8.0	7.4
ENB02	Km 70	Cabdin Dompou (Sec2)	14.10	2013	26.3	0.5	-1.2

Package	From	To	Length (km)	Opening year	EIRR (%)		
					Feasibility study*	2014*	2016**
ENB03	Cabdin Dompu	Banggo (Sec1)	9.00	2012	23.1	3.1	3.2
ENB03	Cabdin Dompu	Banggo (Sec2)	15.00	2013	22.5		
ENB01AB	Sumbawa Besar Bypass		11.20	2012	29.0	19.2	20.7
ENT01	Ende	Aegela	15.60	2015	–	–	-0.1
ESH01	Lakea	Buol	16.23	2013	8.0	4.8	2.9
ESS03	Jeneponto	Bantaeng	25.70	2014	38.0	35.9	35.6
ESS02	Bantaeng	Bulukumba	27.00	2012	32.0	21.5	21.9
ESS04	Bulukumba	Tondong (1)	20.70	2013	38.0	32.5	25.6
ESS05	Bulukumba	Tondong (2)	20.0	2015	41.0	–	0.1
ESS06	Bulukumba	Tondong/ Sinjai (3)	24.30	2015	48.0	–	0.1
ESS01	Sengkang	Impa	3.20	2012	51.0	–	48.4
01	Impa	Tarumpakae	21.0	2012	76.0	42.9	
ESR01	Tinanggea	Kasipute	33.80	2012	12.0	7.8	8.7

Package	From	To	Length (km)	Opening year	EIRR (%)		
					Feasibility study*	2014*	2016**
ESR02	Bambea	Sp. Kasipute	23.89	2012	11.0	1.0	4.8
No. of Packages with EIRR less than 15.0%					3	8	12
* EINRIP M&E program, <i>Third Monitoring Survey Key Findings</i> , April 2015							
** Preliminary results of cost–benefit analyses carried out by M&E consultant, September 2016							

ANNEX THREE: EVALUATION FRAMEWORK

Effectiveness: Was EINRIP effective in the achievement of intended outcomes?			
Evaluation question / sub question	Evidence required	Data collection method and source	Analytical approach
To what extent do the physical infrastructure and capacity gains established through EINRIP reflect those outlined at project inception? (E1)	The degree to which completed infrastructure reflects the original and revised scope of work	Document review: To trace evolutions in scope against final deliverables (project completion report, loan agreement, annual reports, AQC reports)	Map planned outcomes against actuals
	The extent to which roads meet original estimates relating to travel times, traffic volumes, accident rates and vehicle operating and maintenance costs	Document review: Assess validity of initial assumptions against achievements (baseline & monitoring surveys, EIRR calculations)	Categorise and tabulate KPI data
	The extent to which innovations demonstrated in the design, planning and delivery of EINRIP have been taken up by DGH	Stakeholder interviews: To understand current practice in Indonesian road construction (DFAT, DGH, World Bank, ADB, engineering consultants)	Collate and synthesise feedback from stakeholders
What were the positive and negative, intended and unintended consequences associated with EINRIP? (E2)	The extent to which intended benefits were delivered (as above)		
	Feedback from stakeholders as to the appropriateness of roads and the EINRIP approach	Stakeholder interviews: To capture perspectives of DGH and other institutional stakeholders Document review: To capture perspectives of road users and communities (social surveys)	Synthesise feedback from stakeholders Synthesise evidence from communities

Effectiveness: Was EINRIP effective in the achievement of intended outcomes?

Indicators and performance criteria where values were higher or lower than expected	<p>Document review: To identify outliers (EINRIP annual reports, AQC reports)</p> <p>Stakeholder interviews: To investigate possible causes for under/over performance</p>	Issue identification to guide fieldwork
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Sustainability: Did EINRIP positively influence the approach the Government of Indonesia now takes to road infrastructure?

Evaluation question / sub question	Evidence required	Data collection method and source	Analytical approach
To what extent did EINRIP, either through targeted institutional strengthening actions or by virtue of a demonstration effect influence the road construction practices employed by DGH on its general road construction activities? (S1)	The degree to which EINRIP capacity-building activities effectively facilitated the transfer of knowledge and skills	<p>Document review: To identify the scope and scale of EINRIP capacity building measures.</p> <p>Stakeholder interviews: Test recall/application of skills (DGH)</p>	Map actions against key capacity areas
	The extent to which the key lessons and successes from EINRIP have been effectively shared with DGH and across the infrastructure sector	<p>Document review: examine approach to learning and communications</p>	Identify key lessons
		<p>Stakeholder interviews: test awareness of EINRIP lessons (DGH, engineering consultants/contractors)</p>	Compare stakeholder responses against lessons
	The degree to which broader infrastructure institutional and financial structures work to enable the application of the approach advocated by EINRIP	<p>Stakeholder interviews: Assess contextual factors as inhibitors or enablers (DGH, engineering consultants, WB and ADB)</p>	Test viability of key EINRIP features
	Identification of examples of other DGH road projects replicating the EINRIP approach	<p>Stakeholder interviews: Solicit details of other road projects following EINRIP approach (DGH, engineering consultants, WB and ADB)</p>	Identify possible EINRIP type projects
		<p>Document review: Examine sample documents for key EINRIP features</p>	Verify use of EINRIP approach
How effective was the EINRIP M&E program in guiding the successful implementation of the project and demonstrating the value of the EINRIP approach to stakeholders? (S2)	The degree to which issues identified through various M&E process have been subsequently addressed and resolved	<p>Stakeholder interviews: Identify a sample of issues and probe during interviews as to whether these have been addressed. (DFAT, DGH)</p> <p>Document review: Examine annual documents (AQC reports, M&E surveys) to test for recurrent issues</p>	Test utility of EINRIP M&E

Sustainability: Did EINRIP positively influence the approach the Government of Indonesia now takes to road infrastructure?

The degree to which data and analysis generated by EINRIP M&E processes has been influential in DGH decision-making

Stakeholder interviews: Solicit views as to the lessons learned through EINRIP and how these have been communicated (DGH)

Test influence of EINRIP M&E

Efficiency: Does EINRIP represent value for money, both relative to the quality of roads constructed and the institutional gains made?

Evaluation question / sub question	Evidence required	Data collection method and source	Analytical approach
Was the modality (mix of loans and grant TA) relevant to intended EINRIP outcomes? (VFM1)	The extent to which intended outcomes (stated and additional*) reflect inputs	Document review: Identify links between grant and loan-funded activities (project completion report, loan agreement, annual reports)	Map links between grant and loan funded streams
	The extent to which grant-funded activities directly support loan outcomes	Stakeholder interviews: Solicit views as to the complementarity of grant and loan-funded activity. (DGH, DFAT)	Synthesise feedback from stakeholders
What are the early indications of the sustainability of both EINRIP-supported institutional capacity and completed roads and bridges? (VFM2)	The extent to which EINRIP project roads, particularly those completed some time ago, are in good repair	Document review: Examine assessments on road conditions (annual reports) Field Visit: Verify condition of a sample of EINRIP roads	Synthesise data on the status of EINRIP roads Test for resolution of identified faults
	The extent of maintenance work required on EINRIP project roads	Document review: Identify maintenance expenditure on EINRIP and non-EINRIP roads Stakeholder interviews: To understand DGH approach to road maintenance	Compare expenditure levels Describe road maintenance arrangements
	The degree to which EINRIP supported capacity-building measures remain relevant and in use	As per question S1 above.	
Do EINRIP roads represent value for money? Taking into account any increases	The extent to which the planned and actual benefits from EINRIP roads exceed costs	Document review: Examine feasibility study and 2015 re-evaluation of costs and benefits	Categorise roads according to net

* See EINRIP theory of change, Figure 1.

Efficiency: Does EINRIP represent value for money, both relative to the quality of roads constructed and the institutional gains made?

in traffic volumes, have the additional costs associated with project preparation and higher quality standards been effectively offset against levels of required maintenance expenditure and other economic benefits (e.g. reduced vehicle operating cost)? (VFM3)	Total EINRIP costs including both loan and grant elements	Document review: Identify total project cost	Present value & benefit-cost ratio
	Road construction cost data for non-EINRIP roads	Stakeholder interviews and document reviews: Identify typical road construction cost in Indonesia	Apportion grant costs to roads
	Data on maintenance expenditure, vehicle operating costs, travel times, accident rates		Compare EINRIP costs against Indonesian norms
			Update economic evaluation
	The extent to which the EINRIP approach influenced the construction/upgrading of other roads	As per S1 above	

Cross cutting issues: Did ENRIP road packages take adequate account of cross-cutting issues?

Evaluation question / sub question	Evidence required	Data collection method and source	Analytical approach
Main question			
Did the design and implementation of ENRIP take adequate account of needs of women as road users and facilitate their involvement in project delivery?	Whether the needs of women were taken into account explicitly or implicitly	Document review: To assess the consideration of gender issues in planning and reporting (social safeguards plan, loan agreement, M&E manual, social surveys, annual reports, AQC reports)	Synthesise treatment of gender issues
	The extent to which the strategy faithfully implemented	Stakeholder interviews: To triangulate evidence gathered and gauge perceptions as to the priority placed on gender	Synthesise and triangulate feedback from stakeholders
Were other key safeguard and cross-cutting issues, such as resettlement, road safety, environment and HIV/AIDS, given appropriate attention?	The extent to which cross-cutting issues were identified and suitable strategies developed in the planning stage	Document review: to assess the consideration of resettlement, environment, road safety and HIV/AIDS in planning and reporting (social safeguards plan, loan agreement, M&E manual, social surveys, annual reports, AQC reports)	Synthesise treatment of each of the four key cross-cutting issues
	Whether these strategies were faithfully implemented, monitored and reported against The extent to which strategies were adapted to address any emerging issues	Stakeholder interviews: to triangulate evidence gathered and gauge perceptions as to the priority placed on key cross-cutting issues	Synthesise and triangulate feedback from stakeholders

ANNEX FOUR: REFERENCES

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