EXPENDITURE PLANNING AND PERFORMANCE-BASED BUDGETING

IN THE DIRECTORATE GENERAL OF HIGHWAYS

**INDONESIA
INFRASTRUCTURE
INITIATIVE**

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ACRONYMS

AusAID	Australian Agency for International Development
BPJT	Toll Road Regulatory Agency (*Badan Pengatur Jalan Tol*)
DGH	Directorate-General of Highways
GOI	Government of Indonesia
IndII	Indonesia Infrastructure Initiative
Lakip	*Laporan Akuntabilitas Kinerja* (Report on Accountability and Performance Indicators)
MOF	Ministry of Finance
MOT	Ministry of Transportation
MPW	Ministry of Public Works
MTEF	Medium-term Expenditure Framework
Bappenas	Agency for National Development and Planning
PBB	Performance-based budgeting
RENSTRA	*Rencana Strategis* (Strategic Plan)
RPJM	*Rencana Pembangunan Jangka Menengah* (Medium-Term Development Plan)
RPJP	*Rencana Pembangunan Jangka Panjang* (Long-term Development Plan)
SiPP	*Sistem Informasi Pemantauan Projek* (Intranet report on project implementation by Satker to DG)

EXECUTIVE SUMMARY

BUDGETING REFORM FOR THE ROAD SECTOR

As part of important planning and budgeting reforms, the Government of Indonesia (GOI) is implementing multi-year performance-based budgeting (PBB) and a medium-term expenditure framework (MTEF) in the period 2010-14 under guidelines published by Ministry of Finance and Bappenas in 2009. This study provides support to the Directorate General of Highways (DGH), Ministry of Public Works in preparation for the new procedures which are to be implemented during 2010 and to produce the first 3-year rolling budget and program for the period 2011-13. Since this initiative coincides with the government's strategy *Reformasi Birokrasi* the study also identifies areas of potential improvements to DGH performance in the road sector which would be reflected in the performance-based budget structure and evaluation.

Placing budgeting on a three-year rolling basis under an MTEF is intended to improve the predictability of funding allocations for the road sector, improve the continuity of funding especially for multi-year capital expenditures, and focus the budgeting debate onto the effectiveness of current policies and the potential benefits of policy changes. The three key elements of the process are strategic policy making, portfolio budgeting and a system for managing running costs. The GOI application includes an annual review in the first quarter and mid-semester review in the final quarter, and requires identification of 'priority policies' which would be considered for allocation of additional resources in the national fiscal review.

The inclusion of performance-based budgeting (PBB) is intended to improve the connectivity between planning and the achievement of outputs and outcomes, and also improve the effectiveness and efficiency of sector spending. To date there has been no formal connection between the goals of the long-term or medium-term plans and the funding resources required to achieve them. The PBB defines a new performance-based structure of accountability for the work program and budget and the basis on which the performance of work units will be evaluated. These specify an unambiguous linkage between activities and specific organisational units, give the work unit managers responsibility and control over implementation, make managers accountable for achieving the unit's outputs and outcomes, and establishes the linkage of top-down policy goals and resource allocation to the need for bottom-up credible implementation plans and efficient service delivery.

International experience with MTEF and PBB has shown that significant improvements to the efficiency and effectiveness of public spending can be achieved when these principles are applied across the board to all general and sector-specific public spending. The key ingredients to making a successful transition to MTEF include political commitment of both general ministries and sector ministries, keeping the process simple and uniform across sectors, and making it the sole basis for national resource allocation. The national approach is generally consistent with this good practice. Of the many general lessons learned, six stand out with special relevance to the road infrastructure sector, i.e.:

(a) *Be comprehensive by including all budget sources available to the sector*: The policies and resource allocation process should cover all the public road system, its infrastructure and operation, and all funding resources (national and sub-national public and private funds). For the road sector, the policies and performance for road infrastructure provision (under the Ministry of Public Works) need to be linked to those for road traffic management and regulation (under MOT).

(b) **_Develop a mechanism for effective stakeholder participation._** This should include a layer of professional, technical and social review above the sub-sector agency, e.g., at an infrastructure sector level, that has competence to evaluate the feasibility and prioritisation of the program under existing policies, and a cross-sectoral review at the ministerial level to assess priorities for changes in policies and resource allocation.

(c) **_Enhance transparency in the process at both political and managerial levels as an essential ingredient to achieving effective accountability._** Improving public access to information on the program and sector performance, including feasibility of the proposed programs and expenditures, combined with the impartial review mechanisms of effective stakeholder consultation, should increase the accountability for performance.

(d) **_Identify sector activities in sufficient detail for proper evaluation of resource allocation and performance, in terms of outputs and outcomes, to Echelon 2 work unit level._** The definition of sub-activities and activities that give a clear indication of the outputs expected at work unit level improves the clarity of the budget and the management of performance.

(e) **_Give increased attention to the efficiency and effectiveness of sector expenditures._** For effectiveness, performance indicators should help to evaluate the prioritisation and selection of projects and the value for money obtained in achieving the intended performance. For efficiency, the indicators should evaluate the cost of delivering particular goods or services and the delivery times as performance measures of budget execution.

(f) **_Develop and sustain effective oversight of the MTEF-PBB process._** Oversight at a national level should be able to evaluate the results and performance of DGH against the plan and program, benchmark the costs and delivery times against international comparators, and assess real improvements in the outcomes for the sector. At agency level, the oversight exercised by the MPW, DGH and managers should focus more on the quality and life of works and services delivered, and on the costs and time taken to deliver works and services.

EVALUATION OF RECENT SECTOR PERFORMANCE

The current long-term and medium-term plans for public works infrastructure aim to address the disparity in road density between the populated regions of the west and the remote regions of the east and north, the poor condition of the local road network compared with the national network, the need for finding an optimal maintenance strategy, weak controls over truck overloading and a lack of performance measures for efficiency and effectiveness. This review notes that the plans lack a strategy on growing the capacity and standard of the road system to support national economic and social growth, and show little linkage between the national economic development targets that are set and their implications in increased traffic demand.

DGH continues to perform strongly in budget execution and output, but a number of issues regarding quality imply that there is scope for significant improvement in both efficiency and effectiveness. During the past five year plan, 2005-09, DGH managed the addition of 8,300 km – a 32 percent increase in the length of the national road network by reclassification and improvement of sub-standard roads; increased capacity by about 13 percent; and kept the overall condition to about the same high level of 88 percent stable (good and fair) condition and 85 percent paved as at the end of 2004. Analysis of the program found the following key issues relating to performance:

- **_The performance and coverage was rather uneven across provinces_** - the road condition barely improved in most provinces and even deteriorated in some provinces, raising questions on the effectiveness of needs assessment and prioritisation.

- ***Funding tripled during the period but there was little increase in annual output coverage*** and resulted in steeply higher average costs for both preservation and development works. While this may have translated into higher technical standards, it prompts questions on the added value achieved and the efficiency of pricing in the recent program.

- ***The actual life and performance of the road treatments appears relatively short***, and this is resulting in comparatively heavy treatment requirements, based on the annual coverage of the program and the relatively neutral improvement in condition of the network. There is a need to review the design life standards policy and the management of quality in both design and construction.

- ***The policy on improvement of sub-standard road width is expensive because of the high average cost of incremental widening,*** which includes most of the 8,000 km of strategic roads added to the network – a review to consider the benefits of a longer-term policy of more comprehensive renewal and reconstruction of those roads which would have lower long-term costs is needed.

- ***The policy of providing major capacity expansion on trunk routes may not be an optimal use of development funding.*** Widening to 4-lane divided standard is providing congestion relief in the medium-term, however the long-term need is for a separate integral expressway network which is lagging behind under the current toll road program. The policy on major infrastructure development needs to extend to a long, 50-year horizon so that adequate resources are allocated to accelerate the expressway development to meet steep economic demand.

- ***Present funding is sufficient for preservation if applied with optimal policies***, but development funding will need to increase to meet forecast growth in demand.

Review of the 2010 program and the RENSTRA for 2010-14 (from draft through to final) showed that a significant increase is proposed in the both the funding and the outputs. In the final version released in February 2010, the budget was raised to a high scenario of about IDR 30 trillion per year and the program shows an average of 8,660 km of major works output each year, both nearly double the 2009 program. However the scaling up of activities implies an over-supply of preservation and development on the existing network, equivalent to covering every road within 4.5 years or 110 percent of the network in five years. A significant portion of the funding (about 55 percent) is allocated to road and bridge development, however most of that is allocated to road widening and the review recommends instead a planned progressive approach to road renewal in which the development needs are combined in a comprehensive program to modernise the arterial road network. This review recommends that the priority for budget resources above IDR 20 trillion/year be allocated to the development of expressways and trunk routes, in order to address the urgent need for high-capacity trans-regional and metropolitan road links.

In order to help shape the identification of suitable program and performance indicators under the new MTEF-PBB approach, the review identified the following issues which should be addressed in the formulation of the strategy and program:

(a) ***The urgent need to enhance trans-regional and metropolitan mobility.*** With the rapid growth in road transport and the demands for competitive economic growth, the provision of high-capacity road infrastructure for trans-regional travel and intra-urban travel in the metropolitan centres within the next ten years emerges as the top challenge facing the sector. This will require (i) substantial acceleration of provision of the expressway network (from the recent 14 km/yr and the currently processed 80 km/yr to over 150 km/year); (ii) explicit definition of an expressway network supplementing the arterial network; and (iii) efficient multi-year allocation of resources between regional route development (which will service traffic demand in the immediate 5-10 year term) and expressway development in the same trunk corridors (which will take at least ten years to develop).

(b) ***A need to improve the efficiency and effectiveness of the preservation program.*** The recent and current allocation of resources to the road preservation program has been strong (at IDR 200 million/km/yr or USD 20,000/km/yr this is high relative to many other countries) and the condition of road infrastructure is fairly good, however the outcomes indicate that the program is barely compensating for a fairly high rate of deterioration in the network. There is need to increase the efficiency of the use of available resources (both in the cost of treatment and in the life-cycle, or average medium-term, cost) and to improve the effectiveness (through improved quality, enhanced performance and extended life) of the preservation activities. The current simplified design approach for preservation treatments, with its inherently short design lives, should be revised to extend the design life and reduce life-cycle costs.

(c) ***A need to improve the effectiveness of the development program.*** The current approach of incremental widening of roads in the betterment program, while yielding short-term benefits, is both expensive in life-cycle cost and in the long-term may have missed opportunities to improve the alignment and average travel speeds. A more comprehensive approach to road renewal, with redesign of alignment and pavement and bridge structures, would provide more optimal use of resources in the long-run and improve the capacity of the road system in the long-term to cope with the rapidly rising demand for road travel.

(d) ***A need to identify performance measures of quality and cost, and to extend accountability for sector performance to the work units at activity and sub-activity level.*** An important aim of the PBB policy is to achieve better 'value for money' from public expenditures – improving the quality and performance of the outputs at the same time as controlling or reducing costs. Since the work units implementing the activities have the primary influence over achieving value for money, it is therefore important that their efforts to achieve improved value and reduced cost be measured and recognised.

RECOMMENDATIONS

The medium-term and performance-based budgeting structure which is recommended for the DGH program focuses on what are considered to be the three core business areas, namely:

(a) Improve major [trans-regional] road infrastructure to support competitiveness of regional and internal trade and production.

(b) Improve quality and capacity of national arterial road network to connect remote and central regions.

(c) Improve the performance and accountability of central and local road agencies in providing sustainable and cost-effective local road infrastructure.

These objectives are incorporated in the definitions of Program and Activities which are recommended for DGH for RPJM-2. The detailed tables are given in Annex A, and a summary of the key Activities and Indicators is given in Table 13, of the report. The definitions of Activities and indicators follow the new 2009 guidelines on PBB for MTEF which differ in significant ways from the previous approach to program and performance evaluation, e.g.:

- ***At Echelon 1 level*** - there is a single Program which is evaluated in terms of Outcome, a single Strategic Target, and a series of "Program Main Performance Indicators" which define key outcome type measures aligning with the mission and core business of the Department (measured primarily in terms of the coverage achieved to certain performance standards)

- ***At Echelon 1b and 2 levels*** - Each Directorate is a work unit with a single Activity and Activity Output Indicators which identify sub-activities for budget allocation purposes – physical 'goods' (such as bridge length constructed) is an output only for the final production unit (Wilaya) and all

intermediate products (such as design, plans) are 'services'. Quality, efficiency and cost are measured through Activity Performance Indicators (API or IKK) are intended to be used by DGH primarily for internal management purposes to improve the efficiency and effectiveness of program delivery.

A number of recommendations for enhancing the performance of the DGH program and its delivery arose from the detailed review, i.e.:

i.   ***Enhance Trans-Regional and Metropolitan Travel Performance:*** The need for a more systematic and long-term approach to investing in capacity expansion is considered to be urgent and the top priority for the sector at present. It requires strategic planning, stronger prioritisation, and increased mobilisation of financial resources. The current emphasis on expanding trunk routes to multilane facilities on existing road alignments in trunk route corridors is considered a costly short-term measure and a strong and vigorous concentration on the accelerating the expressway program is recommended. In order to guide the allocation of resources between the two competing programs and to achieve reasonable efficiency in resource requirements, we recommend:

   a.   Determine optimal investment and construction strategies for the expressway facilities and parallel trunk route national roads for the main regional road corridors, conducting detailed traffic demand forecasts and analysing funding alternatives;

   b.   Definition of an integral expressway network as a subset of the national road network, incorporating 'toll roads' where appropriate but extending to include future links independently of financing sources; and

   c.   Review of how the institutional structure and responsibilities for the management of the expressway program, currently separated between BPJT and DGH, might be adapted to improve the overall performance – within the current Road Law in the medium-term and with possible modifications to the Law in the long-term.

ii. ***Enhance Value for Money (1) Optimum Whole Life Cost, Extend Design Life*** – In order to achieve better value for money in the design phase, it is recommended that a whole life cost approach be introduced in which the pavement design life and costs for construction, periodic maintenance and rehabilitation be optimised to incur the least average annual cost, taking account of the vehicle operating costs of traffic. It is expected that this would entail a change to the current short-term design life standards to double the expected life from 5 years for periodic maintenance and 10 years for construction to the more common international norms of about 10 years and 20 years respectively. This should result in a 25-30 percent reduction in the medium-term average cost of road preservation, although in some cases this may include a 40 percent increase in the initial costs. The progress in converting the network to these higher standards could be monitored through an indicator of "Expected Life" on each segment of the network.

iii. ***Enhance Value for Money (2) Asset Quality and Performance*** – Improvements to the quality and actual performance of road assets and the work inputs are also expected to enhance the value for money received from the sector spending. Achieving the intended performance and life of road assets would reduce the long-term average costs of funding the network. It is recommended that a measure termed "Historical Pavement Life", representing the age of the existing pavement since the last intervention, be introduced to be used as a tool for monitoring and improving actual performance.

iv. ***Enhance Work Program Delivery (1) Efficiency in Project Delivery*** – The cost and time efficiency of the project implementation process is cause for concern, and improvements to it are the responsibility of DGH management. A series of indicators are recommended for monitoring the progress in improving delivery performance, i.e., (i) The delivery time in each of four phases

bound by specific dates in the project cycle – Preparation (to bid advertisement), Procurement (to contract signing); Implementation (to provisional handover); and Evaluation (to final performance record); and (ii) cost parameters – contract price (variance from owner's estimate), contract completion (variance from contract price), project completion (variance from original estimate) and number of variation orders.

v. ***Enhance Work Program Delivery: (2) Procurement Quality*** – In order to encourage improvements to the overall quality of procurement in terms of competition and efficiency, performance indicators should include contract package size and possibly bid participation, e.g.: report by work unit: (i) total effective output; (ii) total number of contract packages; (iii) total value of contract packages; and (iv) basic statistics (average, maximum, minimum).

vi. ***Enhance Work Program Delivery: (3) Benchmark Output Costs*** – In addition to monitoring the process performance, it is useful to measure the reasonableness of the overall costs being achieved. This is ultimately the major measure of economic efficiency achieved by a sector program. Performance indicators are recommended in three main categories and some sub-categories, i.e.:

   a. *Program-level average costs per unit output* (e.g., program-average cost of (i) preservation/functional km and (ii) development/effective km; program coverage of (i) preservation effective length percent of network, (ii) development effective length percent of network);

   b. *Sub-Activity or Work-type average costs* (e.g., routine maintenance per functional km, preservation excluding routine maintenance per effective km, development (existing roads) per 2-lane equivalent effective km, development (vertical structures) per effective lineal meter, development (new roads) per 2-lane equivalent effective km.)

   c. *Sub-activity technical norm* (e.g., preservation works: average equivalent asphalt thickness; Development works: costs and equivalent thickness by pavement type (concrete, asphalt, gravel)).

vii. ***Work Program Delivery: (4) Organisational Effectiveness*** – It is recommended that a performance reform review be made of two key areas in the current form of decentralized DGH organisational structure where improvements could be achieved in terms of accountability for effectiveness and efficiency, i.e., (i) The responsibility for managing the value-for-money issues is shared between the central engineering policy directorate (Bintek), the work units (satkers) at a sub-provincial level and the project officers (PPK) at a project or contract package level; and (ii) The responsibility for procurement quality and efficiency is spread over numerous (about 700) project officers and there appears to be little or unclear accountability for the procurement performance at the institutional level (Balai or Wilaya).

viii. ***Local Road Program Support*** – In order to learn from leading examples of how other countries manage the performance of local road networks under a decentralized government system, it is recommended that a review be conducted of countries where a form of technical support and collaborative management have been established.

POTENTIAL TECHNICAL SUPPORT

DGH has already begun to adopt some changes in sector policy based on the findings of this review. DGH has also identified a number of areas where technical support would be helpful, falling into three categories, i.e.:

i. ***Capacity-building for application of Medium-term and Performance-Based Budgeting***:

   a. Awareness of MTEF and PBB methodology and proposals in DGH;

b. Finalizing the consensus on and definition of program and performance indicators;

c. Upgrading programming and project preparation procedures under MTEF-PBB;

d. Study visit on MTEF experience in the road sector;

e. External training in performance-oriented sector management.

ii. *Development of 2011-2014 DGH Program*

a. Planning study on major road infrastructure development in main corridors;

b. Support on preparation of arterial road development program - (i) Analysis of trunk road and expressway alternatives in main corridors; (ii) Improvement of sub-standard sections on trunk routes; and (iii) Upgrading strategic roads;

c. Support on preparation of road and bridge preservation program (application of whole-life cost and design standard enhancements to the process using IRMS).

iii. *Institutional strengthening*

a. Reform of the implementation organisation (Wilayahs) to improve program delivery;

b. Review of medium and long-term options for improving organisation for managing the expressway network;

c. Scoping development of Asset-level project programming tool (to supplement IRMS);

d. Design sustainable technical support arrangements to improve local road management.

Further support is planned by AusAID's IndII project to assist DGH in developing terms of reference and implementing the tasks chosen by DGH.

CHAPTER 1: INTRODUCTION

1.1 CONTEXT

The Government of Indonesia (GOI) is implementing important planning and budgeting reforms which unify the previously separate 'development' and 'recurrent' budgets in a single unified budget, and now will implement performance-based budgeting (PBB) with a medium-term expenditure framework (MTEF) for the 2010 budget and 2010-2014 medium-term plan. A new government took office in October 2009, and drafting of the national 2010-2014 Medium-Term Development Plan (RPJM) and the sectoral Ministry Strategic Plans (RENSTRA) were underway during the study period.

This initiative is being conducted using a set of guidelines issued by the Ministry of Finance (MOF) and the National Development Planning Agency (Bappenas).[1] These attach particular importance to improving the present program-activity architecture so as to provide a better linkage between organisation structure (ministries and work units), budget structure (functions/sub-functions, and programs/activities), policy planning structure (priorities/targets), and the performance management structure (program-outcome, and activity-output measures).

The Directorate-General of Highways (DGH or Bina Marga), which is part of the Ministry of Public Works (MPW), has responsibility for the management and development of the national road network and a supporting advisory role to local government agencies for the management of provincial, district (kabupaten) and urban (kota) roads. The Toll Road Regulatory Agency (BPJT), which is a related agency under MPW, is responsible for the regulation and management of designated toll roads, while DGH remains responsible for the technical regulation applying to expressways, including toll roads. DGH, which has used medium-term planning systems for formulating annual and indicative forward programs within a defined fiscal envelope for more than a decade, was one of the first agencies willing to pilot the new budgeting approach. The year 2010 is designated a 'preparation year' and all Line Ministries are required to prepare the first 3-year rolling budget in PBB program structure and MTEF budget format for the 2011-13 period.

1.2 SCOPE OF STUDY

The present support was requested by the DGH Director of Planning to provide technical assistance and training for the implementation of PBB and MTEF in DGH. The support, provided through the Indonesia Infrastructure Initiative (IndII) funded by the Australian Agency for International Development (AusAID), comprises three phases:

- *Phase 1:* Review of DGH medium- and long-term plans, alignment with Bappenas and MOF procedures, and preparation of a training program and technical assistance for introducing MTEF in 2010.

- *Phase 2:* Provision of training for key DGH planning and budgeting personnel in the application of PBB and MTEF methods in the road sector; and

- *Phase 3:* Assistance with the preparation of the pilot MTEF for the national roads program for the period 2011-2013.

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[1] Implementation of Performance-Based Budgeting and Medium-Term Expenditure Framework, Directorate-General of Budget, Ministry of Finance, May 2009, 5 volumes

This study reports on Phase 1, covering the following main tasks, i.e.:

1. Review the current long-term and medium-term national and strategic plans, and the draft medium-term plans (RPJM and RENSTRA);

2. Review the guidelines on MTEF and PBB, and the draft application by DGH to the road sector, and assist finalization of the new program-activity structure and performance indicators;

3. Review the draft medium-term road program, including road and bridge preservation and development activities, and their alignment with the medium-term fiscal envelope to be set by MOF and Bappenas, and the adopted planning and budgeting guidelines; and

4. Prepare design proposals for Phase 2 and 3, and identify other priority actions to enable effective implementation of MTEF and performance management in the road sector.

The report is structured to address: (1) Summary of the Methodology issues, including international experience and the GOI guidelines on MTEF and PBB; (2) Assessment of the current plans and application of the guidelines to the coming plan periods for DGH; (3) Opportunities for enhancing performance in the sector program arising from the reviews; (4) Identification of support under Phases 2 and 3, and several other priority actions arising from the study; and finally (5) Conclusions and Recommendations for consideration by DGH.

CHAPTER 2: PRINCIPLES AND METHODOLOGY

2.1   PLANNING & BUDGETING REFORM IN INDONESIA

The current reform of public financial management in Indonesia began after the regional financial crisis of 1997-2000 and resulted in key legislation being passed in 2003 and 2004 with the intent that these would be implemented for the current long-term plan beginning in 2005. The key elements of the reform comprised a framework for improved budgeting techniques through application of a Unified Budget, and applying a rolling MTEF process with performance-based budgets. Implementation of these parts of the State Finance Law (Law 17/2003), State Treasury Law (Law 1/2004) and State Audit Law (Law 15/2004) however has been deferred until now and is being introduced in line ministries beginning in 2010.

2.1.1 Medium-Term Expenditure Framework

A Medium-Term Expenditure Framework (MTEF) is used to manage the government's budget and policies over a fixed multi-year period, usually 3 to 5 years, instead of the traditional single-year period.[2] The mechanism is intended to show both the full-year and the medium-term effects of current government policies and expenditures. It can be used to determine the effects of adjustments to policies and budgets which typically take a number of years to implement or to have an impact. It allows longer term events, including macroeconomic realities, expected revenues and the long-term needs of sector programs and policies to be taken into account.

An MTEF comprises a top-down estimate of fiscal resources available for public expenditure consistent with macroeconomic stability, bottom-up estimates of the costs of implementing existing policies and new policies, and a framework for reconciling the costs with the fiscal resources. The first year of an MTEF budget is fully consistent with the annual budget, and expenditure forecasts for the outer years are usually indicative. The multi-year estimates are rolled over each year – in some countries these outer-year estimates are an integral part of the budget process and expenditure control, while in other countries the estimates are used only as background information for policy making.

This process is intended to increase discipline in the planning of government expenditures. It aims at reducing the imbalance between what is affordable based on macroeconomic considerations, revenue estimates and government obligations on one hand, and the sector programs that will achieve the policy objectives and can practically be implemented. To improve predictability the estimates need to be provided down to the Activity level where the budget requirement can be matched to the output generated, and aggregated by Program and Agency.

An MTEF will include: (i) revenue projections (by major categories); (ii) expenditure estimates (including projections by strategic or functional area and by capital/recurrent), projections of entitlement programs and forecast of investment programs; and (iii) projections of other fiscal aggregates (e.g., interest and financing costs). The baseline budget includes the costs of existing policies over the multi-year period, e.g.:

1.   Cost of maintaining the existing level of service, taking account of expected changes in the number of users and beneficiaries over the period;

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[2] Medium-Term Expenditure Framework (MTEF) Guide, Ministry of Finance of Indonesia, February 2006.

2. Recurrent costs after opening of investment projects to be completed during the planning period;

3. Forward costs of ongoing investment programs; and

4. Future costs of entitlement programs that have already been approved or decided.

The cost implications of a new policy or material changes to existing policies need to take account of the timing for introduction of the policy change and extraneous factors affecting the output. Policy changes include the ending, reduction or modification of an existing policy.

Typically, the first step is to develop a set of baseline estimates for the multi-year period, and then to create a series of forward projections based on a set of assumptions and forecasts for each potential policy change. These forward projections should preferably be based on a full planning-programming approach, which identifies the specific costs and outcomes of a proposed policy or program in each year of the planning period. This should be done at a sector level, and should clearly separate the estimates for the baseline from the various policy options.

2.1.2 Performance-based Budgeting and Unified Budget

Performance-based budgeting (PBB) is introduced to create connectivity between the funding resources and the expected outputs and outcomes (effectiveness), as well as efficiency in producing the outputs and outcomes. It complements the MTEF approach which improves the continuity of activities through making the budget available over a multi-year period so that the performance achievements can be seen.

Previously, there has been little connectivity between plans and resources, because a resource envelope has not been used as a basis for formulating the National Long-Term Development Plan (RPJMN) or the sectoral Strategic Plans (RENSTRA). In the past five-year plan, performance indicators were used to report sector outputs, however these have not yet been used to measure the achievement effectiveness of national development targets nor to measure the performance accountability of work units.

2.2 INTERNATIONAL EXPERIENCE

The MTEF concepts have been applied in numerous countries since the early 1990s. The process of forward estimates and medium-term budgeting had been applied earlier in countries such as Australia and other middle- or high-income countries although often in differing forms. The applications in the 1990s in Sub-Saharan Africa and Eastern Europe were aimed at improving public financial management in developing and transition countries and were linked to poverty reduction and economic reforms. As many of the lessons learned from the MTEF experience are relevant to the adoption of MTEF by the Government of Indonesia, this section focuses on those lessons which have some relevance to application at a sector level, which is pertinent to DGH. These lessons are summarised in Table 1 and notes on a number of references in the literature have been compiled in Annex B. Specific lessons are also drawn from two strong economies, as described below.

Table 1: Lessons Learned from International Experience with MTEF

A number of reviews have been conducted to evaluate the experience of countries implementing MTEF over periods of ten years or more beginning in the 1990s through to the mid-2000s. While many have included major economic reforms, others have focused on improving budgetary outcomes and reprioritisation of budget allocations. The following success factors have been derived from these reviews – the first few apply more to government adoption of MTEF, and the latter ones indicate how to optimise MTEF benefits in sector programs.

- **Integrate MTEF with budget in single unified process** – *It is essential that the MTEF budget be approved by both the sector management and the political bodies to ensure seamless implementation.*

- **Improve public expenditure management at sector level first** – *The practice of budget management, execution and reporting needs to be functioning well for the MTEF to function; budget formulation is easier to reform than budget execution.*

- **Develop a performance-oriented budgeting system** – *An effective evaluation of performance against targets is needed to realise the MTEF benefits of predictability of funding, and competition for additional funding. Many conducted a performance evaluation of the sector programs in parallel to the MTEF process, and more countries are moving to adopt full performance-based budgeting.*

- **Comprehensive coverage of all budget resources available to sector** – *The MTEF should cover all financial resources available to the sector (on- and off-budget; domestic, foreign and borrowed funds; national and local level).*

- **Participation in MTEF process by key stakeholders** – *Effective consultation with key stakeholders (MOF, Planning, sector & beneficiaries, civil society and technical professionals) helps to link approvals of new policies and accountability for performance, especially when professional expertise and citizens are involved.*

- **Achieving accountability requires transparency at political and managerial levels** – *Transparency on the criteria and prioritisation of projects, and on performance and outcomes, is crucial to achieving balance of technical and political needs in the program.*

- **Adequate detail in sector activities to catalyse budget reallocation** – *Attention to details in sectoral activities, performance and allocations is important for improving the efficient and effective use of resources; this is the source of substantial savings and reductions in implied future costs.*

- **Budget predictability is achieved only when execution is monitored against planned outputs at activity level** – *Monitoring of budget execution and performance needs to cover the Activities implemented by work units to ensure that the assumptions of budget, output and outcome are achieved.*

- **Attention to efficiency and effectiveness of resource use at implementation level** – *Managing the cost and quality of outputs delivered at the implementation level, to reduce life-cycle costs and improve benefits, is the basis for achieving efficiency or effectiveness gains at a program level.*

- **Oversight mechanisms are a common weakness** – *The use of performance agreements can improve expenditure management and budget execution problems at the implementation level.*

Source: Review of international literature by authors (see Annex B and references)

South Africa first established the MTEF in 1998-2000 after taking a period of four years to persuade the government and sectoral ministries of the benefits of MTEF and to work out a viable three-year budgeting process. The key lessons for making the transition to MTEF successfully included the importance of ***political commitment*** (empowerment of line ministries, choice of policies, delivery of outputs), ***keeping it simple*** (the same three-year schedule for all departments, and leaving detail to the line ministries), and ***making it matter*** (replacing the budget process, imposing financial discipline, and using existing plans as the baseline). The process is now well established and all planning and budgeting at central, provincial and municipal levels is done on a rolling three-year basis. They have turned growth around from a variable near-nil growth in the 1990s to a consistent 4-6 percent/yr GDP growth currently.

Key lessons from South Africa which are relevant to the infrastructure sectors in Indonesia include:

i.   The MTEF must first reach national agreement on affordable total amounts of revenues, available funds and allocations;

ii. Sectors need to develop feasible policy options and their related budget requirements, outputs and development benefits/outcomes – the principles to be followed include: (i) affordable changes are used to make tradeoffs between and within programs; (ii) resources are re-prioritized from low priority to high priority programs; (iii) the allocation of new resources is driven by credible implementation plans; (iv) past spending performance is evaluated against measurable objectives and targets;[3] and

iii. Building consensus to determine prioritisation and reallocation of resources among sectors. The review process is thorough, involving:

(a) MTEC Infrastructure Subcommittee (including Treasury, line departments, sub-national government, and technical professionals) which reviews the expenditure trends, implications of the baseline, costed policy options, and benchmarking of costs and performance;

(b) Capital Budget Committee, which reviews progress on infrastructure capital projects and assesses proposals for new infrastructure funding;

(c) Medium-Term Expenditure Committee (MTEC), which hears and reviews submissions on baseline programs, policy options and priorities from the various sector sub-committees and makes recommendations to the Ministers' Committee on Budget; and

(d) Ministers' Committee on Budget, which considers the MTEC recommendations on: performance of spending programs in relation to objectives and targets, viability of spending plans relating to additional funding requests, and any adjustments to baseline programs and estimates, and submits the MTEF to the Cabinet for approval.

In South Africa, capital projects are classified into three categories by size, i.e., Mega (>USD 35 million or involving loan or PPP financing), large (USD 3 to 34 million) and small (<USD 3 million), and by existing/new. The review and appraisal procedures are tailored to these categories, but include the following:

1. Needs analysis – why the project is required and how it aligns with the Strategy;

2. Options analysis – all possible ways of meeting the need and identification of preferred option;

3. Cost-Benefit analysis – showing build-up of costs, revenues, benefits and calculation of economic and financial net present values – this may be supplemented by a Cost Effectiveness analysis and sensitivity analysis;

4. Life-cycle costs and affordability – forecasting operational impacts in future years;

5. Implementation readiness – stage of project preparation, schedule, implementation arrangements, stakeholder issues, risk assessment and mitigation; and

6. Funding and approvals – revenue potential, alternative funding sources, funding plan, permits, consents and approval process.

Australia[4] embarked on a comprehensive economic reform program in the 1980s and elevated a system of forward estimates that was being piloted to a central role for planning resource allocation and resource use. After testing a negotiation approach during the pilot phase they evolved to the method, which is now the basis of MTEF, of defining a baseline program in terms of current policies and making the forward estimates based on a set of forecasting factors. By giving assurance of budget for the baseline program over the three-year period, this shifted the political debate from

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[3] "Medium-Term Expenditure Framework Treasury Guidelines: Preparing Budget Proposals for 2007 MTEF". National Treasury, Republic of South Africa, July 2006.
[4] Improving budgetary outcomes – the Role of MTEF. Malcolm Holmes.

haggling over the basic program to focus instead on the effectiveness of the underlying policies and to the merits of policy changes. The three key elements of the process included strategic policy making, portfolio budgeting and a running costs system. By setting sector envelopes through the strategic policy making, the line minister was then given the responsibility for preparing and managing the portfolio program to achieve those policy objectives. Use of the running costs system delegated the issues of personnel and administration to line managers and freed ministers from administrative details. Thus, decision-making was efficiently distributed from the Cabinet, through line ministers to sector managers. Performance-based budgeting was introduced progressively to link inputs (i.e., resources) to outputs and outcomes, and to define accountability and measures of performance. The result has been a steady improvement in efficiency and effectiveness of government programs, and a greater resilience to handle economic crises, such as those that occurred in 1997 and 2009.

2.3   INDONESIA GUIDELINES ON MTEF

The legal basis for implementing MTEF in Indonesia is given in Law 17 (2003) on State Finance and Government Regulation 21 (2004) on Guidelines for the Formulation of Work Plans and Budgets of State Ministries/Agencies (RKA-KL). The technical instructions for applying the MTEF to sector programs are given in Manual 3 of the MOF-Bappenas series.[5]

In order to implement the MTEF for the budget in 2011, the GOI will take the following six steps:

1. Evaluate ongoing policies in 2010 in relation to priorities stipulated in the plans;
2. Re-prioritisation of existing policies in 2010 and determining new policies to be implemented through a budget competition mechanism;
3. Calculation of funding allocation to policies to be implemented in 2011;
4. Determine funding baseline for each policy in Budget Policy Statement for 2011-13;
5. Determine the economic and non-economic parameters to be used for calculating forward estimates; and
6. Calculate the forward estimates for the three fiscal years 2011-13 using the parameters.

This timetable for applying MTEF in Indonesia is depicted in Figure 1, where 2010 is designated as a 'preparation year' and 2011 is the first 'budget year'. In the context of planning and budgeting in Indonesia, the ideal implementation period would be five years to match the presidential term of office, because the MTEF was part of the election platform and will be an instrument of accountability to the public. However it is recognised that a three-year period is more realistic in order to avoid the uncertainties of forecasting out five years at a time when the macroeconomic situation is so dynamic. The budget and program will roll forward, so during 2011 the budget will be prepared for 2012-2014.

Figure 1. Rolling Medium-Term Expenditure Framework – First Period of Application in Indonesia

Preparation Year, y_0 2010	Budget Year y+1 2011	*y+2* 2012	*y+3* 2013	y+4	y+5

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[5] Manual 3: "Application of the Medium-Term Expenditure Framework (MTEF). Ministry of Finance and Bappenas, Jakarta, Government of Indonesia, June 2009.

Ongoing sector policies and new initiatives will be evaluated in January-April each year, and a mid-semester evaluation of the current fiscal year will be conducted in October-November each year. For new policies, the evaluation will cover the policy background and legal framework, definition of goals, feasibility and relevance of targets, and policy timeframe. Bappenas will evaluate the program targets, design of activities and indicators, and achievement of outcomes, including the strategic plan, management of implementation and performance record. The Ministry of Finance will evaluate the budget execution compared to allocations, and assess financial performance based on efficiency of resource use (costs), quality of output achieved, and quantity of output achieved.

Provision is made also for establishing **Priority Policies**. In the guides, these are indicated as policies separate from an existing policy which would be implemented if the available fiscal envelope became higher than expected. The policies would be awarded funds on a competitive basis against other programs if they indicate significant impacts and benefits, are urgent, and can be realistically implemented within the budget period. It is not altogether clear from the manuals how these "Priority" ratings should be applied in the case of expanding the scope of the program, and this warrants further discussion with MOF.

2.4   INDONESIA GUIDELINES ON PBB

The legal basis for applying Performance-Based Budgeting (PBB) in Indonesia is given in Law 17 (2003) on State Finance, Law 1 (2004) on State Treasury, Law 15 (2004) on Inspection of the Management and Accountability of State Finances, Law 25 (2004) on National Development Planning System, Government Regulation 21 (2004) on Guidelines for the Formulation of Work Plans and Budgets of State Ministries/Agencies (RKA-KL), and Regulation 20 (2004) on Government Work Plans.

Concepts of Performance-Based Budgeting (PBB): The conceptual basis of PBB follows a logical framework, with four key principles illustrated in Figure 2 and set out in Table 2. The first principle – *"Money Follows Function, Function Follows Structure"* – means that the budget will be allocated to fund an Activity which is based on the duty and function of a Work Unit. Tying an Activity and performance measures to the duties and functions of a particular unit within the organisation ensures that no duty or function of the organisation is omitted from the plan and none is duplicated. At the same time it ensures that delivery of the output and related outcomes are the responsibility of that work unit.

The second principle – *"Let the Manager Manage"* – means that the manager of the work unit should have a fair degree of flexibility on the methods of implementation in order to achieve the outputs and outcomes specified for that work unit and Activity. With that comes also the third principle – *"Accountability"* – which implies that likewise the units will be held accountable for delivering the outputs and achieving the efficiency and effectiveness implied by the related indicators. The fourth principle covers the **link between top-down planning and bottom-up implementation** – the policy and planning objective is achieved through authorizing the activity to a Work Unit with appropriate duties and functions, and the work unit is given the budget with which to achieve the outputs and outcomes with appropriate efficiency and effectiveness.

Figure 2. Structure of Performance Indicators for Performance-Based Budgeting in Indonesia

Planning and Budgeting Structure and Performance Indicators
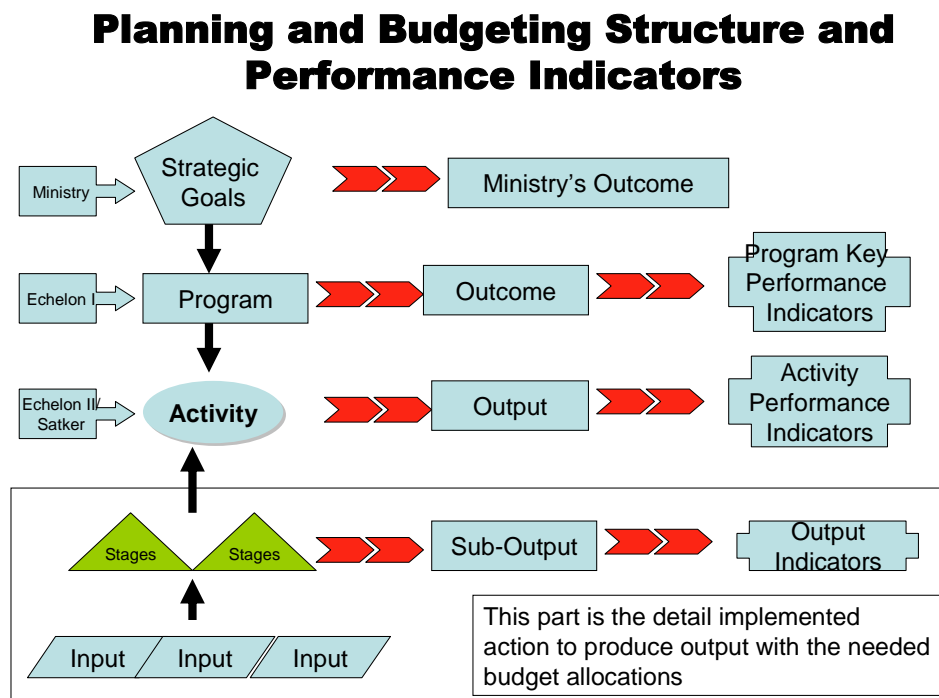
Components of PBB. The PBB structure is formulated through three components, i.e.:

1. **Performance Indicator** – a tool to measure the success of a program or activity. The MOF definition is tied very specifically and uniquely to the various levels of administrative units and thus to the Program and Activities, as shown in Figure 2. The Main Performance Indicator of Program (IKU Program) relates only to the program at Echelon 1A level, and is the main measure by which the MOF and government will assess the performance of the agency. The Activity Performance Indicators (API or IKU Kegiatan) relate only to an Activity at Echelon 1B or 2 – these are used in assessing the work unit's achievement of output against the budget and plan. Finally Output Indicators relate only to a sub-output or Stage of an Activity – these are used internally in the ministry/agency to manage the performance of all parts of the budget execution process and to improve their efficiency and effectiveness.

2. **Cost Standard** – Cost standards are applied as a measure of output cost, initially in approximate form for preliminary planning to link budget to outputs. A General Cost Standard (SBU) is standardized across state ministries and or across regions (such as salaries or administrative costs). A Special Cost Standard (SBK) is an average or unit cost for a specific ministry or region.

3. **Performance Evaluation** – Performance evaluation is conducted by an Echelon 1 unit to provide feedback for improving the quality of performance of its Program. The performance of each Work Unit (Echelon 2 and satker) is assessed in terms of efficiency (budget per unit output) and effectiveness (method of implementation and quality of outputs and outcomes) so as to identify opportunities for improving performance.

Table 2: Performance-Based Budgeting - Summary of Concepts & Terms

A. LOGICAL FRAMEWORK

1. **Money Follows Function, Function Follows Structure**:
Budget allocation to fund an Activity is based on the duty and functions of a Work Unit. The duties and functions of an organisation are completely covered by the duties and functions of each Work Unit without duplication.

2. **Let the Manager Manage**:
Once the output of the Activity and outcomes of the Program have been specified, the Work Unit determines the method of implementation.

3. **Accountability:**
The responsibility and thus accountability for each Activity and Program is clearly related to the respective Work Unit and Organisation and their leadership.

4. **Top-Down and Bottom-Up Views:**
The planning perspective is top-down, with planning and policy set by the highest policy-maker in government but implemented ultimately by the Work Unit. The budget perspective is bottom-up, because the budget is allocated to implement Activities, which collectively achieve the Program outcomes, which together relate to national development impacts.

B. COMPONENTS

1. **Performance Indicators**:
A tool to measure the success of a Program or Activity, specifically:
(i) *Program Main Performance Indicator (IKU Program)* – assesses Program performance;
(ii) *Activity Performance Indicator (IK Kegiatan)* – assesses Activity performance; and
(iii) *Performance Indicator* – assesses performance of a Sub-Activity.

2. **Cost Standard:**
A standard of input cost used in early stage of planning for PBB, and later used as a standard for comparing output cost. A General Cost Standard (SBU) applies across all agencies; a Special Cost Standard (SBK) is specific to a specific agency and program.

3. **Performance Evaluation:**
Process of assessment and problem-solving to provide feedback for improving performance quality in terms of *efficiency* (actual v. planned use of resources) and *effectiveness* (actual outcome v. target).

Performance-Based Structure of Work Program: The structure of a work program under the PBB framework follows a strict pattern linked to the administrative level of the work unit, as evident in Figure 2. The definitions for each part of the program and for the performance indicators are summarised in Table 3. Each Echelon 1A unit has a single **Program**, which comprises a number of **Activities** each of which is implemented by an Echelon 1B or Echelon 2 unit. For a ministry agency such as DGH, the program is called a *Technical Program,* which provides external services to beneficiaries who are outside government. That is treated differently from a *Basic Program* which provides support or internal services to government staff or administration. In the DGH case, the external services are the delivery and operation of a serviceable road network including outputs of road length maintained, additional road space constructed, road geometry and safety improved,etc., and the services are delivered to road users and the general public. All intermediate stages, such as planning, design and procurement, are considered activities or sub-activities but are not considered as outputs – only the final goods or services received by the beneficiaries are considered as output.

An **Activity** is the part of the Program that is implemented by an Echelon 2 level work unit. The unit is solely accountable for that Activity, because the Activity is defined in terms of the duties and functions of the unit. This definition is thus different from the way activity was defined under the previous RPJM1 where it related to an objective.

Table 3: Performance-Based Budgeting - Structure of Program and Performance Indicators

A. CLASSIFICATION OF PROGRAM & ACTIVITIES

1. Program:
A policy instrument comprising Activities implemented by a ministry/agency to achieve the targets and objectives of the unit, to receive budget allocation and/or allocated public activities. The two types of Program are:

(i) *Technical Program:* produces services for public or target group (external services); and

(ii) *Basic Program:* provides support services to government staff (internal services).

Only one *Technical Program* of external services is implemented by one Echelon 1A Unit (E-1A). However, an E-1A Unit may implement more than one Technical Program if justified by the complexity of Activity implementation or amount of budget managed by the related units. The target of the Technical Program directly reflects the duties and functions, and supports the Vision, Mission and Strategic Plan (Target) of the ministry. The performance achievement can be evaluated based on defined time periods. Technical Programs are executed over the medium-term period, and can only change when subjected to a formal Evaluation.

A *Basic Program* of internal services is implemented by one E-1A Unit, the Program is made unique by appending the name of the unit, and the Basic Program aims to support a Technical Program.

The Program is formulated through:
(i) identification of the vision, mission and strategic targets of the E-1A unit;
(ii) formulation of Strategic Target indicators;
(iii) formulation of Program Performance Indicators; and
(iv) naming the Program.

2. Activity:
A part of the Program implemented by a Work Unit at Echelon 2 level, comprising a set of *Resources* (in the form of personnel, goods including tools and technology, funds or combinations) used in *Actions* to produce *Outputs* in the form or goods or services.

Each Echelon 2 Work Unit has responsibility (performance accountability) for only one Activity. An Activity is thus aligned with the functions of the Work Unit, rather than with an objective. *Note: The definition of "activity" in 2009 becomes a "Sub-Activity" in the new PBB, and is monitored through its "Performance Indicator".*

3. Economic Classification:
Classifies the type of expenditure to be incurred, including goods, personnel, capital, social aid, interest, grants, subsidies, etc.

B. FORMULATION

1. **Vision:** Future-oriented, creative, based on public values, history and culture of organisation, expresses ideals, benefits provided, builds corporate spirit, uniqueness of image, challenging for members.

2. **Mission:** States real actions needed to fulfil the Vision: purpose of agency, main product, uniqueness, change in past 5 years, likely change in next 5 years, actions needed to achieve those changes in products or services.

3. **Strategic Targets:** Something produced during the 5-year period that reflects the Mission and describes the duties and functions of the ministry. It will have intermediate targets set for each of the 5 years that will result from the Activities. Each Mission can have a Strategic Target, provided the result is specific. A Strategic Target can also support a combination of Missions having the same final objective.

4. **Outcome of Ministry:** Reflects the Strategic Targets of the ministry in line with Vision, Mission, Duties and Functions; and supports achievement of national targets and objectives.

5. **Program:** An effort expressing Ministry Policy, comprising several Activities using available resources to reach results which are measured against the Mission of the ministry, and implemented in line with the Duties and Functions of the E-1A unit. The Program statement should show its connection with the policy that becomes its basis, and have a clear measurable performance target to reach the objectives of the policy. A Program can support only one Strategic Target.

6. **Program Outcome:** The Program Outcome reflects that an Output has resulted from the Activities in a Program; it supports the Strategic Target achievements of the E-1A unit, and it can support achievement of only one Strategic Target.

7. **Program Main Performance Indicators (IKU Program):** These reflect the efficiency, effectiveness, customers and outcomes that are characteristic of the E-1A unit. They should indicate superiority of performance, may be the best Activity IK, and should be connected to the Strategic Target to be reached.

8. **Activity:** The name of the Activity should reflect the duty and functions of the E-2 unit and the output produced, should be connected to the Program it supports, and have clear measurable outputs that support the targets of the Program.

9. **Activity Output:** In the form of goods or services which result from the Activity, in support of the Program and policy outcomes. The level of success of the Activity Output is the responsibility of the E-2 Work Unit. Output can be measured quantitatively and qualitatively, focused on achievement of Activity performance. The Activity Output is stated in the Annual Work Plan (RKA-KL) of the ministry.

10. **Activity Performance Indicator (API or IK Kegiatan):** An Activity may have several Activity Performance Indicators, reflecting the various products produced by the Activity. The API/IKK may be defined by quantity (output volume), quality, and output price. Baseline data should be prepared in the case of a Quality API/IKK for purposes of comparison.

11. **Output Indicators:** These are parts of forming the Output, or support the forming of the Output. The OI should be specific, measurable, a needed data item (attributable), relevant, and time-related.

12. **Priorities:** In case there is a decrease or increase in budget, a Priority (ranked from 1 downwards) needs to be assigned to Sub-Activities. For the DGH program, these would normally be a 'duty function sub-activity'.

The formulation of the Program also differs from the approach used previously by the GOI. The **Vision** is expected to be a forward-looking stimulating goal which is not likely to change much from one 5-year plan to the next. The **Mission** is a statement of what needs to be done to achieve the vision and has some focus on the particular actions needed during this specific five-year period and the target of what will be achieved by the end of the five-year period. This links to the **Strategic Targets** which describe something that will be produced during the five-year term and can be allocated in annual intermediate periods, and which links to the Mission and strategic objectives of the ministry. Typically an Echelon 1A unit would have only one Strategic Target reflecting its mission statement and the primary goal of the five-year period, which would complement the Strategic Targets for other Echelon 1A units under the ministry.

A **Program** represents the effort needed by an **Echelon 1 unit**, using available resources through a series of Activities, to implement a ministry policy in line with the main duties and functions of the unit. An Echelon 1 unit can have only one Program and can only support one Strategic Target[6]. An **Outcome** reflects the result of the outputs under the Program, and can support only one Strategic Target. The detail of results coming from different activities under the Program is represented through a series of 3 to 5 **Program Main Performance Indicators (Program IKU)**. The Program IKU reflect the superiority of Program performance through measures of efficiency, effectiveness, customers or outcomes, are connected to the Strategic Target, and reflect the functions of the Echelon 1 unit.

An **Activity** is the part of a Program that is implemented by an Echelon 2 work unit and comprises a group of Actions which use resources, such as personnel tools and funds, to produce an output in the form of goods or services. The name of the Activity should reflect the duties and functions of the work unit, should show connectivity to the Program and should have clear measurable outputs. The **Activity Output** is in the form of goods or services produced by the Activity, and is a phrase which reflects the duties, functions and performance targets of the work unit and is measurable by the indicators. **Activity Performance Indicators** are measures of the quantity, quality or price of the activity outputs. **Output Indicators** are quantitative parts of the Activity output which are spelled out

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[6] Manual 2: "Implementation of Performance-Based Budgeting", Chapter 2. Ministry of Finance, Government of Indonesia, June 2009.

as budget heads in the work program of an Echelon 2 unit – thus they form the various parts of the work needed to produce the activity.

These principles of the MTEF and PBB approach, as they have been defined and adopted by GOI through the MOF-Bappenas Manuals, are applied to the DGH program in the following chapter, after first examining the substance and performance of the program in the past five-year period.

CHAPTER 3: APPLICATION OF MTEF & PBB TO THE DG HIGHWAYS PROGRAM

3.1 OVERVIEW OF THE ROAD SECTOR & TRENDS

The Indonesian road system in 2008 totalled 355,856 kilometres of roads in six road networks, as detailed in Table 4. On a demographic basis, the network density of 14.95 km/10,000 population ranks well in Asia but the spatial density of 0.185 km per km^2 appears low, which means that overall accessibility levels are reasonable but regional disparities may exist. The road system is strongly characterised by the archipelago geography of the country and highly disparate population densities in the six main island groups, ranging from 935 people per km^2 in Java to 10 people/km^2 in the sparsely populated Maluku and Papua area. When viewed in regard to economic activity, the road network appears adequate in the sparsely populated areas, but inadequate in the areas of high economic activity, namely Java, Sumatra and South Sulawesi. However the social and economic development objectives of the government include a justifiable focus on improving infrastructure services in the under-developed and remote areas.

Table 4: Length of Road by Status in 2004-2009

Road by Status	2004	2005	2006	2007	2008	2009
National	26,271	34,629	34,629	34,629	34,629	34,629
Provincial	38,914	46,771	46,771	50,044	50,044	48,681
District	222,981	229,208	229,208	245,253	245,253	264,326
Urban	21,863	21,934	21,934	23,469	23,469	23,469
Other (including Toll Roads)	460	773	773	773	773	688
Total	**310,489**	**333,315**	**333,315**	**354,168**	**354,168**	**371,793**

Source: National Road Sector Assessment and Strategic Plan 2010-2014, Directorate General of Highways, Ministry of Public Works, November 2009. Length in km.

The demand for road transport is rising rapidly, with the vehicle fleet doubling in the past five years (2004 to 2009) from 41 to 81 million vehicles – within this growth, 2-wheeled vehicles increased by 130 percent during that period to 60 million, while motor vehicles increased by 56 percent to 21 million. With motorization at only 70 vehicles (280 if 2-wheelers are included) per 1,000 persons and economic income of USD 2,271[7] per capita, growth in the vehicle fleet and road travel can be expected to continue at a pace in the vicinity of 10 percent per year. About one third of total vehicle travel is made on the national road network, which DGH estimates to have grown by about 6 percent per year to 79.6 billion veh-km/yr. There is likely to be a strong concentration of this vehicle travel in the six metropolitan centres and other urban centres, as well as on the regional routes. Road travel speeds however remain low, with average speeds on the national road network in the order of 42 km/hr, due to generally low-speed road geometric standards that are characteristic of the generally hilly terrain, and to generally high levels of side friction arising from extensive ribbon development and weak controls on land use. In order to meet the projected rising demand and remain

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[7] Source: Antara, 18 February 2009

competitive, substantial improvements in road capacity, traffic management and land use management will be needed in the decades ahead.

The Ministry of Public Works (MPW), through DGH and the Toll Road Regulatory Agency (BPJT) is responsible for managing the expressway and national road networks, and for providing technical support to local government agencies responsible for managing the regional road networks (provincial, district roads and urban). The national road network under DGH direct control extended by 29 percent to 34,628 km during the past 5 years, and will extend by 36 percent to 47,600 km during the next five years by reclassification of roads and designation of strategic roads that have national social, economic and security significance. These demands increase the challenge for DGH and MPW in their responsibility for managing the national road network.

3.2 NATIONAL LONG-TERM TRANSPORT SECTOR PLAN (RPJP)

The long-term national development vision is "Independent Indonesia, advanced, just and prosperous", and the RPJP (2005-2024) for the transport sector sets out general development priorities in each five-year period of the plan, summarised as follows:

- RPJM2 (2010-14): Accelerate construction of infrastructure, with more improvement works using government and international resources;
- RPJM3 (2015-19): Integrate infrastructure following the National Spatial Plan; and expand the transportation network; and
- RPJM4 (2020-24): Achieve integrated safe road infrastructure unifying all regions and supporting economic growth.

At the start of RPJM2, Bappenas identifies the key issues of the road sector as: minimal maintenance being performed, a lack of lane capacity and new roads, and slow growth in the capacity of strategic roads (arterial and toll roads). Other specific issues noted in regard to the road assets include:

- The network in the sparsely populated eastern region (Maluku and Papua) is less dense on an area basis than on the four main islands, and road conditions are generally worse also. That region also has the lowest coverage of paved roads, currently 54 percent;
- Performance indicators still focus on physical outputs, and not yet on outcomes, benefits and impacts. Some measures of road construction quality and road condition relative to the beneficiaries (population) should be added;
- The gap between the national road network and the local road networks (province, district and urban) in terms of quality and performance;
- Optimizing the allocation of budget for maintenance; and
- Truck overloading, which reaches about 100 percent in the Java northern corridor and 40 percent in Sumatera, remains a challenge that requires higher construction and preservation costs to achieve the planned performance.

In regard to the road assets in the sparsely populated regions, a specific strategy needs to be devised which is both cost efficient and effective. On a population basis, the network density in Maluku-Papua is nearly double that in the main islands, which implies a higher cost for maintaining the network relative to the size of the population and regional economy. Although road conditions are still comparatively poor, with 39 percent in unstable condition in Maluku and Papua at the end of 2008, this has been improved substantially over the past 4 years by 47 percent in Maluku and by about 11-12 percent in North Maluku and Papua.

The most important long-term planning linkage which is missing in the plan is between the national economic growth targets, transport demand including modal split, and the implied road traffic demand in the various islands and trans-regional corridors. A more rational approach to forecasting future traffic demand, especially for the main trans-regional corridors and metropolitan areas, is needed to support adequate forward planning of major infrastructure such as the expressway network which has a 7-10 year delivery period, and to make optimal decisions on the intermediate option of expanding capacity on current alignments in the major corridors. As elaborated below for the RPJM, the implied budget is equivalent or greater in size to that of the current road sector budget, and thus a rational basis for optimizing resource allocation between these two is important.

3.3 DRAFT STRATEGY & PLAN FOR ROAD SECTOR 2010-2014 (RPJM & RENSTRA)

Before reviewing the new plan, the achievements of the previous five-year plan are reviewed to identify a baseline and learn lessons on the effectiveness and efficiency of current policies.

3.3.1 Review of 2005-2009 DGH Program

In the first five-year program (RPJM1), the national road network was extended by approximately 8,000 km from 26,886 km to 34,629 km through the inclusion of 7,757 km of reclassified roads in 2005. Without detailed analysis it is not clear how much of the 2005-09 program was devoted to these new national roads. The program summary in Table 5 shows that the output was in the order of 4,000 km per year, comprising about 1,000-1,400 km of preservation works and 2,900-3,500 km of development works each year, see also Figure 3. [The data for 2007 show less than half these amounts and are under review]. The APBN budget during this period rose steeply from 2006 to 2009 to IDR 17 trillion, which is nearly four times higher than the 2004 budget of IDR 4.5 trillion.

However this additional budget appeared to go almost entirely into much higher costs of treatment which tripled (to IDR 2-3.4 billion/km for preservation and IDR 3-3.5 billion/km for construction) while the output increased by less than 20 percent. While there were some steep rises in petroleum costs during that period, which affects asphalt costs in particular, the net direct increases in construction costs were typically between 25 and 40 percent.[8] The most likely reason for the rest of the steep increase is a greater use of higher-cost treatments, such as betterment and thicker construction, especially within the preservation program, although there may have been other market forces in effect. In any event, the average cost of preservation treatment in 2009-10 of over IDR 3 billion/km, which equates to over USD 300,000/km, seems high by international norms and is equivalent to reconstruction or major structural rehabilitation. After spiking higher in 2007 the prices seem to have stabilised around the IDR 3 billion/km mark for 7m-wide pavements. These trends suggest that there is room for improving the efficiency of the program to reduce the average cost of road management while maintaining or improving performance.

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[8] Analysis of treatment costs in 2006 shows that asphalt material components comprised 30-35% of new construction and capacity expansion costs, and 60-70% of rehabilitation or betterment costs.

Table 5: Summary of 2005-2009 Work Program & Budget

YEAR	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
BUDGET (IDR billion)						**OUTPUT (effective length km, excluding bridges)**				
Good Governance	0	42	241	382	465					
Emergency Recon	0	0	0	0	508	0.0	0.0	0.0	0.0	0.0
Preservation R&B	1,349	1,648	2,676	3,004	5,330	1,122.0	1,185.0	599.0	1,362.0	1,484.7
Development R&B	4,004	5,254	6,594	11,696	10,703	2,859.0	3,208.0	1,205.0	3,483.8	3,027.1
Program Total	5,353	6,945	9,510	15,082	17,006	3,981.0	4,393.0	1,804.0	4,845.8	4,511.8
AVERAGE OUTPUT COST (IDR billion/km)										
Preservation R&B	1.2	1.4	4.5	2.2	3.6					
Development R&B	1.4	1.6	5.5	3.4	3.5					
Program Total	1.3	1.6	5.3	3.1	3.7					
CONDITION (%)										
Good	48.9	31.0	31.3	49.3						
Fair	29.8	49.6	50.9	33.6						
Poor	8.8	11.0	13.3	13.3						
Bad	12.6	8.5	4.5	3.4						
Stable (G+F)	78.7	80.6	82.2	82.9						
Defective (F+P+B)	51.1	69.0	68.7	50.7						

Figure 3. RPJM1 2005-2009 Program Activities & Resource Use
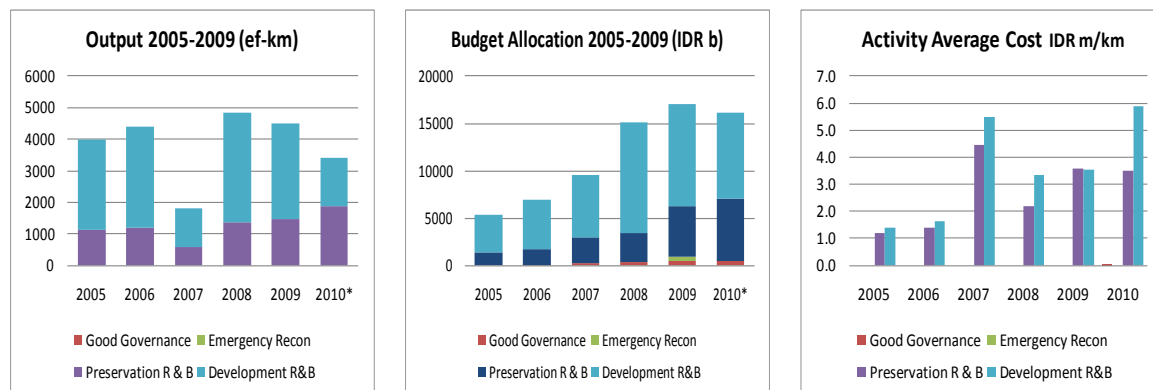
(a)   Activity Outputs   (b)   Activity Budget Allocations   (c)   Activity Average Costs

The effectiveness of the program can be seen from its impact on road network condition. The addition of 7,757 km of reclassified roads in unstable condition to the network in 2005 caused a drop in percentage terms from 88 percent in stable condition at the end of 2004 to 79 percent at the end of 2005 which became the new baseline for RPJM1. In the three-year period following, road conditions have improved to 83 percent stable.

Disaggregating these results by province shows more mixed performance, which is illustrated in three different ways in Figure 4 (change in condition over three years by province), Figure 5 (condition before and after three-year program by province) and Figure 6 (change by Island Group). All provinces had less than 15 percentage points reduction in the extent of unstable condition and about one-third saw the percentage rising over the three-year period. The technical policy focus was on reducing the sections in bad condition, seen in Figure 4 **chart (b)** and Figure 5 **chart (b)**, where bad sections were eliminated in all except six provinces by 2008 and this was to be reduced further to zero by the end of 2009. The impact was strongest in Kalimantan and Maluku-Papua where the improvements covered 23 percent and 32 percent of the network respectively.

Figure 4: Program Effectiveness in Change of Condition by Province, 2005-2008

(a) Change in extent Stable condition

(b) Change in extent Bad condition

(c) Change in extent Good condition

Figure 5: Program Effectiveness in Condition Before/After by Province, 2005-2008

(a) Extent unstable condition

(b) Extent Bad condition

(c) Extent Defective condition
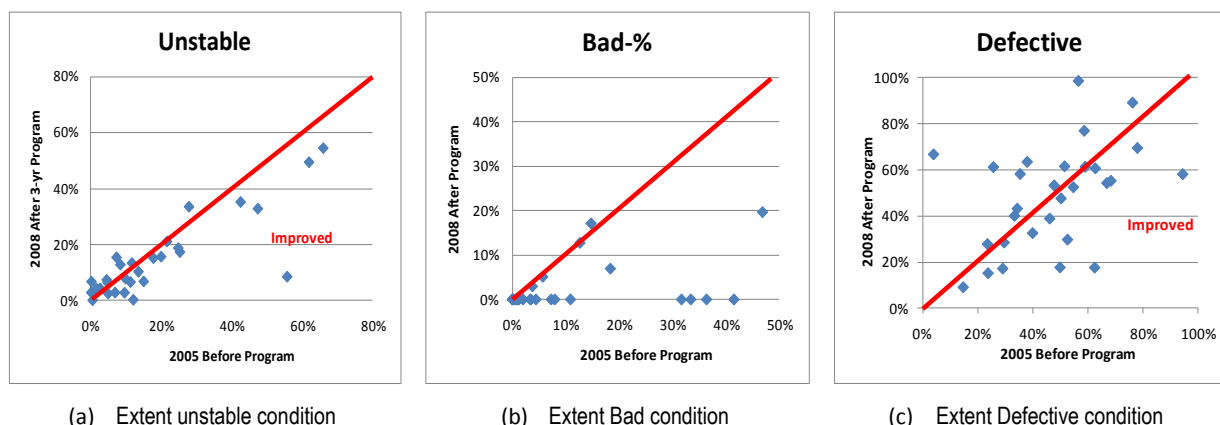
It is expected that a balanced and prioritised preservation program would reduce the extent of defective pavement assets over time (defined here as any section not in good condition) through a mix of periodic resurfacing (of fair sections) and rehabilitation (of poor-bad sections, i.e., unstable). The results however show that the lengths in defective condition rose over this period in nearly half

of the provinces (13), even though the overall severity of the condition was being reduced – see Figure 4 **(c)** and Figure 5 **(c)** – and these were in Java and Sulawesi, see Figure 6 **(b)**.

Figure 6: Program Effectiveness in Condition by Island Group, 2005-2008

| (a) Stable condition before/after | (b) Defective condition before/after | (c) Change in extent bad condition |
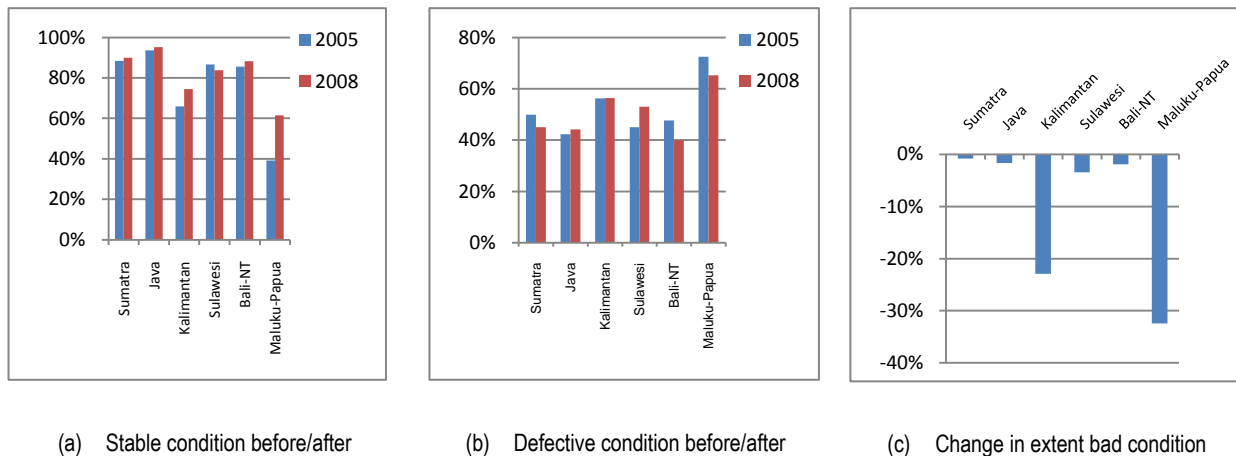
In regard to ***bridges***, about 17 percent of the 330 km total length is in unstable condition, i.e. about 56 km in poor, critical or collapsed/missing condition (or 13 percent or 2,260 by number). While the number and length of bridges is increasing by about 2.5 percent/year (8,000 m), there has been no significant improvement in overall condition as a result of the DGH program. During 2005-09, an average of 72,200 m of bridge routine or periodic maintenance was performed annually, namely coverage of only 21 percent. Of particular importance to road safety and network closure risk management is the number and location of bridges in structurally unsound condition which have potential for catastrophic failure in the event of either heavy vehicle overloading or natural disasters like flooding. It is recommended therefore that much stronger attention be given to bridge condition and program outputs in future.

This review has shown that the 2005-09 Program has covered an effective length of about 4,000 – 4,500 km per year, which represents about 12 percent of the total arterial road network, or 25 percent of the extent in defective condition annually. While the program has reduced the severity of condition overall, including the significant impact of almost eliminating the sections in bad condition (from 12.6 to 3.4 percent, or by a total of 3,200 km), overall the length in defective condition increased and some provinces saw overall deterioration of condition. The findings indicate that the road network condition is deteriorating rather faster than the program is able to maintain it and raises the following issues which deserve further attention in the next 5-year period, i.e.:

(a) Potential for improvement in the efficiency of the preservation and development programs, in terms of the selection of treatment and the value for money in terms of output per unit cost, to ensure that the long-run or life-cycle costs of successive treatments are minimized;

(b) Improvement in the effectiveness of project prioritisation and the coverage across provinces and across strategic sub-networks such as the regional routes; and

(c) Understanding of the reasons why the network appears to be deteriorating faster than would be expected compared with international norms of 20-yr structural life and 8-10-yr surfacing life, together with a review of the current DGH technical policy of short design life for preservation treatments.

3.3.2 Expressway Network

The expressway network comprises dual carriageway multi-lane highways with full access control that provide the highest level of service, with a typical design speed of 100 km/h but operating speeds that depend on the function. Since to date all the expressways in Indonesia have been operated as toll roads they are commonly referred to as 'toll roads'. The Road Law 38/2004 defined these as *Jalan Bebas Hambatan* which has been translated as 'freeway' but it is recommended that the term 'expressway' be preferred, since it aligns with other major countries in Asia, focuses on the road function and avoids relating the facility to the means of financing.

Since Road Law 38/2004, administration of the expressway network has been separated between DGH which has a regulatory function for general provision of the expressway network development, and the Indonesia Toll Road Authority (BPJT) which is the regulator administering all toll road concessions and is also authorized to procure concession agreements. The expressways are stated to be an integrated part of the national road network master plan. DGH has issued an expressway development plan (MPW Decree 360/KPTS/M/2008) that outlines an additional network of 2,411 km of expressways in Sumatra, Java, Bali and Sulawesi islands in the long-term plan to 2024.

The status of expressway development and operation is shown in Table 6 and Figure 7. In the initial surge of development, from 1975-99, beginning with government implementation and loan financing and progressively involving private sector investment through concession agreements, the network reached a length of 580 km (about 23 km/yr). Since the financial crisis in 1997, the progress was hampered by financing and implementation issues and slowed to 14 km/yr, and the targets of 762 km set in 1997 and 1,700 km announced in 2005 have been ambitious. Since the establishment of BPJT in 2005 and the development of a rigorous financing structure, that provides for competitive tendering, financial risk management and government pre-financing of land acquisition,[9] the program has been accelerating.

The charts in Figure 7 show the forward estimates of the present program rising to 80 km/yr over the next ten years and 150 km in the following ten years, based on the current status of concessioning and project preparation. The achievement of this program, which has not yet been committed to time-bound targets, will be very dependent on the performance of the new land acquisition mechanism and the concession tendering process.

Table 6: Past & Planned Development of Expressway (Toll Road) Network

STATUS	LINKS	LENGTH	AGE	YEAR OPEN	INVESTMENT	AVG COST
		km	yr		IDR b	IDR b /km
Operation - Jasa Marga	23	529.42	3-31	1978-2006		
Operation – Private	8	158.45	1-21	1987-2008		
Concessioned, open 2009	1	35.00	0	2009	2,095	59.9
Concessioned, construction	10	393.7	F05	2014	34,431	87.5
Concessioned, pre-constrn	9	341.23	F10	2019	28,682	84.1
Government construction	1	5.4	0	2009	3,268	605.2
Government pre-constrn	3	70.51	F10	2019	6,579	93.3
Tender preparation	17	677.88	F15	2024	46,795	69.0

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[9] Through a revolving fund managed by a General Service Unit (BLU)

STATUS	LINKS	LENGTH	AGE	YEAR OPEN	INVESTMENT	AVG COST
Planning	20	877.09	F20	2029	99,065	112.9
Total to 2008	**31**	**687.87**				
Total to 2009	**33**	**728.27**				
Total to 2014	**43**	**1,121.97**			**34,431**	
Total to 2024	**72**	**2,211.59**			**87,805**	

Figure 7: Expressway Development Past & Planned through 2025
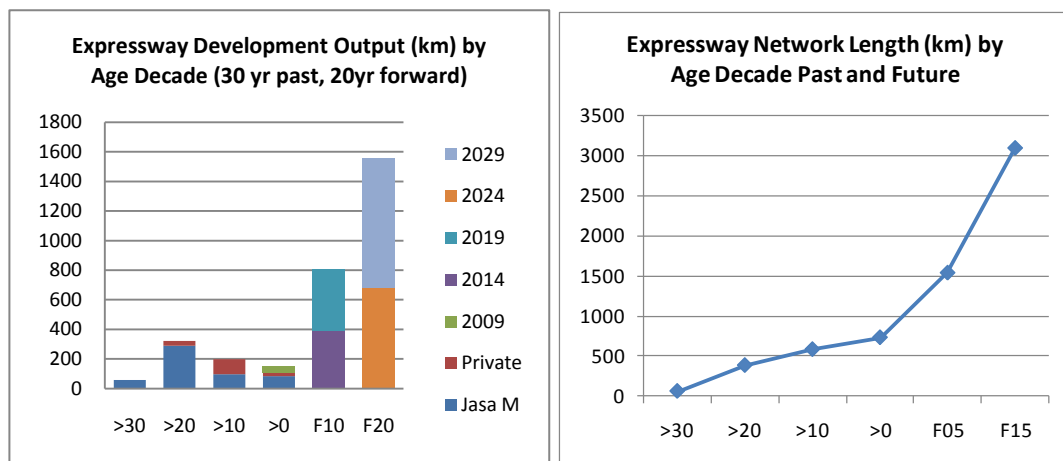
What is not apparent from the plan documents is an assessment of the lane-capacity and share of vehicle travel currently carried by the expressway network, how the share is forecast to change in the medium-term, and how this capacity relates to and interacts with the regional and trunk route national roads, which frequently run parallel to the expressways. Forward plans for expansion and development of the regional routes should be supported by a network capacity analysis in the route corridors[10] which would yield a rational basis for forward estimates of travel demand on both the expressway and regional route roads in the corridor. This is important to determine the optimal allocation of resources between the regional route program, with its continual demand for widening and disruptive land acquisition in strip development areas, and the expressway program.

As part of its responsibility for general provision and planning for the expressway and arterial road networks, DGH should include in the RENSTRA an analysis of the forecasts of trans-regional travel demand in the main corridor, and demonstrate a strategy for providing the requisite capacity in the trans-regional corridors over the balance of the long-term plan (RPJPN to 2024) and for achieving the stated targets of trans-regional travel speed and level of service on both networks.

It is not clear, for example, whether the present rate of expressway development is adequate, or the degree to which it should be given priority for further allocation of public resources in the event of a higher fiscal allocation to the sector. If traffic growth continues at the level of about 10 percent/yr, and given the relatively long gestation period of expressway links of 7-10 years and the land acquisition limitations on expanding the regional routes, the demand for capacity in the main corridors may well outstrip the provision within the next ten years to 2019, especially in the Java and

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[10] For example, similar to the Java Arterial Road Network Study (JARNS) conducted in 2000.

Sumatra main corridors. Achievement of the full 3,100 km expressway network would only place Indonesia fourth in Asia behind Malaysia, China and Philippines for expressway density (0.1 km per 10,000 population), and similar to Thailand, but at present this may not be achieved until 2024.

The resources required for the expressway program opening in the 2010-14 period are estimated to be IDR 34.4 trillion, or an average of IDR 6.9 trillion/yr. Land acquisition ranges from 10-30 percent of the investment cost. Average construction costs, inclusive of land acquisition, are in the order of IDR 70-85 billion/km which is 15 times higher than the construction costs of a 2-lane highway, excluding land costs. The three planned government-financed links are forecast to cost IDR 6.6 trillion over an as yet undefined period but probably ten years to 2019.[11] The expressway program is expected to be the largest user of Public-Private Partnership funding in 2009-2011, as shown in Figure 8. However the time period for committing the funds and demands on public funds (APBN) is not clear, and Figure 9 combines available information from Bappenas and the BPJT program.

Figure 8: PPI Financing for Major Infrastructure 2009-2011

	Toll Road	Electricity	Water	Ports	Airport	Rail	Housing
■PPP	84	67	30	17	11	39	72
■APBN	12	42	7	7	9	16	12
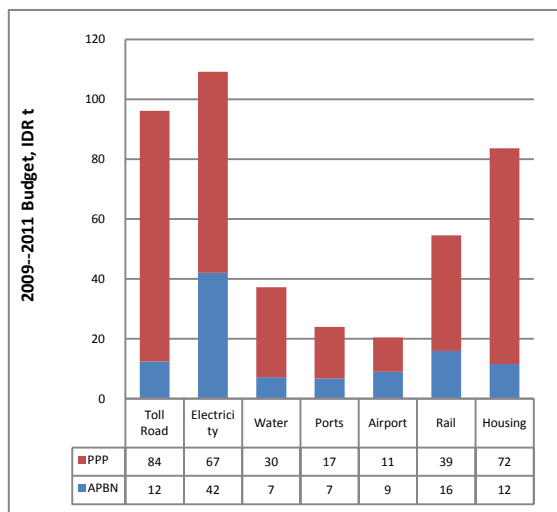
Figure 9: Expressway Financing Requirements for 2010-2024 Program by Commitment Year

■APBN ■PPP+APBN ■F05 ■F10 ■F15 ■F20   Fxx = xx Years to Operation
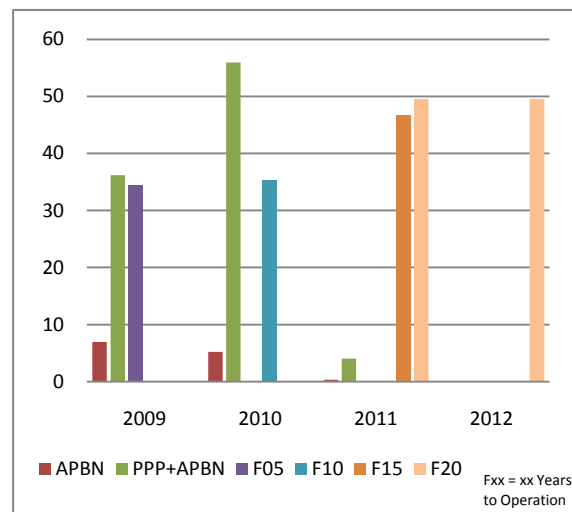
3.3.3 Review of Draft 2010 Program

The draft 2010 program prepared by DGH is summarised in Table 7 and some initial performance indicators from a brief analysis of the program are shown in Figure 10. The program is prepared for a baseline budget of IDR 16.2 trillion which is similar in size to the 2009 program. These draft 2010 figures are shown in the earlier Figure 3 for comparison with the 2005-09 data, which shows for preservation the output and cost being similar to 2009 but for development the output is lower and the average cost is higher.

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[11] In 2005-09 the Suramadu Bridge was built for a cost of IDR 3.5 trillion.

Table 7: DGH Draft Program 2010 & Related Costs

Activity	Output				Budget	Average Costs	
Sub-Activity	Functional		Effective		Total	Task	Program
	km	m	km	m	IDR b	IDRm/km	IDRm/km
Good Governance					**465.0**		**14.2**
Emergency Reconstruction					**31.0**		**0.9**
Preservation R&B	**32,700**	**83,451**	**1,862**	**13,944**	**6,535.6**	**3,510.0**	**199.2**
Road maintenance	32,455		5		1,504.1	46.3	
Road periodic	245		1,857		3,923.3	2,112.7	
Bridge maintenance		83,331			104.9	1.3	
Bridge periodic		120		13,944	576.9	41.4	
Preservation services					426.4		
Development R&B	**113**		**1,555**	**5,003**	**9,140.9**	**5,878.4**	**278.6**
Road construction	113		1,422		6,025.8	4,237.6	
Vertical structures				4,511	974.7	216.1	
Expressway			5		400.0	80,000.0	
Strategic road			128		442.1	3,453.9	
Strategic bridges				492	65.6	133.3	
Development services					1,232.7		
Program Total	**32,813**	**83,451**	**3,417**	**18,947**	**16,172.5**		**492.9**

Figure 10: Analysis of DGH Draft 2010 Program

(a) Budget and Output

(b) Network Coverage (% national road length)

(c) Budget allocation, IDR billion

(d) Network Average Program Costs (IDR million/km)
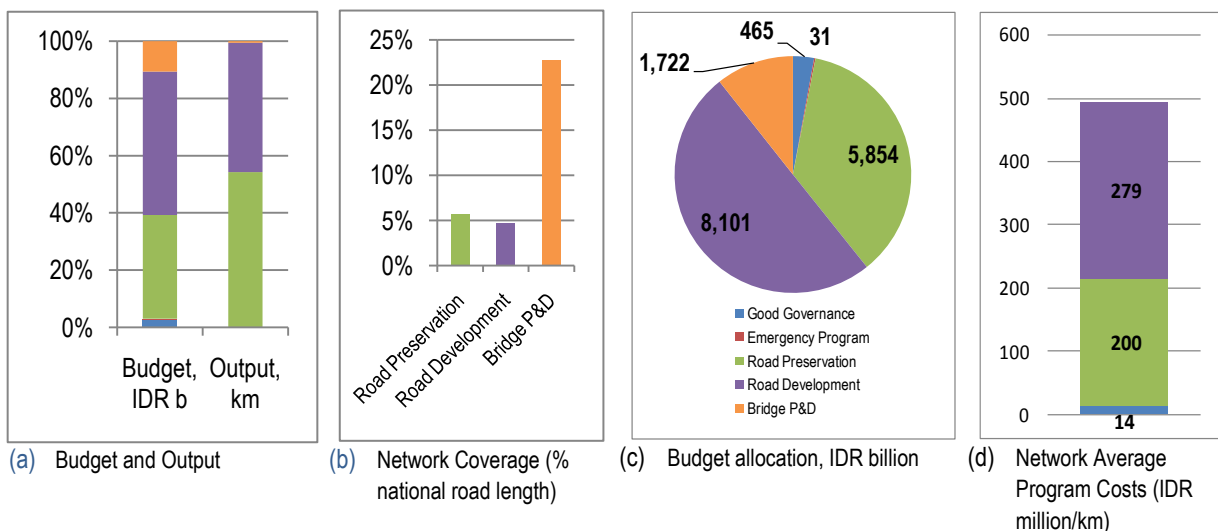
For Preservation, the periodic maintenance average cost of IDR 2.1 million/km provides for a reasonable mix of simple resurfacing and structural rehabilitation, but at a coverage of 5.5 percent of the network it can address only about one-tenth of the defective roads. This means that it must be prioritized well and must achieve high quality and longer life than in the past in order to stabilise the

condition of the network. By comparison the allowance for routine maintenance of about IDR 46 million/km is very generous and considerably higher than the international norm, which is typically less than one-half of this level. This assessment depends very much on the types of works included in the routine maintenance, and the costs will be higher if there is a high level of asphalt patching and repair of pavement failures. If this is the case, then special attention is needed to make the maintenance program as efficient as possible – through competitive and performance-based implementation. In this respect, more attention should be given to eliminating force account works (by provincial agencies) and to introducing performance-based contracts, with a target of reducing the routine maintenance cost to under IDR 30 million/km and improving performance.

For development, the output is lower and the average cost higher than in 2009, primarily because the proposed 2010 program includes construction of part of the Medan-Kualanamu expressway and some 4-lane widening of trunk routes, which both have much higher average costs than single carriageway development. This increased focus on divided highways and dual carriageway facilities is generally appropriate, given the capacity demands noted in the earlier discussion. However it highlights two issues – first, the need for a carefully prioritized and optimised program of capacity expansion covering the main transport corridors that optimises the capacity and standard of facility (4-lane v. expressway) and, second, the need to present the development output in terms of road space, i.e., lane-km, when discussing and evaluating the efficiency and effectiveness aspects of the program.

For bridges, the output allocation of 13,944 lin m for periodic maintenance and 4,511 lin m for development represents a coverage of 33 percent of the unstable condition bridge length, if all allocated to those critical assets, and a 5.5 percent coverage overall. Since bridge condition remained at the level of about 82 percent stable from 2006 to 2008, and those in critical or collapse condition (including crossings lacking a bridge) declined by only 0.9 percent (from 17.7 to 16.7 percent) over those two years, some attention is needed to ensure the prioritisation of the bridge preservation and development program in relation to traffic demand, safety risk and vulnerability to natural hazards.

Special parts of the development program include about 12 percent for urban congestion relief by the construction of flyovers, 6.4 percent for strategic roads and bridges, and 5 percent for the expressway program. This means that the bulk of it, 76 percent, is allocated to the capacity expansion and new road program on the arterial road network.

The program shows clear signs of being consistent with the emerging RPJM2 strategy. However it is also apparent from discussions with Bipran staff preparing this program that they lack tools for processing and prioritizing among the numerous needs and the various objectives and sub-programs, and for forecasting the outcome of the program. While a road management system such as the IIRMS was intended to assist with this programming task, in practice the system is not workable at the level of detail required. Thus the method applied is essentially a spreadsheet-based allocation of funds and outputs to manually selected projects meeting the RPJM2 plan's objectives.

3.4 REVIEW OF RENSTRA & RPJM2 2010-14 PROGRAM

The medium-term plan (RPJM) and draft strategy (RENSTRA) for the next five-year period are produced at the line ministry level, i.e., MPW, though each sector has a distinct plan. The RENSTRA identifies the strategic objectives and gives guidance on the composition of the program in the medium five-year term. The strategy and plan were being drafted during the course of this study, so early findings of the previous section provided input to DGH in finalizing the plan. The following therefore updates the early work and is based on the RENSTRA approved in February 2010.

The Strategy of the Ministry of Public Works includes the Vision, Mission and Objectives in Table 8.

Table 8: Ministry of Public Works Mission & Strategy for 2010-14

Vision:
Adequate public works infrastructure based on regional development.
Mission:
Develop and stabilise the condition of public works infrastructure with maximum effort based on the spatial plan.
Objectives:
1. Improve the quality of planning and of controlling land use to achieve sustainable development (including adaptation and mitigation of climate change);
2. Improve the reliability of public works infrastructure networks to increase competitiveness, food security, energy security and national economic growth;
3. Improved quality of human settlements, coverage of basic services, and community participation in the public works sector for improvement of social welfare;
4. Increase development of strategic areas, under-developed areas, and disaster-prone areas to reduce regional disparities (sector integration based on a regional approach); and
5. Optimise the roles and performance accountability of staff for improving the effectiveness and efficiency of public infrastructure services.

For DGH, the strategy for RPJM2 is structured around four main business areas of DGH and their related functions, and three strategic objectives linking to the Long-term Plan and Spatial Plan:

Business Areas	Strategic Objectives
• Regulation (*Pengaturan)*	• Economic Growth
• Facilitating (*Pembinaan)*	• Social Welfare
• Developing (*Pembangunan)*	• Environment and Safety
• Controlling (*Pengawasan)*	

Some consideration is being given to alternatives for restructuring the organisation based on these views. However, more fundamental reform that could separate the functions of policy and regulation from implementation is also being considered, including examples such as South Africa where the implementation function has been established as a corporate entity (see Annex C).

The strategic issues regarding the road network identified by MPW and DGH include:

1) Accessibility requirements to remote, isolated regions, border areas and islands; mobility requirements to developing regions including major cities and trunk routes; and accessibility requirements to production and industrial centres and transport nodes; and

2) Maintaining functionality and avoiding closures of roads; good land acquisition procedures for road widening and new construction; road safety and environmental impacts; regulation and clarification of rights, responsibilities, risks, etc; funding system and patterns of investment in the road sector; general management of regional roads; citizens' role in road management; organisational and institutional issues.

The Vision, Mission and Policies identified by DGH for 2010-14 focus on improving accessibility at the regional level, improving mobility, and improving implementation of the program in respect to safety and environment, transparency and accountability, performance of regional roads, and community and private sector participation, as summarised in Table 9.

Table 9: Draft DGH Mission & Strategy for 2010-14

DGH Vision: Achieving Reliable Road Networks
DGH Mission: 1. Improve regional accessibility to enhance the improvement of social welfare.   2. Improve the mobility of people and goods in support of regional economic growth.   3. Implement road management with better safety and environmental effects.   4. Conduct management of the road program with transparency and accountability.   5. Improve the performance of road management in general for better regional roads.   6. Improve both community and private sector participation in road management.
Policies: 1. Improve level of accessibility: *In border areas, remote and isolated areas; the outermost islands; and for production centres, distribution nodes; activity nodes and outlets.*   2. Improve mobility of goods and people: *Through preservation of existing road network in good condition; widen roads with sub-standard width; widen and add lanes to roads needing additional capacity; construct urban ring roads; construct toll roads; construct major and minor regional routes; and construct tunnels.*   3. Carry out road program with improved road safety and environmental consideration: *Reduce number of accident risk locations; apply environmental and road safety guidelines to road management process.*   4. Carry out road management in an orderly, transparent and accountable manner.   5. Improve performance of road management regarding regional roads.   6. Improve the roles of the community and private sector in road management.
DGH Program and Main Performance Indicators 2010-14:   **Program:** Road management   **Business:** Achievement of reliable road networks   **Targets:** 1. Improved accessibility for supporting regional development; and   2. Improved mobility of people and goods for supporting economic growth.   **Main Performance Indicators - Outcomes:**   1. Functional national road network in stable condition over 95 percent coverage; and   2. Connected and functional national trunk routes with minimum standard 6-m width and stable condition over 100 percent coverage.

The program and resources proposed for implementing this road infrastructure strategy (RENSTRA) for 2010-14 are presented in **,** which includes a comparison with the planned and actual achievement of the 2005-09 plan. Detailed tables are presented in Annex D, covering the main five-year matrix in Table D.1, the Activity details in Table D.2, and an analysis of average output rates and output costs in Table D.3.

The total budget proposed of IDR 148 trillion, nearly IDR 30 trillion/yr, represents DGH's estimate of moderate priority program, which is 83 percent more than the current allocation for 2010 and 150 percent above the average for RPJM1. The allocation of the overall budget and related output is shown graphically in Figure 11 (a) and (b). The proposed output leaps to 8,666 km/yr from 4,400 km/yr in RPJM1, and comprises 4,415 km/yr of road preservation, 3,851 km/yr of road widening, and 446 km/yr of road construction (including urban highways, strategic roads and expressways). A breakdown of the road budget and program, in Figure 11 (c) and (d), shows that the preservation and development outputs would cover about 21 percent of the network each year and that half the budget would be allocated to road widening. The structures program would also be large, comprising 24,600 m of bridge rehabilitation, 6,140 m of bridge and flyover construction and 160 m of tunnel construction annually.

Table 10: Comparison of RENSTRA 2010-14 with RENSTRA 2005-2009

PARAMETER	2005-09			2010-14		2010 DRAFT
	RENSTRA	ACTUAL	ACHIEVED %	RENSTRA	COVERAGE %	
DGH Budget, IDR trillion	65.7	55.98 +		148.4		16.4
OUTPUT:						
Road Preservation, km	175,484	179,028	102	148,247	400%	32,415
Road Rehabilitation, km		5,752		22,076	59%	1,014
Road Construction, km	7,666	6,161	80	19,407	52% + 8%	959
Bridge Preservation, m	976,116	367,282	38	554,941	301%	69,041
Bridge Rehabilitation, m				47,980	26%	11,046
Bridge Construction, m	32,079	53,265	166	26,670	15%	4,149
ASSET STATUS (End of Period):						
Expressway, km		714				
Highway (4LD), km		1,177				
Medium road (7 m), km		3,626				
Small road (5.5-7 m), km		18,613				
Sub-standard road, km		11,212				
National roads total, km		35,342				
Bridges, lin m		183,875				
ASSET CONDITION:						
Lane capacity, lane-km		84,985		104,702		
Stable condition, %		82		95		
Paved asphalt, %		85.4				
Unpaved gravel, %		10.3				
Unpaved earth, %		4.3				

Sources: DGH files 10 February 2010 (Bipran)
Notes: Coverage based on 2009 actual network shown in plan.

The scope of the budget is tremendous, and key points include:

- *Acceleration of expressway construction:* An expenditure of IDR 1.7 trillion/year on toll roads is planned to increase the output to about 140 km/year. In addition, there would be IDR 0.85 trillion/year spent on about 30 km/year of new interurban and urban highways and about 2,450 m of flyover. The allocation for toll road construction however is only about IDR 12 billion/km (including budget for land) or 20 percent of the construction cost so that substantial dependence on private sector investment will remain. Most of the funds are designated for three major projects totalling 146 km (Solo-Kertosono and Bandung Intra-urban in Java, and Medan-Kualanamu in Sumatra) plus land costs for another 443 km.

Figure 11: Allocation of Budget and Outputs in DGH RENSTRA 2010-14
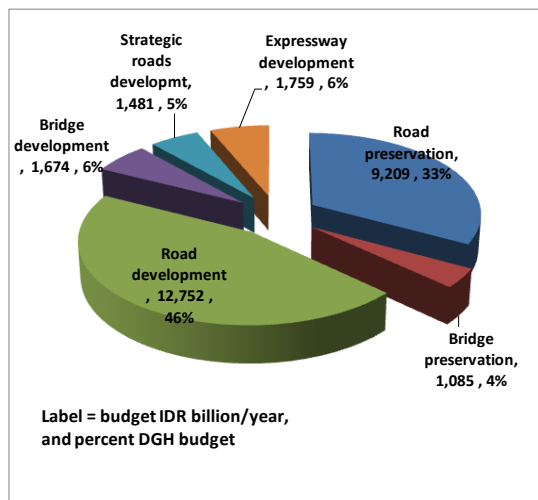
(a) RENSTRA Budget Allocation by Activity
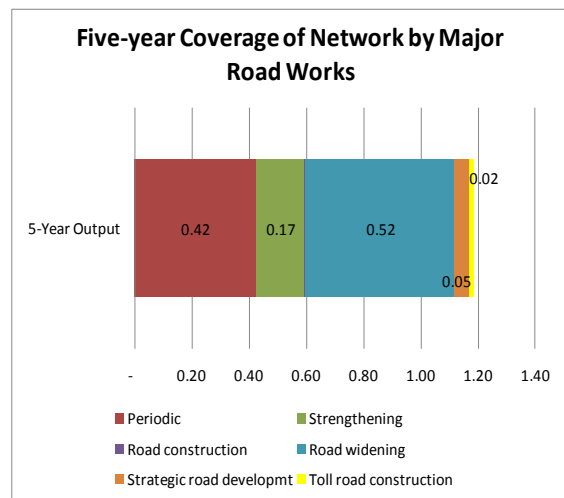
(b) 5-yr Coverage of Road Network by Major Works
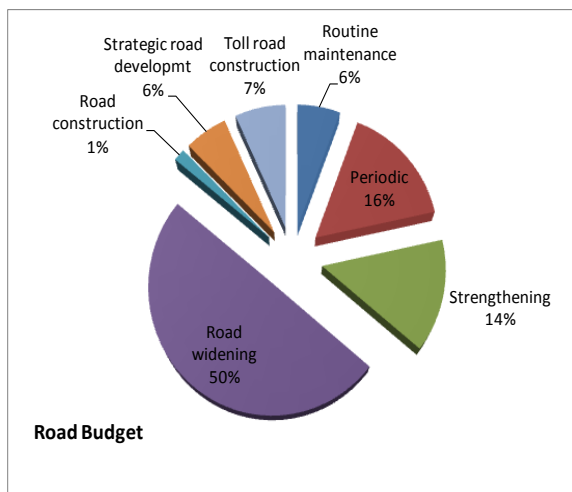
(c)   Allocation of Budget for Road Sub- activities
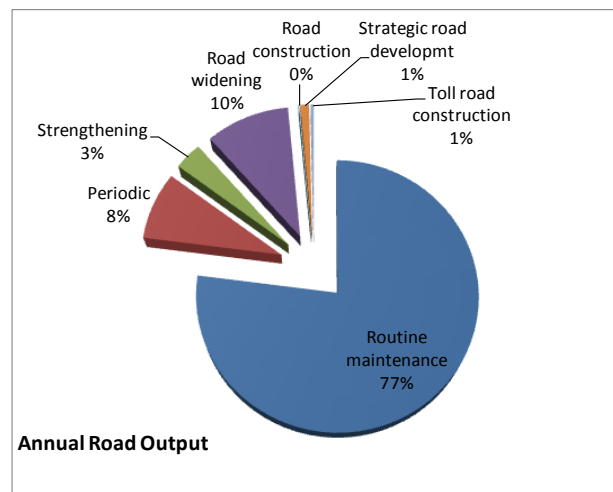
(d)   Annual output of road sub-activities
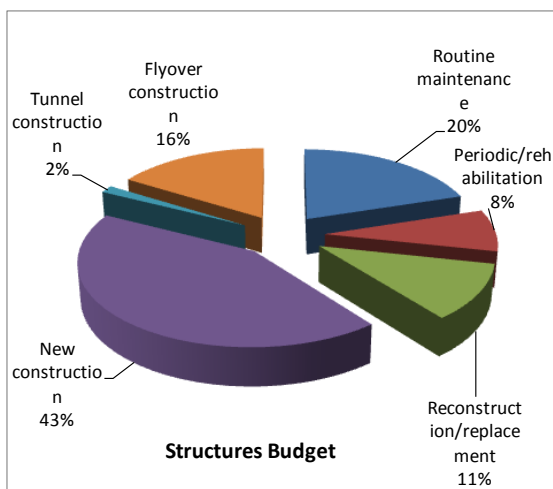
(e)   Allocation of Budget for bridge sub-activities
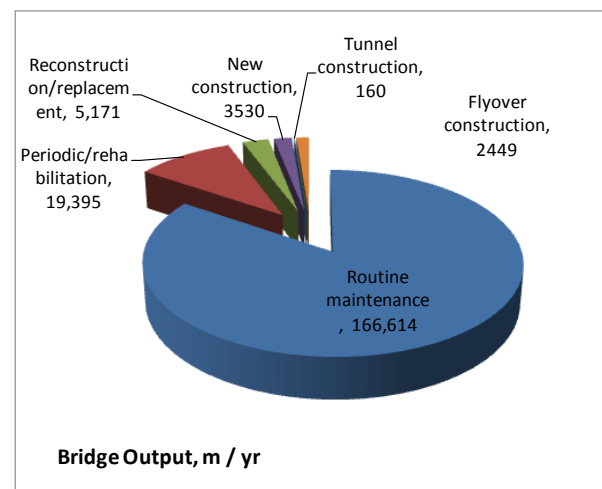
(f)   Annual output of bridge sub-activities

- *Substantial increase in allocations for road and bridge preservation:* The allocations to provide coverage of about 12 percent of the national road network and 15 percent of the national bridges with periodic maintenance, rehabilitation and strengthening annually would be ample if the expected life from the works is at least eight years. This portion of the program has strong potential for improvements in efficiency and effectiveness.

- *The primary focus is on road widening.* The core of the program, costing IDR 12.7 trillion/year or half of the road budget, is an expansion of the trunk road program, including widening of the present east Sumatra trunk road corridor and the new south Java trunk road corridor, adding about 4,000 lane-km of road space each year. The cost is also high, averaging IDR 3.3 billion per lane-km (USD 330,000/lane-km) so it is very important that this intervention is justified as the most economic means of supplying additional capacity, not only in the short term but also in the medium and long-term (see section 4.2).

- *There is substantial focus also on strategic roads.* The budget provides IDR 1.5 trillion/year for building, upgrading and maintaining 400 km of strategic roads, but this is at a very high cost of IDR 5.4 billion/km which is typical for building a new 7 m highway. A high priority should be placed on making efficient use of these funds, by building the road facilities to modern standards of alignment, structural capacity, drainage and safety, to the extent that these are economically and socially justified.

Within this program however there are also some key areas for concern that should be reviewed in more detail by Bina Marga, e.g.:

- *The entire national road network would be covered by major works during the five-year period.* When the outputs from periodic maintenance, rehabilitation and reconstruction (road preservation), and road widening are added over the five-year period, they total 110 percent of the length of the national road network, see Figure 11 (b). This would be neither an efficient use of funds nor good management of the network. Such a major program is also counter-intuitive considering the relatively good initial condition of the network, with 88 percent in stable condition. Continuation of such policies would imply that the economic life of the road works is no more than 4.5 years, instead of the expected norm of 10-20 years. While some of this would undoubtedly reduce the backlog of rehabilitation needs, the funds could be used more efficiently by focusing on a program of **road renewal**, where widening and strengthening needs were both addressed at the same time. This approach would progressively modernise the road structure and overall functional standard comprehensively in priority corridors, and would require a plan that would sequence the work along the corridors until completed.

- *What is the optimal investment for increasing the capacity of the national road network?* The DGH strategy of widening the regional trunk routes to multi-lane divided highways is clear and continues in RPJM2. The capacity benefits from this strategy are likely to be short- to medium-term in nature, however the long-term benefits from accelerating development of the expressway network are likely to be greater. A separate analysis of the overall network needs suggests that the basic preservation needs can be met with a budget in the order of IDR 15-17 trillion/year, so the balance of IDR 13-15 trillion/year could be devoted to investment in modernizing and adding capacity to the network. The budget provides this level of development allocation, but more could be allocated to the long-term investments such as expressways.

The methodology used by DGH to prepare the draft five-year plan includes use of the computerized road management system IIRMS, which conducts a simulation forecast of life-cycle economic costs of road work needs over a 10-20 year period based on the road inventory, road condition and traffic usage, for an estimate of the preservation program on the existing network. The use of IIRMS however appears limited to an estimate of overall resource requirements in an unconstrained budget scenario, whereas the preparation of individual annual programs, designation of treatment and allocation across links or provinces, is made using more manual spreadsheet-based techniques

extrapolating from previous programs. In this instance, the final version of the RENSTRA has indications that it used a norm-based approach to reach certain percentage coverage targets for the preservation program, and then these were scaled back in line with reduction in the overall fiscus available to DGH.

What appears to be lacking is the kind of analysis and master plan that shows how all the needs in these corridors and for the stated strategic objectives have been evaluated and prioritised. Thus the prioritisation and adjustments of the program to any variation in the fiscal envelope for the road sector will also be essentially ad hoc, even though these may be within the stated strategies and objectives. For example, the decisions on allocation between an expressway and trunk route in the same corridor, and on the design approach to width standards and realignment, are also likely to be made individually on a project design basis rather than through a trade-off or optimization based on overall traffic demand forecasts.

3.4.1 Prioritisation for Alternative Fiscal Envelopes

To date, there has been no attempt to make a comprehensive zero-base budget estimate as the basis for a Baseline budget (in South Africa the government required a review to exclude unnecessary costs from the baseline, including technical options, operations management, staffing, overheads, etc.). The baseline has been adopted as the 2009 budget of IDR 16.3 trillion, and the original DGH proposal for fiscal envelope alternatives of 30 percent and 110 percent increases over the Baseline estimate are shown in Figure 12. Their strategy would first raise the preservation program by 65 percent under the moderate fiscal scenario while holding the development program to a 7 percent increase; and then would pump further resources almost entirely into development, up by 130 percent in the 'optimal' scenario. Although this review has noted that the current levels of preservation program are barely adequate to cope with the rate of deterioration of the network, improvements to the efficiency and effectiveness of the preservation program should take priority before the allocation of substantially more resources. Subsequently the Moderate scenario was raised to IDR 31 trillion and the Optimal scenario to IDR 37.6 trillion (IDR 188 trillion over five years).

From this review, the primary need for additional resources appears to be the demand for additional capacity, especially in the long-term for high-capacity trans-regional corridors. Although the expressway program is relatively expensive to deliver, the timeframe for delivery is also long, and the more that can be done to accelerate the expressway program, the more likely the program is to meet road transport demand over the next ten years and more. Detailed analysis is needed to determine the tradeoffs between accelerating the expansion of the regional trunk routes and the expressway in the same corridors, but the pace of demand seems likely to require the expressway capacity within the ten year timeframe it will require to deliver the main expressway program (see Chapter 4). On this basis, the priority of the development program for the moderate fiscal scenario deserves further review relative to the preservation program allocation.

Figure 12: Fiscal Scenarios in DGH 2010 Proposal
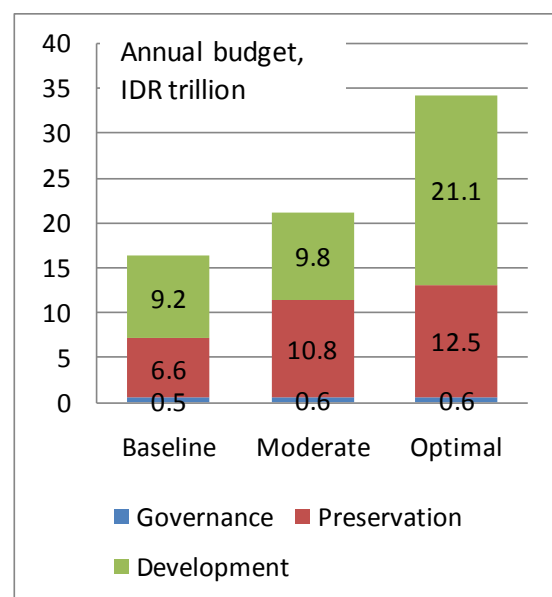
3.5   APPLICATION OF MTEF TO THE DGH PROGRAM CYCLE

As DGH has already been using a multi-year approach to planning, and has a number of multi-year contracts, the transition to multi-year budgeting could be relatively smooth. Although the IIRMS road management system produces multi-year program recommendations at a road link level, in reality the system has not been used for the more detailed preparation of multi-year programs. This has been due in part to resistance to a fully prioritized reallocation of budget across provinces, and in part due to the credibility gap between an average treatment need generated at a road link level to the more detailed treatment needs produced by a project-level design. The system has however, provided a strong database of asset inventory and condition which has supported all the analysis and presentation of program allocations. On this basis, Bipran tends to have prepared the programs with considerable bottom-up input from the provincial level, collated and adjusted manually through spreadsheet tools to generate the budget estimates and the detailed list of project packages which form the basis of the one-year budget and program (DIPA). An extension of this manual approach is being used to produce the multi-year programs for 2010-14.

A second issue is the lead time required for conducting detailed investigations and design for major activities such as rehabilitation, reconstruction, road widening and new construction. In the single-year approach, there has been a risk to the quality of design arising from late insertions or changes to the program or reallocations of budget for such projects, and the consequent reduction in time for project preparation. A major advantage of the multi-year approach will be the greater certainty with which the forward program of investigation and design can be planned and conducted, and the enhanced quality that could result.

The current program and budget preparation cycle, which is similar across all public funded sectors, is shown in Figure 13, together with typical project implementation cycles for single-year and multi-year projects. Projects are identified in the first two months of the year, based in part on the results of the management system and road survey, and then proceed through a series of consultations and reviews at regional and then national levels, leading to preliminary design and project preparation in the period June-October, and agreement on the program in the Satuan 3 document in October. The schedule shows the pressure that can arise on the implementation of single-year projects if there are delays in either the approval of the DIPA or in the procurement of a contract, which can reduce the time available for implementation down from about nine months to four months.

Figure 13: Program Cycle for Road Sector Adapted to MTEF Approach

No.	BRIEF	ACTIVITY	Y0 - CURRENT YEAR	Y1 - BUDGET YEAR	Y2	Y3	Y4
			1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12			
		PREPARATION - Program, Budget, Project					
0	Survey	Network surveys					
1a	IIRMS	System-based network program					
1b	Asset	Update Asset-level program					
2	RENJA-KL	Indicative budget MOF					
3	KONREG	Regional consultation & inputs					
4	RKP	National consultation draft work plan					
5a	Design	Design of committed projects					
5b	RKA-KL	Project design, Socialization					
6	RAPBN, NK	Budget Note, Draft APBN					
7	RDP DPR-RI	MPW meet V-DPR on RAPBN					
8	Satuan 3	Agreed program, budget					
9	PP APBN	Decree on APBN allocation					
10	SIP, DIPA	Detailed project commitment					
		PROJECT IMPLEMENTATION					
11	SK-PPK	Appointment of PPK project mgr					
12		Establishment procurement ctte					
13a		Procurement					
13b		Procurement committed projects					
14		Implementation					
15		Handover & Evaluation					
16		Performance evaluation					
14a		Multi-yr proj implementation					
15a		Multi-yr proj evaluation					

There is no indication that the official schedule would change with the application of MTEF to the budgeting process. For the road sector, DGH could take the opportunity of making slight modifications to the process in three steps that would help to improve the forward estimates for a multi-year program, shown in the diagram by sub-steps as follows:

- **Step 1b** - Assist the stage of project identification by analysing treatment options for all segments of road in a corridor or along a regional route covering a 3-5 year forward period, and optimizing these to meet the required budget constraints and performance targets, including minimizing life-cycle costs. This task, currently done manually project by project, could analyse treatment and timing options at a preliminary design level, and manage and present all the performance data along a route or in a region – which would also be very helpful to the consultation process. There seems to be a case to develop a new asset-level management tool to facilitate this process.

- **Step 5a** – With the identification of both single-year and multi-year projects two or three years ahead, there is the opportunity to schedule field investigation and design for the projects well in advance, so that the best quality can be assured and the design teams will be able to better manage their workflow. Thus design activities can be conducted throughout the year, especially for committed projects being implemented one-two years in the future. This would be in parallel to the regular schedule for preparing more standard projects like periodic maintenance from June-October.

- **Step 13b** – The advance commitment of projects will also provide an opportunity for beginning the procurement of committed projects earlier in the cycle, when the project design and bidding documents have been prepared in advance – provided only that the award of contract can only be made after formal approval of the budget (Step 10).

Not shown in this cycle is the modification that will be required to Step 5 requiring the reporting of performance results against targets in the RKA-KL document. This disclosure of performance indicator results is a key part of the performance-based budgeting approach, and uses the PI status at the beginning of the current year Y0 to support the budget request for Y1 and beyond.

3.6   PERFORMANCE-BASED BUDGETING STRUCTURE FOR DGH PROGRAM

Under recent formats for public expenditure reporting, DGH has been monitoring and reporting performance indicators over the past five years. Sector performance has been measured in terms of output indicators from contract reports and disbursement reports made through the Bipran unit responsible for monitoring and evaluation. The Lakip Report, which has been published each year since 2006, is prepared for each Directorate and then aggregated into a DGH report. The output and disbursement of each project has been reported in a DGH system SiPP, which is accessible on the internet through password controls.

The 2010 requirements for performance-based budgeting (PBB), outlined in Chapter 2, place more emphasis on the linkage between outputs, outcomes and impacts in order to establish a more tangible linkage between policies, resource allocation and development results and to establish accountability for achieving those results. At the same time, line ministries and agencies are being encouraged to identify opportunities for organisational reform (*reformasi birokrasi)* that would improve their efficiency and effectiveness in achieving the results.

In the present review the draft statements prepared by DGH, summarised in Table 8 have been reviewed against the issues and needs faced by the sector identified in the preceding sections. In view of the reform objective, the team has rethought aspects of the sector strategy and mission, as well as identifying suitable performance indicators, which would address these issues and aim to improve the efficiency and effectiveness of resource use in the sector. The views presented in the following sections have been developed out of discussions with DGH staff and represent substantive inputs to formulation of the performance-based budget structure for 2010-14. It is intended that they would assist in developing consensus on the formulation.

The key findings on the issues and past programs in the sector which should be addressed in the formulation of the strategy and program, include:

(a) **The urgent need to enhance trans-regional and metropolitan mobility:** With the rapid growth in road transport and the demands for competitive economic growth, the provision of high-capacity road infrastructure for trans-regional travel and intra-urban travel in the metropolitan centres within the next ten years emerges as the top challenge facing the sector. This will require (i) substantial acceleration of provision of the expressway network (from the recent 14 km/yr and the currently processed 80 km/yr to over 150 km/year), and (ii) efficient multi-year allocation of resources between regional route development (which will service traffic demand in the immediate 5-10 year term) and expressway development in the same trunk corridors (which will take at least ten years to develop).

(b) **A need to improve the efficiency and effectiveness of the preservation program**: The recent and current allocation of resources to the road preservation program has been strong (at IDR 200 million/km/yr or USD 20,000/km/yr this is high relative to many other countries) and the condition of road infrastructure is fairly good; however, the outcomes indicate that the program is barely compensating for a fairly high rate of deterioration in the network. There is need to increase the efficiency in the use of available resources (both in the cost of treatment and in the life-cycle, or average medium-term, cost) and to improve the effectiveness (through improved quality, enhanced performance and extended life) of the preservation activities. These imply the need to review the current simplified design approach for preservation treatments, with its inherently short design lives, and other aspects.

(c) **A need to improve the effectiveness of the development program:** The current approach of incremental widening of roads in the betterment program, while yielding short-term benefits, is both expensive in life-cycle cost, and in the long-term may have missed opportunities to improve the alignment and average travel speeds. A more comprehensive approach to road renewal, with

redesign of alignment and pavement and bridge structures, would provide more optimal use of resources in the long-run and improve the capacity of the road system in the long-term to cope with the rapidly rising demand for road travel.

(d) **A need to identify performance measures of quality and cost, and to extend accountability for sector performance to the work units at activity and sub-activity level:** An important aim of the PBB policy is to achieve better 'value for money' from public expenditures – improving the quality and performance of the outputs at the same time as controlling or reducing costs. Since the work units implementing the activities have the primary influence over achieving value for money, it is therefore important that their efforts to achieve improved value and reduced cost be measured and recognised.

In the following sections the team's views on performance objectives and measurement are presented through the standard forms provided by MOF for presenting the PBB structure of the work program and budget.

3.6.1 Agency Level (Echelon 1)

The vision, mission and program indicators identified for DGH at the agency level are shown in Table 11. The vision includes a number of key words that reflect some key policies for the sector, compared to the very concise Vision given in Table 8. i.e., 'access' reflecting accessibility, 'integrated' reflecting an effective linkage between the hierarchy of networks and economic generators, 'reliable' indicating level of services provided to users, and 'sustainable' reflecting safety, environmental-friendliness and affordability. Furthermore these benefits will be available to beneficiaries throughout the country.

The Mission Statement reflects what are considered to be the three core business areas for DGH, rather than the six policy objectives listed as mission in Table 8. and these form the basis for defining strategic objectives and targets for the medium-term plan.

(a) *Improve major [trans-regional] road infrastructure to support competitiveness of regional and internal trade and production.* This reflects the challenge of the road system at the macro-level, providing for efficient safe transport across regions and between borders that will boost the competitiveness of trade and general mobility. In essence this raises the delivery of the expressway network and any supporting regional route network to a more visible level. Neighbouring countries such as Malaysia, China and Thailand have all had major national programs to rapidly deliver a fully-connected expressway network to link regions and serve as a backbone for road-based transport and trade. While there have been problems in delivering expressways in Indonesia, many of those problems have been addressed and there can be little doubt that delivery of this primary backbone for road transport for the 21st century should be the supreme strategic objective of the next ten years. Defining it as a key strategic objective and target of the medium-term plan will help get national policy and the necessary resource support for implementing it. Defining it as a trans-regional issue will allow DGH to develop optimal plans and make the necessary technical and economic tradeoffs between the expressway facilities and regional routes in the same corridors. The expressway network should be seen as the primary backbone, providing shorter distances, faster travel speeds, higher capacity for passengers and freight, and higher safety than the existing arterial network.

(b) *Improve quality and capacity of national arterial road network to connect remote and central regions.* Efficient management of the existing arterial network is the second and major business area of DGH. While the preservation of the functionality of the existing network will remain a priority, this must become more efficient and be balanced with a program for improving reclassified roads, upgrading strategic roads and increasing capacity of arterial roads that are chronically congested. While the preservation and developmental aspects of the arterial

network could be separated into two separate mission objectives, the combination in a single objective will help to ensure an economic balance between the two aspects. The strategic targets should be defined in terms of the coverage of required levels of pavement and bridge condition, and functional standards of width and alignment.

(c) Improve performance and accountability of central and local road agencies in providing sustainable and cost effective local road infrastructure. In response to a shift in emphasis from Sec Gen MPW and in view of the continuing generally poor condition of the regional and local road networks, the national responsibility of DGH to provide leadership and support to local road agencies for the management of regional roads is defined as the third important mission of DGH. It is envisaged that the guidance from DGH should extend beyond technical standards to include institutional and governance aspects relating to resource allocation, road management and performance management. Although DGH is not directly responsible for implementing the management of regional roads, the outcome and effectiveness of their guidance should be measured by the standard and conditions of the regional road network that results.

Table 11: Performance-based Program Structure (Echelon 1) – Directorate General of Highways

Unit Echelon I: **DIR-JEN BINA MARGA (DIRECTORATE-GENERAL OF HIGHWAYS)**			
VISION: Access to an integrated reliable sustainable road system is available nation-wide to support economic growth and social well being.			
MISSION: 1. Improve major road transport infrastructure to support and attract regional and internal trade and production. 2. Improve quality and capacity of national arterial road network to connect remote and central regions. 3. Improve performance and accountability of central and local road agencies in providing sustainable and cost effective local road infrastructure.			
CORE BUSINESS AND FUNCTIONS	**IMPACT & INDICATORS**	**OUTCOMES & INDICATORS**	**PROPOSED PROGRAM**
Core Business Formulation and implementation of technical policies for the development and management of road system infrastructure. **Function** 1. Formulation of technical policies for the sustainable development and management of road system infrastructure. 2. Delivery of sustainable expressway, arterial and strategic national road networks 3. Facilitation of local road agencies and monitoring the local road network for sustainable road system infrastructure. 4. Facilitation and promotion of private sector participation in investment and delivery of road services, with efficient use of resources. 5. Conducting business with good governance and transparency, with skilled professional staff and efficient administrative systems.	**Impacts** 1. Improved mobility of road transport between regions and national border. 2. Reduced freight and passenger travel costs for road transport. 3. Reduced fatalities. **Impact Indicators** 1. Trans-regional travel time (hr/100 km direct distance) [average of 4 main islands trans-regional] 2. Road fatality/10,000 vehicles or /100,000 pop.	**Outcome** Improved connectivity, mobility and safety on the national road network, with improved accessibility in strategic areas. **Strategic Target:** National trunk route roads improved to applicable service standards, over X percent of length. **Program Main Performance Indicators (IKU):** 1. Trunk and regional route roads meet or exceed 6 m width minimum standard, percent length 2. Road condition on national arterial roads is stable, percent length. 3. Expressway development projects defined and issued for preparation, length. 4. Strategic roads meet national functional standard and stable condition, percent length. 5. National arterial road links with unsafe performance (number links with > x fatalities/year). 6. Local road network (Province, Kabupaten, Kota) in stable condition, percent length.	Development and management of road system infrastructure.

Reflecting these various aspects in a single outcome is a challenge, but the following identifies the four key aspects, i.e., "*Improved connectivity, mobility and safety on the national road network, with improved accessibility in strategic areas*". Then targets are set for the individual aspects through the Program Main performance Indicators (PMPI). The first four define targets for each of the main networks – expressways, regional routes, arterial roads and strategic roads; the fifth defines a target for road safety, and the sixth defines a target for the support to regional road agencies. For expressways, given the long delivery period and especially pre-construction period, the best target would relate to length under construction; however, as this is not directly under DGH control, the measure proposed is the length defined and issued for project preparation, which is more upstream.

The aspect proposed as the DGH strategic objective for RPJM2 is the development of the trunk route network. Even though development of the expressway network is considered to have a higher long-term priority, the need for delivering an improved regional route network in the interim is recognised, provided it is balanced so as not to conflict with the expressway development. Delivery of expressway length in operation could be made the strategic objective of the BPJT.

The impact measures focus on the trans-regional mobility, where overall travel time over direct distance is proposed as the measure (hour/100 km direct distance). These would be reported for key corridors (e.g., Medan-Padang-Lampung; Merak-Jakarta-Surabaya; Ujung Pandang-Manado, etc.). This definition allows for direct comparison with other modes of transport as it is independent of the road alignment. Clearly it could also be inverted to the more familiar terms of speed (km/hour), although this could tend to be confused with vehicle speeds on the roads.

3.6.2 Work Unit Level (Echelon 2)

The main physical outputs of the DGH program, such as lengths of road constructed or preserved, are the activity output only of the Wilaya/Balai Implementation Directorates. In the cases where the activity provides an intermediate stage of delivering the final output (such as planning and programming, engineering design and supervision, etc.) the activity output is defined as 'advisory services'. The specific intermediate products – such as engineering design, contract procurement, land acquisition and resettlement plan, project supervision – are defined as 'activity performance indicators'. The output indicators identify the parts of the activity output which will be allocated budget and will be identified and monitored in the DGH Work Plan (RKA-RKL).

Some measures of quality and cost that can supplement the traditional quantity indicators, and some measures which are relevant to performance evaluation, have been included in the activity performance indicators. These attempt to address the findings of the review of the past programs (see Sections 3.3 and 3.4) and Bappenas/MOF comments on the line ministry programs. The details developed for each Echelon 2 work unit are presented in the standard MOF table format (format 1b) in Annex A and highlights are discussed below.

(a) **Bipran: Planning, Programming, Budgeting and Evaluation** (see Table A.2 in the Appendix): The focus of the core business of planning and programming is placed on the '*sustainable and efficient allocation of resources and related forecasting of performance*' which includes elements of quality and cost that are not directly mentioned in the activity and output names. The four key functions are shaped around (i) resource planning for all road networks; (ii) specific management of the national arterial and strategic road network; (iii) the development and operation of planning and information management tools to support decision-making; and (iv) performance monitoring and evaluation. The activity output is advisory services which are subdivided into three output indicators for budget management purposes, i.e., planning and

programming, monitoring and evaluation, and support to regional road agency planning functions.

The API focus first on the consistency of planning with the strategy and forecasts — the compliance between the MTEF and the five-year RENSTRA and between the current program baseline and previous forecasts. Second they attempt to define the economic quality of the program, through an economic benefit measure of the Program (e.g., percentage of program cost with positive net present value, or benefit cost ratio above a threshold value). Another measure 'average program cost' indicates annual spending per km which can be benchmarked against a target life-cycle cost, which is separated into preservation (basic management expenditure) and development (representing level of growth investment).

(b) **Bintek, Engineering and Technical Services** (see Table A.3.): The core business and functions remain largely unchanged, although it is proposed to include more emphasis on a responsibility for achieving higher efficiency and quality through the technical and engineering services. Under the current organisation, Bintek is responsible for establishing technical policies and overseeing their application, but not for directly implementing design and engineering work which is undertaken at the project level by the implementation directorates. One of the key conclusions of the program review, which is elaborated further in Chapter 4, is that significant savings in medium- and long-term costs of road management could be possible through changes in technical policies – from ones favouring lower initial costs and higher outputs, but shorter design lives – to ones which with higher initial cost and lower outputs deliver better performance and require less resources over the medium- and long-term. Thus, performance indicators include measures relating to life-cycle costs and the actual performance of the assets against the design life assumptions, which will serve as measures of the efficiency and effectiveness of design and quality management policies. Other indicators reflect policies on prioritisation, by monitoring the assets which are in critical condition, and monitoring the adequacy of project preparation (in terms of design process and attention to safeguards of land and environmental impacts).

(c) **Implementation Directorates at Wilayah and Balai Levels** (see Table A.4.): Under the current DGH organisation, the responsibility for all parts of project implementation and delivery – investigation, design, procurement and supervision - fall under the two Wilayah Directorates, but in a manner which is further decentralized to the *satkers* (work units) at provincial level (where the actual work is done) and which are placed under the guidance and coordination of the *Balai* level. The accountability relationship is further complicated by the direct accountability of the project manager to the Minister of Public Works for budget spending authority relating to the procurement and delivery of a specific contract.[12] Regardless of the roles and responsibilities of individual staff, the accountability for all aspects of project implementation performance has to be placed here under the Implementation Directorates of the Wilayah.

The output indicators identify eight sub-programs of works, which have been grouped by arterial roads, bridges and tunnels, strategic and reclassified roads, emergency works and engineering design and supervision services. The arterial road programs are further subdivided into development, preservation and (routine) maintenance, and bridges into development and preservation.

The quality, cost and efficiency elements are identified in the API. First, measures of delivery time can be made for each project phase (design, procurement, implementation, evaluation),

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[12] This organisation and its effects on performance and accountability are discussed in more detail in Section 4.4.

but the two selected for the API are 'average procurement duration' and 'over-run on original contract time' since these are critical areas of performance. In regard to cost, the APIs selected are the 'variance of original contract price from the engineer's estimate', which intends to monitor the competitiveness and level of market prices compared with the administrative norms. Since project scope is often adjusted to reduce it to within the budget if bid prices are high, the second API monitors 'achievement of original project scope' in percentage terms. Finally two APIs monitor aspects of project management (invoice payment performance) and private sector participation (coverage of routine maintenance by contract, v. by administration).

(d) **Binkot - Expressways and Metropolitan Highways** (see Table A.5.) - For Binkot, a stronger emphasis is applied to its responsibility for driving and guiding the overall expressway program as a primary part of core business and functions, as well as to the metropolitan highways, i.e., a focus on high-capacity, limited access highways and structures. The APIs would monitor a range of aspects such as the long-term plan and clear five-year program of specific expressway projects, the financial and economic aspects in comparison to demand, and a series of indicators of implementation progress of both expressway and metropolitan highway programs. The output indicators subdivide the program into expressway development; metro highway development, preservation and structures; expressway planning and engineering services; and metro highway engineering services.

(e) **BPJT – Regulating Agency for Toll Roads** (see Table A.6.) – The dual functions of regulating toll road concessions and facilitating new concessions to expand the expressway network are both recognised in the core business and functions. The output indicators reflect the four primary tasks of the agency, i.e., supervision of toll road services, administration of toll road concessions, opening of new toll roads, and the conclusion of new concessions. The APIs cover a range intended to measure the quality of the concessioning process, delivery of expressway assets against the strategic plan, average construction and land costs (to be benchmarked), and four measures of performance from a user's perspective – satisfaction of toll road service, travel speed, traffic safety level, and tollgate queue-delay.

Finally, to summarise these recommendations, the output indicators are summarised in Table 12 in the format used for summarising the DGH budget in MTEF format.

Table 12: Multi-year Budget Presentation Based on Outputs & Output Indicators

No.	ACTIVITIES / KEY OUTPUT INDICATORS	FOCUS PRIORITY	BUDGET			BASELINE FORWARD ESTIMATES			
			ACTUAL 2008	ESTIMATE 2009 MY	BUDGET 2010	2011	2012	2013	2014
1.	**PROGRAM PLANNING AND EVALUATION**								
KP-1.1	Planning and programming services								
KP-1.2	Monitoring and evaluation services								
KP-1.3	Regional road agency advisory planning services								
2.	**GUIDE TECHNICAL QUALITY OF PROGRAM**								
KP-2.1	Engineering design services								
KP-2.2	Technical standards and guidance services								
KP-2.3	Emergency works engineering services								
KP-2.4	Technical guidance and support to regional road agencies								
3.	**EXPRESSWAY AND METRO HIGHWAY DEVELOPMENT**								
KP-3.1	Expressway development, lane-km								
KP-3.2	Metropolitan highway development, lane-km								
KP-3.3	Metropolitan highway preservation, eff-km								
KP-3.4	Engineering services for expressway planning and implementation								
KP-3.5	Engineering services for metropolitan highway projects								
4.	**ROAD PROGRAM IMPLEMENTATION (by Wilayah and Balai)**								
KP-4.1	Arterial road development, lane-km								
KP-4.2	Arterial road preservation, eff. km								
KP-4.3	Arterial road routine maintenance by contract, km								
KP-4.4	Bridge development and preservation, eff.lin-m								
KP-4.5	Strategic and reclassified road improvement, eff. km								
KP-4.6	Emergency works, eff.km								
KP-4.7	Engineering design and supervision services, per contract								

CHAPTER 4: OPPORTUNITIES FOR ENHANCING PROGRAM PERFORMANCE

4.1   IDENTIFYING POLICY OPTIONS UNDER MEDIUM TERM BUDGET APPROACH

The review of the current network needs, as well as past and forward five-year plans, has identified four areas where there is potential for improving the performance achieved with the resources allocated to the sector, and which could form the basis for policy options and organisational reform options.

The policy option with the largest potential impact on resource allocation is the issue of trans-regional travel performance and, in particular, the alternative options for allocating resources to the expressway program and the regional route program. This choice depends mostly on the policies regarding long-term investment in infrastructure for the 21st century.

Two areas relate to the potential for gains in efficiency and effectiveness of resource use through changes to technical policies and mechanisms for implementing projects under the DGH development and preservation programs. The first relates to getting better 'value for money' through improving the performance and life achieved from the work program, and the second relates to improving the efficiency of project delivery and reducing implementation costs and times.

The fourth area involves transforming the modality of support for local or regional roads in order to achieve a significant improvement in the condition of the regional road networks.

4.2   TRANS-REGIONAL TRAVEL PERFORMANCE

There is an urgent need for a more systematic and long-term approach to investing in the expansion of network capacity to meet future road transport demand. With sustained national economic growth and the rate of motorization also likely to grow from the low current level, the already high rates of growth in vehicle fleet and traffic volumes are likely to continue over the next ten years at least and continue at some level well beyond that.

The means for providing this large increase in network capacity require strategic planning, economic prioritisation and substantial capital investment.

- *Strategic planning* is required because of spatial development and land use implications. The location of road infrastructure becomes quasi-permanent so current decisions shape future economic development and land use for generations to come, and the acquisition of land has strong social impacts and is usually politically sensitive. The planning implications extend 50-100 years.
- *A strong prioritisation approach* is needed because major construction projects take a long time to execute, from 5 to 15 years owing to the complex land acquisition, financing and contracting issues. Also there are usually intermediate lower cost options which may appear to be preferable in the short term but may not be economic in the medium- to long-term.
- *The investment costs are substantial* in relation to the national economy – potentially 2-5 percent of GDP and several times greater than the normal annual sector budget. They thus require special approaches to financial **resource mobilisation**, involving private as well as public sector finance and timing of capital flow, and to ensuring a **transparent and accountable use of funds**, since the risk of misuse is high and ultimately the public pay for the cost.

The major spatial challenge facing the road sector in Indonesia is providing trans-regional connectivity and urban mobility. Currently the time required for road travel on the existing network, across each main island and between island groups, is slow – road speed averages about 40 km/h in most corridors, but travel time between main economic centres is even lower, say 20-30 km/h (3-5 hours per 100 km) on a straight line distance basis because of the low-speed geometry of the network. Similarly, mobility in and around the metropolitan centres is constrained by high levels of congestion which has driven most of the investment in expressway development to serve the peri-urban demand.

There are two solutions to improving regional connectivity to the levels required to support economic growth and to spur the development of new economic hubs. The **intermediate option** is to increase the capacity of existing highways along the main corridors, widening the roads to 4 or 6 lanes as needed, dividing traffic flow where possible, and improving bottlenecks by intersection treatments at grade or constructing flyovers where justified. This solution has moderate cost and will usually be economically justified by the savings in traffic costs. However, it is always constrained by continuing pressure and social impacts from land acquisition and resettlement through built-up areas and is also constrained in the amount of realignment which is feasible. Consequently, this option can improve the road speeds to 50-60 km/h on a long distance average but eventually will be constrained as traffic volumes grow and congestion increases, which is likely to be fairly rapid as the roads are already in developed areas.

The **high level option** of constructing expressways as separate limited access facilities on a high-speed alignment will achieve road speeds of 100 km/hr and corridor travel speeds in the order of 80 km/h because they would also achieve a shorter travel distance. Ultimately this will be needed for regional connectivity and for trade to be economically competitive. Some Asian countries, such as China and Malaysia, have moved directly into building the separate expressway network to provide smooth fast travel connection between regions, like the United States of America and Europe have done. India opted to adapt its main highways to divided carriageways but now already faces the challenge of providing new full access-controlled expressway facilities as well.

The strategic issue for Indonesia in planning for inter-regional and peri-urban capacity expansion is how quickly to move on building the separate expressway network, given the difficulties and delays experienced to date as noted in Chapter 3. ***What is the appropriate balance between the intermediate option of widening key corridors in the 'regional route' programme and the expressway construction program*** (see Figure14)? Forecasts of traffic growth in the trunk corridors, given expected growth in motorization and economic activity, indicate that 4-laning on many parts will provide relief for perhaps up to 10 years but thereafter the separate expressway network would be essential. Figure 15 shows schematically how demand will out-strip the capacity of the intermediate option in the medium-term. With the lead time required for building expressways also being about ten years, the expressway program will need to begin now on a broader front than currently planned in order to be open in 10 years time.

Although the trunk route program provides temporary medium-term relief, it also causes two problems for the expressway program:

- It reduces the margin of benefits and profitability which can be achieved with an expressway by providing a moderately good alternative (i.e., postpones the time when an expressway becomes economically viable); and
- It diverts public investment funds from the expressway program.

Thus it is important to coordinate the investment in both facilities and analyse alternative resource allocation between the trunk route program and expressway program so that (a) the long-term

solution of an expressway is achieved as efficiently and as soon as possible, and (b) there is optimal use of public funds.

Figure 14: Trans-Regional Corridors for Expressways and Main Trunk Roads in Western Region

Figure 15: Trade-offs in Travel Speed and Traffic Capacity in Building Parallel Trunk Route and Expressway Facilities
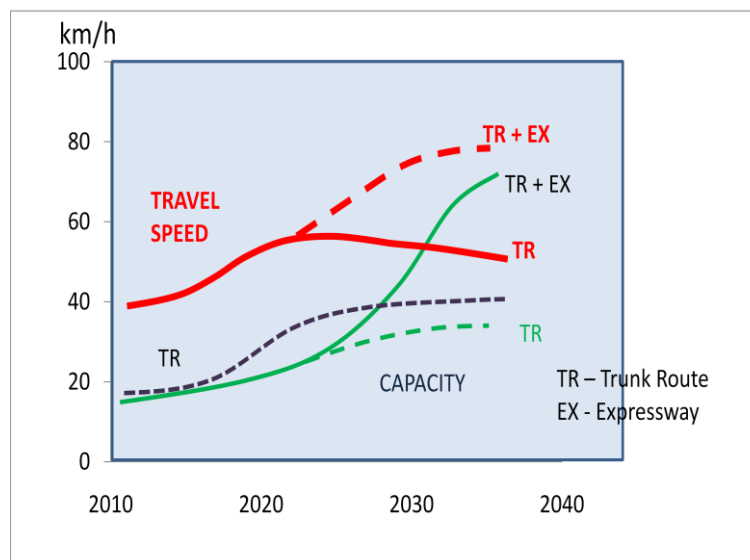
Special alternatives, such as the staged construction of an expressway, should also be considered. For example, in regions where traffic volumes are currently low (such as Kalimantan or Sulawesi) the construction of a new highway on the new alignment of a future expressway could be undertaken instead of repeated widening of the existing road on a low-speed alignment. This could yield the medium-term benefits of better regional connectivity through shorter distance and travel times, added traffic capacity, and easier land acquisition and resettlement. It would also facilitate the ultimate construction of the expressway.

Recommendation: *Conduct network analysis and feasibility studies in the regional corridors for trunk routes to determine optimal investment and construction strategies for the parallel expressway and national highway facilities.*

4.3   ENHANCING VALUE FOR MONEY

A key measure of the effectiveness of road management is the value achieved in terms of road life and performance for the money that is spent. For example, achieving say 50 percent longer life from the works for the same expenditure will lead on average to a 33 percent savings in long-term average budget requirements, i.e., 100/150 or 67 percent of the long-term average cost per km of network. Thus the reform objectives should include consideration of ways in which the effectiveness and value for money of current DGH programs can be enhanced. The two key ways of looking at this are through the design life and through asset quality and performance.

(a) **Extension of Design Life and Optimizing Whole Life Cost:** The whole life cost (WLC) of a road pavement comprises all the expenditures on the pavement during its lifetime: that is, the original construction cost, the resurfacing or preventive maintenance costs applied periodically and the annual routine maintenance costs applied until the structural capacity of the road pavement requires full rehabilitation in order to carry the forecast future traffic loading. The WLC may also be defined to include all costs up to the time when the functional capacity of the road has been exhausted and the road requires both reconstruction and capacity expansion. The annual average life cost of the pavement is therefore the WLC divided by the period between original construction and structural rehabilitation or, for existing pavements it is the WLC divided by the period between successive structural rehabilitations or reconstructions. The aim of effective road management is to minimise the average expenditure (AALC) for any given traffic level and standard of minimum performance.[13]

Currently DGH continue to apply a policy on design standard that was initiated in the 1980's in order to accelerate the improvement of the condition of the main road network. That design policy allowed short design lives of five years for preventive or periodic maintenance and 10 years for reconstruction or rehabilitation, and used the savings in expenditure to increase the annual output in length of improved road conditions. The policy was supported by the international lending institutions as a short-term measure, but it was anticipated that DGH would later resume the international design standards which are generally double those design periods, i.e., 8-10 years and 15-20 years for rehabilitation and reconstruction. Indeed a number of agencies overseas, especially those with very highly trafficked urban highways, are modifying procedures to achieve much longer design lives in the order of 30 years or more, notionally 'maintenance-free' pavements, in order to reduce the maintenance and rehabilitation requirements at a network level.

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[13] The absolute level of the cost rises with the traffic level, so at a network level a road management system optimises the total costs including road user costs.

The potential savings to be achieved in the AALC by doubling the design life is in the order of 25 percent. In order to double the design life in terms of years, the structural capacity has to be increased by about 200 percent (allowing for 7 percent annual growth) but due to the economies of scale involved in structural design this is achieved with only about 40 percent increase in equivalent construction cost (see Figure 16 - this factor ranges from 30 to 50 percent depending on various design assumptions). As the interval between major rehabilitations or reconstructions is doubled, and the annualized costs of periodic maintenance and routine maintenance are slightly reduced, the annualized cost of the long–life design policy is 25-30 percent less than the short-life design policy.

Figure 16: Impact of Raising Design Standard on Annualized Life Cost
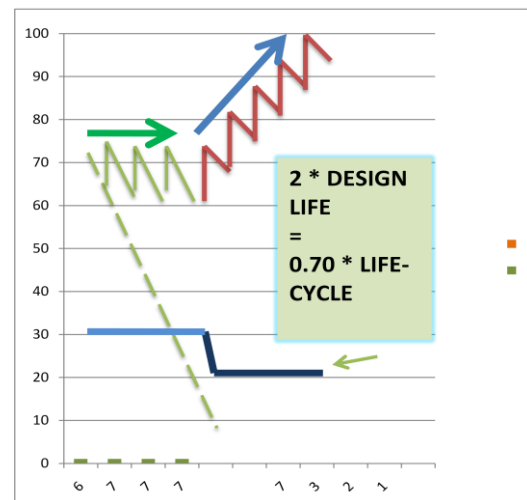
This policy proposal raised concerns that the average treatment cost would be 40 percent higher and thus implies that the output would be 30 percent less than under the existing policy. The financial savings would be achieved and noticed only in the medium- to long-term. Thus this policy would have to be presented to MOF and to the road user stakeholders in that way – as a means of reducing costs in the long term. A suitable performance measure for this policy is the residual performance period or residual capital investment period of the rehabilitated pavement – as the policy is implemented, the length of network with a residual performance period in the order of 20 years (instead of 10 years) would steadily increase, and would reduce the implied future budget requirements.

(b) **Improve Asset Quality and Performance:** The second means of improving value for money is to improve the quality and thus performance of implemented works so they achieve the full potential intended by the design and specifications. Indications from technical audit, supervision and anecdotal reports, as well as inference from the trend of road condition data over the past 5-10 years, imply that the performance of the implemented works may not be achieving the intended design life. Quality factors not addressed during supervision, such as inadequate preparation of weak spots, drainage or material quality, may only show up years later when the condition deteriorates to poor before the design life has been achieved.

The implication of even a 30 percent loss of performance in terms of life is an increase of 40-50 percent in annualized life cost of the road pavement and thus also in the future budget requirements.

Figure 17: Definition of Historical Life from Work History in Road Section Diagram

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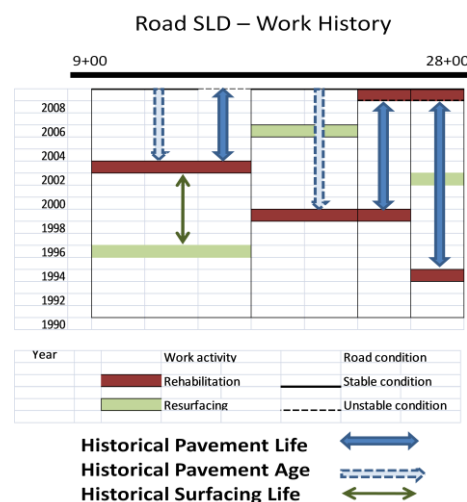
A performance measure for monitoring construction quality can be difficult to define because of the many different factors involved. However, a single general measure that could be used is termed the 'historical life'. Similar to the residual life indicator, but backward-looking instead of forward-looking, this is defined as the life of the pavement since the last major rehabilitation or reconstruction, or the age at which the pavement condition becomes 'poor' or 'unstable', whichever is less, as shown in Figure 17. The historical pavement life (HPL) could be calculated automatically if the work history, with years of the previous rehabilitation/reconstruction and resurfacing, is recorded for each road section – it would have a firm value when the current condition is 'poor' or worse, and it would have a lower bound value (e.g., historical pavement age) when the current condition is 'fair' or better. An indicator of historical surfacing life could also be recorded based on the time since the most recent resurfacing (thinner than a major rehabilitation).

The South Africa National Road Agency Ltd (SANRAL) uses pavement age, defined like the HPL, as one of its performance measures. They can report the percentage of their pavements which have exceeded the design life, and in fact have found that a substantial percentage (about 70 percent) have exceeded the design life by a substantial amount. The HPL indicator is in effect a retrospective proof of the quality of past work, but as expenditure programs continue in the future, it could provide useful comparisons of relative quality across the network.

4.4 ENHANCING WORK PROGRAM DELIVERY

The efficiency of road management is a function of the cost and time required for delivering the work program. While section 4.3 focused on achieving the most appropriate design and quality standards as a value and effectiveness issue, this section focuses on DGH performance in getting the right price for the work and managing the implementation process to complete the work on time and in budget. The objective is to deliver the works with the specified quality at the lowest final cost and within the programmed time. This study did not include detailed review of the implementation process, but it does identify the following three sets of indicators which could be used to the performance of work program delivery, and thus to identify weaknesses and to monitor improvements in work delivery performance.

(a) **Implementation Delivery Process:** The project cycle can be divided into four primary phases of execution – preparation, procurement, implementation and evaluation – as shown in Figure 18. The figure shows on the top line the various events regarding commitment and disbursement of funds, in the middle the timeline of project and contract milestones, and in the bottom line the primary function performed during each phase. For the monitoring to be reliable and transparent, the milestones between the phases have been selected from robust sign-off dates which are formal events in the project cycle, i.e., advertisement for invitation to bid (ITB), contract signing, provisional handover (PHO) and completion of the final performance evaluation report. Only the milestone marking the beginning of the cycle and the preparation phase presents some difficulty. We propose the event be termed 'project identification' – for capital projects this would be equivalent to the date on which the project is assigned for investigation and preliminary design, and for other projects this could be the anniversary date of the budget cycle which is typically 01 January each year.

Performance standards should be established for each of these phases, and it is likely that the projects may need to be categorized by size or type for this purpose, at least into small and large (e.g., one year and multi-year contracts). For the implementation phase, the performance base will be the contract period so that contract completion time is reported as percentage time over- or under-run compared to the original contract. Duration should be counted simply in

calendar days and performance can be reported in both calendar days and percentage of the norm or base. Exception reporting can also be used, such as the number and value of contracts exceeding 20 percent time over-run, or exceeding 15 percent contract cost over-run. Such exception reports are useful for flagging areas where there are persistent under-performance or management issues.

Figure 18: Project Cycle Timeline and Proposed Performance Phases
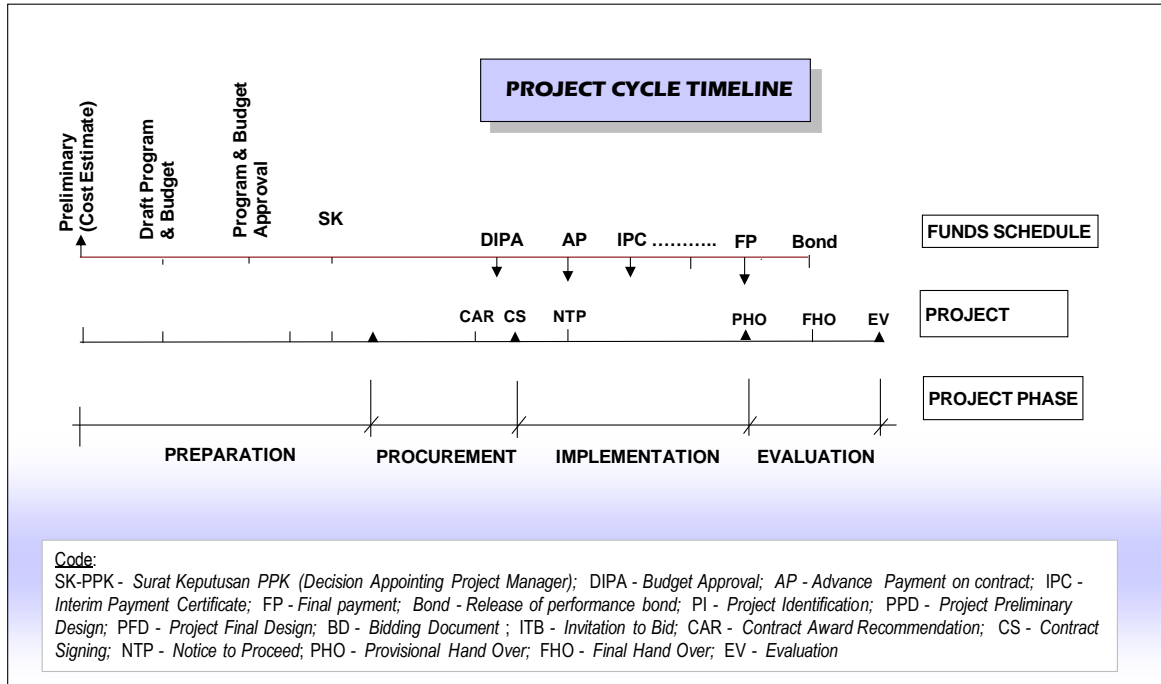
Likewise the management of **contract costs** should be monitored and normalized against a project-specific base. Typical cost parameters for each project/contract are: preliminary cost estimate; owner's cost estimate; contract price (at signing); contract completion cost (at final payment).

The key indicators to monitor include:

i.   Contract price (as percent variance from owner's cost estimate);

ii. Contract completion (as percent variance from contract price), and

iii. Project completion (as percent variance of contract completion cost from preliminary cost estimate).

Another indicator could be:

iv. Number of variation orders.

Furthermore, the contract output should be monitored, because the approved budget is frequently treated as a rigid expenditure ceiling and project outputs are scaled down to accommodate variation orders and price increases. Thus, the contract cost monitoring should be supplemented by a **key output measure**, such as the **effective length of treatment** (e.g., at contract completion, as percent variance from the base of the owner's estimate and bidding documents). In some cases further detail may be wanted, such as the area of resurfacing, or the equivalent average thickness of rehabilitation, etc. where the design may have been reduced after budget approval but the output in terms of effective length has not been changed.

(b) **Managing Competition and Efficiency – Contract Packaging:** Review of the contract data recorded in the SiPP database indicated that many contracts were small, in the order of 2-3 km. This is also clear from the work program data at an aggregate level for the annual work program – as the total annual output is in the order of 4,000 km (for preservation and development) and the total number of contracts managed is over 1,000, the average output is only 4 km per contract. As the development and multi-year projects are presumably larger in output, it appears that the majority of contracts are less than 3 km in effective length.

There is a strong correlation between efficiency in terms of cost, time and quality, and the size of firm. There is also considerable potential reduction in management effort to be gained from bundling these numerous contracts into fewer larger contracts. Thus contract packaging, contractor qualifications and the upstream identification of project lengths are a big source of potential gains in efficiency for program delivery.

For performance monitoring purposes, the main components of the work programs should report: (i) the total effective output; (ii) the total number of contract packages; (iii) the total value of contract packages; and, (iv) the related averages, minimum and maximum values of contract package size. DGH management can set performance targets to be achieved in relation to the average contract package size and expect implementation units to achieve those targets.

Experience from major road agencies in many countries is showing that bundling preservation work and rehabilitation work into long-term performance-based contracts, usually in large packages of a few hundred kilometres road length, can deliver substantial savings in road management or preservation costs in the order of 15-25 percent, as well as improved performance. Hence, this performance measure of contract size, in terms of output and cost, will be useful for monitoring DGH progress in improving efficiency in delivery of the overall work program.

(c) **Benchmarking the Cost of Outputs:** The performance indicators above provide **relative** measures of performance that can be used to compare performance from year-to-year, between regions or provinces, between work programs, and even in some cases between sectors. However, it is particularly difficult to benchmark overall cost efficiency of road work programs when there are many variables involved. We have seen in the review of the RPJM1 performance that the average program-level cost of preservation works and of development works per unit of output made a substantial jump of 100-200 percent between 2006 and 2007-2008 (see Figure 3). Clearly this is a significant issue both for MOF in managing the allocation of financial resources and for DGH/MPW in managing the efficiency and effectiveness of program delivery. It deserves both performance indicators for monitoring it and also supplementary indicators for validating it.

The following is recommended as a basis for cost benchmarking indicators, i.e.:

i. Annual program-level average cost indicators like those shown in Table 5:
   a. Program-average cost of preservation per unit functional length (total network);
   b. Program-average cost of development (road and bridge) per unit effective road length;
   c. Coverage of preservation program, effective length as percentage of total network; and
   d. Coverage of development program, effective length as percentage of total network.

ii. Sub-program level average cost indicators for major work categories, e.g.:
   a. Average cost of routine maintenance per unit functional length;
   b. Average cost of preservation (excluding routine maintenance) per unit effective length;
   c. Average cost of development (road works) per unit 2-lane-equivalent effective length;

  d. Average cost of development (bridges and tunnels) per unit effective length; and

  e. Average cost of development (new roads) per effective length.

 iii. Sub-program technical indicators. In order to allow these program-level costs to be validated, for example compared with similar or neighbouring countries, they could be supplemented with the following more detailed indicators which would require the relevant indicator to be reported with each project design, i.e.:

  a. Preservation works ((ii) b. above): The average equivalent thickness of asphalt included in the preservation works (in each project this may be stated as a nominal thickness but otherwise would be calculated from the total volume or weight of asphalt material divided by the area covered over the effective length); and

  b. Development road works ((ii) c and e above): The average costs split by pavement type – concrete, asphalt, surface treatment, gravel – and the average equivalent thickness of concrete or asphalt for concrete and asphalt pavement sub-groups.

(d) **Organisational Implications:** The current organisational structure and lines of accountability in DGH for managing the delivery of the work program are shown in . This shows a strongly decentralized structure, in which project management is devolved to the PPK (Project Commitment Officer) level where there are nearly 700 staff managing over 1,000 contract packages, and the degree of management and responsibility for performance is not very clearly aggregated within the department. A number of observations flow from this, when viewed from the perspective of the performance indicators mentioned above in this Chapter.[14]

  i. The responsibility for value for money is shared between the central engineering policy directorate (Bintek) (not shown) which establishes design standards and engineering guidance, and the work units (satkers) at a provincial level which perform the investigation and design function, but also the project officer (PPK) who ultimately administers the contract and supervision;

  ii. For procurement and implementation efficiency, the individual PPK project officers are clearly directly responsible for their individual packages, however the procedures involve so many persons and variable levels of skill and capacity that there appears little direct institutional control or accountability for delivery performance, except through the Balai units.

This process and structure deserves to be reviewed to clarify responsibility for managing implementation performance in terms of costs, time and quality, and for achieving improvement in value for money.

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[14] A detailed review is outside the scope of this study, and other studies are addressing aspects such as procurement.

Figure 19: DGH Organisation & Accountability Structure for Program Delivery

Code:
SK-PPK - *Surat Keputusan PPK (Decision Appointing Project Manager);* PI - *Project Identification;* PPD - *Project Preliminary Design;* PFD - *Project Final Design;* PPK - *Pejabat Pembuat Komitmen (Project Commitment Officer);* Satker - *Satuan Kerja (Work Unit);* FBD - *Final Bidding Document ;* CE - *(Owner) Cost Estimate;* BD - *Bidding Document ;* ITB - *Invitation to Bid;* BO - Bid Opening* BER - *Bid Evaluation Report;* CAR - *Contract Award Recommendation;* CS - *Contract Signing;* NTP - *Notice to Proceed*; PHO - *Provisional Hand Over;* FHO - *Final Hand Over;* EV - *Evaluation*

4.5   LOCAL ROAD PROGRAM SUPPORT

Prior to decentralization of road management responsibilities for the sub-national road networks to sub-national local governments, DGH performed a strong technical guidance role in establishing road management practices and facilitating internationally-financed programs supporting the management of sub-national roads. Under decentralization, DGH was still to provide technical assistance to sub-national governments for road management and was still responsible for reporting on the whole road network at a national level. However, these roles have diminished in reality, and currently there is little direct or active support from DGH to local governments on sub-national roads.

Local governments have access to growing financial resources for road management. In addition to the central block grants, which are not earmarked to specific sectors, they have access to revenues from vehicle registration taxes and road user charges which have recently been increased substantially. Despite this, the evidence of available road condition data indicates that the overall condition of sub-national roads has declined (more than 50 percent in unstable condition) and it is likely that the disparities between individual administrative areas have also worsened. Statistics on the levels of expenditure by local governments on roads are not readily available so it is not possible in this study to evaluate the performance or expenditures.

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Some lessons can be drawn from other countries who have decentralized road management to local governments. South Africa, which has implemented MTEF budgeting, is finding the performance of provincial and municipal governments to be highly variable from strong to very weak and the primary factor appears to be the governance capacity of the local government. They have established a cooperative technical support structure, named a 'regional road board' which comprises representatives of each provincial road agency, the national road agency (SANRAL) and technical experts and meets quarterly to discuss program and technical issues. The national agency has assisted the group by compiling and analyzing road performance data from the sub-national agencies and supporting moves to establish practical road management procedures in the sub-national agencies. The regional road board is complemented by local road boards in each province which bring together all local agencies within the province. New Zealand, which manages its national (state) roads through a national agency, has formed an association of local governments and a charitable (not-for-profit) company that provides road management assistance to local governments.

For Indonesia, some form of collective technical support is likely to be an appropriate solution. DGH could consider playing a catalytic role in this by identifying alternative solutions and experience around the world, and assisting with the formation and operation of a national or collective association. The model of forming a corporate agency responsible to the local governments and mandated to assist them with road management and monitoring, is one of the solutions to be considered.

CHAPTER 5: POTENTIAL AREAS OF SUPPORT

5.1   STATUS AND IMPLICATIONS OF DGH MTEF-PBB IMPLEMENTATION

In finalizing the RENSTRA for 2010-14, and taking into account the findings of this study, DGH is adopting some key shifts in sector policy including:

(a) Trans-regional corridor approach to planning for expressway and trunk route development;

(b) Modification of technical policy, extending the pavement design life standard to 20 years for structural design and 10 years for surfacing design, and intending to adopt performance measures of expected life and historical life for road infrastructure assets;

(c) Reviewing organisation and arrangements for implementation of the work program, including responsibilities of the Wilayah, Balai and satker units in DGH; and

(d) Adoption of vision and mission recommendations in regard to priority of focus on trans-regional, arterial and local road system hierarchy.

Arising from discussions on how these policy shifts can be implemented, DGH has identified the following areas requiring technical support:

(a) Capacity building for adopting and applying the new MTEF-PBB approach in DGH;

(b) Preparation of indicative 2010-14 road program options for alternative fiscal scenarios, including activity-level outputs and network outcomes for Baseline, Moderate and Optimistic fiscal scenarios that optimise economic life cycle costs and incorporate the plans for major road infrastructure (item (c) above).

(c) Analysis and planning of major road infrastructure development in four main trans-regional corridors for the 2010-29 period, to optimise infrastructure standards (including expressway, trunk route and staging options), financial resource allocation, prioritisation and multi-year programming;

(d) Review and reform of organisation and procedures for work program implementation, with a focus on improving the efficiency and effectiveness of program performance;

(e) Upgrade of technical policies and methods to improve the effectiveness of expenditures for the upgrading, widening and preservation of arterial roads, through raising design life standards and tools for preparing detailed multi-year programs that optimise life-cycle costs at an asset level; and

(f) Improving management and performance of regional/local roads.

5.2   CAPACITY BUILDING FOR APPLICATION OF MEDIUM-TERM PERFORMANCE-BASED BUDGETING

Five areas can be identified for building capacity in DGH for applying the MTEF and PBB in the road sector.

(a) **General Awareness of MTEF and PBB Methodology in DGH:** All units involved in preparing the expenditure programs and reporting on performance should be given training in the concepts and methodologies adopted by MOF and Bappenas for application of MTEF and PBB. This would include: (i) the concepts and terms of MTEF and PBB (e.g., Table 2 and MOF booklets); (ii) the responsibilities of each work unit and accountability for performance; (iii) the measurement and reporting of performance indicators; and (iv)change in budgeting and program preparation procedures to three-year medium-term.

(b) **Finalize the Definition of Performance Indicators and Methodology for Processing:** The recommendations on the list of outputs, outcomes and various indicators mentioned in Table 11 and Tables A-1 to A-5 have been considered by DGH prior to their finalization of indicators for the official DGH performance-based budget structure. This task would review the decisions, and reach consensus on any changes and finalization of the reportable indicators and the supplementary indicators (such as activity performance indicators). In particular the task would review and help finalize the procedures for data collection, data processing and management, and the analysis and reporting of all performance indicators.

(c) **Upgrade Programming, Evaluation and Project Preparation Procedures for MTEF-PBB:** This task would provide assistance in the review, modification and application of programming and budgeting procedures for the annual preparation of multi-year program and budget submissions, to apply the recommendations of this report so far as they are adopted by DGH. It would focus primarily on the upstream procedures for planning programming and budgeting, but would require coordination with the TA assisting reform of the implementation process downstream (see 5.4.1) – especially in aspects such as survey, data collection and data processing. The task would: (i) generally review current procedures for survey, data collection and processing, project identification, consultation and prioritisation and identify modifications to suit the multi-year approach; (ii) define procedures and arrange for collection and processing of work history data; (iii) assess the current viability of the IRMS as a programming tool for use at the central level and at the *balai* level; (iv) define requirements for the asset-level programming tool (see 5.4.3), working with central units (PUM, PAN, etc.) and representatives of the implementation units (*balai* and *satker)*, test the prototype and make recommendations on scale-up and roll-out; and (iv) provide support for upgrading of the procedures for evaluation, measuring, processing and reporting of performance indicators.

(d) **Study Visit on MTEF Experience in Road Sector[15]:** As the lessons from international experience with MTEF have shown, there are a number of factors which contribute to success in making the MTEF work well. The experience of South Africa, which has a strong growing road sector and reformed the organisation of the road sector in the wake of its major political democratization in 1993, is potentially very useful for DGH in several ways. MTEF has been applied to the national budget for about 7 years and, although performance-based budgeting is not yet applied formally, the performance indicators of the national road agency (SANRAL) are reviewed annually as part of the multi-year budget review process. More background on the country its road sector and the potential value for Indonesia is given in Annex C.

South Africa provides very useful examples in respect of the road program and budget structure, road management system and surveys, financing options, funding and managing of sub-national road networks including metropolitan cities and municipalities, and encouraging a competitive construction industry. In terms of institutional structure, there is the opportunity to see one of the best examples of a corporatized road agency (SANRAL) in a low-middle income country, and the arrangement for sub-national roads is similar to Indonesia's, with a system of block grants. Although it has a drier climate and more diverse demographics than Indonesia, it shares an experience of substantial political and institutional reform over the past 15 years. A visit of about five days is recommended to study the road sector aspects and to have an opportunity of observing some field work and sub-national operations. The two main focuses suggested are:

i.   Road management approach (road program structure and preparation, surveys, performance measures and accounting, and construction industry); and

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[15] This recommendation of the Draft Report was implemented in February 2010 and is reported separately.

ii. Institutional (road agency and sub-national government arrangements, financing options, land acquisition, consultation and budgeting issues).

The cooperation would be arranged through contact with the National Department of Transport (International Relations Department and the Director, Infrastructure Finance and Coordination), and the Head of Budget Office National Treasury, through the Ministry of Foreign Affairs.

(e) External Training Courses

A number of institutions offer external training in competencies that would support the MTEF-PBB approach. These include for example:

i. Results-based performance management; and

ii. Application of medium-term expenditure framework.

A schedule of courses offered by SETYM International includes the above courses in the next year.

5.3 DEVELOPMENT OF 2011-14 PROGRAM

The current outline of the 2010-2014 expenditure program included in MPW/DGH RENSTRA is based on an extrapolation of existing programs, without direct analysis of needs or of prioritisation between investment alternatives. Projection of the program to higher levels of moderate and optimal fiscal envelopes has also involved broad multipliers of national GDP economic activity. The policy and resource allocation alternatives are substantial, especially in regard to the major infrastructure investment allocations in the four main corridors and to the improvement of substandard sections of the arterial and strategic road networks.

Support for review and development of the five-year program from 2010-14 is proposed, including support for the immediate 2010 program and preparation of an outline four-year program, 2011-14. Analysis would be based on: (i) the latest 2009 road network data including available work history; (ii) preliminary categorization of the network and needs into the main functional categories relating to the DGH strategic performance targets; (iii) life-cycle forecast and optimization of treatment alternatives using the new technical policies where adopted; (iv) categorization of outputs conforming with new proposed Activity performance indicators; and (v) estimation of strategic performance indicator values conforming with the DGH Echelon I indicators.

The program comprises six major categories of activity for analytical purposes, and these could be packaged into three study components for administrative purposes, as follows:

(a) **Major Road Infrastructure Development in Four Main Corridors:** A corridor analysis would be undertaken for the main road transport corridors to identify a long-term development plan for expanding road capacity to meet traffic demand and achieve trans-regional mobility and connectivity goals in each corridor. The analysis would take account of existing expressway development plans, regional highway system goals and economic trade forecasts for the corridors in determining traffic demand forecasts and the traffic demand split between the parallel road facilities.

The plan would determine the optimal staging of expressway development on new alignments and optimal design standards for capacity expansion of existing main trunk roads, and the related financing needs and allocation of national budget resources. Consistent with the 20-year long-term plan, the study would prepare a detailed four-year (2011-14) program of expressway

construction and trunk road capacity expansion for each corridor for alternative expenditure allocations of between IDR 6 trillion and IDR 25 trillion per year for this program. The four main trunk route corridors are Java Northern, Sumatra Eastern, Trans-Kalimantan and Trans-Sulawesi corridors. The extent to which transverse and spur corridors would be included in this analysis is an option for DGH to consider.

(b) **Arterial Road Network Development Program:** The study would help DGH prepare four-year 2011-14 programs for two sub-programs involving capital improvement to the road network that could significantly benefit from adopting a long-term optimization approach, i.e.:

  i. **Improving Sub-Standard Sections of Trunk Routes** – Covering road links forming part of the trunk routes (excluding main trunk routes) which are identified to require widening to the minimum width requirements (6 m or 7 m, depending on location) or realignment to minimum standards for horizontal alignment; and

  ii. **Upgrading Strategic and Reclassified Roads** – Covering roads, in remote and isolated areas such as islands and sparsely populated areas, requiring construction to gravel or paved standard, or roads that were previously not classified as national roads;

The study would produce an indicative program of works for each sub-program, for 2-3 levels of budget and for each year (2011-2014) at a preliminary design and feasibility level, i.e., for each section – location, type of treatment, output (effective length), estimated cost, estimated life-cycle cost and economic benefit, and performance forecast to 2014. The budget levels would represent the baseline, moderate and optimal fiscal levels, i.e., about IDR 5, 10 and 15 trillion per year.[16] For each sub-program ('activity') the study would: (i) identify the road sections from road inventory and database records and specific designations through a screening process; (ii) arrange for the validation and updating of road and traffic data; (iii) identify and analyse a range of initial treatment options (from incremental widening or repair up to full renewal, i.e., reconstruction and realignment) together with subsequent preservation requirements over the life-cycle; (iv) conduct life-cycle cost and performance forecasts for each alternative and optimise; and (v) present the resulting programs in a form which provides for a consistent design standard and allows projects to be deferred or advanced according to the budget envelope which could be adjusted in any year during the 4-year period. It is intended that this study would have a strong focus on optimizing the design standard to minimize life-cycle costs or maximize net present value, with a view to establishing stable functional road links that are serviceable over three to five decades.

(c) **Road and Bridge Preservation Program:** All national arterial road links and bridges which are not covered by the previous three programs (main trunk routes, sub-standard trunk routes, and strategic roads) would be studied to prepare indicative four-year programs of preventive maintenance and rehabilitation and to indicate budget needs for preservation under three fiscal levels. The study would apply the modified technical policies adopted by DGH (arising from the recommendations of this MTEF-PBB report) including an extended design life standard, a life-cycle approach and measures of historical and expected life. The programs would take into account the preservation requirements forecast for the other networks in the 2011-14 period. It is expected that the budget levels would correspond to baseline, moderate and optimal fiscal envelopes, beginning at IDR 6.5 trillion/yr (Table 7) and a maximum defined by optimal life-cycle costs or an appropriate performance target. The study would also review the unit costs and

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[16] The 2010 DGH allocation under Road Development is about IDR 4-5 trillion for Road Construction and Strategic Road development activities (excluding Development expenditure on the Main Trunk Routes, Vertical Structures and Expressways) (see Table 7).

average costs of standard preservation treatments against market benchmarks to establish efficiency targets.

The study components would be coordinated so that the resulting programs avoid redundancy and each road link has a unique indicative multi-year program.

5.4 INSTITUTIONAL STRENGTHENING

5.4.1 Reform of Implementation Organisation to Improve Program Delivery

The review noted significant opportunities for improving the efficiency and effectiveness of program implementation and recommended various measures that could be used for monitoring agency performance in delivering the program. While the review outlined the current management-accountability structure and the project cycle processes (see Figure 18 and Figure 19), it did not include detailed evaluation of the management structure and staffing or the options for reform. The key issues were high degree of fragmentation of projects (in planning and procurement), low competency and quality at project design and supervision level, lack of transparency and competency in procurement, and unclear or insufficient management oversight of the processes.

DGH is working on this reform as a priority issue, and this task would assist DGH in: (i) a detailed evaluation of the current implementation management structure and its performance; (ii) identification and evaluation of options for reform; (iii) assistance with internal and stakeholder consultations; (iv) assistance to DGH with formulation of a recommended reform proposal, covering organisational structure, improved processes for managing projects (design, procurement and supervision) and asset monitoring, definition of job functions and responsibilities, upgrading of competency and qualification requirements, and identification of job performance measures. DGH would like to begin as soon as possible.

5.4.2 Organisation for Delivering Expressway Program

Accelerating the delivery of the expressway program has become an urgent priority, and one of the key factors will be providing a clearer accountability for the performance in delivering the overall program. A scoping study would identify measures which could be undertaken by MPW under the current law and regulations to streamline and expedite delivery of the expressway program, taking account of recent relevant studies. Typical measures to be considered include: (i) Assist DGH to define an expressway standard and network, of which toll roads would form a subset; (ii) Review accountability for execution of the expressway development program and budget, and define options for clarifying or realigning roles of DGH (Directorate of Expressways and Urban Highways) and BPJT; (iii) Review options and procedures for utilizing a substantial allocation of public funds to expedite the program in the event that surplus funds are made available from the national fiscus; and (iv) Review the options for adaptation of the organisation of BPJT to improve its effectiveness, with reference to a recent paper[17] which recommended revision of the organisational structure to provide a clearer balance of functions and activities between the government and the infrastructure providers. This could realign the administrative functions of expressway administration that are currently performed by Binkot, Bipran and BPJT, and could transfer the functions of development, ownership and operation of the expressways to a new Expressway Corporation, established as a

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[17] A Review of Institutional Options for Accelerated Expressway Development in Indonesia, World Bank, November 2008

state-owned enterprise or BLU, which in turn would manage the third party concessions on individual expressways.

This advisory task would: (i) review the above recommendations; (ii) develop the administrative tasks that are feasible in the short-term; and (iii) outline and develop recommendations on other medium- and long-term actions for realignment of functions or reorganisation.

5.4.3 Scoping Development of Asset-level Project Programming Tool

DGH has had the computer-based IRMS (Indonesian Road Management System) in place for over 20 years now, which was designed to operate at network level to identify road programs and projects and to prioritize these on a multi-year life-cycle cost basis. The application of the tool has experienced difficulties in practice, in large part because it has functioned at network level whereas the project design and implementation at asset level has often resulted in different outputs and costs. Also under Indonesian budgeting procedures regional or local stakeholders have significant participation at asset level (see Figure 13 for example). This task would follow the preliminary assessments to be made of IRMS under the task 5.2 (c) 'Upgrade programming, evaluation and project preparation procedures for MTEF-PBB'.

This task involves developing the concept of a new programming tool which operates at asset level (a group of roads and potential projects in a local area) and generates an optimised medium-term program of activities and performance forecasts for each asset and the asset group. The tool would be designed for use by a local road management unit and would present data and program results in a clear graphical manner (e.g., strip map or straight-line diagram) that would facilitate communication and consultation with local and national stakeholders. The expected user would be a road management unit of DGH, or a road management contractor under a long-term output- or performance-based contract. The tool would process and manage road, traffic, work and expenditure history, and safety data, generate alternative multi-year activity options, life-cycle costs and performance forecasts, and produce a recommended medium-term program (3-5 years) including location, activity type, output quantities, performance indicators, cost estimates and prioritisation measures.

In order to develop the concept and software, it is proposed that this be handled on a seed funding basis to find a group that is willing to develop the concept and prototype models to meet DGH requirements, and then to assume commercial responsibility for producing and supporting the model in the future. An advantage of this approach is that the tool has potential value for use by road management contractors who would be able to enter into individual commercial arrangements. Separate assistance for providing training and implementation support would be identified during testing of the prototype.

5.4.4 Devising Sustainable Technical Support to Local Road Management Agencies

Regional and local roads represent a large portion of the road infrastructure in the country, comprising nearly 400,000 km in length. Based on available information, the condition of this vast network has not improved in the past decade and only one-half is in stable condition. Local government agencies at provincial, regency and municipal levels responsible for developing and managing the networks generally lack technical capacity and have multiple responsibilities. In general, substantial funding is available through central block grant transfers and road user revenues which accrue to the local government. DGH wants to identify a mechanism for improving the

performance of local road management and the role and functions it could have as a national road agency.

This task would review relevant international experience in providing technical and advisory support to local road agencies under a decentralized government structure. It would identify and evaluate suitable models for technical and policy support, and facilitate consensus in DGH and with local government representatives on the recommended option. A road map for implementing the model would be developed.

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

6.1   CONCLUSIONS

6.1.1   Implications of the MTEF and PBB Approaches for DGH and the Road Sector

Application of the MTEF in Indonesia by placing budgeting on a three-year rolling basis is intended to improve the predictability of funding allocations for the road sector, improve the continuity of funding especially for multi-year capital expenditures, and focus the budgeting debate onto the effectiveness of current policies and the potential benefits of policy changes. The three key elements of the process are strategic policy making, portfolio budgeting and a system for managing running costs.

The addition of performance-based budgeting (PBB) to the process should greatly improve the connectivity between planning and the achievement of outputs and outcomes, and also improve the effectiveness and efficiency of sector spending. To date there has been no formal connection between the goals of the long-term or medium-term plans and the funding resources required to achieve them. The application of PBB in Indonesia is driven by four key principles, i.e.:

(a) Resources will be allocated to achieve a specific policy and functions, and these functions are the responsibility of a specific organisational unit *(money-follows-function and function-follows-structure)*;

(b) The method and tools for implementing the functions are the responsibility of the manager of the unit *(let the manager manage)*;

(c) Managers and their units are accountable for achieving the outputs and outcomes under their control and responsibility *(accountability)*; and

(d) National performance is dependent on an effective top-down process for setting policy goals and allocating adequate resources, and an effective bottom-up process for preparing credible implementation plans and efficient service delivery (Link top-down planning to bottom-up implementation).

International experience with MTEF and PBB has shown that significant improvements to the efficiency and effectiveness of public spending can be achieved when these principles are applied across the board to all general and sector public spending. The key ingredients to making a successful transition to MTEF include political commitment of both general ministries and sector ministries, keeping the process simple and uniform across sectors, and making it matter by being the sole basis for national resource allocation. The approach adopted in Indonesia appears to be following the key principles of MTEF and PBB and the lessons learned on implementing the transition well.

Of the many general lessons learned (see Table 1), six stand out with special relevance to a sector such as road infrastructure, i.e.:

(a) ***Be comprehensive by including all budget sources available to the sector***: The planning and resources allocation process should cover all parts of the road system, its infrastructure and operation, for example national funds, private sector funds, guarantees, domestic and international borrowing, all user revenues and local funding resources (including any road funds), for expressways/toll roads, national roads and local roads, and for traffic management and vehicle regulation including traffic safety and loading controls. This means that while the ministerial responsibility for road traffic management and regulation (under MOT) remain separated from the responsibility for road infrastructure provision (under MPW), special

provisions should be made in the budget and performance evaluation process for reconciling and coordinating the respective policies affecting performance of the road system in providing road traffic services. Also the proposed Road Preservation Fund and its related program should be incorporated in the same rigorous planning and performance management process as national funds.

(b) ***Develop a mechanism for effective stakeholder participation:*** Successful applications of MTEF include layers of technical review before the multi-year budget and program proceed to ministerial and political review. Typically the reviews include impartial technical input from professionals outside the implementing agency, review by an infrastructure committee representing various sub-sectors that has the skills and competence to evaluate technical and economic feasibility, and a process that deals with prioritisation in accordance with current policies. The present budget consultation process, with its focus on local jurisdictional interests, could be strengthened by incorporating more rigorous and transparent sectoral review of technical, performance and prioritisation aspects, upstream of any political decisions at either local or national level. This extended focus would impact two stages of the program cycle – the survey and performance evaluation, and the program preparation and consultation.

(c) **Enhance transparency in the process at both political and managerial levels as an essential ingredient to achieving effective accountability.** Using tools which improve public access to information on the program and sector performance, including feasibility or justification of the proposed programs and expenditures – such as disclosure of asset condition, project procurement and delivery performance, comparison of costs and efficiency across jurisdictions/regions and by year – will greatly improve the transparency of decisions being made by DGH and work unit level managers. When this is combined with the impartial review mechanisms of effective stakeholder consultation above, it should also improve transparency at the political level when the programs are reviewed for consideration and approval by inter-ministerial or cabinet-level committees. Such transparency and disclosure is essential to develop and sustain effective accountability for performance at both the managerial level (sector agency and work unit) and political level (local and regional government and national cabinet).

(d) **Identify sector activities with sufficient detail to allow proper evaluation of resource allocation and performance, in terms of outputs and outcomes, to Echelon 2 work unit level.** Subdividing the activities and the implementation process into common parts which are practical, relevant and measurable will improve the ability of the manager to manage, and the opportunity for the agency to identify and demonstrate how it is improving the efficiency of delivery (lowering unit costs and delivery times) and improving the effectiveness of sector expenditures (improving value for money in terms of quality, performance or lifetime of assets and work outputs). Getting these linkages right should encourage and empower the Echelon 2 managers and work units to improve performance. Since it is at this level of the activity that the budget is executed, it is this level which ultimately determines how efficiently the budget is spent, and how effectively the budget will achieve the policy outcomes and impacts.

(e) ***Give increased attention to the efficiency and effectiveness of sector expenditures.*** While it remains important to report outputs so as to validate and verify the expenditure of public funds on public goods and services, the full value of applying the MTEF and PBB approach comes from being able to evaluate how well the funds have been allocated and spent. For effectiveness, performance indicators should help to evaluate the prioritisation process (e.g., Are the right projects being selected at the right time and with the right standards? Is the distribution appropriate in terms of balanced outcomes for social development as well as economic growth? etc.) and the value for money (e.g., Is the quality adequate to achieve the

intended performance and service life? Are the technical standards and performance optimal for achieving performance over the medium-term? etc.). For efficiency, the performance indicators should help to evaluate and optimise the cost of delivering the particular goods or services (e.g., in terms of average unit cost) and to shorten delivery times and reduce uncertainties in the delivery and execution of the budget.

(f) ***Develop and sustain effective oversight of the MTEF-PBB process.*** Experience has shown that the benefits of the MTEF-PBB processes are not fully realised if the oversight mechanisms are weak. For the sector it will be important that the oversight exercised by Bappenas and MOF at a national level will be able to evaluate the results and performance of DGH against the plan and program, benchmark the costs and delivery times against international comparators, and achieve real improvements in the outcomes for the sector – significant improvements in travel speeds and safety, in the coverage and condition of road and bridge assets, and in the business efficiency and integrity of DGH operations. For DGH, the oversight exercised by the Ministry MPW, DG and managers should focus more on the quality and life of works and services delivered, and on the costs and time taken to deliver the works and services.

6.1.2 Evaluation of recent sector performance.

The stated issues driving the long-term sector plan and current medium-term plan include the disparity in road density between the populated regions of the west and the remote regions of the east and north, the poor condition of the local road network compared with the national network, the need for finding an optimal maintenance strategy, weak controls over truck overloading and a lack of performance measures for efficiency and effectiveness. However, little emphasis is given in the plans to growing the capacity and standard of the road system to support national economic and social growth, and the plans lack a direct linkage between the national economic development targets that are set and their implications for increasing traffic demand.

Review of the past five-year plan RPJM-1 showed that DGH managed to absorb the addition of 8,000 km, or 29 percent increase, in length of the national road network by reclassification, increase its capacity by about 13 percent to 84,985 lane-km and restore the overall condition to about the same high level of 88-89 percent stable (good and fair condition) and 85 percent paved as at the end of 2004. The performance was rather uneven across provinces however – the road condition barely improved in most provinces and even deteriorated in some provinces, while most of the overall improvement came from eliminating the bad condition of roads in the remote regions of Maluku, Papua and Kalimantan.

The review concludes that the current road preservation strategy is barely adequate to maintain the overall condition and functional standard of the network, and the generally neutral results are relying on substantial funding of development works. The reason for this appears more likely to lie in the quality and performance of the works than in the funding. The total annual output which has averaged about 4,000 km/yr (about 30 percent preservation and 70 percent development) gives a coverage of 11.5 percent per year and thus implies that the performance life being achieved is about 9 years on average. While this is not far short of an expected average of 10-12 years, it is being achieved through a high proportion of much more expensive development works.

The funding level was tripled during RPJM-1, from IDR 5.3 trillion to IDR 17 trillion per year, but this was translated into higher costs and standard of treatments because the output remained fairly constant at 4,000 km/yr. The average cost of the preservation program tripled from IDR 1.2 billion/km to IDR 3.6 billion/km, of which about 60 percent (IDR 2.1 billion/km) was devoted to

pavement works which is very high (double expected norms), equivalent to very thick treatments (of over 120 mm asphalt) and typical of major rehabilitation.

Similarly the average costs of road development have increased to IDR 4.2 billion/km which are close to the costs of new road construction. Much of this funding has been devoted to the incremental widening of sub-standard roads, which comes at a high unit cost and often does not bring the structure and overall alignment of the road up to the intended functional standard. This policy needs review to consider the benefits in comparison to a longer term policy of more comprehensive renewal (reconstruction and realignment) of the roads at a slower pace.

The review thus concluded:

(a) Present funding is sufficient for preservation if applied with optimal policies, but development funding will need to increase to meet forecast growth in demand;

(b) The efficiency of both the preservation and development programs needs to be improved in terms of the selection of treatment and in the value for money, both in output per unit cost and in quality (expected life), to ensure that the long-run or life-cycle costs of successive treatments are minimized;

(c) The effectiveness of project prioritisation and the coverage across provinces and across strategic sub-networks such as the regional routes, need to be improved; and

(d) The actual life and performance being achieved from the current preservation and development works needs to be evaluated, and the current DGH technical policy of short design life for preservation treatments should be reviewed.

The development of the expressway network has fallen far behind the growth in traffic demand and is now causing significant constraints on the efficiency of trans-regional travel and of access to and around the metropolitan cities. While some of the key impediments to implementing the expressway development program have been addressed – transparent and robust processes for mobilizing private sector investment and risk management, and funding and managing land acquisition – there remains a significant funding gap. There are also shortcomings in the institutional arrangements which are hampering the planning and management of the expressway program, with responsibility divided between DGH and BPJT.

The key conclusions of the review on issues which should be addressed in the formulation of the strategy and program include:

(a) **The urgent need to enhance trans-regional and metropolitan mobility:** With the rapid growth in road transport and the demands for competitive economic growth, the provision of high-capacity road infrastructure for trans-regional travel and intra-urban travel in the metropolitan centres within the next ten years emerges as the top challenge facing the sector. This will require (i) substantial acceleration of provision of the expressway network (from the recent 14 km/yr and the currently processed 80 km/yr to over 150 km/year) and (ii) efficient multi-year allocation of resources between regional route development (which will service traffic demand in the immediate 5-10 year term) and expressway development in the same trunk corridors (which will take at least ten years to develop).

(b) **A need to improve the efficiency and effectiveness of the preservation program**: The recent and current allocation of resources to the road preservation program has been strong (at IDR 200 million/km/yr or USD 20,000/km/yr this is high relative to many other countries) and the condition of road infrastructure is fairly good, however the outcomes indicate that the program is barely compensating for a fairly high rate of deterioration in the network. There is need to increase the efficiency in the use of available resources (both in the cost of treatment and in the life-cycle, or average medium-term, cost) and to improve the effectiveness (through improved

quality, enhanced performance and extended life) of the preservation activities. These imply the need to review the current simplified design approach for preservation treatments, with its inherently short design lives, and other aspects.

(c) **A need to improve the effectiveness of the development program:** The current approach of incremental widening of roads in the betterment program, while yielding short-term benefits, is both expensive in life-cycle cost and in the long-term may have missed opportunities to improve the alignment and average travel speeds. A more comprehensive approach to road renewal, with redesign of alignment and pavement and bridge structures, would provide more optimal use of resources in the long-run and improve the capacity of the road system in the long-term to cope with the rapidly rising demand for road travel.

(d) **A need to identify performance measures of quality and cost, and to extend accountability for sector performance to the work units at activity and sub-activity level:** An important aim of the PBB policy is to achieve better value for money from public expenditures – improving the quality and performance of the outputs at the same time as controlling or reducing costs. Since the work units implementing the activities have the primary influence over achieving value for money, it is therefore important that their efforts to achieve improved value and reduced cost be measured and recognised.

6.2   RECOMMENDATIONS

The medium-term and performance-based budgeting structure which is recommended for the DGH program focuses on what are considered to be the three core business areas, namely:

(a) *Improve major [trans-regional] road infrastructure to support competitiveness of regional and internal trade and production;*

(b) *Improve quality and capacity of national arterial road network to connect remote and central regions; and*

(c) *Improve the performance and accountability of central and local road agencies in providing sustainable and cost-effective local road infrastructure.*

These objectives are incorporated in the definitions of program and activities which are recommended for DGH for RPJM-2. These definitions and the proposed outcome and performance indicators are summarised in Table 13 and the detailed tables are given in Annex A. The definition of activities and activity outputs follow the new 2009 guidelines on PBB for MTEF – the output describes the goods or services produced by the activity, and the details of the output are defined in the output indicators. The program main performance indicators define key outcome type measures of the overall sectoral program aligning with six aspects of the mission and core business of the department, and measured primarily in terms of the coverage achieved to certain performance standards. The activity performance indicators (API or IKK) incorporate several key measures of efficiency and effectiveness which measure the performance of an Echelon 2 work unit and are intended to be used by DGH primarily for internal management purposes to improve the efficiency and effectiveness of program delivery.

A number of recommendations for enhancing the performance of the DGH program and its delivery arose from the detailed review, i.e.:

i.   *Enhance Trans-Regional and Metropolitan Travel Performance:* The need for a more systematic and long-term approach to investing in capacity expansion is considered to be urgent and the top priority for the sector at present. It *requires* strategic planning, stronger prioritisation, and increased mobilisation of financial resources. The current emphasis on expanding trunk routes

to multi-lane facilities on existing road alignments in trunk route corridors is considered a short-term remedy which is also costly. Instead, a strong and vigorous concentration on accelerating the expressway program is recommended. In order to guide the allocation of resources between the two competing programs and to achieve reasonable efficiency in resource requirements, we recommend:

a. Determine optimal investment and construction strategies for the expressway facilities and parallel trunk route national roads in the trunk road corridors, based on detailed traffic demand forecasts; and

b. Define a set of expressway standards and an expressway network as a formal part of the national road network, of which toll roads would be a subset; and

c. Consider realigning the functions and responsibilities for the management of the expressway program, in DGH and BPJT, to improve performance and increase accountability in delivering the investment program.

Table 13: Summary of Proposed Performance-based Structure of DGH Program at Echelon 1 and 2 levels

Work Unit	Program or Activity	Outcome or Output	Output Indicators	Performance Indicators
Echelon 1	*Program*	*Outcome*	*Strategic Target:*	*Program Main Performance Indicators (IKU):*
DG Highways / Bina Marga	Development and management of road system infrastructure	Improved connectivity, mobility and safety on the national road network, with improved accessibility in strategic areas	National trunk route roads improved to applicable service standards, over X percent of length	1. Trunk and regional route roads comply minimum functional standards (percent length) 2. Road condition on national arterial roads is stable (percent length) 3. Expressway development projects defined and issued for preparation (length) 4. Strategic roads meet national functional standard and stable condition (percent length) 5. National arterial road links with unsafe performance (number links with > x fatalities/year) 6. Local road network (Province, Kabupaten, Kota) in stable condition (percent length)
Ech. 1b, 2	*Activity*	*Activity Output*	*Output Indicators*	*Activity Performance Indicators*
BPJT	Development and regulation of toll roads in expressway network	Sustainable toll road services and concession arrangement	1. Supervision of toll road services, length km 2. Administration of existing toll road concessions, number 3. New PPI toll road concessions finalized, number 4. New PPI toll roads in operation, length km	1. Competitive selection, negotiation and finalization of concession agreements (nr.) 2. Achievement of toll road development strategic plan (% length, forecast delay (yr) 3. Achievement of land acquisition for active concessions (%) 4. Average net construction cost of new concession (Rp. b/km) 5. Average net construction cost of toll road capacity expansion (Rp. b/lane-km) 6. User satisfaction rating of toll road services (score) 7. Travel speed on toll road (Average (km/hr), Length chronically congested (speed <30km/h)) 8. Traffic safety (accidents/10,000 veh.,fatalities/10,000 veh.) 9. Toll gate queuing time (minutes)

Work Unit	Program or Activity	Outcome or Output	Output Indicators	Performance Indicators
Bipran	Planning, programming budgeting and evaluation of national road work program	Advisory services on multi-year resource allocation, work program, performance forecast and priorities for the sector resource envelopes	1. Planning and programming services 2. Monitoring and evaluation services 3. Local road agency planning advisory services	1. Compliance of MTEF targets with RENSTRA for national roads 2. Deviation of new baseline program from previous MTEP (PAJM) forecast (%) 3. Economic benefit of program above threshold (NPV or BCR) 4. Average Activity costs (Rp. million/km, for Preservation; Development) 5. Program treatment coverage of defective road sections (%) 6. Program treatment coverage of defective bridges (%) 7. Provinces with arterial road network condition less than 90 percent stable (number) 8. Preparation of RENSTRA allocation in feasible annual targets for five years 9. 3-year rolling MTEP (PAJM) medium-term expenditure program 10. Annual performance evaluation report on DGH targets 11. Road management and performance evaluation information updated and available 12. Development and operation of road asset planning and performance monitoring systems
Bintek	Guide and monitor the efficiency and technical quality of national road work programs	Advisory services to formulate technical standards, and to optimise the cost and quality of national road and bridge assets through efficient design and specification	1. Engineering design services 2. Technical standards and guidance services 3. Emergency work services 4. Regional road agency technical advisory services	1. Compliance of road class with applicable geometric standards (% length) 2. Expected life of paved roads, until next action (yr) 3. Average life-cycle cost of paved roads (Rp. million/km/yr) 4. Bridges in critical condition (%) 5. Safety improvements programmed (% blackspots) 6. Average sub-activity cost (Rp. million/km each sub-activity 7. Supervision team appointed before works contract award (percent) 8. Project design commenced 12 months before budget year(percent of development projects) 9. Value of equipment provided for work by administration (Rp. b) 10. Road development projects designed (length) 11. Bridge development projects designed (length) 12. Environmental impact assessments completed (nr.) 13. Land acquisition plans prepared (nr, affected persons) 14. Safety remedial schemes prepared (number) 15. Technical guides updated (nr.) 16. National procurement and inventory control of special goods 17. Emergency/Disaster Relief programs authorized (Rp. b) 18. Disaster relief and SKPD units trained (nr.)

Work Unit	Program or Activity	Outcome or Output	Output Indicators	Performance Indicators
Binkot	Development of expressway network and metropolitan arterial highways	Expressway and metropolitan arterial highway development and financing program (LTEDP) delivery, measured by:	1. Expressway development (publicly financed), km 2. Metropolitan highway development, lane-km 3. Metropolitan highways preserved, lane-km 4. Metropolitan highway structures, m 5. Expressway planning and engineering services 6. Metropolitan highway engineering services	1. Long-term expressway development plan (2010-2030) 2. Strategic 5-year program of expressway development 3. Available expressway space (lane-km/100k pop; per REGDP) 4. Analysis of investment and modality for planned expressway projects (nr projects) 5. Distribution of financial risk (% public, private, contingent liability) 6. Land and environmental plans for expressway and metro projects 7. Average expressway net construction cost, excluding land (Rp. /km) 8. Expressway program implementation progress, % and slippage 9. Metro highway program implementation progress, % and slippage 10. Land acquisition progress (% strategic plan targets) 11. Expressway program delivery time, by project phase (months) 12. Survey of trans-regional and metropolitan travel times
Wilayah	Prepare and execute preservation and development projects for roads and bridges on national arterial roads in area	Delivery of road and bridge work sub-programs on national arterial and national strategic road networks	1. Arterial road development, lane-km 2. Arterial road preservation, eff. km 3. Arterial road maintenance, km 4. Bridge development, lin-m 5. Bridge preservation, lin-m 6. Strategic road improvement, km 7. Emergency works, km. 8. Engineering design and supervision services	1. Average procurement duration (cal.d) 2. Variance of original contract price from engineer's cost estimate (%) 3. Achievement of original project scope/output (%) 4. Over-run on original contract time (%) 5. Payment performance (cal.d) 6. Routine maintenance by contract (% road length, % bridge length)

ii. ***Enhance Value for Money (1) Optimum Whole Life Cost, Extend Design Life*** – In order to achieve better value for money in the design phase, it is recommended that a whole life cost approach be introduced in which the pavement design life and costs for construction, periodic maintenance and rehabilitation be optimised to incur the least average annual cost, taking account of the vehicle operating costs of traffic. It is expected that this would entail a change to the current short-term design life standards to double the expected life from five years for periodic maintenance and 10 years for construction to the more common international norms of about 10 years and 20 years respectively. This should result in a 25-30 percent reduction in the medium-term average cost of road preservation, although in some cases this may include a 40 percent increase in the initial costs. The progress in converting the network to these higher standards could be monitored through an indicator of 'expected life' on each segment of the network.

iii. **Enhance Value for Money (2) Asset Quality and Performance** – Improvements to the quality and actual performance of road assets and the work inputs are also expected to enhance the value for money received from the sector spending. Despite continual efforts to improve quality it is apparent from the observed rate of deterioration that many road works still fail to achieve their intended performance and life, which places an extra strain on financial requirements. It is recommended that a measure termed 'historical pavement life', which represents the age of the existing pavement since the last intervention, be introduced so it can be used as a tool for monitoring and improving actual performance.

iv. ***Enhance Work Program Delivery (1) Efficiency in Project Delivery*** – The cost and time efficiency of the project implementation process is cause for concern, and improvements to it are the responsibility of DGH management. A series of indicators are recommended for monitoring the progress in improving delivery performance, i.e.: (i) The delivery time in each of four phases bound by specific dates in the project cycle – Preparation (to bid advertisement), Procurement (to contract signing); Implementation (to provisional handover); and Evaluation (to final performance record); and (ii) Cost parameters – contract price (variance from owner's estimate), contract completion (variance from contract price), project completion (variance from original estimate) and number of variation orders.

v. ***Enhance Work Program Delivery: (2) Procurement Quality*** – In order to encourage improvements to the overall quality of procurement in terms of competition and efficiency, performance indicators should include contract package size and possibly bid participation, e.g.: report by work unit: (i) total effective output; (ii) total number of contract packages; (iii) total value of contract packages; and (iv) basic statistics (average, maximum, minimum).

vi. ***Enhance Work Program Delivery: (3) Benchmark Output Costs*** – In addition to monitoring the process performance, it is useful to measure the reasonableness of the overall costs being achieved. This is ultimately the major measure of economic efficiency achieved by a sector program. Performance indicators are recommended in three main categories and some sub-categories, i.e.:

a. Program-level average costs per unit output (e.g., program-average cost of (i) preservation/functional km and (ii) development/effective km; program coverage of (i) preservation effective length percent of network, (ii) development effective length % of network);

b. Sub-activity or work-type average costs (e.g., routine maintenance per functional km, preservation excluding routine maintenance per effective km, development (existing roads) per 2-lane equivalent effective km, development (vertical structures) per effective lineal meter, development (new roads) per 2-lane equivalent effective km.)

    c.   Sub-activity technical reference (e.g., preservation works: average equivalent asphalt thickness; development works: costs and equivalent thickness by pavement type (concrete, asphalt, gravel)).

vii. ***Work Program Delivery: (4) Organisational Effectiveness*** – It is recommended that a performance reform review be made of two key areas in the current form of decentralized DGH organisational structure where improvements could be achieved in terms of accountability for effectiveness and efficiency, i.e.: (i) The responsibility for managing the value for money issues is shared between the central engineering policy directorate (Bintek), the work units (satkers) at a sub-provincial level and the project officers (PPK) at a project or contract package level; and (ii) The responsibility for procurement quality and efficiency is spread over numerous (about 700) project officers and there appears to be little or unclear accountability for the procurement performance at the institutional level (Balai or Wilaya).

viii. ***Local Road Program Support*** – In order to learn from leading examples of how other countries manage the performance of local road networks under a decentralized government system, it is recommended that a review be conducted of countries where a form of technical support and collaborative management have been established.

6.3   POTENTIAL TECHNICAL SUPPORT

DGH has already begun to adopt changes in sector policy based on the findings made during preparation of the 2010-14 RENSTRA (RPJM-2), in regard to trans-regional corridor planning, extending technical design life standards, organisational review of implementation functions and performance-based budgeting structure. Arising from discussions on the findings of this review, DGH has identified a number of areas where technical support would be helpful. The areas fall into three categories, i.e.:

(a)   Capacity-building for application of medium-term and performance-based budgeting;

(b)   Development of 2011-14 DGH Program; and

(c)   Institutional strengthening.

Specific tasks identified from the discussions are listed in Table 14, and more details are provided in Chapter 5. Further support is planned by AusAID's IndII project to assist DGH in developing terms of reference and implementing the tasks chosen by DGH.

Table 14: Summary of Potential Technical Assistance Tasks on MTEF-PBB in DGH

Brief Task Description	Inputs	Timing
1. Capacity Building for Application of MTEF-PBB		
1.1 General awareness of MTEF and PBB Methodology in DGH		Q1-Q2/10
1.2 Finalize definition of Performance Indicators and Processing Methodology	1.5 months	Q1-Q2/10
1.3 Upgrade Programming Evaluation and Project Preparation Procedures for MTEF-PBB	1.5 months	Q2, 2010
1.4 Study visit on MTEF Experience in Road Sector		completed

	Brief Task Description	Inputs	Timing
1.5	External training in performance-oriented sector management		Q2-Q4/10
2.	**Development of 2011-2014 DGH Program**		
2.1	Planning Study on Major Road Infrastructure Development in Regional Corridors	8 months	Q3/10 to Q1/11
2.2	Planning of Arterial Road Network Development Program	6 months	Q2-Q4/10
2.3	Planning of Road and Bridge Preservation Program	3 months	Q2-Q3/10
3.	**Institutional Strengthening**		
3.1	Reform of Implementation Organisation to Improve Program Delivery	4 months	Q2-Q3/10
3.2	Review of Organisation for Delivering Expressway Program	2 months	Q3/10
3.3	Scoping Development of Asset-level Programming Tool	4 months	Q2/10
3.4	Devising Sustainable Technical Support to Local Road Management Agencies	2 months	Q2/10

ANNEXES

ANNEX A PERFORMANCE-BASED PROGRAM STRUCTURE FOR DIRECTORATE GENERAL OF HIGHWAYS

Table A.1: Performance-based Program Structure (Echelon 1) – Directorate General of Highways

Unit Echelon I: **DIT-JEN BINA MARGA (DIRECTORATE GENERAL OF HIGHWAYS)**			
VISION: Access to an integrated reliable sustainable road system is available nation-wide to support economic growth and social well being.			
MISSION: 1. Improve major road transport infrastructure to support and attract regional and internal trade and production. 2. Improve quality and capacity of national arterial road network to connect remote and central regions. 3. Improve performance and accountability of central and local road agencies in providing sustainable and cost effective local road infrastructure.			
CORE BUSINESS AND FUNCTIONS	**IMPACT & INDICATORS**	**OUTCOMES & INDICATORS**	**PROPOSED PROGRAM**
Core Business Formulation and implementation of technical policies for the development and management of road system infrastructure. **Function** 1. Formulation of technical policies for the sustainable development and management of road system infrastructure. 2. Delivery of sustainable expressway, arterial and strategic national road networks 3. Facilitation of Local Road Agencies and monitoring the local road network for sustainable road system infrastructure. 4. Facilitation and promotion of Private Sector Participation in investment and delivery of road services, with efficient use of resources. 5. Conducting business with good governance and transparency, with skilled professional staff and efficient administrative systems.	**Impacts** 1. Improved mobility of road transport between regions and national border. 2. Reduced freight and passenger travel costs for road transport. 3. Reduced fatalities. **Impact Indicators** 1. Trans regional travel time (hr/100 km direct distance) [average of 4 main islands trans regional] 2. Road fatality/10,000 vehicles or /100,000 pop.	**Outcome** Improved connectivity, mobility and safety on the national road network, with improved accessibility in strategic areas. **Strategic Target:** National trunk route roads improved to applicable service standards, over X percent of length. **Program Main Performance Indicators (IKU):** 1. Trunk and Regional Route roads meet or exceed 6 m width minimum standard, percent length 2. Road condition on National Arterial Roads is stable, percent length. 3. Expressway development projects defined and issued for preparation, length 4. Strategic roads meet national functional standard and stable condition, percent length 5. National arterial road links with unsafe performance (number links with > x fatalities/year) 6. Local road network (Province, Kabupaten, Kota) in stable condition, percent length	Development and management of road system infrastructure.

Table A.2: Performance-based Program Structure (Echelon 2) - Planning & Programming Services (Bipran)

Unit Echelon 2:	**BIPRAN – PLANNING, PROGRAMMING AND EVALUATION SERVICES**	
Core Business & Functions	**Activity Output & Output Indicators**	**Activity & Activity Performance Indicators**
Core Business Sustainable and efficient allocation of resources and related forecasting of performance to guide the strategic goals for management and development of the road system infrastructure. **Functions** 1. Multi-year planning of sustainable infrastructure and resource requirements for the whole road system (trans-regional, national and regional) in support of national and regional economic growth and social well-being. 2. Preparation of annual and medium-term work program and budget for national arterial and strategic road infrastructure, optimised within strategic plan objectives and performance targets. 3. Developing and maintaining management information and support systems to ensure the efficient and effective operation of the organisation. 4. Monitoring performance and benefits of the road system, implementation of the program, and the organisation.	**Activity Output** Advisory services on multi-year resource allocation, work program, performance forecast and priorities for the sector resource envelopes. **Output Indicators** 1. Planning and programming services. 2. Monitoring and evaluation services. 3. Local road agency planning advisory services.	**Activity** Planning, programming budgeting and evaluation services for management of the national road system. **Activity Performance Indicators (API)** 1. Compliance of MTEF targets with RENSTRA for expressways, arterial and strategic national roads. 2. Deviation of new baseline program from previous MTEP (PAJM) forecast. 3. Economic benefit of program above threshold (NPV or BCR). 4. Average Program costs for Preservation; Development. 5. Program treatment coverage of defective road sections (%). 6. Program treatment coverage of defective bridges (%). 7. Provinces with arterial road network condition less than 90 percent stable (number). 8. Preparation of 5-yr Strategic Expenditure Plan (RENSTRA) allocation in feasible annual targets for five years. 9. 3-year rolling MTEP (PAJM) medium-term expenditure program. 10. Annual performance evaluation report on DGH targets. 11. Road management and performance evaluation information updated and available. 12. Development and operation of road asset planning and performance monitoring systems.

Table A.3: Performance-based Program Structure (Echelon 2) – Engineering & Technical Services (Bintek)

Unit Echelon 2:	**BINTEK – ENGINEERING & TECHNICAL SERVICES**	
Core Business & Functions	**Activity Output & Output Indicators**	**Activity & Activity Performance Indicators**
Core Business Facilitation of engineering services and establishment of technical standards and guidelines for provision of sustainable road system assets. **Functions** 1. Formulating and updating technical standards and guidelines for road system assets. 2. Dissemination and training for technical standards and guidelines. 3. Monitoring the application of technical standards and guidelines. 4. Implementing engineering services on complex and special projects. 5. Ensuring quality assurance for all road program. 6. Optimizing the project implementation process and modality.	**Activity Output** Advisory services to formulate technical standards, and to optimise the cost and quality of national road and bridge assets through efficient design and specification. **Output Indicators** 1. Engineering design services. 2. Technical standards and guidance services. 3. Emergency work services. 4. Regional road agency technical advisory services.	**Activity** Guide and monitor the efficiency and technical quality of national road work programs. **Activity Performance Indicators** 1. Compliance of road class with applicable geometric standards, % length. 2. Expected life of paved roads, until next action (yr). 3. Average life-cycle cost of paved roads (Rp. million/km/yr). 4. Bridges in critical condition (%). 5. Safety improvements programmed (% blackspots). 6. Average cost of each work sub-program (Rp. million/km). 7. Supervision team appointed before works contract award, percent. 8. Development project design commenced 12 months or more before budget year, percent of development projects. 9. Value of equipment provided for work by administration. 10. Road development projects designed, length. 11. Bridge development projects designed, length. 12. Environmental impact assessments completed, nr. 13. Land acquisition plans prepared, affected persons. 14. Safety remedial schemes prepared, number. 15. Technical guides updated, nr. 16. National procurement and inventory control of special goods. 17. Emergency/Disaster Relief programs authorized. 18. Disaster relief and SKPD units trained.

Table A.4: Performance-based Program Structure (Echelon 2) – Wilayah & Balai Regional Implementation Directorates

Unit Echelon 2:	WILAYAH AND BALAI IMPLEMENTATION DIRECTORATES	
Core Business & Functions	**Activity Output & Output Indicators**	**Activity & Activity Performance Indicators**
Core Business Efficient delivery of national arterial and strategic road work program to applicable standards with environment-friendly methods. **Functions** 1. Preparation and management of project execution. 2. Management and procurement of private sector participation in delivery of work program. 3. Achieving satisfactory quality and cost in work program delivery. 4. Ensuring continuous serviceability of national arterial roads. 5. Coordination or work program with Provincial road agencies.	**Activity Output** Delivery of road and bridge work sub-programs on national arterial and national strategic road networks. **Output Indicators** 1. Arterial road development, lane-km. 2. Arterial road preservation, eff. Km. 3. Arterial road maintenance, km. 4. Bridge development, lin-m. 5. Bridge preservation, lin-m. 6. Strategic and reclassified road improvement, km. 7. Emergency works, km. 8. Engineering design and supervision services.	**Activity** Prepare and execute preservation and development projects for roads and bridges on national arterial roads in area. **Activity Performance Indicators** 1. Average procurement duration (cal.d). 2. Variance of original contract price from engineer's cost estimate (%). 3. Achievement of original project scope/output (%). 4. Over-run on original contract time (%). 5. Payment performance (cal.d). 6. Routine maintenance by contract (% road length, % bridge length).

Table A.5: Performance-based Program Structure (Echelon 2) - Expressways and Metropolitan Highways (Binkot)

Unit Echelon 2:	BINKOT – EXPRESSWAYS AND METROPOLITAN HIGHWAYS	
Core Business & Functions	**Activity Output & Output Indicators**	**Activity & Activity Performance Indicators**
Core Business Implementing policies and the strategic plan for the development and management of expressways and metropolitan arterial highways. **Functions** 1. Planning and programming of expressway network and metropolitan arterial highways. 2. Establishing finance and investment policy for expressway development and operation. 3. Determining implementation modality and program for delivery of expressway projects. 4. Implementation of public-funded expressway projects and metropolitan arterial road projects. 5. Monitoring & evaluation of expressway assets and program.	**Activity Output** Expressway and metropolitan arterial highway development and financing program (LTEDP) delivery, measured by: **Output Indicators** 1. Expressway development (publicly financed), km 2. Metropolitan highway development, lane-km 3. Metropolitan highways preserved, lane-km 4. Metropolitan highway structures, lin-m. 5. Expressway planning and engineering services 6. Metropolitan highway engineering services	**Activity** Development of expressway network and metropolitan arterial highways. **Activity Performance Indicators (API)** 1. Long-term expressway development plan (2010-2030). 2. Strategic 5-year program of expressway development. 3. Available expressway space (lane-km/100k pop; per REGDP) 4. Analysis of investment and implementation modality for planned expressway projects. 5. Distribution of financial risk (% public, private, contingent liability). 6. Financial resources committed (% strategic plan resources) 7. Land and environmental plans for expressway and metro projects. 8. Average expressway net construction cost, excluding land (Rp. /km) 9. Expressway program implementation progress, % and slippage 10. Metro highway program implementation progress, % and slippage 11. Land acquisition progress (% strategic plan targets). 12. Expressway program delivery time, by project phase (months) 13. Survey of trans-regional and metropolitan travel times. 14. Performance evaluation of expressway & metro highway program.

Table A.6: Performance-based Program Structure (Echelon 1b) - Toll Road Regulatory Agency (BPJT)

Unit Echelon 1b: BPJT [REGULATING AGENCY for TOLL ROADS]		
Core Business & Functions	**Activity Output & Output Indicators**	**Activity & Activity Performance Indicators**
Core Business Regulation of toll road concession and development of road environment consideration. **Functions** 1. Regulation of toll road, including recommendation of initial tariff and adjustment mechanism to MPW. 2. Take over toll roads at the end of concession and recommending mode of operation of post-concession operation. 3. Concessioned construction of toll roads through concession preparation, investment preparation, and facilitating land acquisition. 4. Supervision of management and toll roads under operation, through monitoring and evaluation of toll management and toll road services.	**Activity Output** Sustainable toll road services and concession arrangement. **Output Indicators** 1. Supervision of toll road services, length km. 2. Administration of existing toll road concessions, number. 3. New PPI toll road concessions finalized, number 4. New PPI toll roads in operation, length km.	**Activity** Development and regulation of toll roads in expressway network. **Activity Performance Indicator** 1. Competitive selection, negotiation and finalization of concession agreements. 2. Achievement of toll road development strategic plan (% length, forecast delay (yr). 3. Achievement of land acquisition for active concessions (%). 4. Average net construction cost of new concession (Rp.b/km). 5. Average net construction cost of toll road capacity expansion (Rp. b/lane-km). 6. User satisfaction rating of toll road services 7. Travel speed on toll road: (i) Average (km/hr), (ii) Length chronically congested (speed <30km/hr). 8. Traffic safety: accidents/10,000 veh., fatalities/10,000 veh. 9. Toll gate queuing time.

ANNEX B: SUMMARY OF SAMPLE LITERATURE ON MTEF AND PBB EXPERIENCE

Document	Summary	Lessons
1. P. Le Houerou and R. Taliercio. Medium Term Expenditure Frameworks: From Concept to Practice. Preliminary Lessons from Africa. Africa Region WPS No. 28, World Bank, Washington DC, USA. February 2002	An evaluation of the experience of introducing MTEFs in nine African countries over a ten-year period, deriving lessons for improving the effectiveness of the MTEF process and the method of its introduction in developing countries. Outlines the MTEF concept – linking top-down resource allocation, bottom-up estimate of current and medium-term costs of existing policies, and matching costs with available resources – the stages of the introduction process, objectives and a useful typology for evaluating MTEF design and performance. Success is critically dependent on prior improvement of public expenditure management, in budget execution and reporting. Regarding general design, disaggregation to intra-sectoral activities and allocations is important to improve efficient effective use of resources in implementation phase, and 3-yr period is best. In technical design, a standardized approach specifying sectoral strategy, objectives, activities and outputs is essential, and key value lies in the details. In organisational design, MTEF should be integrated with the budget process and approved by both management and political bodies. For managing MTEFs, participation of key stakeholders (MoF, Planning, sector) improves accountability especially when including civil society and professional expertise. Oversight mechanism is common weakness, but use of performance agreements could improve 'third level' expenditure management and budget execution problems. The impact of these MTEFs was limited in changing resource allocation and improving budget predictability (measured by Budget Deviation Index). Measures of public and political accountability include publication and dissemination of MTEF, allowing public scrutiny of numbers and transparency.	Success factors for introducing MTEF include: • integrating MTEF with budget in single process, • prior improvement of public expenditure management including sector levels, • adequate detail in sector (SEF) to catalyse sub-sectoral reallocation and monitoring performance at activity level, • participation of key stakeholders in development of MTEF – MOF, Planning, sector, and civil society – and joint approval by the executive and parliament Achieving public and political accountability requires increased transparency at political and managerial levels, e.g.: facilitating consensus-based decisions by disclosing relevant information; publishing the MTEF; consultation with technical/professional experts and civil society prior to submission; etc. Budget predictability is only achieved when execution is closely monitored against planned outputs. Budget formulation is easier to improve than budget execution, but deferring explicit match to the execution level would postpone important efficiency gains of the MTEF approach. Accountability for budget execution can be improved through: i) increased transparency, including sufficient disaggregation and detail in the program structure to encourage efficient and effective use of resources at the implementation level; and ii) strengthened use of internal and external audits.

Document	Summary	Lessons
Malcolm Holmes with Alison Evans (2003). A Review of Experience in Implementing Medium Term Expenditure Frameworks in a PRSP Context: A Synthesis of Eight Country Studies. Overseas Development Institute, London, UK. November 2003.	A slightly later European review of applications of MTEF in the same African countries as above plus Albania, with a focus on effectiveness in achieving development objectives and linkages to poverty reduction strategies. In addition to similar general lessons regarding MTEFs, specific observations include: importance of comprehensive coverage of all financial resources (on- and off-budget, domestic and foreign funds); the degree to which outer year costs are treated as forward estimates of costs of current policies or as a forward budget; importance of consistent structure and format for presenting budget and execution results to facilitate monitoring. On sector expenditure programs, the importance of: prioritisation within sector programs, integrated approach to recurrent and investment spending, linkage to national strategic plans, identification of outputs and monitorable indicators. An assessment of the effectiveness of existing policies should be an input to MTEF preparation, and the analysis should show how sub-program allocations should change over future period. Caution is advised to avoid proliferation of performance indicators and possible misuse, and on linking resource allocation to performance too quickly. Performance information is considered to be primarily a management tool at the sector and organisational levels.	• Make MTEF comprehensive of all resources available to sector • Sector working groups should be mandated to coordinate development of SEF, strategic budgeting, and policy initiatives • Develop performance-oriented budgeting system • More attention to efficiency and effectiveness of resource use at implementation level

ANNEX C: MTEF EXPERIENCE IN ROAD SECTOR OF SOUTH AFRICA

1. South Africa has had successful experience in implementing a medium-term expenditure framework (MTEF) for multi-year budgeting of public expenditures, including for the road sector. The Government of Indonesia had previous contact in 2005 with the South African government when they were considering implementing MTEF. A short preliminary technical visit by an advisor was arranged to learn how MTEF and performance-based budgeting (PBB) were being applied in the road sector and the potential for exchanging experience on improving performance in the road sector. A short series of meetings was held in Pretoria on 1-2 October 2009 with the Department of Transport, the South African National Roads Agency Ltd (SANRAL) and the Ministry of Finance. Below is a summary of the financing and management of the road sector in South Africa and a recommendation on liaison between the two countries on applying the MTEF in the road sector. This is followed by more detail on each aspect as background to the recommendations.

2. Summary of Financing and Management of the Road Sector in South Africa. The national road network, of about 16,000 km length, is managed centrally by the national road agency, SANRAL, which is established as a wholly state-owned commercial company and is a premier example of a semi-autonomous road agency. The annual program is financed by national budget (22 percent), toll road revenue (6 percent) and borrowing (72 percent). The provincial networks are managed by the nine provincial governments with the assistance of central block grants, and municipal road networks including district and rural roads are managed by the local governments with the aid of municipal infrastructure grants. The national budget for SANRAL, which can only be used on non-toll roads, is allocated per MTEF on the basis of a 3-year rolling plan which shows the performance achieved against key indicators and the total program including the borrowing commitments. Performance-based budgeting is not yet formally applied at a national level, however the overall performance is reviewed annually. SANRAL itself has a very strong road management system with many performance measures, and currently has a large capital improvement program totalling about USD 3 billion equivalent/yr. The performance of provincial and municipal governments in road management is quite variable, with some especially weak in both maintenance and allocation of the grants, and they are currently discussing ways for improving that.

3. Recommendations on Potential Liaison regarding the Road Sector. All three agencies expressed a willingness to engage with the DGH and to share experience with MTEF and management of the road sector. The DOT and SANRAL host many visitors and SANRAL in particular conducts many training courses and public consultations. While the climate and demographics are somewhat different, the institutional structure for sub-national roads is similar to Indonesia's, the structure for national roads includes reform elements that have been considered and there are many aspects which would provide very useful examples in respect of the road program and budget structure, road management system and surveys, financing options, funding and managing of sub-national road networks including metropolitan cities and municipalities, and encouraging a competitive construction industry. The cooperation could be fostered through contact with the National Department of Transport (International Relations Department and the Director, Infrastructure Finance and Coordination), and the Head of Budget Office National Treasury, through the Ministry of Foreign Affairs. A period of about seven days would be needed to study these five aspects and to have an opportunity of observing some field work and sub-national operations. The two main focuses suggested are: (i) road management approach (road program structure and preparation, surveys, performance measures and accounting, and construction

industry), and institutional (road agency and sub-national government arrangements, financing options, land acquisition, consultation and budgeting issues).

4. <u>General</u>. South Africa, with a population of 49 million, underwent a major democratization and integration during the 1990s and restructured government processes during 1994-99. Since 1999, economic growth has averaged 4 percent/yr and the country now has strong legal and financial systems, and strong industrial, energy and transport sectors. The road network is managed at four distinct levels. The national road network, comprising about 16,000 km (or 330 km per 1000 population, higher than Indonesia's on a per capita basis) is managed centrally by a national road agency. The nine provincial governments control and manage the provincial road networks (about 300,000 km), and the local (municipal) governments manage the municipal, district and rural road networks (about 250,000 km), all with some central budget transfers. Metropolitan cities (168,000 km) can access both municipal grants and raise their own revenues.

5. <u>Transport Policy</u>. The Department of Transport (DoT) is responsible for formulating transport sector policy. The Road Infrastructure Strategy issued in 2006 guides road sector policy at all levels. For the Provinces, this required reclassification of all roads by functional classification and for expenditure programs to be prepared with a rational prioritisation based on an acceptable network management system. All agencies – SANRAL, Provinces and Municipalities – are required to prepare a multi-year business plan as the basis of their MTEF submission. Many of the agencies outsource the preparation of the business plan, but some have not budgeted for data collection surveys to support the asset management systems, and some do not adhere to the plan after the budget is approved. Currently performance evaluation is not a formal part of the budget cycle, but business plan targets are based on indicators such as roughness (IRI), Visual Condition Index, etc. DoT reviews the business plans and targets and deals with quality issues arising from that. As the quality of business plans and the performance of some agencies are not always satisfactory, DoT and the National Treasury are considering options for strengthening the current voluntary system to improve the performance.

6. <u>Financing</u>. The National Treasury transfers funds to the provinces in block grants and DoT may support increased funding for provinces which perform well against their sector business plans. Problems occur with some provinces who may neglect strategic roads or municipalities which neglect maintenance. Local roads are funded through Municipal Infrastructure Grants, also in a 3-year MTEF framework, and a smaller 'equitable share' grant based on population. The six metropolitan cities are authorized to raise revenues and borrow to supplement funding obtained through the grants.

7. <u>National Roads</u>. As part of the macroeconomic reforms, SANRAL was created in 1998 as an agency of DoT, fully owned by the State and run as a semi-private company under the Companies Act, operating under a shareholder agreement and a performance agreement to manage the national roads. It must adhere to the Public Financial Management Act because it is executing public funds, and must follow financial reporting requirements under the Companies Act. However as a company, it may operate with its own procurement rules and human resource policies. Also as a company, the national road assets and land titles have to be transferred to SANRAL, which has sometimes been complicated. About 91 of the 336 DOT staff transferred to SANRAL, and various functions such as traffic monitoring, land administration, survey and mapping, etc. were spun off into separate companies, which operated with guaranteed work programs for a 5-year period before becoming fully private. The agency reports to Government through the Minister of Transport, and is governed by an 8-member Board that comprises two government officials (National Treasury and the Chief Executive Officer) and six private members (initially these represented constituencies such as hauliers, academia, etc. but now they

represent various business skills such as finance, human resources, etc.). SANRAL's functions and operations were defined in Parliament Act 7/1998 which provides some protection from individual political pressures.

8. <u>SANRAL Business Management</u>. SANRAL has formulated clear asset categories, business functions, budget categories and performance measures as a basis for its business model. Examples of these may be found in their publications and a separate annex. They define their road asset management function in two primary categories:

    a. **Maintain** – routine maintenance, periodic maintenance and protection from overloading (under operating expenses), and strengthening (under capital expenditures). (*Note*: To overcome unreliable overload control by the police, SANRAL now contracts operation of weighbridges to private operators and the police only issue the warrant.)
    b. **Develop** – adding length and capacity to the network, and managing utilization with traffic control and intelligent transport systems (ITS) (equipment installation is capital expense and operations are operating expenses).

    Out of the 20,000 km identified as strategic roads when SANRAL was formed, so far 16,170 km has been formally transferred to their ownership and management. The transfer of other roads is still under negotiation with the provinces concerned. As one means of improving road conditions and addressing the neglect of other strategic roads not under SANRAL's management, the government is considering greatly increasing the national network under SANRAL to over 30,000 km.

9. <u>Financing of National Roads</u>. The work program and budget is formulated under standard activity types aligning with the two main functions above, and two budget heads - operating expenditures and capital expenditures - conforming to the Public Financial Management Act. The budget, work program and administration are all operated on the SAP business system. The budget is developed and authorized on a 3-year allocation, under the MTEF approach. The SANRAL revenues comprise three sources, as follows for the 2009 baseline:

SANRAL Revenues	2009	SAR billion[18]	USD million equiv.
Treasury allocation:	Operating expenses	2.75	370
	Capital expenditures	2.84	380
Toll road revenues:		1.80	240
Total revenues		7.4	990

Operating expenses covers (i) salaries and technical support; and (ii) maintenance – Ad hoc (line marking, etc.), Routine (contracted in 400 km lengths, where the main contractor is required to subcontract at least 80 percent of the work to local small-medium enterprises and to train the SMEs); Periodic (preventive work excluding rehabilitation); Special (slope repairs and spot road rehabilitation of isolated failures – this brings a road link up to its expected life). Capital expenditures cover all other aspects. Toll road revenues can only be used for the maintenance and development of existing toll roads.

Additional funding requirements for capital improvements amounting to SAR 18 billion (USD 2.4 billion) are borrowed on national financial markets, including SAR 12 billion in unsecured bonds

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[18] 1 USD = 7.5 SAR approximately

that are fully subscribed. These borrowings will be serviced through future revenues as outlined in the multi-year business plan, and are approved by the National Treasury under the 3-year MTEF.

10. Road Management Measures. Under the road network management system the network is maintained in good condition. Pavement age is used as a key measure of management performance, with the age being referenced to the most recent strengthening or rehabilitation. Currently 78 percent of the network has a pavement age older than 20 years, indicating very stable conditions, and SANRAL's intent is to extend this to 30-40 years in order to reduce life cycle costs and maintenance needs further. Utilization is tracked by the length of network in each of five levels of traffic volume. The costs of delayed maintenance are computed using an asset management model (HDM4 for project-level and dTIMS for network-level analyses), which show that a 3-5 year delay will cost 6-times more in rehabilitation, and a 5-8 year delay would cost 18-times more in reconstruction, than timely maintenance. A study of the actual cost history of the network has shown that flexible pavements have higher life-cycle costs than expected and that rigid pavements have lower life-cycle costs than expected. Thus they will be considering more use of concrete pavements in order to increase the lifetime and reduce the life-cycle costs.

11. Asset Management and Monitoring. The asset management tools are managed through six aspects (hardware, software, data, people, system funding, and procedures). Data is mostly collected by private agents under contract, especially traffic, pavement and road, and bridge surveys, at a total cost of SAR 40 million/yr, which is equivalent to USD 330/km/yr or less than 0.2 percent of the national road sector budget. For traffic monitoring, SANRAL paid for installation of the equipment, and the contracts cover the collection and analysis of traffic data. The road surveys cover 22,000 km each year in one direction and cover the other direction in the next year. Bridge surveys assess the degree, extent and relevance of condition parameters, and focus on inspection of bridge elements in order to generate specific activity lists. SANRAL operates the road management system centrally, issuing the worksheets with in-built calibration, predictive functions and unit costs to consultants preparing the work plans, and then finalizes the budget and program submission before submission to the National Treasury.

12. Ministry of Finance. As a result of the strong economic growth over the last few years, preparations for hosting the soccer world cup in 2010 and economic stimulus, a larger fiscus has been made available for the budget with emphasis on capital expenditure for infrastructure. The National Treasury has reflected that by raising the budget allocation to SANRAL more than the usual annual increase from SAR 5.6 b to SAR 8.1 b (USD 0.8 b to 1.1 b) in year 3 (2011) and by increasing the borrowing capacity of SANRAL to SAR 50 b (USD 6.9 b) by authorizing the issue of SAR 32 b (USD 4.3 b) in government-secured bonds. Details are published online in the "Estimates of National Expenditure" (ENE). SANRAL is embarking on a large capacity expansion program on the network and plans to service these commitments through tolling a number of existing roads (which is only feasible on about 4,000 km where traffic volumes exceed 5,000 veh/day). MOF find that the block grants to provinces and municipalities are not working well for some sectors – such as transport - and that the current performance indicators are weak and need upgrading. As the allocation for capital expenditure can be increased if the submission is supported by a well-developed business plan, MOF are encouraging the sector and local governments to adopt a good asset management system.

ANNEX D: RENSTRA 2010-14 FOR DIRECTORATE GENERAL OF HIGHWAYS

Table D.1: DG Highways RENSTRA 2010-14 - Targets for Five-Year Budget of IDR 148 trillion

	Program/Activity Priorities	Targets: Expected outcomes, output	Indicator	Target		Total Allocation 2010-14 (IDR billion)	Average cost IDR million/unit output
				2010	2014		
II	**Road Management Program**					**148,419**	**864**
1	Implementation of preservation and development of national roads and bridges	Preservation of roads and bridges	Length of road preservation, km	31,228	171,695	47,546	277
			Length of bridge preservation, km	118,838	602,944	5,426	9
		Development of roads and bridges	Length of road widening, km	3,660	19,370	67,022	3,460
			Length of ring-road/bypass construction, km	0	37	535	14,584
			Length of bridge construction, m	3,170	16,158	4,001	248
			Length of flyovers/underpass construction, m	4,345	10,800	2,437	226
			Length of strategic regional road route constructed in South Java corridor, km	113	1,378	7,404	5,373
2	Implementation of preservation and development of expressways and urban highways	Capacity improvement of toll roads	Length toll road constructed, km	5	120	8,815	73,245
3	Development of policies, programs and budgets, and program evaluation	Improved policies, program and evaluation of program implementation, 100 percent/year	Number of policy, program and implementation evaluations	1	1	1308.48	1,308,480
4	Preparation of guides and standards, supervision and preparation of design, and management of road safety equipment and road materials	Improved standard of technical guidance for road implementation, 90 percent per year	Number of documents issued	0.9	0.9	785.09	872,322
5	Administration and monitoring of road and bridge implementation in west region	Administrative support for road and bridge implementation in west region	Number of monitoring, evaluation and technical administration activities in west region	1	1	1046.78	1,046,780
6	Administration and monitoring of road and bridge implementation in east region	Administrative support for road and bridge implementation in east region	Number of monitoring, evaluation and technical administration activities in east region	1	1	1046.78	1,046,780
7	Management and other technical support to DJBM	Improved quality of road implementation plan, 100 percent per year	Number of management and technical support for implementation of road program	1	1	523.39	523,390
8	Toll roads management	Implementation of preparation, tendering and land acquisition for toll roads, 100 percent per year	Amount of toll road length constructed *by private investors*	1	1	523.39	523,390

Table D.2: DG Highways RENSTRA 2010-14 - Activity Details

	Program	Performance Indicator			Activity / Sub-Activity	Performance Indicator			Budget IDR billion	Remark
		Outcome	Quantity	unit		Output	Quantity	Unit		
2	Implementation of national roads and support for local roads	Utilization of national roads	91.64	billion veh/year	Preservation of roads and bridges	Length road routine maintenance	148,247	km	7,412	By administration
		Reduction in travel time between main national centres	7	percent		Length road preventive or rehabilitation treatment	15,666	km	20,366	By maintenance units
		National road network in stable condition	95	percent		Length road reconstruction or strengthening	6,410	km	18,267	
						Length bridge routine maintenance	554,941	m	2,774	By administration
						Length bridge preventive or rehabilitation work	37,880	m	1,136	By maintenance units
						Length bridge replacement	10,100	m	1,515	
		Additional road space	15,000	lane-km	Improvement of road capacity	Length new road construction	116	km	1,490	Construction units (Sumatra, Java, Sulawesi)
		Length of improved road capacity	19,370	km		Length ring-road or bypass construction	37	km	535	
		Length of road improved to highway standard	400	km		Length of road widening	19,254	km	63,760	
		Length four trunk routes with 7 m standard (in East Sumatra and North Java), and 6 m standard (in South Kalimantan and West Sulawesi)	100	percent		Length new bridge construction	13,627	m	5,934	
						Length tunnel construction	800	m	200	(Java)
						Length flyover and underpass construction	12,243	m	2,237	(Sumatra, Java)
		Percentage national road length sub-standard	10	percent		Lane space on national roads	104,702	lane-km		(includes all)
						Completion land acquisition	100	percent	-	
		Additional length of expressways	800	km	Expressway construction (governm't or private)	Length expressway construction	700	km	6,850	Sumatra, Java
						Area land acquisition for expressways	546	ha	1,947	Sumatra, Java
4	(For Improvement of strategic and remote areas)	Implementation of preservation and development of strategic roads	100	percent	Preservation and development of strategic roads	Length of strategic road preservation and improvement	1,378	km	7,404	Kalimantan, Sulawesi, Nusa Tenggara, Maluku, Papua
		Accessibility level in remote areas	100	percent	Access to emergency areas	Number locations	75	location	1,500	
	Management & technical services								5,093	
	Note: Extract from full "MATRIX RENSTRA BINA MARGA 2010-14" (February 2010)								143,326	

Table D.3: DG Highways RENSTRA 2010-14 - Average Costs and Output Rates for Activities

Activity	Sub-Activity	Average Annual Output		Average Annual Budget	Average Cost	Average Cost
		Unit	Unit /year	IDR billion	IDR million /unit	USD equiv. /unit
Road Preservation			**34,065**	**10,294**	**302**	**33,577**
	Road routine maintenance	km	29,649	1,482	50	5,556
	Road preventive/rehabilitation	km	3,133	4,073	1,300	144,446
	Road reconstruction/strengthening	km	1,282	3,653	2,850	316,641
	Bridge routine maintenance	m	110,988	555	5	555
	Bridge preventive/rehabilitation	m	7,576	227	30	3,333
	Bridge repair/reconstruction	m	2,020	303	150	16,667
Road Development			**34,065**	**14,831**	**435**	**48,375**
	Road construction	km	23	298	12,843	1,426,973
	Ringroad & bypass construction	km	7	107	14,446	1,605,105
	Road widening	km	3,851	12,752	3,312	367,946
	Bridge construction	m	2,725	1,187	435	48,380
	Tunnel construction	m	160	40	250	27,778
	Flyover/underpass construction	m	2,449	447	183	20,302
Strategic Road Preservation and Development			**276**	**1,481**	**5,373**	**596,994**
Expressway Development			**140**	**1,759**	**12,567**	**1,396,354**
Services - management & technical				**1,019**		
				29,384		
Sub-activity Clusters	Road preservation	km	34,065	9,209	270	30,038
	Road Structures Preservation	m	120,584	1,085	9	1,000
	Road development	km	3,881	13,157	3,390	376,634
	Road Structures Development	m	5,334	1,674	314	34,873
	Strategic Road Management	km	276	1,481	5,373	596,994
	Expressway development (share)	km	140	1,759	12,567	1,396,354
	Services - management & technical			1,019		