IV SESSION REPORTS

1. Japan

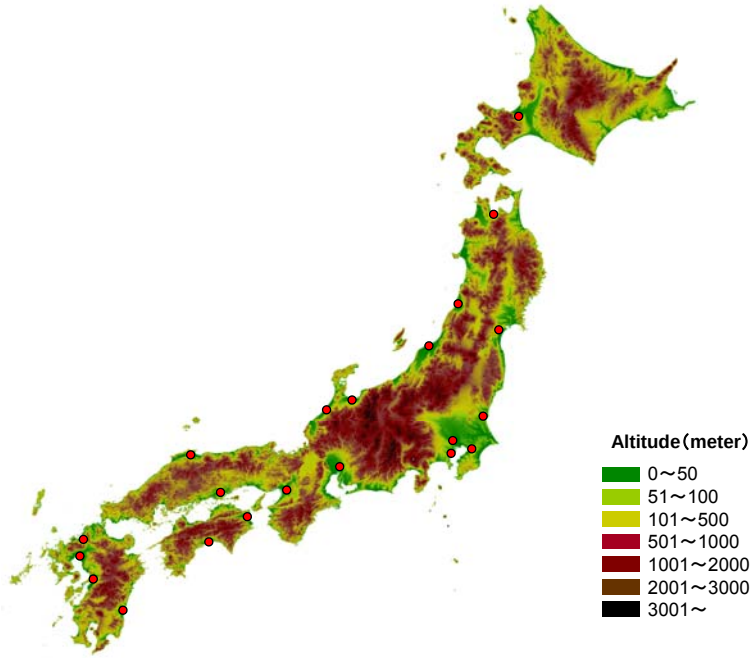
Mr. Kazuhiro NISHIKAWA

Road Planning and Design in Japan

Past decisions and Current challenges

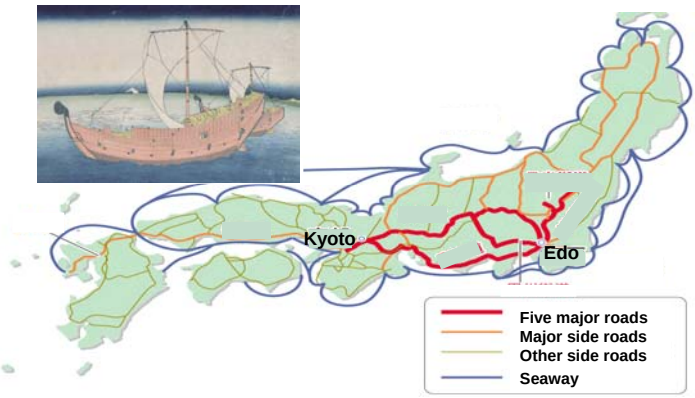
Kazuhiro Nishikawa
Director General
NILIM, MLIT
11 November 2009

Introduction (1)



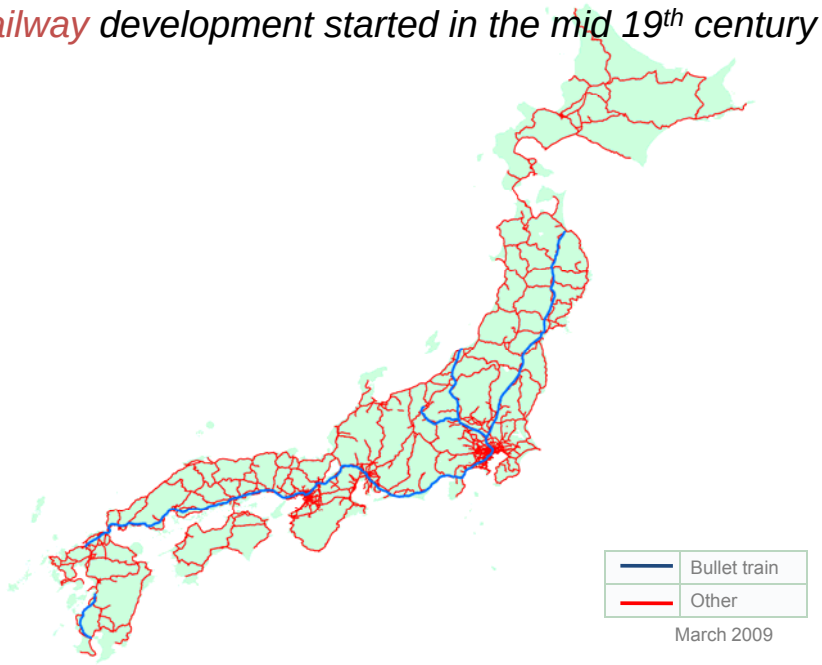
Introduction (2)

Seaways were mainly used before the mid 19th century

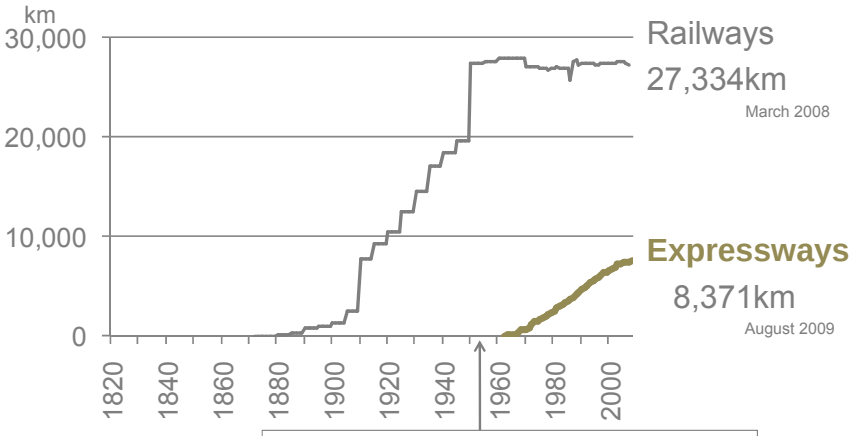


Introduction (3)

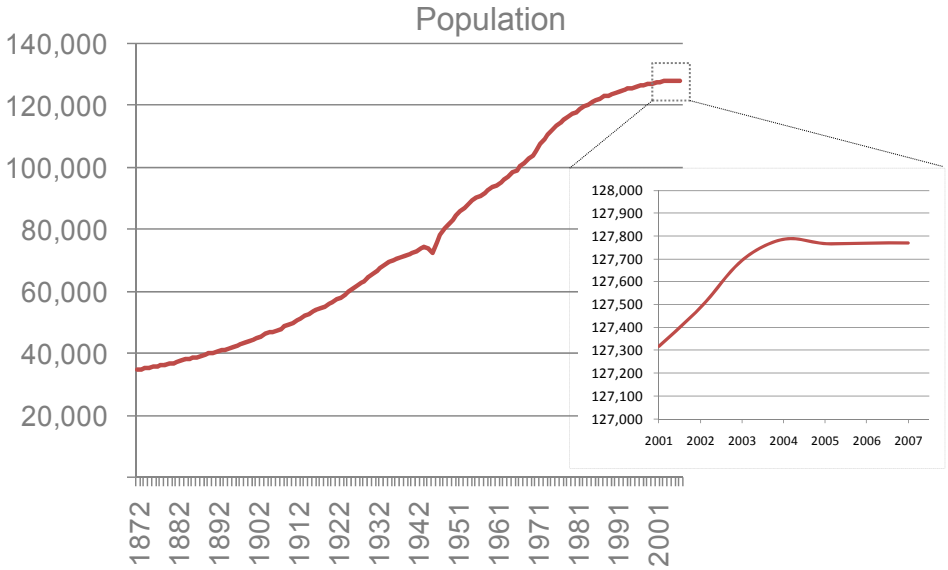
Railway development started in the mid 19th century



Introduction (4)

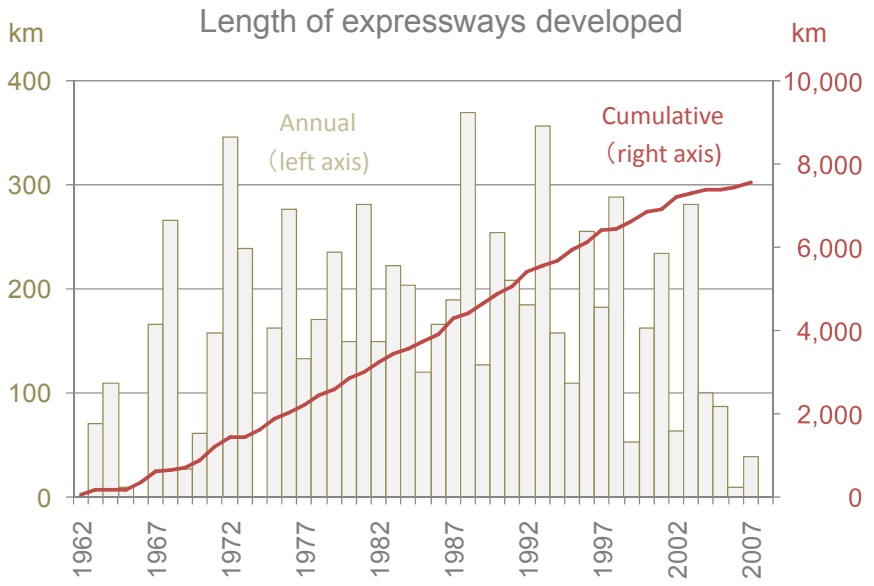


Introduction (5)

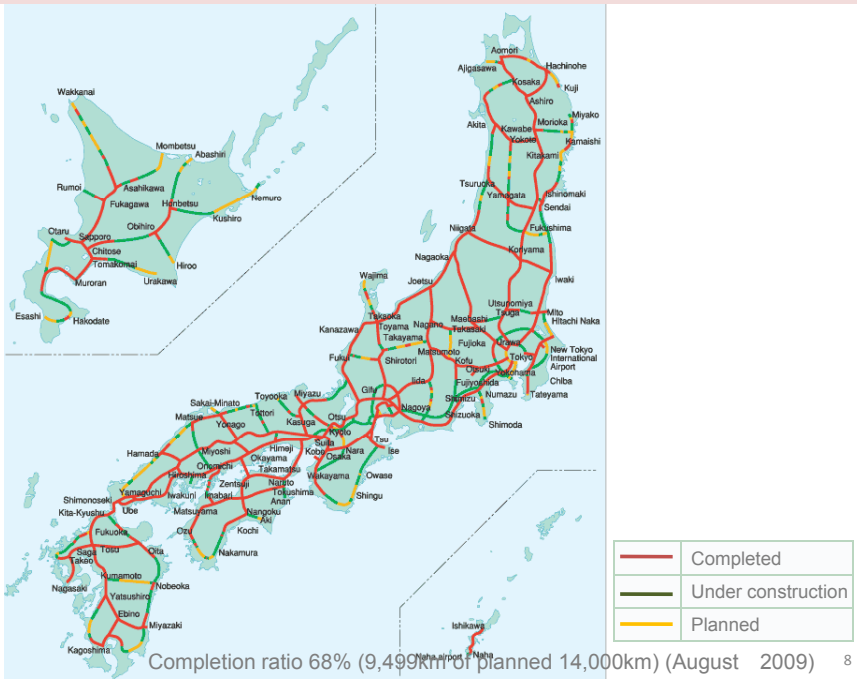


2002	2003	2004	2005	2006	2007
127,486	127,694	127,787	127,768	127,770	127,771

Introduction (6)

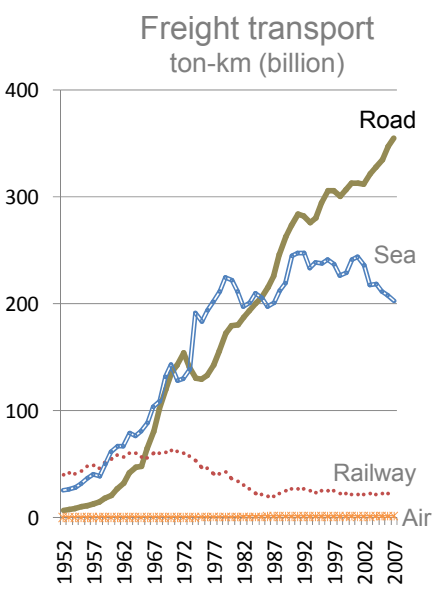


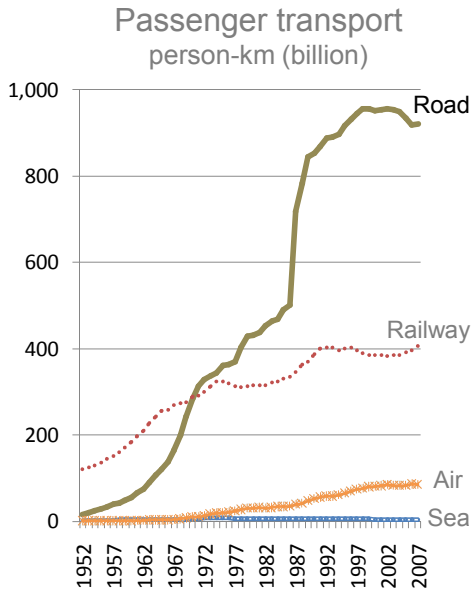
Introduction (7)



Completion ratio 68% (9,499km of planned 14,000km) (August 2009)

Introduction (8)





Past Road Plans and Designs (1)

Decisions made in the 1950's

Option A

Study a desirable road network and build a strategic road network that can cope with future road traffic demand.

Option B

Rapidly construct roads without changing the existing fundamental network structure.

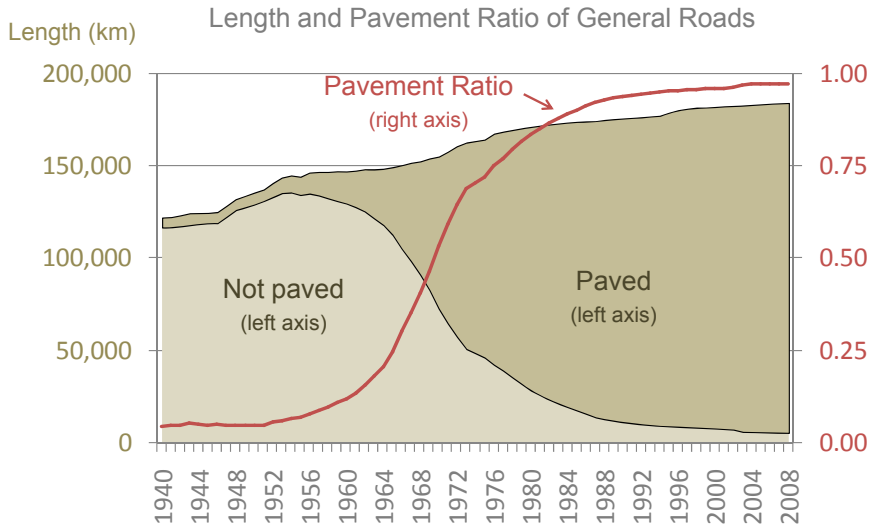
- paving the existing roads -

Option B was adopted in favor of the quick realization of the advanced road network so as to quickly catch up with top-runner countries.

Past Road Plans and Designs (2)

1. Rapid Road Development by Paving Existing Roads

In the past, road development meant paving existing roads.

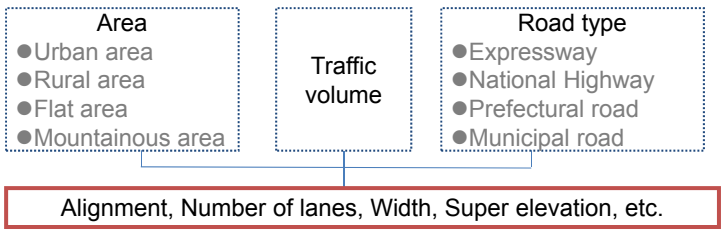


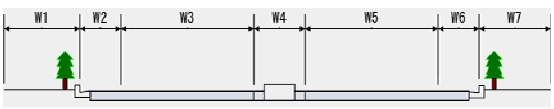
Past Road Plans and Designs (3)

2. Standard Specifications

Standards and systems that allow everyone to draw the same designs were established to make up for the lack of engineers.

✓ Standard Specification for Road Design

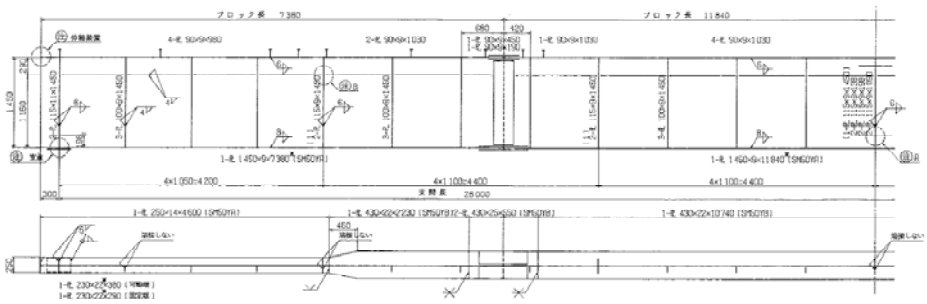




Past Road Plans and Designs (4)

(for bridges)
•Standard Specifications for Highway Bridges
•Drawings prepared for every possible span

Concept: Providing the drawings enables everyone to construct bridges

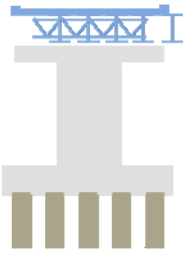


Example: Steel members

Past Road Plans and Designs (5)

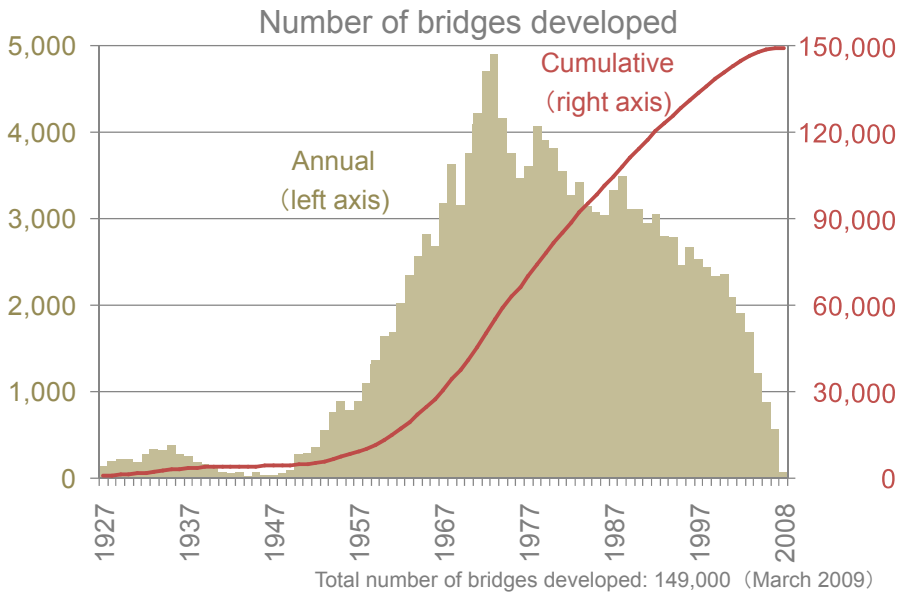
3. Outsourcing and Subdivision of Specialty Fields

✓ Outsourcing to private companies
✓ Technique transfer to private companies
✓ Subdivision of specialty fields
- ◆Investigation
- ◆Design
- ◆Implementation
  - ➢Superstructures
    - • Steel bridges
    - • Concrete bridges
  - ➢Piers, Abutments
  - ➢Foundations



Past Road Plans and Designs (6)

Rapid Bridge Development



Total number of bridges developed: 149,000（March 2009）

Looking back on the Road Plans and Designs in the past 60 years (1)

Consequences of Rapid Road Development

- Road network development occurred very rapidly.
  - – Bolstered high economic growth. *(Miracle of the East)*
  - – Helped Japan quickly catch up with top-runner countries.

- However, various issues were left unresolved.

Looking back on the Road Plans and Designs in the past 60 years (2)

Issues

(1. Rapid Road Development by Paving Existing Roads)

✓ Endless improvement

Lack of capacity, poor alignment, and congestion associated with urbanization

→ Development of new standard roads such as bypasses

(2. Designs Based on Standard Specifications)

✓ Mismatch of standard designs

– High priority roads → Old, poor standards

– Low priority roads → New, high standards

Neither of these situations is rational.

✓ Education of engineers for creativity and imagination

(3. Outsourcing and Subdivision of Specialty Fields)

✓ Education of engineers in comprehensive design management capability

A policy shift may have been necessary sometime in the 1980s.

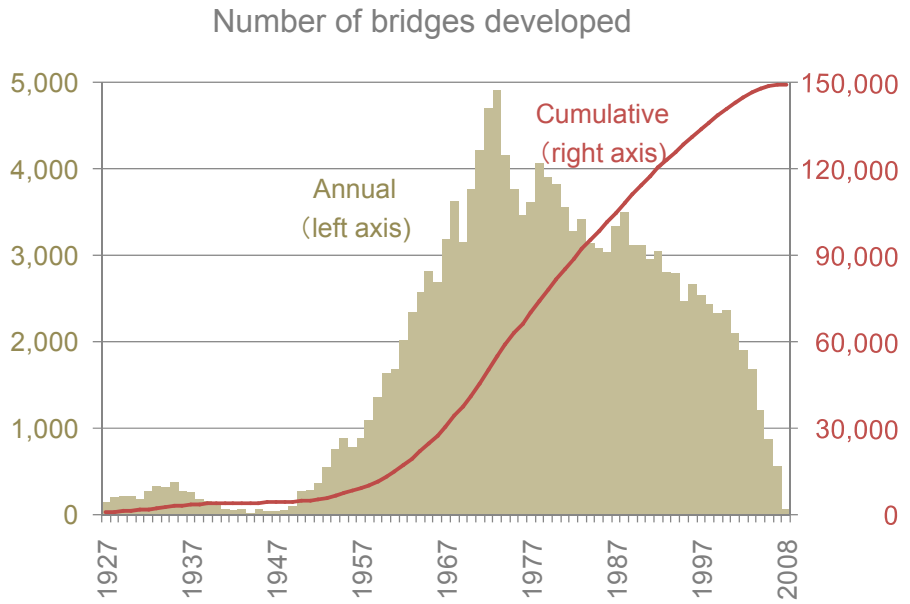
Looking back on the Road Plans and Designs in the past 60 years (3)

Future Direction

1. Shifting from a speed-centered approach to a mindset conscious of performance and quality
   - Fine-tuned responses to the problems, needs and requirements of each region

2. Perspective for the future
   - Social change after network completion
   - Strategic infrastructure maintenance

Strategic Infrastructure Maintenance（1）



Strategic Infrastructure Maintenance（2）

Strategic Maintenance

Road Bridge Life Extension Plan of Road Bridges

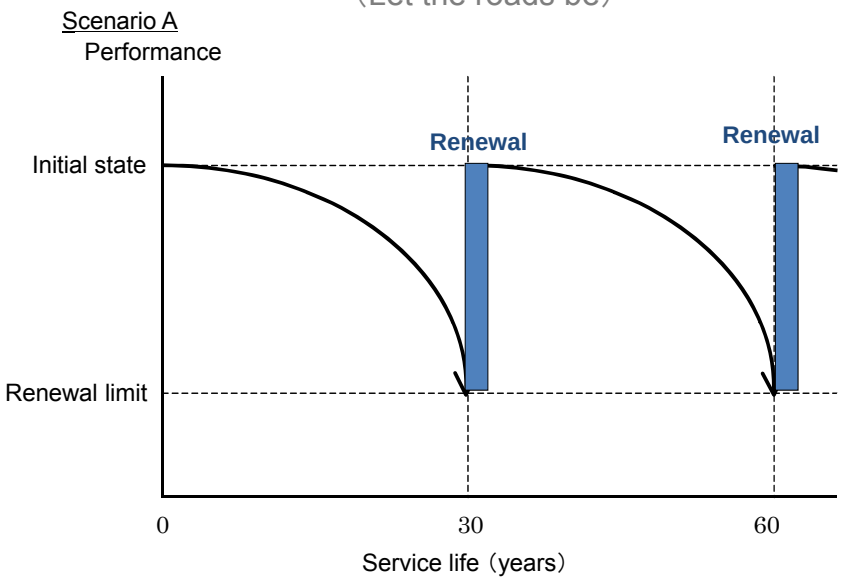
What is strategy?

- The “Strategic Target” is as follows: Road functionality shall be maintained sustainably for many years without loss due to aging.
  - ✓ Roads are meant to serve. They must meet “the unspoken expectation of eternal service”
  - ✓ Characteristics of infrastructure management
- Service life extension of bridges is “Strategy”
  - ✓ Service life extension allows a sustainable maintenance of functionality.
- Preventive maintenance is “Tactics” to extend service life
  - ✓ Preventive maintenance is an effective method for extending service life.

Strategic Infrastructure Maintenance (3)

No maintenance

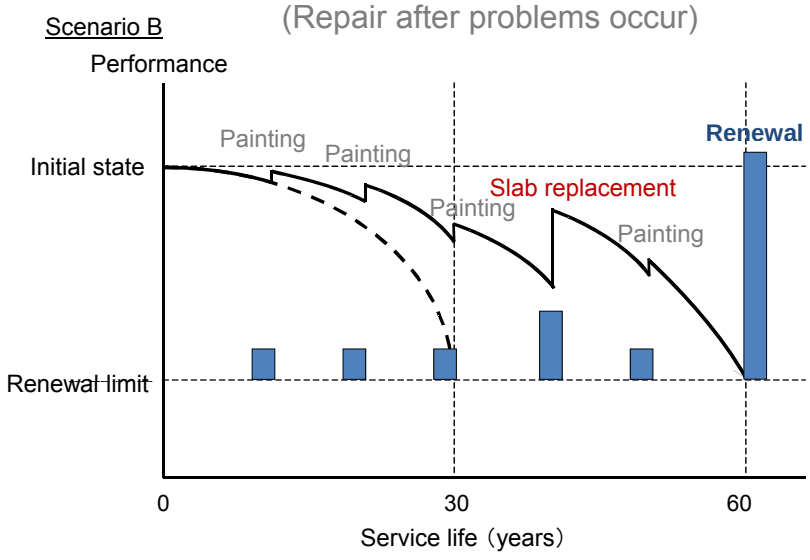
(Let the roads be)



Strategic Infrastructure Maintenance (4)

Traditional maintenance

(Repair after problems occur)

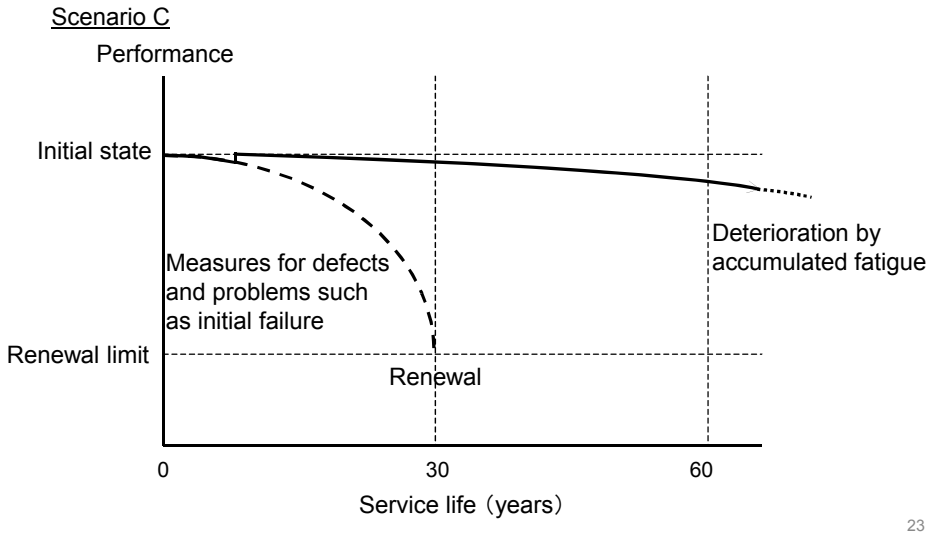


Early treatment: easier and cheaper

Strategic Infrastructure Maintenance (5)

Ultimate ideal maintenance

(Based on US Navy Risk Management)



Thank you for your attention

2. The Republic of Indonesia

Mr. Agus Bari SAILENDRA

JICA GROUP TRAINING COURSE ON INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (JFY 2009)

INCEPTION REPORTS

Name	Agus Bari Syailendra, Ir.,M. Sc.
Country	Indonesia
Organisation	Research and Development Agency, Ministry of Public Works
Position	Director of Research and Development Center for Roads and Bridges

Summary

Roles of the Research and Development Center for Roads and Bridges-Indonesia, formerly known as the Institute of Road Engineering (IRE), in road development and traffic operation in Indonesia is ensuring the use of appropriate technology to achieve best construction quality, efficient construction and traffic operation. As a director of RDCRB, I am responsible to lead the Institute to achieve a common dream that has been set, that is, becoming a leading institution in providing road technology for better future of Indonesia. We have identified urgent and strategic needs and challenges of Indonesia to enable the provision of sufficient infrastructure in relation to geographical condition, environmental constraints, and traffic characteristics of Indonesia. From these challenges, we set our goals to provide the best road construction and traffic operation technology that can be in-harmony with the nature of Indonesia on the basis of local materials and capacity.

1. Organisation data:

(1) Name of Organisation : The Research and Development Center for Road and Bridges (RDCRB), formerly known as The Institute of Road Engineering (IRE)

(2) Summary of Organisation:

The RDCRB is a government owned research institute works primarily in providing technology for road and bridges construction in Indonesia. The institute belongs to the Agency for Research Development of the Ministry of Public Works and works side by side with the Directorate General of Highways (Bina Marga) in ensuring infrastructure quality that meets the necessity of each region in Indonesia.

The establishment of the institute was initiated by the Government of Deutsch-Indische in 1925 functioning as an investigation station for soils and roads. This function had continued and the institute had been part of the Directorate

General of Highways of the Ministry of Public Works until the establishment of the ARD within the Ministry in 1985.

Since 1985, the institute has gradually developed its capacity and management in carrying out R and D in roads and bridges, including tackling problematic-soil, traffic problem and developing safety measures for Indonesian highways network. Today, main tasks of the institute are defined as the following mission statement:

1. Conducting Research and Development in roads and bridges technology to support the provision of strong road networks in Indonesia.
2. Developing standard specifications and guidelines for roads construction; and
3. Improving knowledge and engineering bases of Indonesian engineers in road and bridges technology.

The operation of RDCRB is mainly funded by Indonesian Government from the Ministry's budget. Small portion of funding for consultancy and advisory works is funded by private companies. Within the last three year, the RDCRB managed around 12.5 to 16.3 Mill USD per year research budget. It was between 0.85 to 1.85% of the Directorate General of Highways budget.

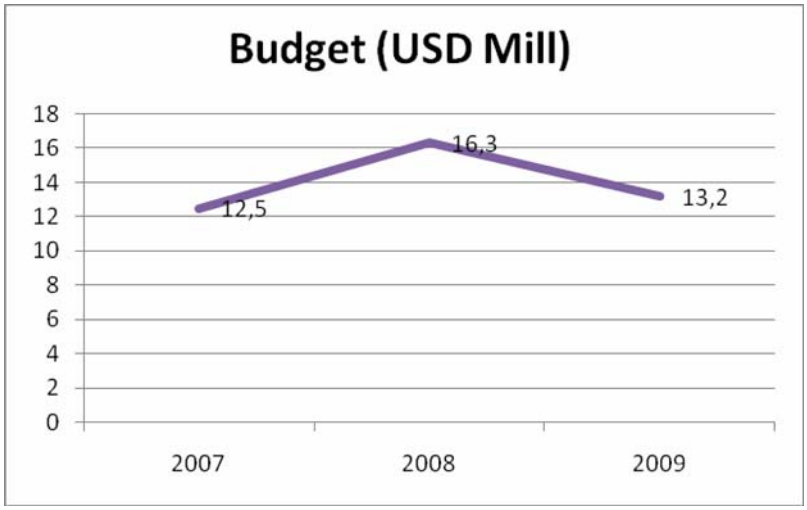


Figure 1 RDCRB budget 2007-2009

Referring to the national program of the Government of Indonesia, the budget of RDCRB was supported from 3 national programs, namely Good-Governance, Science and Technology, and Road and Bridges Program. The budget allocated for good governance program aimed at providing research facilities

and routine expenditures including salary and wages. The fund provided from Science and Technology Program aiming at funding research and development activities, while the Road and Bridges programs funded field trials and pilot projects of technology application. The following figure provides proportion of each activity in relation to the national program.

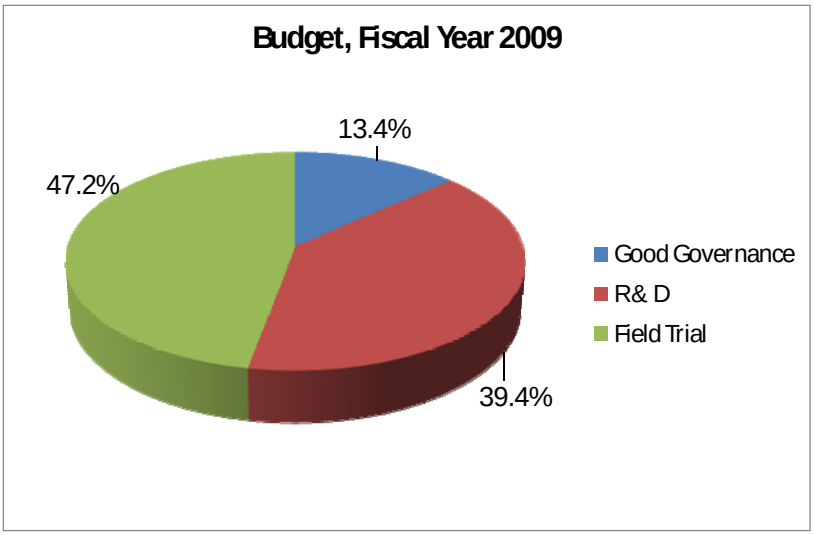


Figure 2 Composition of RDCRB Budget in 2009 by Program

For an institutional budget there are two schemes of Expenditures, namely Material Expenditures and Capital Expenditures. Materials Expenditures includes funding allocated for in-house facility improvement and expenditures for moving items, while the Capital Expenditures associates with expenses which are used for Infrastructures and buildings development.

In each projects budget, the proposed project cost consists of 5 major items, including:

1. Labor Costs and Incentives
2. Transportation and Out off Station Allowances
3. Materials
4. Outsourcing Personnel
5. Others

In accordance with the above categories, the institute's budget in 2009 can be figured as the following chart.

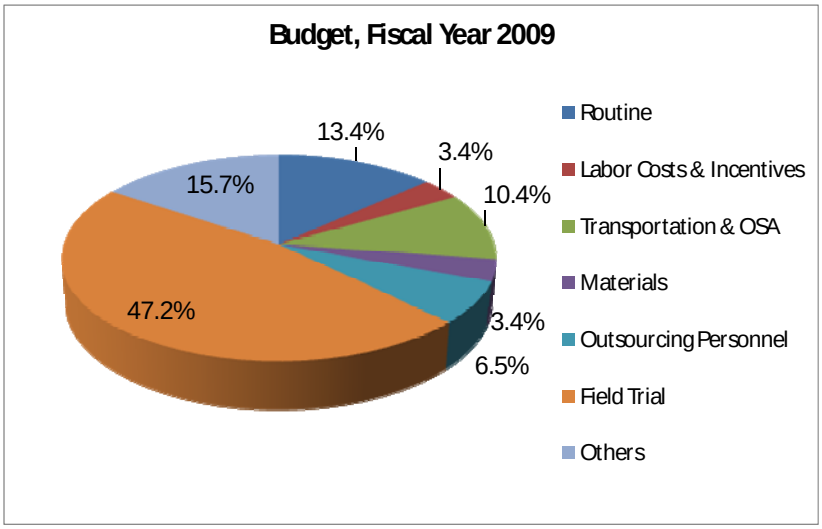


Figure 3 Expenses Category of RDCRB Budget in 2009

(3) Organisation Chart

The Institute runs 4 laboratories consisting of Pavement and material, Geotechnical, Traffic and Environment, and Bridges and Structures laboratory.

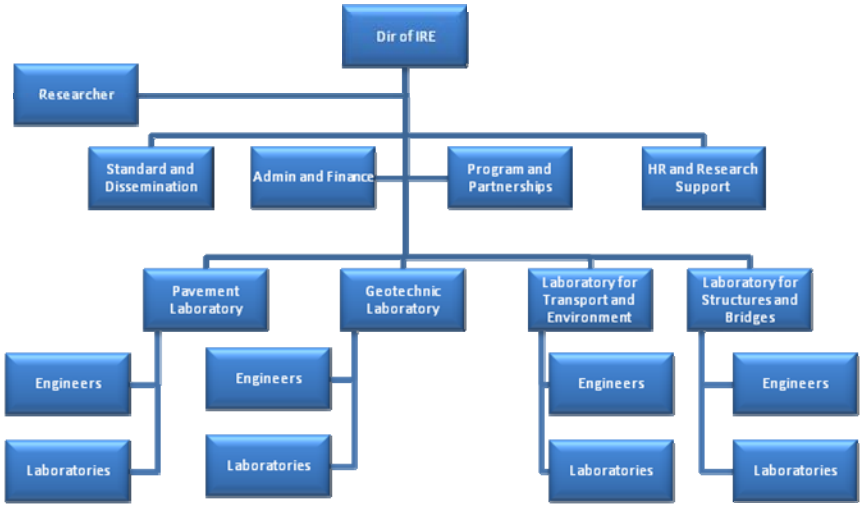


Figure 4 Organisation Chart of RDCRB

As a director of the institute, I am responsible in managing the whole operation of the institute, which consists of research and development (R and D), technical advisory (TA) and Technology Transfer and Dissemination (TTD). For these works, the institute is manned by 373 staffs from various educational background. They comprise 73 specialists (20 %) in pavement, soil and slopes, traffic and environment, and bridges

and road structures. About 40% of the whole staffs are administration and supporting personnel, including guards and cleaning service personnel. The rest are surveyors, laboratory personnel, and technicians.

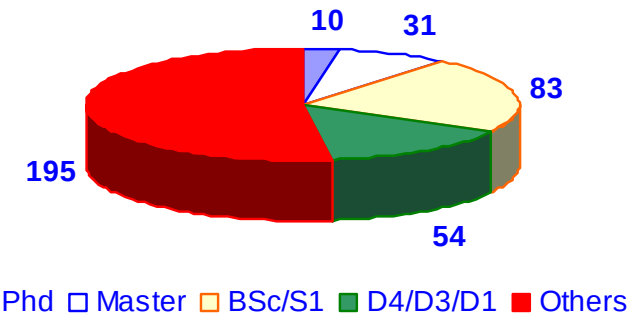


Figure 5 Human Resources of RDCRB by Education Level

(4) Organisation's Position in Government

The Institute has been well known to be a referent institute for road specification and standard in Indonesia. It is designated to support the Ministry of Public Works in managing roads and bridges in Indonesia, especially in relation to capacity development, construction, and supervision tasks. The institute ensures the application of technology which suits the need of each regions and assists the Directorate General of Highways through providing standard procedures for the technology as well as assisting the DGH to solve any practical problems which requires research based problem solving. In addition, the Institute has also provided assistance to the Inspector General of the Ministry in technological audit. Accordingly, the Ministry requires maintaining the position of the Institute being independent and free from any unnecessary pressure.

The Research and Development Center for Roads and Bridges (RDCRB), as well as other Research and Development Center within the Ministry of Public Works, namely Research and Development Center for Water Resources (RDCWS), Research and Development Center for Human Settlement (RDCHS), and Research and Development Center for Socio Economic, Cultural, and Community Participation (RDCSECCP), is administered and supervised by the Agency for Research and Development (ARD) of the Ministry. The head of ARD ranks in the similar level with other Director General in the Ministry. As a research administrating agency, the ARD coordinates with three government agencies namely the Agency for Technological Review and Application (BPPT), The Agency for Standardisation, and Indonesia Institute of Science (LIPI).

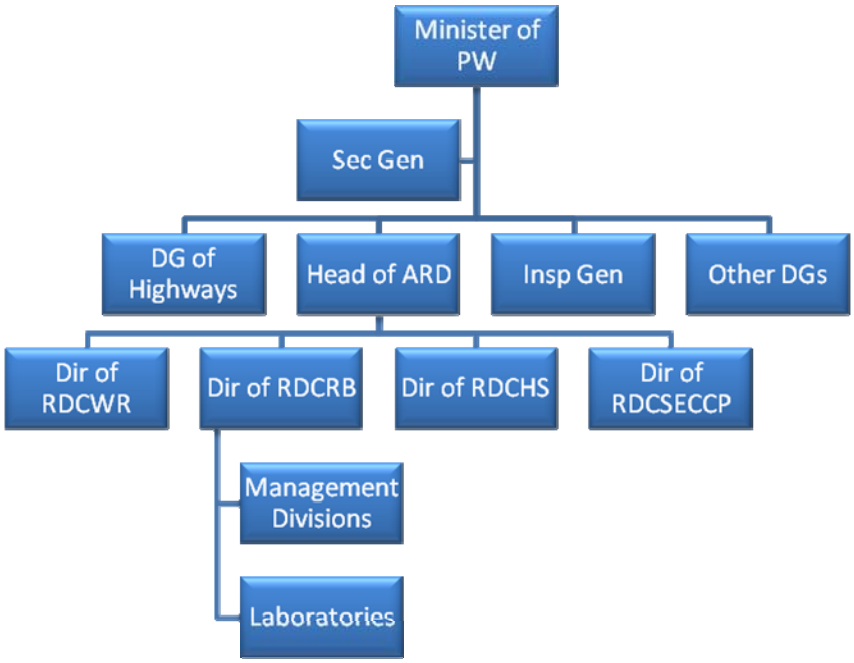


Figure 6 Organisation Chart of the Ministry of Public Works and Positioning of RDCRB

2. Personal Data

(1) Recent Work

I have been joining the Ministry of Public Works for over 30 years when I completed my bachelor degree in Engineering in Bandung. I started my carrier as a field surveyor at the institute, responsible in collecting traffic and road geometry data for road design verification in Mid 1970's. Since then I have gradually improved my education to a full engineer and then took my master degree in Engineering in Surabaya in 1984. My carrier had also been gradually improved being traffic engineer, head of traffic engineer laboratory (2000-2005), head of programming (2005-2007), before I was promoted to be a Director of the institute in 2007.

In the last three years I have focused my work in improving the performance of the RDCRB in providing technology transfer and disseminating research products of RDCRB throughout Indonesia. It was aimed at improving the capacity of Indonesian road engineers to be able to handle more complicated tasks in road and bridges constructions. Also, it is becoming an effective media to introduce new method in road construction and traffic management technology to enable efficient road construction and traffic operation. I took the action in accordance with the new vision of the

RDCRB becoming a leading institute in providing roads and bridges technology for the future of Indonesia.

(2) Contact Address:

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3. Road Policies Implemented According to the Unique Environment and Challenges of Various Region

(1) Issues and Challenges in implementing policies for road development and traffic operation

Effective implementation of policies in road development and traffic operation in Indonesia faces a number of issues in relation to variation on geographical condition of Indonesia, environmental situations, traffic characteristics, and disaster areas. Indonesia is an archipelagic countries consisting over 13,600 islands, wherein the population are unevenly distributed. The distribution of movements is significantly different from one island to another. The availability of road network is following accordingly. Jawa and Sumatra, two of 5 major Islands in Indonesia, are considered beeing more developed than others. In these islands road transports is considered to be a domintant mode that contributes to 70% of freight movements and around 61% of passengers movement. Road network in these two islands are quite well connected. Major issues in these two islands include premature damage of road pavement, traffic congestion in major cities, high accident rates, and sudden road closure due to flood and slope failures.

In three other main islands, Sulawesi, Kalimantan, and Papua, the availability of road network are still quite limited. Except Sulawesi that enjoys the connection of Trans National at Western Coast, most part of these islands have only provided with limited local connection to facilitate movements within province. Other than Sulawesi, in Kalimantan and papua, the Trans National are being constructed. Major issues in these areas include the availability of standard road materials, environmental destructions in association with the presence of wide conservation areas, which brings in high-costs road construction. The challenge in this area is to find out the most appropriate specification for traffic situation and optimalising the use of local materials available in the area.

In smaller islands, except Bali and Lombok, road connections are relatively limited. Road development policy in these islands encounters high-costs and inefficiency problems due to the availability of materials, personnel, and equipments in the areas. Due to the priority of development budget, road developments in these islands are likely abandoned. Bali and Lombok are two islands which have been becoming international destination for tourisms, road developments in these islands are well supported by the development of tourisms and strong demands to connect tourism spots within the island. The efficiency of road development in these islands has been well proven even though the availability of road materials in these islands cannot sufficiently support the construction.

The general issue related to road development and traffic operation in Indonesia is significant gap between the provision of road infrastructure and increases in vehicle ownerships. Data issued by the Directorate General of Highways and Directorate General of Land Transportation (DGLC, Ministry of Transportation) showed that road length in Indonesia has increased by 4.79 % per year while vehicle ownerships increased by 36.94 % annually since 2001. Also, by category, increases in vehicle ownerships is mostly contributed by motorcycle ownerships which grows by 38.6 % on average per year in the last 5 years. This has caused great problem to safety level of road network.

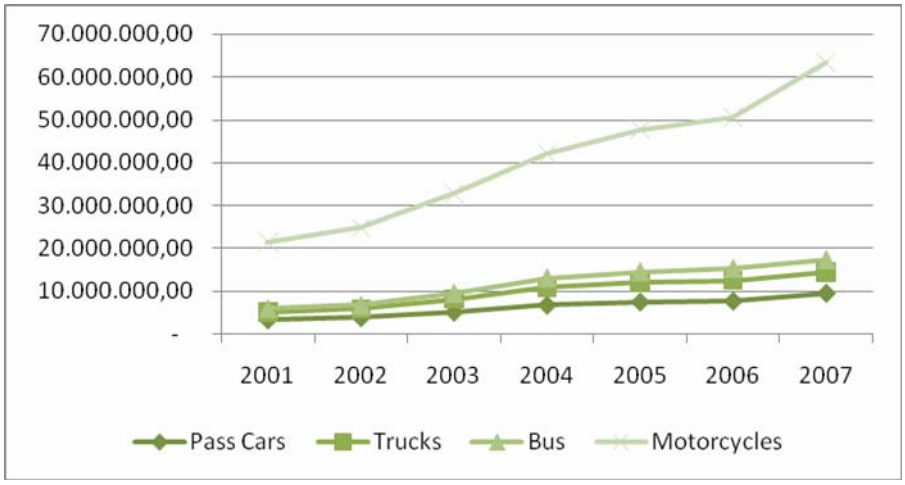


Figure 7 Changes in Vehicle Ownerships in Indonesia 2001-2007

In addition, Indonesia locates at the Pacific Ring of Fire, which is characterised by the chain of active volcanos between Asia and Australia plates. This makes Indonesia suffering from consistent earthquake, volcanic eruptions and landslides. The intensity of earthquake has been increasing in the last 4 years, which has also raised greater concern to the strength of bridges and other structures in Indonesia.

(2) Efforts and Innovation

Anticipating such conditions, the Institute has intensified research on a number of issues as tyhe following:

1) Roads for Sustainable Development
   i) Environmentally friendly roads
   ii) Reformulation Concept of Municipal Roads
   iii) Disaster Mitigation and Prevention
   iv) Safer Roads
   v) Tunnel
2) Technology for better Road Network to support the competitiveness of the nation
   i) Strategic Pavement Research
   ii) Buton Asphalt Pavement
   iii) Long Span Bridges
   iv) Intelligent Transport System
3) Low costs and Low Volume Roads
   i) Unpaved roads technology
   ii) Low-cost bridges
4) Reducing technological gaps by providing local based roads and bridges technology
   i) Road Material Inventory
   ii) Manual Development for the application of local materials and technology

A number of trials for new method and road specification has been undertaken. A number of new pavement specification using Buton Granular Asphalt (BGA) have been published, more environmentally friendly road construction using recycling and mining waste (tailing and slag) materials have been introduced as well as the use of rubber mixed asphalt and concrete. The institute has also introduce dedicated stopping space for motorcycle at the signalised intersection to allow for better accommodation of motorcycles at the intersection. In addition, the use of local materials as substitute of standard aggregates has been on trial in Central Kalimantan since 2007. Through such field trials, the institute could help the acceleration of road development in Indonesia.

For near future, the institute has set up a number of research roadmaps to enable greater support in answering actual global problem, such as climate changes, road safety, MDGs in infrastructure development. A number of technology innovations in road construction and operation are expected delivered from these plans.

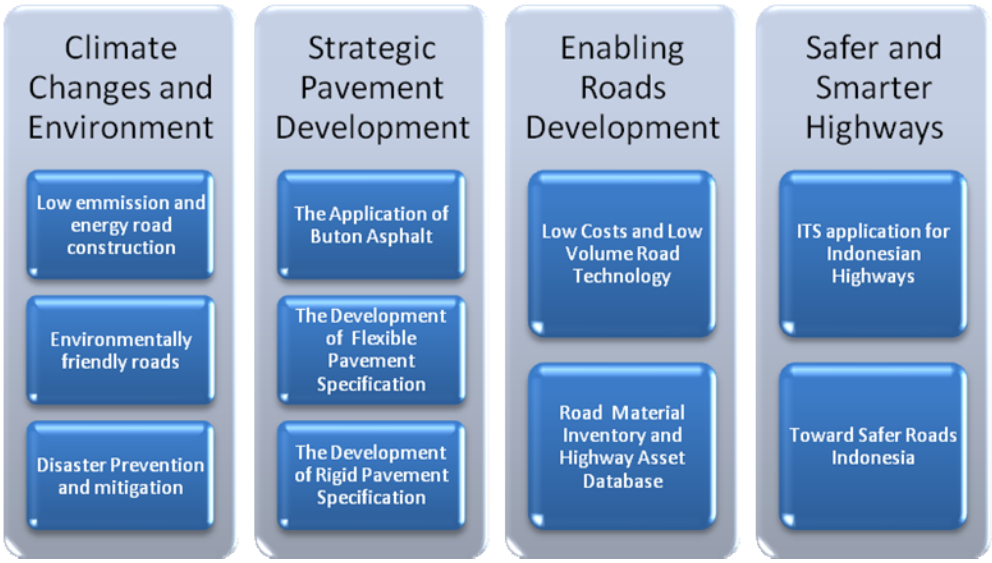


Figure 8 Research Focus of RDCRB 2010-2014

3. The Republic of Indonesia

Mr. Nudin Samaila SIKKI

JICA GROUP TRAINING COURSE ON INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (JFY 2009)

INCEPTION REPORTS

Name	**NURDIN SAMAILA, IR., MSi.**
Country	Indonesia
Organisation	Directorate General of Highways, Ministry of Public Works
Position	Head of National Road Implementation Body (Balai Besar Pelaksanaan Jalan Nasional VI Makassar)

Summary

The role of National Road Implementation Body (Balai Besar Pelaksanaan Jalan Nasional – BBPJN) in road development is ensuring the implementation of road construction in a proper manner inline with the Indonesian government rule and provisions of the technical specification of the Directorate General of Highways. As the Head of the National Road Implementation Body VI of Makassar (BBPJN VI Makassar), I am responsible to lead the Body in achieving a good quality and performance of national road in six (6) provinces in Sulawesi Island. In achieving goals of the body the main task covering design and supervision, implementation and controlling, and quality tests in the development and maintenance of roads. In addition to that task the body also provide services in the supply of road and bridge material and road equipment.

There are ten (10) National Road Implementation Body throughout the country, consiting of seven (8) large bodies (BBPJN) and three (2) small bodies (BPJN). Under BBPJN VI Makassar there are six (6) Provinces consisting of North Sulawesi, Gorontalo, South Sulawesi, Centre Sulawesi, South East Sulawesi and West Sulawesi province. covering of 7.091 Kms of national road laying throughout Sulawesi. The body has responsibility to preserve and maintain the road length of national road every year in order to serve goods transportation and people movement from one place to an other.

1. Organisation of BBPJN :

   (1) Name of Organisation : National Road Implementation Body (Balai Besar Pelaksanaan Jalan nasional VI Makassar, BBPJN VI Makassar)

(2) Summary of Organisation:

Balai Besar Pelaksanaan Jalan Nasional is a Unit of Technical Implementation of national road under Directorat General of Highway. There are 10 Units throughout the country, eight units of type A and two units of type B. These are regional bodies of national road established to ensure that the implementation of road infrastructure fulfill technical specification and meets the necessity of each region in Indonesia.

The BBPJN is a young body owned by the Directorate General of Highway Ministry of Public Works of Indonesia for the effective and efficient implementation of national road. The Units started in early 2007 with the limitation of resources, up to now the requirement of the resources especially human resources including office fasility is still set up, good coordination and cooperation with local government is also need to be build. Main tasks of the BBPJN namely :

1. Provide data and information for planning and programming of national road under its jurisdiction.
2. Conducting design, supervision and implementation on the development of national road and bridges construction, and maintenance/preservation throughout the year.
3. Implementation of quality management system for the implementation of roads and bridges.
4. Provision, utilization, storing and maintenance of road and bridge material and equipment, and carrying out quality testing of construction.
5. Administration of personnel, organization and job description, finance, state asset and carrying out coordination with local public works and related institution.
6. BBPJN VI Makassar covering national road in six (6) Provinces in the island of Sulawesi, covering North Sulawesi, Gorontalo, South Sulawesi, Centre Sulawesi, South East Sulawesi and West Sulawesi. Length of national roads under BBPJN VI responsibility are 7,091.50 Kms of road laying throughout Sulawesi.

The areas, length of national roads and the amount of population of each province in the island of Sulawesi under the BBPJN VI Makassar is summarized as follows :

1.	North Sulawesi	: 13.930.73 Km2	/ 1.267,39 Km	/ 12.333.974 People
2.	Gorontalo	: 12.165,44 Km2	/ 616,24 Km	/ 916.488 People
3.	South Sulawesi	: 6.116,45 Km2	/ 1.556,13 Km	/ 7.475.882 People
4.	Central Sulawesi	: 68.089,83 Km2	/ 1.806,46 Km	/ 2.324.025 People
5.	South East Sulawesi	: 36.757,45 Km2	/ 1.293,87 Km	/ 1.965.958 People
6.	West Sulawesi	: 42.224,65 Km2	/ 551,41 Km	/ 966.535 People
	Total Sulawesi	**: 19.284,55 Km2**	**/ 7.091,50 Km**	**/ 25.982.862 People**

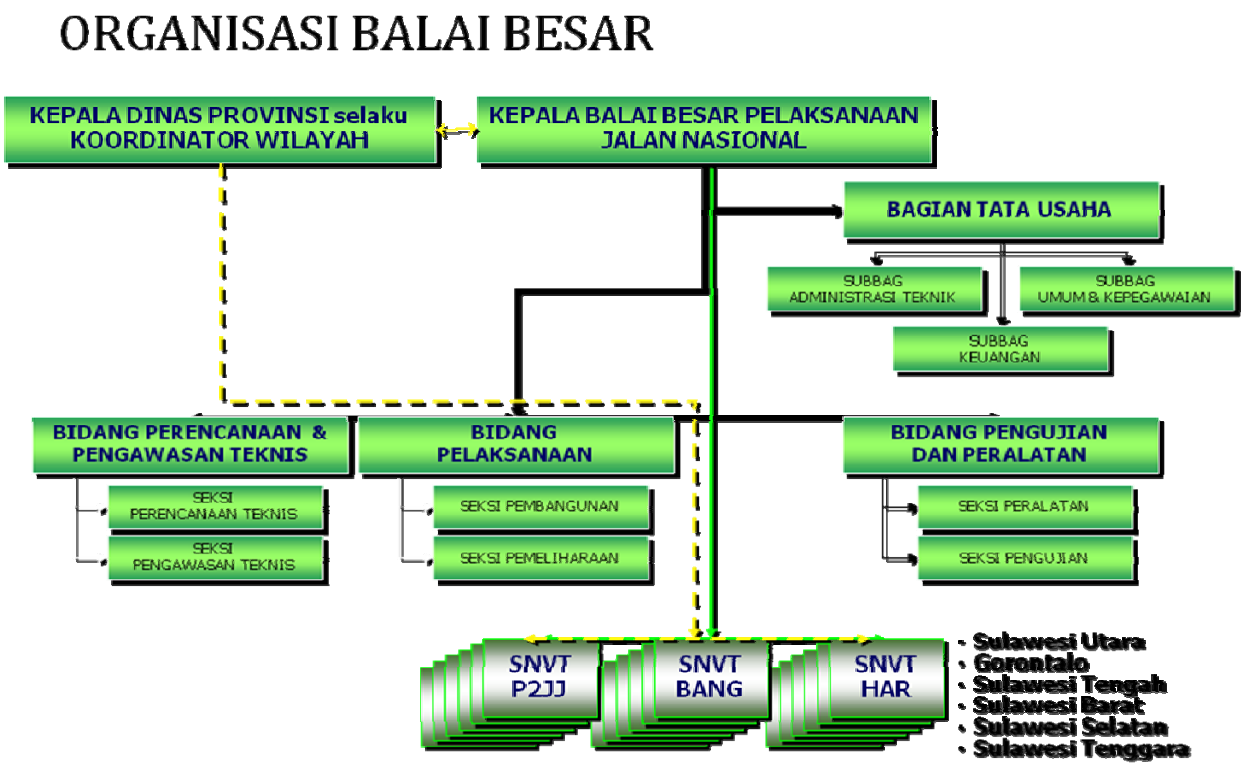
In each province there are three units of project, ie :

1. Design and Supervision Project Unit
2. Road Development Project Unit
3. Preservation/Maintenance Project Unit

The operation of BBPJN is mainly funded by Indonesian Government from the Ministry's budget (APBN). In Fiscal Year 2009 BBPJN VI Makassar managed 2.007 Billion IDR budget. The budget were allocated for three national road programs, namely design & supervision, road development and preservation/maintenance of road. The following figure provides proportion of each activity for Fiscal Year 2009 program.

1.	Design & Supervision	:	Rp. 81,420,371,000
2.	Road Development	:	Rp. 1,433,882,540,000
3.	Preservation/Maintenance	:	Rp. 4,852,188,995,000
4.	SKPD	:	Rp. 68,280,628,000
	Amount of Budget FY 2009	:	Rp. 2,077,370,114,000

(4) Organisation Structure of the BBPJN VI Makassar :



The BBPJN also runs laboratory of material and construction testing consisting of asphalt, concrete and soil material for road and bridges.

National Road Implementation Body is designated to support the Ministry of Public Works in managing roads and bridges in Indonesia, especially in relation to design, supervision, construction and preservation tasks.

2. Personal Data

(1) Recent Work

I have been joining the Ministry of Public Works for over 29 years when I completed my bachelor degree in Civil Engineering in Makassar. I started my carrier as a field Staff of the project, responsible in construction supervision in Mid 1982's. Since then I have gradually improved my education to a full engineer and then took my master degree in Engineering Science in Makassar in 2002 My carrier had also been gradually improved being civil engineer, chief of engineering Section (1993 - 2001), vice of head of provincial Public Works (2005 - 2006), before I was promoted to be a Head of the National Road Implementation Body VI in Makassar (Balai Besar Pelaksanaan Jalan Nasional - BBPJN VI Makassar) in 2007.

In the last three years I have focused my work in improving the performance of the BBPJN VI Makassar in providing national road management and disseminating relevant provisions relating to the development of road and bridge. It was aimed at improving the quality and performance of road and bridges constructions.

(2) Contact Address:

Office Address: Jalan Mesjid Raya No. 72 Makassar - Indonesia

Office Phone Number: +62 411 442673

Fax: +62 411 431877

Email Address: balaibesarmakassar@yahoo.co.id

3. Road Policies Implemented According to the Unique Environment and Challenges in Sulawesi Region

(1) Issues and Challenges in implementing policies for road development and traffic operation

Effective implementation of policies in road development and traffic operation in Indonesia faces a number of issues in relation to variation on geographical condition of Indonesia, environmental situations, traffic characteristics, and disaster areas. Indonesia is an archipelagic countries consisting over 13,600 islands, wherein the population are unevenly distributed. The distribution of movements is significantly different from one island to another. The availability of road network is following accordingly. Major issues include premature damage of road pavement, traffic congestion in major cities, high accident rates, and sudden road closure due to flood and slope failures.

In the islands of Sulawesi the availability of road network are still quite limited. Sulawesi enjoys the connection of Trans National at Western Coast, most part of these islands have only provided with limited local connection to facilitate movements within province. In smaller islands road connections are relatively limited. Road development policy in these islands encounters high-costs and inefficiency problems due to the availability of materials, personnel, and equipments in the areas. Due to the priority of development budget, road developments in these islands are likely abandoned.

(2) Efforts and Innovation

Anticipating such conditions, the BBPJN VI Makassar has initiated a number of activities as the followings:

1) Conducting of Training Staff :
   i) Laboratory Training
   ii) Pavement Material
   iii) Buton Asphalt Pavement
   iv) Utilization of Heavy Equipment
   v) Asphalt Mixing Plan
2) Decimination and Socialization :
   i) Road Safety
   ii) Bridge Inspection
   iii) Quality Management System

3) Participation in Seminar and Workshop :
   i) Road Maintenance Management
   ii) Bridge Material
   iii) Quality Management System

4. The Union of Myanmar

Mr. Tint WIN

SEMINAR ON

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT

COURSE NO J-09-00920
INCEPTION REPORT

Submitted by

WIN TINT

CHIEF ENGINEER (CIVIL)

ROAD AND BUILDING DEPARTMENT

PUBLIC WORKS

MINISTRY OF CONSTRUCTION

MYANMAR.

DATE: 1.10.2009

INCEPTION REPORT ON

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT

INCEPTION REPORT ON

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT

1. Introduction

1.1. Map of Myanmar

1.2. Geography of Myanmar

Myanmar in geographically located at the cross roads between East and West, North and South of Asia continent, serving a natural link between in Asian countries. With the total land area of 676577 square kilometers, Myanmar stands as the longest Country in the Indochina Peninsual, Sharing borders with Bangladesh, India, China, Lao and Thailand and possessing coastal lines by Andaman Sea and Bay of Bengal in the South.

The climate in divided into two main climatic zones, a dry tropical zone in upper Myanmar and a humid tropical zone in lower Myanmar. Rain fall intensities are lower in upper Myanmar (less than 40") in contrast to 80 to 172 inches in lower Myanmar. Monthly mean temperature ranges from 13°C to 33°C. Myanmar has three seasons, summer, rainy and winter. Summer season starts from middle of January to middle of May, rainy seasons from middle of May to middle of September and from middle of September to middle of January is winter season.

1.3. Curriculum Vitae of Participant

(a)	Name	Mr. Win Tint
(b)	Date of Birth	15.6.1960
(c)	Ethnic Race	Myanmar
(d)	Qualification Status	A.G.T.I (Civil) Diploma B.E (Civil)
(e)	Position (Rank)	Chief Engineer (Civil)
(f)	Department	Public Works
(g)	Organization	Ministry of Construction
(h)	Country	Union of Myanmar

1.4. Contact Address

(a)	Office address	Building Department Ministry of Construction Nay Pyi Taw, Myanmar.
(b)	Phone Number	95-67-407424 95-01-534710
(c)	Fax Number	95-67-407065
(d)	Email	wintint2000@gmail.com

2. Development and Administration of Roads in Myanmar

Smooth transportation plays a key role in development of a region. Better transportation will contribute to trade promotion and improvement of socio-economic standard of the local people.

In transportation sector, road transport is more important than other means of transport such as rail, air and water transport.

As such, the State Peace and Development Council has laid down plans for construction of roads and bridges.

Myanmar is surrounded by high snow-capped mountains and offshore seas in addition to rivers such as Ayeyawady, Chindwin, Thanlwin and Sittoung which runs from north to south. Moreover, there are also mountain ranges situated along north-south.

At present, the road and bridge networks have emerged across the nation from the east to the west and from the north to the south.

According to 2008 Record, the followings are miles of road built by the ministries concerned.

No	Subjects	M / F
1.	Public Works, Ministry of Construction	19313 / 7
2.	Ministry for Progress of Border Areas and National Races and Development Affairs.	51843 / 4
3.	Yangon City Development Committee	1951 / 6
4.	Mandalay City Development Committee	605 / 4
5.	Nay Pyi Taw Development Committee	334 / 2
6.	Directorate of Military Engineers of the Ministry of Defence	4296 / 3
	Total	**78345 / 2**

3. My Organization

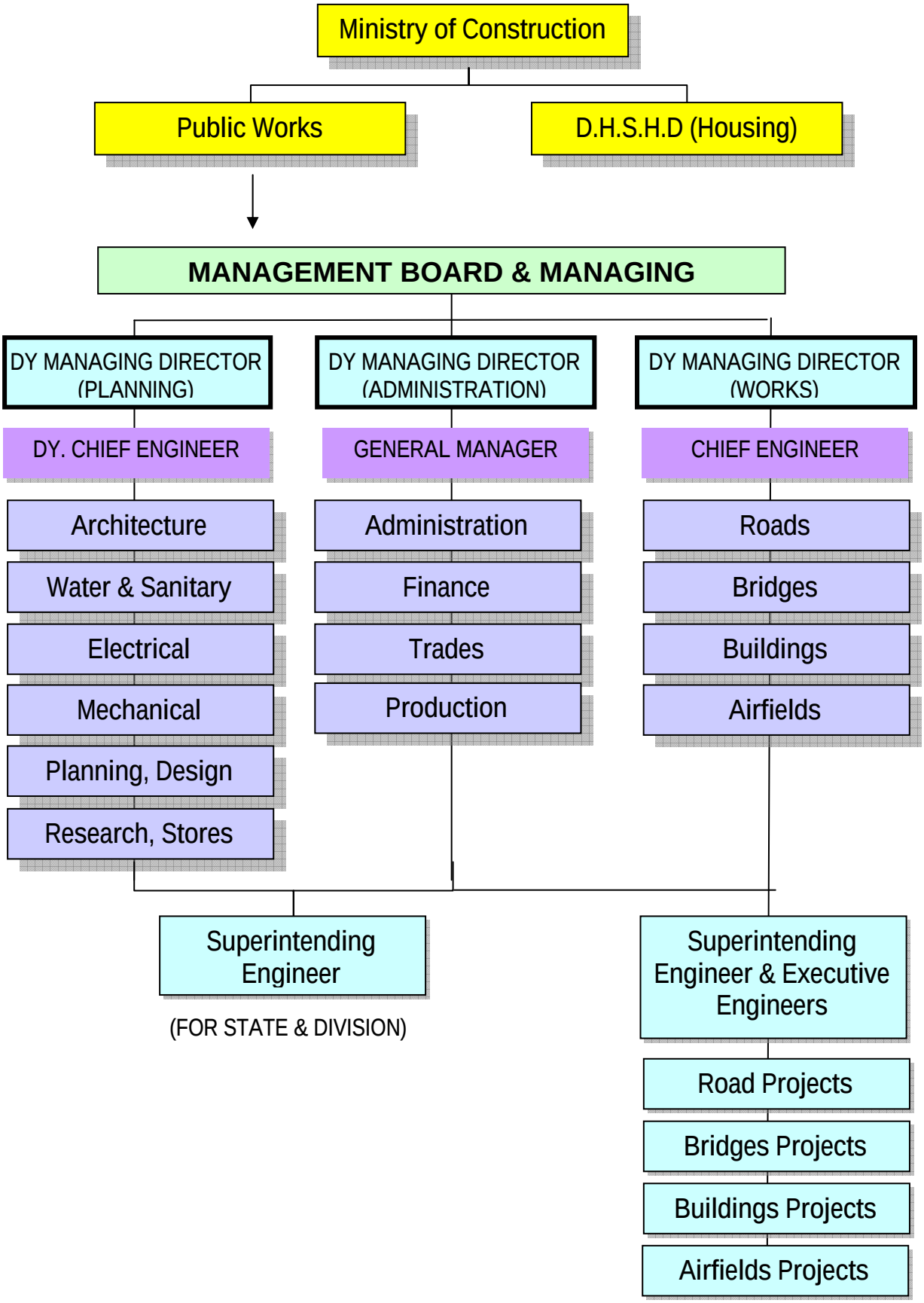
My organization, Public Works under the Ministry of Construction is an organization which is responsible for Construction and Maintenance of roads, airfields, bridges and buildings all over the country.

Overall management responsibilities are vested in Managing Director who reports directly to Deputy Ministers and Minister and is advised by Management Board. Managing Director is assisted by three Deputy Managing Directors, Administration, Planning and Works.

There are Chief Engineers, Deputy Chief Engineers and Superintending Engineers to assist Deputy Managing Director (Works). At the Main Office, sections concerned with pre-engineering works, design and budget are working under Deputy Managing Director (Works). I am one of the Chief Engineers.

Road department (group of road sections) is under Deputy Managing Director (Works). There are five road sections which are responsible for Planning, Finance, Statistics, Road Design and Road Research Laboratory, each section is headed by an Executive Engineer. Public Works' Organization Chart is presented in the Appendix.

4. Organization Chart



5. Duty and Responsibility

- I am chief Engineer from Public Works, Ministry of Construction. I am undertaking and supervising the construction and maintenance of Roads, Bridges and Buildings all over the country.
- I am now supervising the projects implemented in states and Division for completion in time and specification with the field engineers and project engineers.
- I have to submit progress report on road network of Delta region in Ayeyarwady Division to MD, Deputy Minister and Minister of MOC.
- I have to recommend for allotment made by site engineers, project engineers and command engineers of State an Division.
- I am responsible for directing and controlling, both technically and financially, the project engineers who are executing road maintenance rehabilitation and construction works all over the country.

6. Organization Position in Government and The Role of Public Work

Public Works Corporation was established in 1965 after the merger of Highway Department set up in 1952 and 21 Civil Engineering Departments under other ministries. It was recognized as Construction Corporation (CC) in 1972 and Public Works emerged on 1 April, 1988.

The Ministry of Construction has expedited building new roads and upgrading existing ones year after year. Although there were 13635 miles of road in 1988, there were 19999 miles and one furlong in 2009. A total 984 miles of mule tracks are being maintained.

In the past, the Ministry of Construction took responsibility for maintenance of 11 highways stretching 2452 miles in total length.

With a view to undertaking improvement of economic, social, administration and national unity and development, a total of 36 highways from the north to the south of the nation and 45 highways from the east to the west, totalling 81 roads stretching 15344 miles long have been constructed throughout the nation. All these facilities become Union Highways.

A total of 1411 miles of strategic roads are also constructed by Public Works.

With a view to enabling the Ministry of Construction to effectively carry out the secure and smooth transportation assigned by the State Peace and Development Council, Public Works and Private Entrepreneurs are implementing the rehabilitation of the 19 roads through the Build, Operate & Transfer System.

In the last year, the budget allotment for construction of new roads and bridges is (88363.509) K in Million and for rehabilitation works the allotment was (26596.8) K in Million.

7. Present and Past Experiences

At present, I am responsible for directing and controlling, both technically and financially, the project engineers who are executing road maintenance, rehabilitation and construction works all over the country.

In the past three years, I was Executive Engineer of Special Road Construction Unit (15). I was responsible for management of rehabilitation works along two highways, Yangon-Phya Road and Yangon-Pegu road.

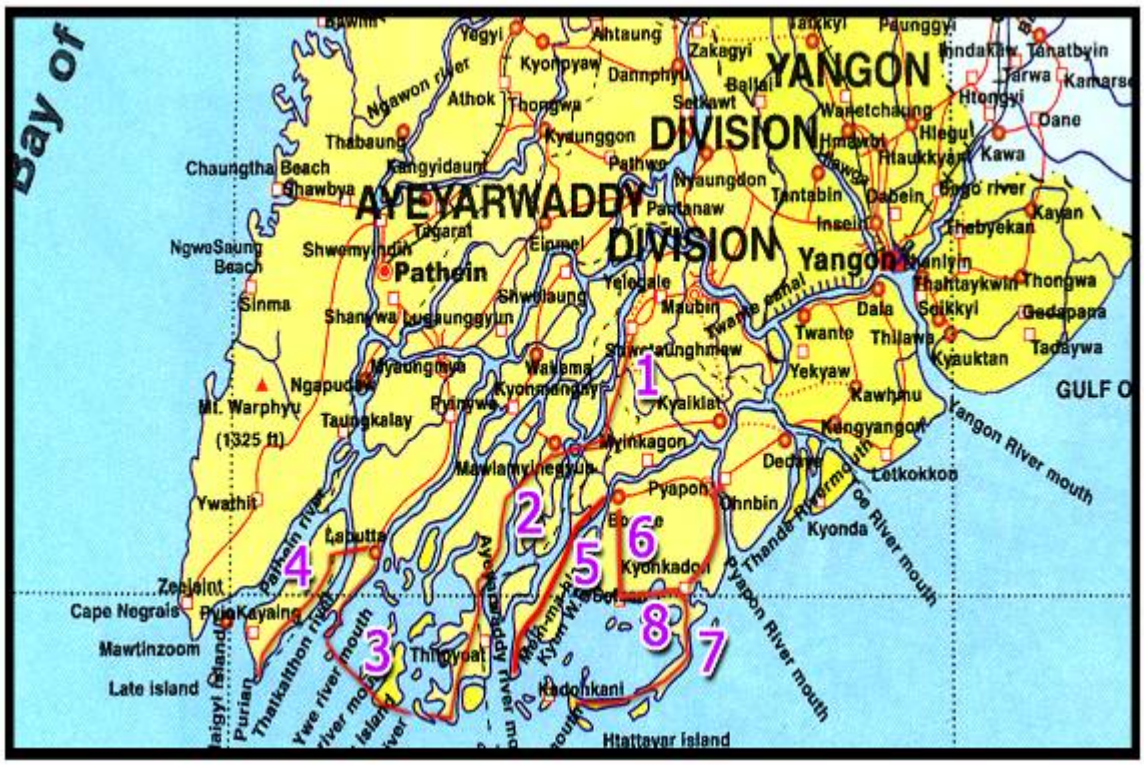
Yangon-Phya road is 175 miles long. It is two lanes asphalt concrete road. Yangon-Pegu road is six lanes road and it is about 60 miles long. I have to maintain and rehabilitate these roads so that traffic can flow smoothly.

Our budget year starts at 1st April. To get budget allotment for maintenance and rehabilitation works, estimates were made based on road inventory and condition of the roads. Traffic survey, axle load survey and road condition survey were made before the starts of the new budget year. In our organization, there is Road Research Laboratory which is responsible for road testing and road structure design. After investigation of roads, Road research Laboratory submitted design for rehabilitation works. Estimates with traffic survey and axle load survey data, road condition chart, work program together with rehabilitation design, are submitted to Head Quarter through Command Engineer of State or Division. This estimate is for routine maintenance and rehabilitation works.

Funds are also available for special maintenance which is required for slope failures in mountainous areas or failure of roads due to heavy rain or overloading of trucks which crossed the road.

8. Delta Region Road Network Development Project in Ayeyawady Division

In accord with the guidance given by the Head of State on his tour of Ayeyawady Division on 21.5.2008, Public Works of the Ministry of Construction commenced implementation of the Road Network Development Project by building five roads. At present, the region has eight roads in the road network including three routes.



(1)	Maubin - Yaylegale - Shwetaunghmaw - Kyaikpi - Mawlamyinegyun Road	43 M 5 F
(2)	Mawlamyinegyun - Hlinephone - Thitpok - Kwinkauk - Pyinsalu Road	69 M 3 F
(3)	Labutta - Thingangyi - Pyinsalu Road	35 M 2 F
(4)	Labutta - Thongwa - Ottwin - Hteiksun Road	39 M 0 F
(5)	Bogale - Kyeinchaung - Kadonkani Road	41 M 2 F
(6)	Bogale - Setsan - Htawpaing - Amar Road	38 M 5 F
(7)	Pyapon - Kyonkadun - Daw Nyein Amar Road	51 M 5 F
(8)	Kyonkadun - Setsan Road	19 M 1 F
	Total	337 M 7 F

9. Road Policies to be Implemented

Geometric Designs are made based on annual average daily traffic and specification of road class adopted from the specified Geometric Design Standards. That is geometry requirement of roads for safety and smooth flow of the traffic.

Road Structure Design is made based on subgrade strength, layer strength and traffic loading expected during the design life.

During the past 4 or 5 years, for some reasons, most of the constructed or rehabilitated roads failed prematurely. The maintenance cost is very high. Some of the roads have to be reconstructed. We are trying to find the causes.

As mentioned in section (5), roads are important in developing the country. Smooth transport and transportation of goods to destinations in a short time are relied on the following points:-

- building roads according to the designs and the standard set,
- driving vehicles in compliance with the directives of automobile producing organizations, and with that of road designing bodies.

There has been a remarkable increase in vehicles in Myanmar. The expense on maintenance of roads is estimated to be 25% of road construction cost if the roads are built in line with the standard set. Otherwise, the expense of maintenance will be higher. The cost of using vehicles forms major part of transporting charges. So, if this can be reduced, transportation charges, commodity prices and fares

will fall down. The cost in use of vehicles will decrease if roads are fine, and goods can be transported to the destinations in a short time.

In every country, road engineers have to honour the set designs and standards in building roads to minimize the damage of roads. In addition, they have to enforce traffic rules for vehicles in coordination with the organization concerned (for example in our country, the Directorate of Road Administration, the Traffic Police Force and Local Authorities) in order that the pressure put by vehicles is in the limit of road withstanding.

It is required to transport more goods with fewer vehicles for ensuring swift flow of commodities. On the other hand, that can cause adverse effect on the roads, so new designs are to be sought to reduce the pressure of the vehicles to minimize road damage.

New designs were also introduced to avert unnecessary damage to vehicles (bodies and lower structures) and overturning of vehicles due to overweight. Therefore, if the vehicle is overloaded,

- the road will be damaged,
- the vehicle's body and its lower structure will be deteriorate and
- the vehicle will overturn resulting from loss of proper control.

Now, owners, seeking own interests, have come to load trucks with excessive goods from 60 tons to 100 tons by strengthening leaf springs and frames, expanding bodies, widening side frames and using different tyres.

In a short run, they can make greater profit, but in the long run, they will face a variety of unnecessary consequences: the treads of wheels become worn and cracked easily; frames and leaf springs are broken; it takes longer than due time; there may be damage to goods, it poses dangers to the driver, people near the roads and surrounding areas and passengers; and the engines can be damaged easily due to overloads, and damage to roads.

Through AASHTO Road Test conducted in 1962, interrelation between total weight, number of axles and road damage was discovered. In the past, in road structure design, the number of trucks with wheel weighing 5000 lbs and subgrade strength during the design life were considered.

However, now roads are designed using Standard Axle Load (18000 lbs) owing to sharp increase in the number of types and vehicles. In this process, Damaging Factor found out in AASHTO Road Test (US) is standardized.

The damaging factor shows how many more times a vehicle can damage to the road than caused by Standard Axle Load.

$$\text{Damaging Factor} = (\text{Axle Load of Vehicle} / \text{Standard Axle Load})^{4 \text{ to } 4.55}$$

According to damaging factor, if the load of the front axle of a 13 tons TE-11 is 7722 lbs. and that of the rear axle, 20878 lbs the damaging factor of the front axle is 0.023 and the damaging factor of the rear axle, 1.964 in accord with the relationship formula to the damaging factor. The total damaging factor is 1.985.

If approximately the factor is 2.0, it can be defined that damage caused by 13 tons truck is equivalent to twice the damage caused by a standard axle.

If the load of the front axle of 60 tons truck with three axles is 34320 lbs and the middle axle, 55440 lbs and that of the rear axle, 42240 lbs, the total damaging factor is 234.399.

Compared with a 13 tons truck and 60 ton truck, it can be concluded that by running a 60 tons truck is equivalent to damage caused by running 118 numbers of 13 tons truck. (234.399/1.985=118)

Now, in other countries, there are limitations on vehicles with high damaging factor in order not to increase the damaging factor. The following ways are used in prescribing limits:

(1) Prescribing limits on type of vehicles, number of axles and axle load.
(2) Prescribing legal axle load limit.

Today's trucks running on motorways in Myanmar -

It is seen that a two axle fixed truck carries from 13 to 20 tons of load, a 3 axle fixed truck from 20 to 60 tons of load and four axle fixed truck from 30 to 80 tons of load and five axle fixed truck from 40 to 100 tons of load approximately.

To reduce the damages caused by vehicles on the roads and to reduce transportation cost, at present, the Government is trying to educate the road users by publishing literatures concerning road

design and factors affecting the performance of roads, in a very simplified way, in news paper (See Appendix I, II, III and IV).

With the consultation of the Road Engineers, the government will implement policies in the near future, to control axle load of the vehicles and to enforce laws so that vehicles are used following the manufacturer's requirements.

We have also tried to reduce the construction cost by adopting stage construction method. Not really successful, because, due to shortage of funds, construction could not be executed as planned.

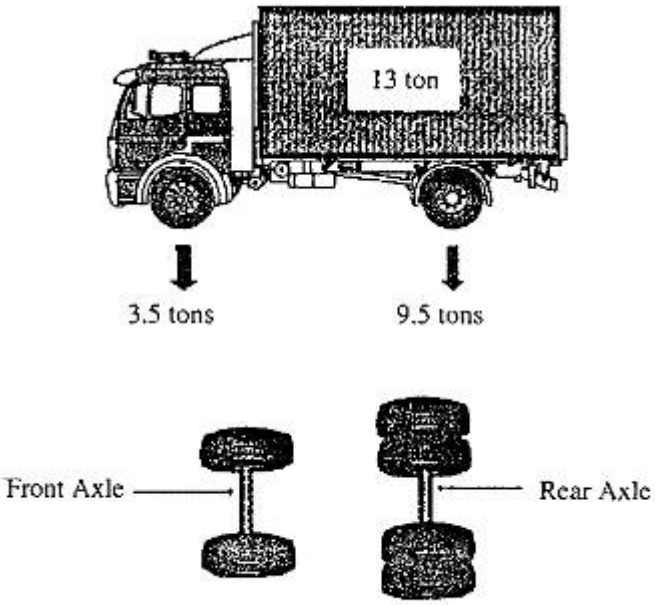
We also have tried to reduce the traffic loading. One way of reducing the traffic loading is to widen the road. If fund is not available for widening, the hard shoulder is constructed as temporary widening.

It is felt that, from this training, road policies for road development and traffic operation exercised in other countries will be learnt. Pavement Management System and Maintenance Management System are also essential for our country.

Annexes - I

Two – axle – fixed vehicle (vehicle + load = 13 tons)

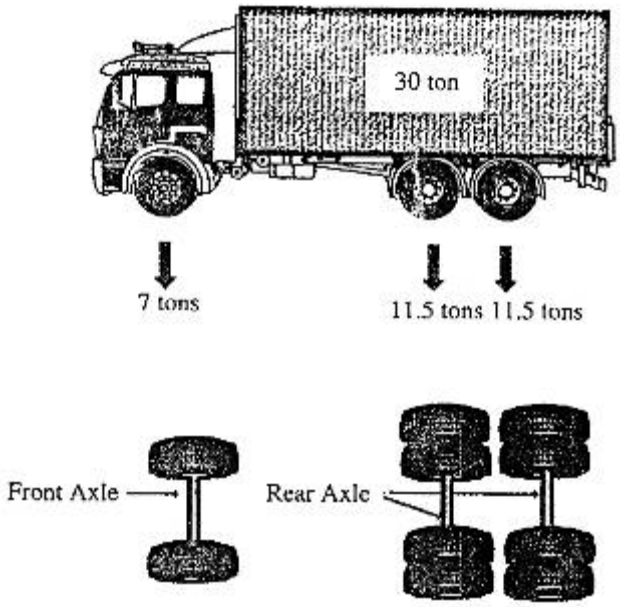
(Six – wheel vehicle in non – technical term)



(Figure-1)

Three – axle – fixed vehicle (vehicle + load = 30 tons)

(10 – wheel vehicle in non – technical term)

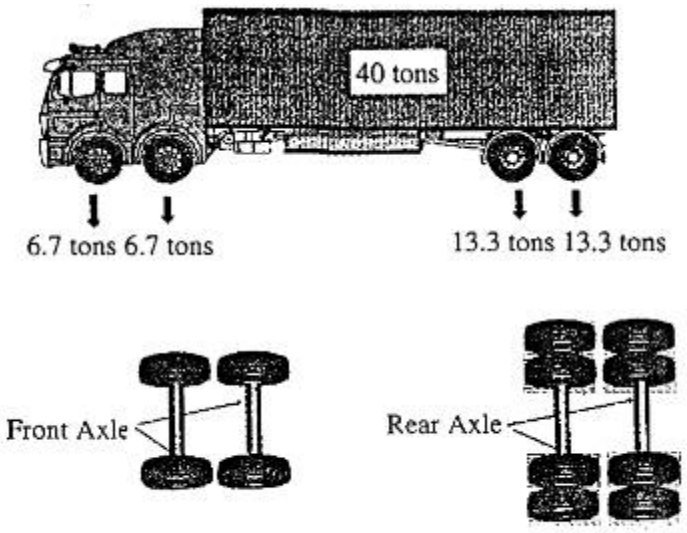


(Figure-2)

Annexes - II

Four – axle – fixed fabricated vehicle (vehicle + load = 40 tons)

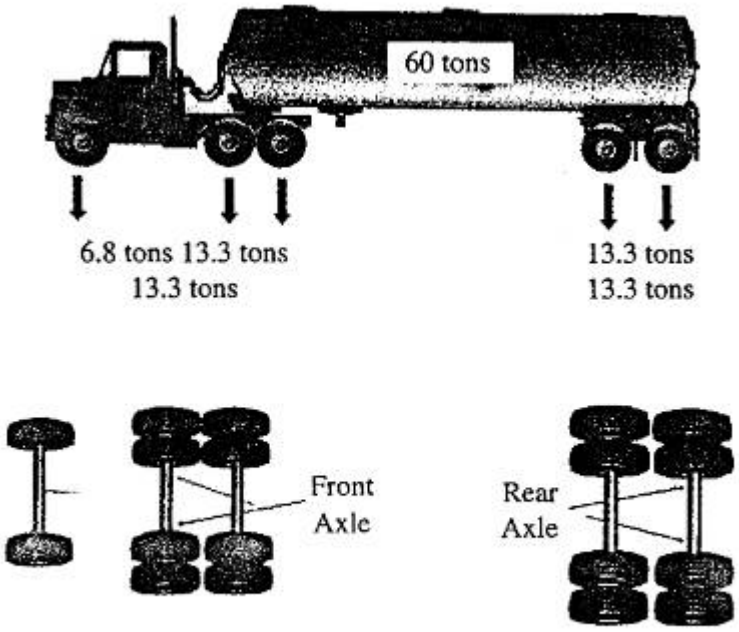
(12 – wheel vehicle in non – technical term)



(Figure-3)

Five – axle – fixed fabricated vehicle (vehicle + load = 60 tons)

(18 – wheel vehicle in non – technical term)



(Figure-4)

Annexes – III

A truck with overload of goods seen on a road

A vehicle overloaded with sawn timber seen on the road

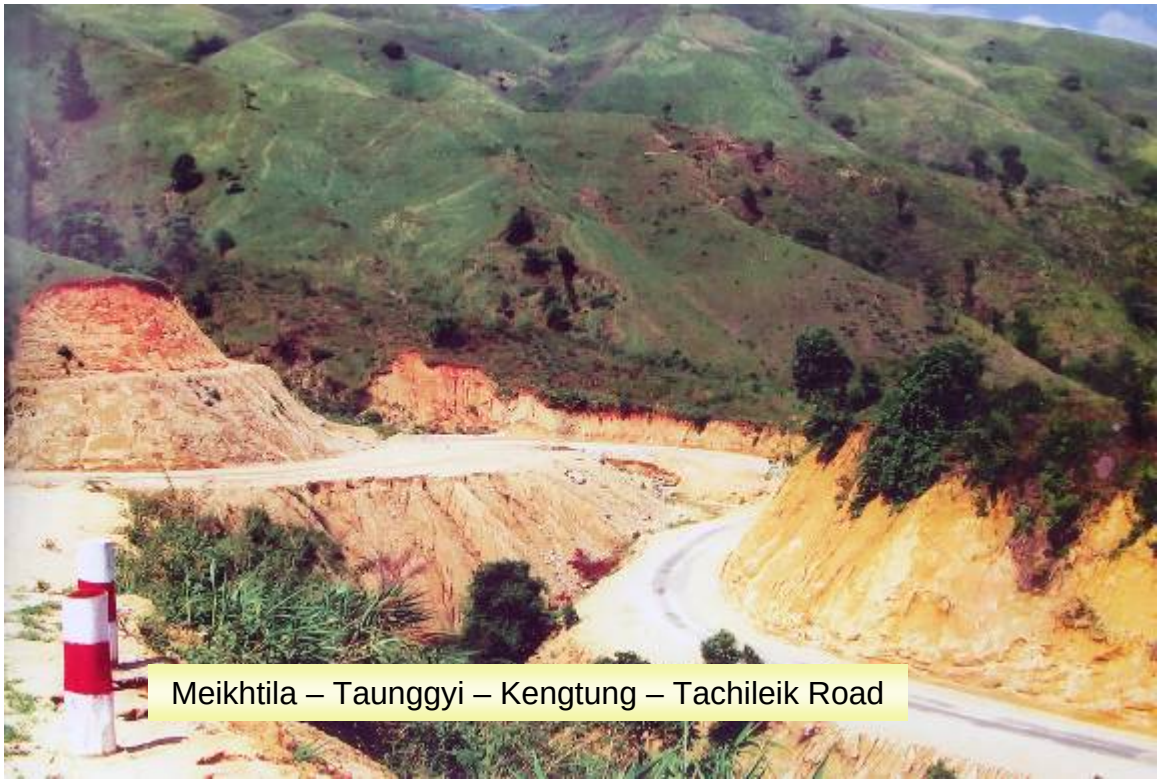
Annexes – IV

Photo shows trucks overloaded with timber logs.

Photo shows trucks overloaded with R.S.J

Road Construction

Ministry of Construction
Public Work



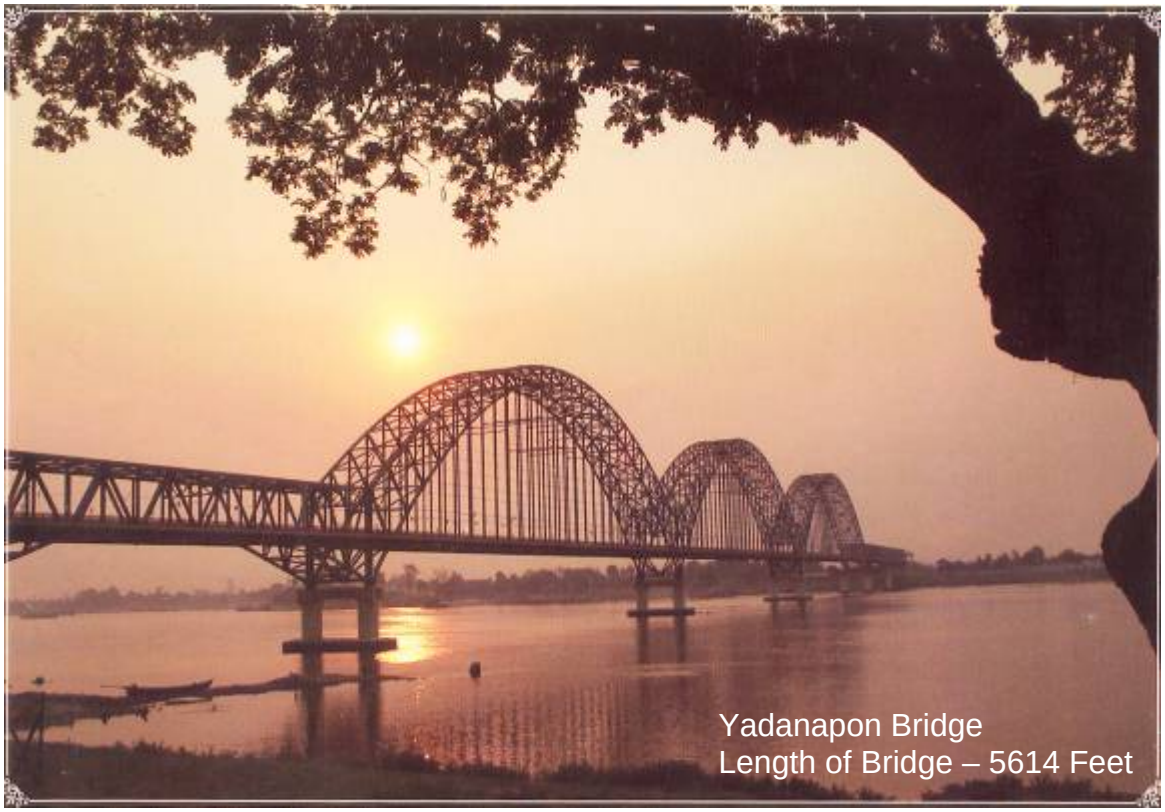
Meikhtila – Taunggyi – Kengtung – Tachileik Road

Yangon – Mandalay Express Road

Bridges Construction

Ministry of Construction
Public Work

Thanlwin Bridge (Mawlamyaing)
Length of Bridge – 11575 Feet



Yadanapon Bridge
Length of Bridge – 5614 Feet

Buildings Construction

Ministry of Construction
Public Work

Maw Tin Tower

Junction Center - Naypyitaw

Airfields Construction

Ministry of Construction
Public Work

Extension of Runway at Kauthoung Airport

Yangon International Airfields Runway Construction Works