III MINUTES

The 18th Conference on Public Works Research and Development in Asia

Session on Subject of Common Interest “Unique Road-Policy Applied to the Regional Condition and Issues”

Minutes

1. Date and venue: 10:00-15:00 Wednesday, 11th November 2009
International Conference Room of NILIM

2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr. Kazuhiro NISHIKAWA
	Mr. Masaaki NAKAYASU
	Mr. Hiroshi SATO
	Mr. Hiroaki TERAMOTO
	Mr. Katsumi UESAKA
	Mr. Hirotaka SEKIYA
	Mr. Toshiaki MABUCHI
	Mr. Masaru TERADA

The 18th Conference on Public Works Research and Development in Asia

“Keynote Lecture”

Minutes

1. Date and venue: 15:00-17:00 Tuesday, 10th November 2009
International Conference Room of NILIM

2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Dr.Eng.Takashi OGUCHI Professor, Infrastructure Planning & Traffic Eng.Lab., Division of Civil and Environmental Sciences, Graduate school of Urban Environmental Sciences, Tokyo Metropolitan University

Keynote Lecture: “Highway Capacity, Operation and Congestion in Japan”

Lecturer: Prof. Takashi OGUCHI ,
Infrastructure Planning & Traffic Eng. Lab.,
Division of Civil and Environmental Eng.,
Graduate school of Urban Environmental Sciences,
Tokyo Metropolitan University

(Keynote introduction by Mr. Teramoto)
Prof. Oguchi is a famous professor in the field of transport science. In 1988 he graduated from Tokyo University in civil engineering. He earned his doctorate in 1993 and started to work for Nissan. He moved to academia in 1995 at Metropolitan University of Tokyo as a civil engineering lecturer. In 2008 he was invited in the Swiss Federal Institute of Engineering. In 2007 he started as a professor at Tokyo Metropolitan University. Prof. Oguchi has many books, publications and works as a special member of many committees at local and national level.

Prof. Oguchi.: Welcome to Japan in the beautiful autumn season.
I prepared 3 topics:

1. brief overview of capacity and service studies in Japan
2. effects of auxiliary lanes upstream of bottleneck sag sections on expressways
3. emission modeling for highway traffic

All these topics were presented at other international conferences (see ppt).
I had my sheet of reference distributed to you. Please see the references for details.

Electronic toll collection (ETC) history shown with monthly data
Almost 80% of vehicles passing tollbooths have ETC.
This impacts traffic congestion on intercity expressways.
Topic 1: The first 4 parts of my talk are about intercity expressway congestion, the 5th part on the urban expressway. And 6 and 7 are urban arterial road network and 8 is on the quality of service.
In our Japanese experience, maximum traffic volume is 2130 pc/h/ln (passenger cars/hour/lane) for multilane highways.
This pie chart shows a summary for 2003 when ETC penetration was less than 20%. Therefore this chart includes tollbooth congestion, which has been further reduced recently.
Sags and upgrade sections were the most frequent locations of observed jams on intercity expressways in 2003.
In sections without merges or diversions, bottlenecks have flow rates of 1800–2000 veh/h/lane in the median lane and max flow was achieved before congestion occurred.
Breakdown flow rates are very probabilistic phemonena.
Breakdown flow rates range widely. The probabilities for each of these levels vary and are stochastic.
Slide 10: Not 'shoulder lane widths', but 'shoulder widths'
Slide 11: two way two lane 'highways' TWTL
Slide 12: This is a curious bottleneck phenomenon. This is a graphic signboard that shows travel time to some point. I'll skip the toll booth congestion part because this is no longer an important problem in Japan.
I'll skip slide 13 because I'll cover it in more detail in part 2 of this talk.
Slide 15: From now on, I'll talk about arterial road capacity phenomena

Slide 16: perhaps No is too strong a word, but there are almost no studies on unsignalized intersection capacity in Japan.
I am one of the members of the committee finalizing the Japanese manual of roundabout design.
Slide 18: In Japan there are many variable signboards.
Slide 19: sample display of the VICS system
Slide 22: That was the overview. Now moving on to second topic: effects of auxiliary lanes upstream bottleneck sag…
Slide 23: You can see many red colors showing bottlenecks in the national and Tokyo area maps
Lets focus on 1 point on the Chuo Expressway and another on the Tomei Expressway
Slide 27: mechanism of bottleneck activation.
Slide 29: slow rate to 1300 veh/2lanes/hour
Slide 31: this diagram shows our air surveillance with video pictures. We drew vehicle trajectories in time space. Each trajectory shows a vehicle's movement. To the right you can see a shockwave with very low speed, which means that traffic congestion occurs. There is no reason other than the sag vertical curve.
Slide 32: Now I'd like to show you about auxiliary lane distribution
Slide 33: This slide shows typical lane use nature. In the case of higher traffic flow, the median lane usage rate is a little bit higher than in the outer lane.
Slide 35: Installation of an auxiliary lane upstream of bottleneck section can equalize lane use.
Slide 38: I considered several types of auxiliary lanes
Slide 39: We can consider the advantages and shortcomings of these 4 auxilliary lane types. An additional outer lane offers only indirect control (a). … (d) looks best. Inside addition at beginning and outside closure at end.
Slide 41: I found some examples of road layout similar to (d) and we monitored lane use
Slide 43: Based on these results, I think this configuration would be useful to control lane use.
Slide 44: We applied my idea at a famous bottleneck. The existing configuration does not work well. I think we can expect almost equal lane usage. This idea will be tested from next January.
Slide 46: Now lets move onto the 3rd topic: emission modeling.
Slide 47: I think emissions can be explained from the fuel consumption. There are many factors involved. One type is from the vehicle side and another from the transport side. I'll concentrate on the highway traffic factors. We need such an emission model or fuel consumption model.
Slide 48: We made a test vehicle to measure speed, acceleration, and instantaneous fuel consumption.
Slide 49: This is an example of the output we measured.
Slide 50: From this measured data, we raised the concept of a short trip: the duration between start of motion, slowdown or stop, and the start of the next start of motion.
Slide 51: Travel speed means the height for a uniform speed; running speed excludes the stop time.
Slide 52: Here are the variables I'd like to use. If we use these kinds of variables, they can be additive, which makes them easy to model. In Japan we know this curve for speed versus fuel consumption: it is nonlinear. But if you convert both variables to reciprocals, then you get an almost linear relationship.
Slide 53: I added a new independent variable A: the speed fluctuation index
Slide 54: This function is only for the running condition and this one only for the idling condition. The total fuel use for one short trip is the sum of these two functions. We found this kind of formula and the values are quite reasonable. Tau means the time ratio for one trip: reciprocal of travel speed. This formula gives you fuel per unit length (per short trip)
Slide 55: This is the empirical model I found.

Slide 56: I'll skip the theoretical version because it is confusing.
Slide 59: I found that the theoretical model can be written like this. We can derive some numerical results from the theoretical consideration.
Slide 60: We can see convergence when we compare the theoretical and empirical models. This 3rd term comes from aerodynamic resistance, but it is negligible.
Slide 61: After simplifying, the empirical and theoretical formulas become rather similar. I found a model to explain emissions from travel time, travel speed and fluctuation factors.
Slide 62: My model is quite different than the unit emission factor model, which uses speed and speed fluctuation indices.
Slide 63: The speed fluctuation indices have significant meaning. We must consider V and A independently.
Slide 64: This figure shows the contribution of those 3 factors. At higher speed with higher speed fluctuations, the speed fluctuation has a contribution more than half.
Slide 65: Last I will show you some examples of using this kind of environmental impact modeling. This is to make a kind of system using a traffic simulator combined with a 3D city model. With it, we can produce pollution and noise predictions.
Slide 67: We developed a network traffic simulator.
Slide 68: demo movie
Slide 69: This simulation is combined with a CO or NOx model.
Slide 70: Emission intensity is shown here.
Slide 71: and combined with a diffusion model here.
Slide 72: They made some visual output like this 3D urban model. This demo shows this kind of concentration of emissions
Slide 73: We extended the model to noise impact. This considers not only noise intensity, but also building attenuation and so on. This is all I prepared for this presentation.

Thank you Prof. Oguchi. This meeting is open to questions. Any questions are ok.

Q(Sailendra): Interesting topic. In general I would like more information. In the future I think we will have more collaboration and an MOU. I want to invite you to collaborate on these topics. For highway capacity, in Indonesia we have an Indonesian highway capacity manual. As far as I know, the basic study looks at traffic flow. In Indonesia we have different traffic behavior and many motorcycles. I want to know what's your opinion. We want to develop the manual development capacity in Indonesia. We have very rapid growth of motorcycles. More than 50% of vehicles in urban areas are motorcycles. In rural areas, about 30%. The motorcycle drivers are not disciplined. We want to have special lanes for motorcycles to develop the highway capacity manual for Indonesia. Our priority is to develop the highway capacity manual especially with the motorcycle lane.
Second, about the sag lane bottleneck, I don't know if there have been studies about auxiliary lanes in Indonesia. What were the criteria for your study?
For the emission model, I agree with your assumptions. I didn't see about the driver behavior. What about driver behavior? In Indonesia, driver behavior is caused by spirits. When they stop, they always keep the vehicle in 1st or second gear and rev their engines. How would this fit in the model?
I want to know about the type of vehicles in your model because we have different types, different fuels, etc.

A(Oguchi): I know that South and Southeast Asian countries have many motorcycles. The highway traffic conditions there are very different from developed countries. Highway

capacity problems are different from developed countries. Some Japanese researchers are trying to survey traffic conditions in South and Southeast Asian countries. I know of some studies in Thailand and the Philippines. The problem is to understand the conditions. The analytical methodology should be newly developed for this kind of traffic condition. This is a very challenging kind of research.

Q(Teramoto): What scenario do you have in the central government? In the future, people will have more income. Will people have intention to buy larger vehicles?

C(Sailendra): People tend to buy the motorcycles. Accidents are very common. We are concerned about the motorcycles. We want to study more about how to create the special lane for motorcycles.

Q(Oguchi): So your government is thinking of a permanent system for motorcycles?

A(Sailendra): not yet.

Q(Oguchi): But a motorcycle lane would be a permanent feature, right?

A(Sailendra): Yes. The motorcycle is very dangerous. 70% of accidents involve motorcycles. How about the rules to reduce accidents or increase capacity for motorcycles?

C(Oguchi): The behavior at the close corner of the road, red-green signal change, all motorcycles go and then cars go afterwards. This is the normal behavior for your country.

C(Sailendra): We need to develop capacity. The motorcycles accelerate very fast from green lights.

QOguchi): Before Japan had an advanced stop line for motorcycles, but Japanese police do not want them anymore.

Is it the normal case in your country that vehicles are condensed in the passing lane compared to the outside lane?

A(Sailendra): We have no passing lane. On freeways, we have an additional lane for the trucks for crawling up 7% grades or steeper.

A(Win): In Myanmar, we control traffic by police. All our roads are 2 lanes. Same lane for cars and motorcycles. In Yangon, 2 lanes in each direction. Outside, 2 lanes for both directions.

A(Sailendra): About the traffic noise, I have read some papers from Japan about traffic noise and about noise abatement barriers. Do you have some info about the material used to build such barriers. If you come in my office, we need a traffic noise barrier.

C(Oguchi): I don't know about the cancelation system for noise, but one of the systems that impressed me was a column above roads that reduces noise.

C(Teramoto): Japanese people are very sensitive to noise. There are not so many noise barriers in the US or Europe. We have higher population density here. I don't know how flat your country is. In Japan we have developed some kinds of barriers with an absorptive body above roads that cuts 2 or 3 dB. This equals to about 2 m of height of barriers. The length of barrier can be shorter with such absorptive bodies.

C(Sailendra): I heard about more than 70 dB from arterial roads, so we want to reduce to less than 55 dB, the standard for hospitals. The people don't care about the noise and air pollution, but in the future they will, so we want to develop this capacity.

C(Teramoto): We will be able to discuss this topic the day after tomorrow.

C(Oguchi): I'm afraid that many of our materials are written in Japanese. But a few can be provided.

C(Teramoto): We have abstracts in English for almost all documents. Read them and when you have interest, I will prepare as many documents as possible.

Q(Sikki): We cannot compare Japan and Indonesia because of differences in industrial and physical environments. Drivers in Indonesia are not disciplined. We are capacity limited. In Sulawesi, we have bejat (3 wheels with no motor). We don't plan for lanes. Land acquisition is very difficult. How about total vehicles in Japan compared to lengths of various types of roads? Why don't you make cars with devices to reduce emissions?

C(Teramoto): Total road length is about 10,000 km for toll roads, about 60,000 km for highways. About 20,000 km of this is under central government control; the other 40,000 is under local governments. Improvements to local government controlled roads is paid half and half by the national/local governments.

C(Oguchi): roughly there are about 80 million Japanese vehicles. Total road length is about 1 million km. Not sure if this includes motorcycles.

C(Teramoto): Use of motorcycles is for young men or normally it has very large engine (very expensive). Ordinary people have small ones with engines like 50 cc. We have two types of users. But I understand that your country has many middle size engines with 150 cc and the whole family rides, sometimes perhaps 4 people.

C(Oguchi): Many companies try to invent devices to reduce emissions and the government has policy measures to reduce emissions.

C(Teramoto): At this stage in Japan, 20% of CO_2 emissions come out from the transport sector. But Prime Minister Hatoyama has declared a commitment to a 20% reduction compared to 1990, or 30% from today. Top priority of vehicle companies has come to environmental

issues, especially CO_2 emissions. Many are in hybrids now, but full electric cars in the future. Toyota focuses now on hybrids, but Nissan focuses now on fully electric cars.

Q&A in Nihongo about the equations used in the simulation modeling of pollutants.

C(SATO): One additional comment on preventing air pollution. 40 years ago we had very bad air pollution. As a result we have regulations on exhaust gases like NO_2, SO_2 and suspended particulate matter (SPM). I think that exhaust gas regulations are the most effective measures to reduce air pollution. Alternative technological systems to treat the free air are less effective than emission regulations because the concentration of pollutants in air is much lower than that at the tailpipe.
In the late 1970s, we had the first regulations. At that time, the regulations were very loose. After a few years, the regulations were progressively tightened. The most severe regulations were promulgated in 2007. In this year, we implemented the newest regulations. The conditions of the air pollution are getting better, but in the areas of most severe pollution, air does not meet the quality standards. SPM meets the quality standards but NO_2 and NOx, standards are not met in some places. emissions other than those from vehicles contribute to the problem. If we want further improvement, we have to total regulate all combustion systems in city areas. Recently, some pollution was emitted from the continental areas and blown to Japan. In western Japan in some places even in uncongested areas, we find some high air pollutant concentrations. A few years ago we considered that NO_2 or SPM are local problems, but now we are aware that they are international problems.

C(Sailendra): Thanks. I want to know about the traffic and highway capacity and noise and air pollution, because we want to know and have important references. We have a study to reduce urban air pollution with a plantation along the roadside. It would be better for us if you help us with this study.

C(Teramoto): Thanks to all members of today's meeting. Especially to Prof. Oguchi who gave us advance information about traffic configuration. If possible we want to use this information.

3. Conference Report by Mr. Masaaki Nakayasu

About 18 years ago the Construction Ministry convened a forum among directors or senior researchers of Asian Public Works ministries and institutes for the following purposes:

1.exchange information 2.discuss common technology issues 3.establish a network

Objective 1, information exchange. Here is a list of the issues covered in the past and a list of topics of discussion on common technological issues.

Through these meetings, we had discussions on the matter of Environmental issues and natural disasters which we Asian countries face with. For example, two years ago we had discussions on “Management of integrated water applied to the climate change” . We had discussion on “Prevention and Minigation of Natural Disasters” in last year. And we have discussion on “Unique Road-policy Applied to The Regional Condition and Issues” in this year.

Through these discussions we hoped to identify the common issues of importance for the future. The establishment of human network. The history of our conference and the main topics at each conference. Up to 19 countries have participated in the past. The total number of participants from each country is over the years. There have been a total of 148 participants. Myanmar is the first time to participate in this meeting . The achievements and research cooperation in Asia: conference participation and information exchange and promotion/cooperation with JICA. Researcher and engineer exchange to support public works projects in cooperation with Asia. 909 people have gone from NILIM to Asia and 1674 have come from Asia to NILIM. I believe that our cooperation has been instrumental in supporting development. The left picture shows a JICA training course on rivers and dams.

I'd like to continue to seek cooperation and we hope you can make this most of your visit. Please enjoy your stay.

Q (Sailendra): I want to know more about the future project especially on capacity building and research exchange. I want to know the program for researcher and engineer exchange. In my country, engineers are not always engineers in practice in the field.

A (Sato): The answer to your question is item 2 on the agenda. Future projects can be discussed in that time frame starting at 13:50. As a first step, we'd like to begin by discussing that topic this afternoon.

Q (Sikki): Talking about natural disasters. In my island Sulawesi, the land is unstable. Every rainy season, many locations experience landslides. From JICA or NILIM, can you give me advice on how to arrange development to minimize landslides and protect people?

Second, you spoke about Sabo. In my country, we have a big dam constructed with a loan from JICA . There was a landslide into this dam. My irrigation friend

asked if Japan can come to the dam to see what is the matter. Perhaps you can help with how to deal with this problem.
A (Nishikawa): I n Indonesia, concerning natural disasters, I believe that they have various teams of cooperation. This is a good opportunity for feedback. We value your feedback and with exchange of views we can devise better and more schemes.
C (Sikki): For Sulawesi, I have responsibility for questions. I can help with identification of places.
C (Nishikawa): This is not directly related to the topic of this meeting, but what you raise is an important issue and we want to exchange views about it.
Q (Win): How many people are in Myanmar from NILIM?
A (Sato): None from NILIM, but there is an attaché at the Japanese embassy in Myanmar and the staff of MMIT is now serving there. If you have questions or requests, please go to him.
We have 4 speakers with presentations. First, Mr. Nishikawa, followed by Mr. Agus from Indonesia and then Mr. Sikki from Indonesia. Mr. Win will present after lunch.

4. Country Reports
Presentation from Japan: Mr.Kazuhiro Nishikawa
Road planning and design in Japan. I'll discuss how Japan has developed its roads and the problems we have faced. Japan is slightly smaller than Indonesia and we are very mountainous. To go between cities we have to cross mountains. The map shows transport more than 150 years ago. We had roads, but these road were for pedestrians. The freight was carried mostly by boat. Transport policy changed in the mid 19th century with modernization by railways. There were very meticulous lines of railways. The total length of railways is more than 27000 km. After WWII, we realized that we lacked roads for autos. About 1955 we recognized the lack of expressways. We started building them around the 1960s. Our population has already peaked and started to decline. The expressway development timeline and the highway network. The green or yellow areas are missing links of the road and expressway network. Regular highways compensate for missing links in the expressway system.
Around 1950 railways played a dominant role. In the past, railway and sea transport dominated. Now the roadways play a more dominant role for freight transport due to increased convenience. The transport policymakers in the 1950's recognized 2 options. A: An optimal road network that could cope best with future road traffic demand. B: develop roads quickly without altering the existing network structure. Japan selected B and paved the existing roads. We could quickly catch up with western countries. The graph shows the pavement ratio
We also had to quickly produce standards for road design. Traffic volume estimation serves as a basis for road design. Here are drawings for bridges. Having them on paper facilitated quicker road development. We outsourced the

work to private sector companies. The superstructure elements were subdivided in this way. The number of bridges has expanded very rapidly in Japan. Speed of development was prioritized, which facilitated rapid economic growth, the miracle of Asia. However, some issues remained. We must make endless improvements. The old network system gives rise to congestion. There is a mismatch of design standards. Old important roads were built to lower standards. New construction of low priority roads is to high standard. Planning was not done by engineers in a comprehensive manner.
From now on, we have to spend time responding to the problems and needs. For the future, we must consider a longer timeframe. Since strategic infrastructure maintenance is my specialty, I'd like to spend time on this. In the future, many existing bridges will rapidly become older and require replacement. We have to extend the lifespan of existing bridges. We have to maintain road functionality in a sustainable manner. This must be our strategic target. Preventative maintenance is a tactic to extend service life. I will show you some different types of maintenance. The first one is no-maintenance. You never make any amendments. The second one is what we do today. Some maintenance work is done before deterioration becomes serious. Doing this is believed to extend the service life and reduce the total cost. When the intervals between the small maintenance works get smaller, the service life can be the longest and the cost be the minimum. It is ultimate ideal maintenance, but we have not yet achieved this.
We have made several vital decisions, resulting in our quick catch up with the top-runner countries, leaving some issues as I introduced today. I hope my presentation can be a good hint that triggers you to speculate as to which way your countries should take. Thank you.

Q (Sailendra): Good presentation. More information has been given to us. I think the Indonesian condition today is likely the be similar to that 60 years ago in Japan. We also chose option B: rapidly developing roads by paving old roads. We have a lack of standards or specifications, particularly for local materials. On different islands, we have different quarry material standards. We should make a national standard for the rock materials. We want to know about information for developing standards and specifications for local materials. Second, for local engineering, we want to increase local engineering capabilities. We also want to increase local management capability. We want to know about Japan's experience with these. We call the maintenance road preservation. We have road maintenance including extending bridge service life. In Indonesia, bridges were built 30 years ago. Under Indonesian conditions, all the roads and bridges are being degraded by overloading. We need to change the design by conventional and analytical design methods. Maybe you have information about that.
A (Nishikawa): It would take time to answer all of your questions so some of your questions will be handled in the afternoon general discussion session. The government has to have a strong commitment to educate the local engineers so

that they can develop your standard specifications for your local conditions. NILIM has a short history, but the PWRI was established 80 years ago. Around 90 years ago we had a big earthquake around Tokyo. To rebuild the city, we had to do many things including material testing, etc. This became the core of technological development. It lead to road construction and river development. Japanese engineers went to local areas to supervise this development. We started training in the public sector and had to transfer technology to the private sector. We provide instruction to engineers of the private sector. As a result, we could develop very good private sector companies. At the beginning you have to make a firm commitment to train your engineers and your private sector. Then everything starts to move. Next, how to train engineers, I have already answered. You have to identify some center or government research institute. This is what we did in Japan. But in the US and Europe, it was the private sector that had the technology first and then they had to transfer technology to the national government. These patterns are different and you must choose which pattern to use. Either way, you have to make a commitment to train your local engineers.

At the beginning we had many foreign engineers coming to Japan and we had to pay them high salaries so that they would teach us. Regarding maintenance, it is like maintaining our health. We have to identify the diseases, the risks of injuries; knowledge is first. Without knowledge, you cannot move ahead. You have to identify the problems and troubles of roads and bridges. Then you have to identify the ways to solve the problems. What are the medicines that can cure the ailments? Japan has not conducted systematic inspections in the past, and we have just started systematic inspections in recent years. We would like to share our knowledge with you.

C (Win): Good presentation. Our country is trying to build roads and railways with new construction. We are building a new city, using technology transfer from Japan to Myanmar. We are building so many roads, trying to let our country modernize. I have no questions.

Q (Sikki): Comparing Japan and Indonesia is very difficult. Indonesia is a big country, with maybe 10 highlands. The road map is from the central government. The second problem is about human resources. Thanks to JICA for helping with this. My question is first, what is the status of roads in Japan? In Indonesia we have many different types of roads and the responsibility for financing also varies.

Also, we have a problem with use of roads by very heavy vehicles. Some trucks carry 15 or 20 tons. How is enforcement in Japan?

A (Nishikawa): About overloading, this issue has not been solved yet. We'll prepare some information about this to share in the afternoon.

Presentation from Indonesia: Mr. Agus Bari SAILENDRA

Strengthening the role of the research an development center for road building and highway engineering under the Director General of Highways budget. The

Dutch began to colonize Indonesia in the 17th century. Indonesia is the world's biggest archipelago. Biggest muslim population. Many current issues. We have 30 provinces, 3 with special status. We have 440 districts. Road network classification. Primary is national roads intercity. Secondary is only in the city. The road status affects financing. According to dimension of vehicles and maximum loads, we classify roads. Class I roads max vehicle length is 2.5 m, max load 10 ton. Class II also up to 10 tons. Class III up to 8 tons. The Research and Development Centre for Roads and Bridges (RDCRB) is in Bandung. The campus is about 30 ha in area.

RDCRB is under the Ministry of Public Works, on same level with water resources and other R&D organizations. The Institute of Road Engineering has 4 main laboratories, each with equipment and engineers. TRMS should be BRMS, bridge management system. Cakar Ayam is for subsoil. One of the problems in Indonesia is the assignment of contracts. We want to develop performance based contracts. Hot mixed asphalt (HMA), etc. From this point are my observations. This is an example of developing tools for pavement design. We have no APT (acceleration pavement test) and no road test so we skip these and jump to road tests.

We have achieved cost reductions for road design and construction.

Q (Teramoto): What is a transroad? Do you mean a road with a special bus system?

A (Sailendra): A transroad is a main road.

Q (Teramoto): It seems that a transroad has a special system for buses.

A (Sailendra): Not yet. The weight load is more than 10 t/axel. Main road is same as primary arterial road to connect the cities of a province.

Q (Uesaka): What is the main purpose of that automatic traffic monitoring system and what kinds of devices do you use?

A (Sailendra): In the past we collected traffic data manually: by men recording. This data is not accurate and takes much time. So we changed to automatic traffic data collection. The devices come from Japan. The automatic counter records number and types of passing vehicles: Truck, car, motorcycle. We want to record data also about vehicle speed.

We also develop equipment in Indonesia based on new technology. If we import the equipment from other countries, it is very expensive; so, we develop ATC ourselves. We put this on the main transroads. Composition, speed, and we hope load/axel.

Q (Uesaka): You are collecting all kinds of data with the system. What will you use this data for? To build new roads? To cite overloaded vehicles? To develop motorcycle lanes?

A (Sailendra): If we want to design a road, we have to have a feasibility study. We have no existing accurate data. We want to develop a database on the traffic.

C (Sato): I understand that local materials are important, especially for pavement. Tomorrow we have a session on pavement and I hope you will pick up this issue then. Do you have any comments about this?
C (Terada): We have some local materials in Japan and we try to use them in constructing roads. But we also have standard specifications. Sometimes we use standards and local materials. Depending on local conditions, sometimes we select suitable materials for local conditions. The way we apply the standards varies. We have to look at the volume of traffic. We try to satisfy local needs with local materials.
C (Sato): Tomorrow I hope you will deliver an informative lecture to the participants.
Q (Sailendra): In Indonesia we have a standard, but not for local materials. We call local materials substandard, but it is difficult to establish a cost price based on local materials. So we try to create local material standards to correct this problem. We want to know more about local materials and standards in Japan.
A (Sato): We would like to answer these questions at the lecture tomorrow. We are far behind schedule. Let's change the schedule. Let's move the Sikki presentation to 12:45. So we will close the morning session. If you have any informal questions, you can ask our staff during the lunch break.

Lunch Break

Presentation from Indoenesia: Mr. Nurdin Samaila SIKKI
Mr.Sikki read his presentation from the powerpoint slides. 24% of the roads is maintained in good condition. 92% of the roads is asphalt pavement and the rest is gravel.
Q (Sato): This is the 1st time we heard about buton asphalt. Can you explain?
A (Sikki): We have tried since 1980 to use it. It is difficult to spread. But we keep working with it.
A (Sailendra): Buton asphalt is not the usual asphalt. The problem is the processing of this product. We process to make it like oil asphalt. Softening from 1995 to 1999.
Q (Japanese side): What is buton?
A (Sailendra): It is a stone in the land. It is an aggregrate bitumen.
A (Sikki): We take it out with excavators. More than 30% asphalt. It is made from soil or gravel.
A (Sailendra): Buton means rock asphalt. There is bitumen content in the rock. It is difficult to process because the bitumen content is variable. We use it with a hot mix.
A (Sikki): The deposit is more than 100 million tons on the small island Buton in SE Sulawesi. We export to China.
A (Sailendra): We want full extraction of buton asphalt.

Q (Nishikawa): You mentioned Sulawesi. And you have Java, which is a big island. Do you have exchange of engineers between Java and Sulawesi.
A (Sikki) : We employ engineers from any place. We have a great need for human resources, especially engineers. In my place perhaps 50% of the engineers are from Java.
Q (Teramoto): Do you have universities in Sulawesi?

A (Sikki): We have 3.
Q (Nishikawa): I have a question about human resource exchange. We are interested in how technologies can be disseminated throughout the country. In Japan, the government hires civil servants and they rotate throughout the country. But those hired by municipalities have to work only in that municipality. Does Indonesia have a system for circulating engineers throughout the country?
A (Sikki): We are always facilitating training, seminars, and hosting visitors from overseas and from Java.

Presentation from: Mr. Tint WIN
Naypyidaw is newly built capital and Yangon is the old capital and the biggest city. Myanmar has 16 states. My organization, Public Works under the Ministry of Constuction is an organization which is responsible for Construction and Maintenance of roads, airfields, bridges and buildings all over the country. We think “Better roads create better environment”. It brings that we have more important role on roads than railways and air. Myanmar is surrounded by high snow capped mountains and river runs from north to south. Roads have emerged across the nation from the east to the west and from the north to the south. 19,313 miles roads were constructed and other 44,296 miles are now under construction. Ministry of Construction has Public works and Housing departments.
I am chief Engineer from Public Works and have to submit progress report on road network to Minister of MOC. There were hard damages by the attack of Cyclone in 2008. Now 8 roads are under construction for the road networking. We are working enthusiastically to uphold our motto “Speed, Quality,Economy”. We are also endeavoring to improve Myanmar’s technical ability by maintaining standards and quality controls.
In 1985 we started to build Yongon International Airport and at first Japan had been supported but it stopped until now. Extension of Runway is under construction at the airport.

Q (Sato): In Myanmar highways, do you frequently use concrete construction? We use it mostly in tunnels and in snow country?
A (Win): We use concreate.
Q (Sato): Why did you choose concrete? Is concrete more durable?
A (Win): Myanmar produces a lot of cement. All of our road construction is with concrete. Myanmar is largely limestone, the raw ingredient for cement.

Q (Teramoto): How many engineers are in your organization, the Ministry of Public Works?
A (Win): 1500. Now all state and divisions have Institutes of Technology.
Q (Sikki): How would you compare the cost between concrete and asphalt?
A (Win): In Myanmar asphalt (bitumen) is imported only. One ton of bitumen is $500 in Myanmar. We are trying to use local materials.
Q (Sikki): What are the costs /m2?
A (Win): Asphalt is more expensive. We use it over the bridges. There is only one asphalt road in Myanmar, funded by an ADB program.
Q (Sato): Japan uses asphalt mainly. Asphalt is a byproduct of refining oil, so it is not very expensive in Japan. We import crude oil for gasoline and the asphalt is an intermediate product. If you import crude oil to make gasoline, then you can get asphalt inexpensively.
A (Win): In Myanmar, we import asphalt, so it is expensive.
Q (Teramoto): Do you import crude oil and refine it or do you import petrol.
A (Win): We import diesel.
C (Sato): You have submitted to us your inception report. Later on we will introduce you to Japanese efforts. What efforts are you taking to counter the problem of overload?
C (Win): We start to control the overload.
Q (Sato): What measures do you use?
A (Win): The police weigh vehicles. Previously we were overloading and all roads were damaged. Now we are trying to control the overload.

C (Sato): Now we want to show you about the Japanese efforts to control overload. About 5 years ago we increased the allowable load by 5 tons/vehicle, but increased enforcement. The person in charge will explain in detail.

Presentation from Japan : Mr.Mabuchi
I want to explain how Japan deals with this issue. From H6 until 2004. Please open page 4 of the powerpoint. This shows frequency distributions of various vehicle weights. We increased the allowed vehicle weight from 20 to 25 tons from 1994 to 1995, together with stricter enforcement and punishment. This successfully helped to reduce the number of heavy vehicles that must have caused damage to the road. Please open page 26: companies were held liable for violations of vehicle load regulations. They could have lost their licenses to do business. Drivers could lose their driver licenses or pay fines. Penalties also against shippers.
In 2008, automatic measurement devices were installed in about 30 locations and the results of the monitoring were put online. In 2009, the period of licenses was extended to 2 years from 1 for load regulation compliant companies.
Slide 27 please: from Oct. 2008 to July 2009, compliance increased from 39 to 43%.

Q (Sailendra): It was very impressive story. What kind of equipment did you use to measure weights in the field? This approach is interesting. What was the cost?
A (Mabuchi): Sometimes we have to call in another truck to haul off excessive loads. We are working with the police on this. Of course money must be paid by the violators. Page 31 please: Here is a road weight measurement device embedded in the road. Each car can be stopped by roadside for physical measurements. This is a bridge gauge that monitors weight as vehicles pass.
C (Sato): Currently we have to physically stop vehicles and weigh them before we can issue a fine. But if the technology becomes more advanced, then we can take action against violators based on automatic measurements (now we just issue warnings). Now actual citation rather than just a warning requires stopping them with help from the police. Of course the automatic devices can be used together with later physical stops by police.
C (Sailendra): We need load per axel width, not total gross weight. So is the bridge sensor for total weight or per axel weight? We want to know the per axel weight.
C (Win): In Myanmar, vehicles carry more load. We need more agents to monitor loads. We have 24 wheel trucks.
C (Nishikawa): I have been studying the durability and service life of bridges. Overloads affect both pavement and bridge service life. We measure wheel load to calculate total load. We also measure how bridges are affected by various loads. Early in the morning we sometimes see 60 kinds of trucks running over bridges. We have to collaborate with police to check trucks. But once we pull one truck over, the other truckers are informed by mobile phone. Weighing in motion is not to enforce laws, but to have understanding of the trend. We have to show the data to the public so we can educate them. We can justify enforcement by showing the trend. There are some political reasons. If we just control loads, we would be stopped from somewhere. This photo shows fatigue damage of an RC slab on the abutment of a bridge. You will visit the lab and see the devices used to measure such damage. This photo shows a machine designed by me 10 years ago to test fatigue of highway bridge slabs. We'll give you a printout of this.
C (Sato): Overload is not in tomorrow's program, which is why we made a short presentation now.
C (Win): In Myanmar we are trying to control loads. Many people carry overloading. The government is controlling overloading to prevent damage to bridges and roads. We are trying to purchase a weighing machine. Trucks in Myanmar carry 40–50 tons. We are trying to control the load. Now studying.
C (Sato): In Japan enforcement should be done or we cannot get the real benefit of the law. In the past, drivers were advising each other by radio so they would know where enforcement was being done. Now they use mobile phones to avoid weighing stations. You will have similar problems when more drivers use

mobile phones to avoid enforcement. We'll discuss it in the general discussion, which begins now.

5.General Discussion

C (Sailendra): We are happy to receive more information and experiences from Japan about our problems. I want more details about that. I hope to transfer technology and know-how for the specification of standards, which would be good for us. Indonesia's situation today is like Japan's 60 years ago. We want to improve the accessability of the country and connect cities.
C (Sikki): I hope to be given more details about the topics of this seminar.
C (Win): In Japan, I am very happy. I study for knowledge. Thank you very much.
C (Sato): There are some moves taking place about standardization. The government made a standard that makes it difficult to adapt to local resources and needs. If you are too rigid, then you cannot incorporate creativity and take advantage of new advances. You have to give weight to the merits of implementing standards in a flexible manner.
C (Nishikawa): Human resources and engineers. How can we develop and nurture the next generation of engineers. This is a very difficult issue to deal with. Japan has a deceleration of the rate of public works. Please encourage the engineers of your country. Give them a lofty goal. You should challenge them to develop their own standards as a way of educating them.
C (Sato): We would like to conclude the general discussion. We are right back on the second theme of continuing cooperation among our countries.
C (Teramoto): I want to explain the background of the enhancement in and improvement of the relationships between our countries. Yesterday Mr. Sato mentioned that this meeting has been held for 17 years with many achievements. But we believe that these achievements are not enough for Asian countries. So we analyzed how to proceed on a systemic level. The person to person style of moving ahead is sometimes stopped by transfer of individuals. On a visit to Bandung last June, my counterpart suggested a close relationship such as with an MOU. We prepared such a document and it has been approved by our Ministry of Foreign Affairs. If Indonesia also agrees, shall we have a ceremony for the signing of this MOU after this meeting.
C (Sailendra): Yes. I approve and have already signed.
C (Teramoto): For Myanmar and NILIM, we would like to continue talks to improve cooperation for mutual understanding. From our understanding, since you are the first participant from Myanmar, for now we want to continue talks. After mutual understanding is achieved, we hope to proceed to enhanced cooperation.
C (Win): Thanks for inviting me. Please invite us next year too.

C (Sato): Thanks very much. The conference session is over. Thanks for your cooperation. At 3 pm we are planning to visit experimental facilities.

End of the meeting

The 18th Conference on Public Works Research and Development in Asia

(Subject：Efficient development and operation of road net works)

Minutes

1. Date and venue: 09:00-09:40 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Dr. Katsumi UESAKA
	Head, Traffic Engineering Division
	Mr.Hirotaka SEKIYA

3. The summary of the discussions, etc.

In Japanese road maps, roads are classified into four different categories according to road management jurisdiction (highways, national roads, major local roads and prefectural roads) with each road indicated using a different color. However, national roads are not always of a high standard, with some sections so narrow that cars traveling in opposite directions cannot pass easily, and so this method of categorizing roads is not necessarily an easy way for travelers who are unfamiliar with the area to understand. With this in mind, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) first created a paper map where roads are classified according to their drivability. Since then, MLIT has been looking at providing this information over the Internet so that it can be included in car navigation systems. This lecture provided information on the current status and issues of these initiatives. It was also proposed that Indonesia and Myanmar create their own drivability maps, and the possibility of doing so was discussed.

Q: (Indonesia) Does this initiative cover the whole country?

A: (Japan) Yes, that’s right.

Q: (Indonesia) Does this initiative cover all roads?

A: (Japan) It covers highways, national roads, major local roads and prefectural

roads.

Q: (Japan) Road maps are the easiest way of providing simple but useful information. However, we don't expect that Japan's drivability map can be applied to Indonesia and Myanmar without any changes. For example, in yesterday's presentation we were shown photographs of places where the roads had become impassable as a result of natural disasters. So one type of drivability map would be to create a map showing blocked roads and unsealed roads. Are you doing anything like this in Indonesia?

A: (Indonesia) In Indonesia we provide information about blocked roads in the newspaper, but we don't create maps listing that kind of information.

Q: (Japan) Perhaps you could create something like that in future?

A: (Indonesia) That's something we'd like to consider. In tourist areas like Bali in particular, we can expect that a map like that would be useful for tourists. This lecture has given us a good idea.

A: (Myanmar) In Myanmar, pamphlets for tourists include road maps. We agree that road maps are very important.

The 18th Conference on Public Works Research and Development in Asia

(Subject: Measures to secure road traffic safety)

Minutes

1. Date and venue: 09:40-10:20 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr. Masahiro KANEKO, Head
	Mr. Keiichi IKEHARA, Senior Researcher
	Mr. Keita NAKASU, Senior Researcher
	Mr. Katsuhiro ITO, Guest Research Engineer
	Mr. Kouki HASHIMOTO, Guest Research Engineer

Advanced Road Design and Safety Division, Road Department

3. The summary of the discussions, etc.

Kaneko from the Advanced Road Design and Safety Division gave a presentation on the current situation of traffic accidents in Japan, and on the measures to prevent traffic accidents. Regarding the current situation of traffic accidents, he presented such as the number of traffic accidents fatalities in Japan, and compared the situation of traffic accidents in Japan with those in other countries. Regarding the measures to prevent traffic accidents, he explained that measures are roughly divided into arterial roads and residential roads, and introduced “Selected and focused” measures for arterial roads and the measures in two-dimensional spaces and zones for residential roads.

After the presentation, there was time for questions and answers and discussion.

Q: In Japan, how do you identify hazardous spots?

A: We identify hazardous spots based on accident rates, calculated as the number

of accidents divided by VK (vehicle - kilometers).

Q: Please tell us which measures are most effective at reducing accidents.

A: We are currently in the process of taking the results from accident reduction measures around Japan and organizing the information about accident reduction benefits. We plan to announce these results in the future.

The 18th Conference on Public Works Research and Development in Asia

(Subject： Environmental issues of Roads in Japan)

Minutes

1. Date and venue: 10:30-11:10 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr. Shinri SONE
	Head, Road Environment Division

3. The summary of the discussions, etc.

The lectures have been taken place in the following current situation of environmental problem in road.

・Environmental Assessment system
・Air pollution and the pollution-control measures
・Noise pollution in road and the noise-control measures
・Current situation and the counter measures toward greenhouse gas

The 18th Conference on Public Works Research and Development in Asia

(Subject: Toward realization of Smartway in Japan)

Minutes

1. Date and venue: 11:10-12:00 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr.Hideto HATAKENAKA
	Head, Intelligent Transport System Division
	Mr.Koichi SAKAI

3. The summary of the discussions, etc.

Mr. Hatakenaka explained the spread of the Electronic Toll Collection System (ETC) and the Vehicle Information and Communication System (VICS) that are currently deployed in Japan, and the concept and services of Smartway using the 5.8 GHz dedicated short-range communication (DSRC) which is now used by ETC.

A DVD was shown to explain an overview of the field operational tests (FOTs) conducted on the Metropolitan Expressway in 2007, and some of the services such as providing information on obstacles ahead and merging assistance. Mr. Hatakenaka introduced the results of these FOTs, and presented overviews of the FOTs of Smartway conducted all over Japan in 2008, and the large-scale FOTs jointly conducted by the four relevant government agencies.

Mr. Hatakenaka also introduced deployment strategies of Smartway in the future.

Q: How much is the benefit of introducing ETC or Smartway? It would be helpful to understand if there was some concrete data…

A: This is an extremely difficult question to answer. The question of how much the benefit for installation is an important one for road administrators when it

comes to introducing these systems, but we haven't been able to express this benefit well so far.

For examples, one of the effects of introducing ETC has been that the traffic congestion at the main lane toll gates has been reduced by more than 80% as the usage rate has reached about 80%. Another example is that the experimental service which provides information on obstacles ahead at the Sangubashi curve (a curve is one of the rear-end collision accident-prone area) has reduced traffic accidents by about 70%, although other traffic accident countermeasures such as installing variable message sign (VMS) were also taken at the same time. In another experiment which was conducted last year at the Rinkai-Fukutoshin off-ramp of the Bay Shore Route of the Metropolitan Expressway, a service which provided information on obstacles ahead reduced the average speed by 3 km/h.

However there are very few examples where the effects can be quantified in this way. For example, we believe that systems which assist safe driving not only reduce the number of traffic accidents, they also give drivers a sense of security. We are conducting questionnaire surveys of test subjects as a way of trying to grasp these kinds of effects.

We believe that the eventual goal of quantifying the effects is to convert these effects into monetary terms and perform a cost-benefit analysis. We are conducting further research towards this eventual goal.

Q: In the other presentation of environmental measures for road improvement, he said that he was implementing measures to increase the speed of vehicles, because the environmental impact (such as CO_2 emissions) increased when vehicles were traveling slowly. But just now you said that you are trying to lower the speed of vehicles. What is the relationship between these two goals?

A: It is important to slow the speed of vehicles traveling too fast down to a safe speed in order to prevent traffic accidents. That's why measures to make vehicles travel slowly to prevent accidents are important at accident-prone areas.

Moreover, although CO_2 emissions increase substantially as vehicle speed decreases, the minimum emissions occur at 60 to 80 km/h, and emissions are more or less the same in this interval. In the example of the Rinkai-Fukutosin off-ramp mentioned before, the vehicle speed was around 60 km/h and lowering the speed would not so significantly affect CO_2 emissions.

The 18th Conference on Public Works Research and Development in Asia

(Subjects： Earthquake disaster management for Roads)

Minutes

1. Date and venue: 13:15-13:55 Thursday November 12th 2009
   No.204 Meeting Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Dr. Susumu TAKAMIYA
	Head, Earthquake Disaster Prevention Division

3. The summary of the discussions, etc.

Regarding earthquake disaster management for roads in Japan, the framework of the management, road damages due to earthquakes in Japan in the past, risk management pertaining to earthquakes and crisis management to be taken right after being struck by earthquakes were introduced and discussed. Regarding risk management, the technical policies to be taken for newly constructed road facilities and existing road facilities were introduced. And regarding crisis management, various support systems for checking the damages to the road facilities, and communicating and sharing that information were introduced.

Q: Will it be effective to introduce the SATURN system into Indonesia?

A: The SATURN system is a system that will estimate damages incurred upon the road facilities, right after being struck by earthquakes, in an effort to improve efficiency in the subsequent inspection activities. Introducing this system into Indonesia will be effective. However, it will be necessary to obtain ground motion data right after being struck by earthquakes, and also necessary to have data such as “ground” data prepared and maintained in advance, in order to estimate the damages incurred upon the road facilities using this system. These points should be taken into consideration.

Q: Will it be possible to inquire furthermore about the details of the SATURN system?
A: Yes, it is. If you have any questions, etc., you can make those inquiries to the National Institute for Land and Infrastructure Management.

Q: Today's lecture was about earthquake disaster management, and I would like to know whether it is also the subject of researches to be conducted here, to predict ground motions or inform the citizens of them.
A: No, they are not. The subject of researches to be conducted here is the way to conduct management of reinforcement of social infrastructure facilities such as roads, against earthquakes.

Q: I want to know about the specific earthquake-proof reinforcement measures to be taken, such as for road bridges.
A: The Public Works Research Institute is in charge of the specific earthquake-proof reinforcement measures to be taken. Since there will be a lecture by a bridge specialist from the Public Works Research Institute, later on, please inquire about the details at the lecture.

The 18th Conference on Public Works Research and Development in Asia

(Subject： Strategy for maintenance of Road structures)

Minutes

1. Date and venue: 13:55-14:35 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr. Toshiaki MABUCHI Senior Researcher, Bridge and Structures Division, Road Department,NILIM

3. The summary of the discussions, etc.

I introduced the current state of aging and damage for Japanese bridges, and explained how performing efficient maintenance had become a challenge, and about the maintenance efforts underway in Japan.

It is necessary to establish a mechanism to carry out systematic management comprising inspection, prediction, assessment and countermeasures, as well as periodic inspections to collect data on which to base those actions. The inspection of areas that cannot be covered in periodic inspections (internal parts, underwater parts, etc.) poses a problem. I introduced efforts at maintenance, which were discussed.

Q: Is any equipment used in periodic inspections?

A: Inspections mainly involve getting close and performing inspections visually, and vehicles for conducting testing are sometimes used.

Q: What is the timing for performing each type of work (preventative maintenance, repairs and replacements) and who performs the work?

A: The road administrator determines what type of action to take. Preventative maintenance is at an advanced level in Japan. Replacements are carried out when no effective countermeasures are available.

In the area of preventative maintenance and repairs, these differ greatly depending on the circumstances at the bridge location, and the road administrator determines what to undertake based on the volume of traffic, nearby conditions, and so on.

Q: If severe damage is discovered after performing an inspection, what is done in the lead up to funds being secured and the commencement of repair work?

A: At that point we take whatever emergency measures are possible. For example, we may consider closing the road to traffic or restricting the passage of large vehicles.

The 18th Conference on Public Works Research and Development in Asia

(Subject： Techniques for inspection and reinforcement of bridge)

Minutes

1. Date and venue: 14:45-15:25 Thursday November 12th 2009
   No.204 Meeting Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr.Taku HANAI,
	Mr.Naoki YANADORI
	Bridge and structural Technology Research group,
	Center for Advanced Engineering Structural
	Assessment and Research, PWRI

3. The summary of the discussions, etc.

We described the defects of concrete and steel bridges and ways to maintain, repair and reinforce them.

With respect to concrete bridges, we presented the results of a defects survey on concrete structures across Japan, and described the deterioration tendencies of concrete structures in Japan.

For steel bridges, we explained about the corrosion of steel components and fatigue on concrete decks as the typical forms of deterioration, as well as ways to maintain, repair and reinforce such structures.

Q: I would like to know about earthquake reinforcement work for bridge piers.

A: We explained about RC-jacketing reinforcement methods and steel jacketing reinforcement methods while referring to diagrams.

Other: The Indonesian attendees introduced case examples of concrete decks in Indonesia having developed many cracks.

The 18th Conference on Public Works Research and Development in Asia

(Subject：Efficient maintenance of the pavements and tunnels)

Minutes

1. Date and venue: 15:25-16:25 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr.Kazuyuki KUBO
	Team Leader, Pavement Research Team,
	Mr.Nobuharu ISAGO
	Senior Researcher, Tunnel Research Team,
	Road Technology Research Group, PWRI

3. The summary of the discussions, etc.

We will introduce the current state of maintenance and management of the pavements and tunnels in our country, centering on directly-controlled national highways, and also explain about the investigations and researches aimed at achieving efficient maintenance and management in the future.

In regard to pavements, I will report about the current state of the pavements in our country, and also introduce the pavement management support system that has already been applied to directly-controlled national highways, etc. Furthermore, I will explain about the preventive-repair, which is currently under investigation and research at the Public Works Research Institute.

Furthermore, in regard to tunnels, I will explain about the current state of maintenance and management of the road tunnels in our country, the workflow in tunnel inspection, and representative repair and reinforcement methods, and I will also introduce the maintenance and management of tunnels in Japan in the future.

○ About effective utilization of locally produced (low quality) materials

Q: In Indonesia, the quality of aggregate is not so good in some regions. Isn’t

there a similar problem in Japan?

A: We have similar problems. In Okinawa, for example, only limestone can be mined. In Japan, the state does not publish the manuals directly, but the Japan Road Association publishes them, and the administrators of the roads will draft their original specification sheets by referring to those manuals. In most cases, they conform to such books published by the association, but when the aggregate situation is different from the nationwide standard situation, as is the case in Okinawa, they will draft their original specification sheets, by working on it independently, or starting up a third party committee. It may turn out that I visit Indonesia next March, so I might have a chance to discuss the details in the field.

○ About crack sealants

Q: Is there any means to select a good crack sealant?

A: We are in the process of investigating and researching a quality criteria for crack sealants. Repeated bending tests may be effective. At the present moment, we have no choice but trust big manufacturers, such as NICHIREKI Co., Ltd.

○ About nondestructive examination of pavements

Q: Do you use the Benkelman beam or the like, for detailed examinations of the road surface?

A: We usually use the FWD (Falling weight Defrectmeter), but it is still in the research level, not in the practical application stage yet.

○ Other comments

- With the decrease in maintenance and repair budgets, it is necessary to clarify the management level of the pavements, for a rational maintenance and management of the roads, but it is difficult to make that clarification, with the issue of defect in the management.

- Overloaded vehicles can be blamed as one of the causes of extremely deep ruts being dug up, but the number of deep ruts has dropped drastically in Japan, because, with the amendment of the Road Traffic Law, not only the drivers, but also their companies and the customers giving them orders became punishable.

- There are few concrete pavements in Japan. I think one of the reasons for this is that it is difficult to repair them when they are damaged.

- In Indonesia, we are currently in the process of proceeding the investigations about construction of road tunnels, with the support of JICA.

- Past examples of tunnels in Myanmar is limited to waterway tunnels and railway tunnels, and there is currently no road tunnel.

The 18th Conference on Public Works Research and Development in Asia

(Subject：Risk Management Strategy in Privatization of Expressway Public Corporations in Japan))

Minutes

1. Date and venue: 16:35-17:15 Thursday November 12th 2009
   International Conference Room of NILIM
2. Participants

Indonesia	Mr. Agus Bari SAILENDRA
	Mr. Nurdin Samaila SIKKI
Myanmar	Mr. Tint WIN
Japan	Mr. Katsuhiko NAKAMURA

Planning Division, Japan Expressway Holding and Debt Repayment Agency

3. The summary of the discussions, etc.

In Japan, four expressway public corporations were privatized in 2005, and at the same time the Japan Expressway Holding and Debt Repayment Agency was launched.

The agency's role is to ensure that its debts are paid off within 45 years, as well as to provide support to ensure that companies construct necessary roads and steadily maintain them.

The biggest risk factors in repaying the debt are traffic volume and interest rates. The risk management of these factors is very important.

With respect to force majeure risk, financial support is available from the government in case of major disasters.

Out of consideration for the recent economic and social conditions, tolls were drastically reduced through government-funded investment.

Q: What is the state of pricing for large vehicle, which have a significant impact on damage to the expressways?

A: Expressway tolls are divided into five levels. Standard-sized cars are regarded as 1.0, and based on the size of the car, the levels go in sequence of 0.8, 1.0, 1.2, 1.65 and 2.75. The per-kilometer toll for a standard-sized car

is 24.5 yen.

Q: What is the basis for the unit toll for the base standard-sized car and for the proportions paid by each of the other classes of car?

A: The tolls take everything into account, including construction costs, administrative expenses and the benefit to users. I don't have a detailed basis for the tolls on hand.

Q: In Indonesia, efforts are made to raise tolls every three years due to inflation. Are the tolls ever changed in Japan?

A: The tolls take everything into account, including construction costs, administrative expenses and the benefit to users. I don't have a detailed basis for the tolls on hand. Due to recent economic conditions, in Japan tolls have not risen for the past decade or so, and raising them in the future is not feasible. In addition, as I explained before, with the change in government discussions have just begun over making expressways toll-free.