

# ICUS Newsletter

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International Center for Urban Safety Engineering Institute of Industrial Science, The University of Tokyo

## Challenges in Urban Transportation in Yangon, Myanmar

By Hironori Kato Professor The University of Tokyo

#### Introduction

Yangon is one of the largest economic cities in the Republic of the Union of Myanmar. It has been experiencing rapid motorization since about 2010, which has caused serious traffic congestion at many road sections and intersections in the city, and led to significantly negative impacts on regional and local economies. Although the socalled truck bus was one of the most popular public transportation options for commuters in Yangon (Kato et al., 2010), the use of private cars has been recently increasing rapidly. The Japan International Cooperation Agency (JICA) implemented the Project for Comprehensive Urban Transport Plan of the Greater Yangon (YUTRA) in 2013. This project collected large-scale data in Yangon (Figure 1) and formulated a longterm transportation infrastructure development plan, in which I

have been involved as an external advisor.

### Urban Transportation in Yangon

Figure 2 shows modal shares including all modes, excluding walk,

and excluding non-motorized modes. This implies a unique characteristic in Yangon's transportation where bus is a dominant travel mode for local people. However, the service quality of public transportation including bus and rail is very poor (Figure 3).





Source: JICA (2013)

Figure 2: Modal shares for all trips, excluding walk, and excluding non-motorized mode

Figure 4 shows the modal share by car ownership and by monthly household income. The modal share of walking is the highest in the household whose monthly household income is less than 200 US\$. This is, firstly, because the workplaces low-income individuals of are located near their residence and, secondly, because the lower-income individuals participate less in leisure activities at places further from their residence. The modal share of buses in the middle income class (200-275 US\$) is higher than that in other income classes for both car owners and non-car owners. The higher income car owning households use cars and the higher income non-car

owning households use taxis while the lower income households tend to walk. Finally, the modal share of buses in the car owner subgroup is 22.8%. They use public transportation services even though they own cars because they use their cars not only for personal use but for commercial use such as commercial taxi services, few household members have their own car licenses, and because they often do not like to spend money fueling up.

Figure 5 shows the travel speeds observed at major roads in Yangon. The average travel speed along major roads connecting suburbs with the CBD varies from 15 to 35 km/h. Outbound traffic from the CBD suffers from serious traffic congestion during evening peak hours while the inbound traffic to the CBD suffers from traffic congestion both during morning and evening peak hours. Inbound traffic congestion during the evening peak hours may be due to poor traffic management and the low capacity of intersections. The lower travel speed during the morning peak hours also leads to longer travel time for commuters.

### Challenges of Urban Transportation in Yangon

YUTRA summarizes urban transportation problems into "traffic congestion," "long travel time,"



Photos: Hironori Kato

Figure 3: Poor public transportation services in Yangon (Left: Over-crowded track bus; Middle: Low-skilled engineering work; Right: Sub-standard rail system)



Source: JICA (2013)

Figure 4: Modal share by vehicle ownership and household income level

"poor public transportation service," and "mobility gap between high and low income individuals."

Solutionstotheurbantransportation problems in Yangon are challenging because travel demand continues to increase at a high growth rate while the capacity of implementing the appropriate transportation policies may be poor in Myanmar. Top priority should be given to the projects with high efficiency and low cost such as optimizing/upgrading existing facilities, namely: (1) rapid bus transit into major corridors of the city to increase traffic capacity and continue to attract people to use public transportation with a better level of service, (2) improvement of the existing road/rail facilities to increase traffic capacity and upgrade the service quality, and (3) traffic management including intersection improvement such as signal improvement and lane assignment to make full use of the road capacity.

However in the long-term, a mass rapid transit system as well as the urban expressway network should also be introduced to Yangon. Additionally, urban sprawl should also be controlled by improving the



Figure 5: Travel speeds observed at major roads during morning, afternoon, and evening

efficiency of land-use patterns in the CBD as well as by developing strategically located satellite industrial cities so that travel time could be reduced and traffic congestion in the CBD could be eased.

#### References

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# Quick report on Kamishiro fault earthquake in Nagano prefecture

## By M. Numada

On September 22, 2014 at 22:08 PM, a severe earthquake with magnitude (Mw) 6.7 and depth 5 km hit Northern Nagano. JMA intensity 6+ was observed in Nagano city, Otari village and Ogawa village while intensity 5+ was observed in Hakuba village and Shinano town. This earthquake caused no deaths but unfortunately 10 and 36 people were, respectively, severely and slightly injured. 80 houses were totally collapsed, 160 houses were half collapsed and 1787 houses were partially collapsed.

I visited Hakuba village in Nagano prefecture where severe damage occurred (Figure 1). The earthquake occurred before the snow season. However, when I visited, heavy snow covered the area to a depth around human height.

Evacuees had just started to move from the public gymnasium for evacuation (photo 1 and 2) to their temporary houses for two years (Photo 3 and 4).

Though the evacuees could move to the temporary houses from the gymnasium, as a matter of course, the housing is small in size compared to their own housing, and cold due to the winter weather.

As the evacuess have to find a new place to live during the two year stay in temporary housing, tough decision making will be needed especially for vulnerable people such as the elderly.

Before I visisted Hakuba, I researched the local conditions and collected information on the damaged area and what kinds of response were conducted by organizations from national to local level.

Although plenty of information is provided to grasp the overall situation in Hakuba, it was difficult to follow the process of responses. Much information provided by the web sites of public organizations is not well structured and contain the same information but with different details, different release time, and different format etc. Therefore, time-line analysis is needed to understand the response of different l organizations.



Figure 1: Location and JMA intensity



Photo 1: Outside of the public gymnasium used by evacuees



Photo 2: Inside view of the gymnasium



Photo 3: Temporary housing



Photo 4: Moving of furniture inside each family space.

Sinkholes in Pokhara, Nepal

Prof. Kuwano of ICUS, together with Associate Prof. Kiyota and other members re-visited the sinkhole site at Pokhara, Nepal, in November



Sinkholes filled with soil. (June 2014)

2014. Nearly 200 sinkholes appeared on the fields of rice and other crops in November 2013. About 50 families had to evacuate since the sinkholes



Grasses covering the filled sinkholes. Some filled holes had collapsed. (November 2014)

also appeared beside houses. When the site was first visited in June 2014, almost all the holes had been already filled by the locals, as reported in the ICUS Newsletter 14-1. However, many of the filled holes were found to be collapsed and a number of holes had reappeared in the field, indicating that the internal erosion was still ongoing. 3D laser scanning was performed to obtain detailed topography of the area and also a surface wave survey was conducted to detect cavities and the loosened parts in the ground. On November 3rd-6<sup>th</sup>, the 13<sup>th</sup> International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA 2014) was held. Five students from ICUS attended this symposium: Ryosuke Yabe, Yudai Aoyagi, Yuki Horiuchi, Kenjiro Yamamoto, and Punyawat Jiradilok. This was the first time for us to go to Myanmar, and we were excited and nervous when we arrived at Yangon International Airport.

As soon as we arrived at the airport, we moved to Sakura Tower and joined the symposium welcome party. At this party we talked with participants of USMCA2014 from other Japanese universities like Hokkaido University. After the welcome party, we moved to our hotel, and we were very surprised to



see our rooms. They were so different from those in Japan, We found many blotches on the mirror and there were cockroaches and lizards. One of our rooms even had a bird's nest.

On the second day the conference was held at Sedona hotel, which is one of the biggest hotels in Yangon. Presentations by researchers and Professors were given on this day. Our tasks were assisting the organizer, taking pictures, and helping at the ICUS booth. In addition, we attended the conference after finishing our tasks. Once the evening section finished, we joined the banquet where we could eat many kinds of delicious Myanmar food.

On the third day, the conference was held at Yangon Technological University (YTU). All of us had to give a presentation on this day. The picture on the right is the presentation held by Yudai san. He was given the Excellent Young Researcher Award. His presentation was very nice, and he was asked questions by many people. After all presentations were completed, we had a farewell party at a Chinese Restaurant. At the restaurant we could talk a lot with students from YTU, and we could see the daily lives of students from Myanmar. We enjoyed the traditional dance and making new friends. This is the picture of the YTU students and us. We thank all YTU students for organizing the conference



at YTU.

On the last day, we did some sightseeing of Yangon City. We visited many places, but the most memorable place was the Shwedagon Pagoda. Although there was bad weather that day, we thoroughly enjoyed the Pagoda visit. We were very impressed by the elegance and gorgeous architecture of the Pagoda. The picture on the right was taken at the Pagoda. Kenjiro san came into contact with a child from Myanmar. The child concealed the stick used for ringing the bell and Kenjiro san tried to recapture it.

We had a very enjoyable time in Myanmar and we thank all of the people who attended the symposium. It was very precious for us to have a chance to give a presentation in English and to talk with many kinds of people. Finally, we'd like to extend our gratitude to all ICUS members, especially Ms. Yoshimoto and Mr. Kodaka for organizing USMCA2014.

# USMCA2014 in Yangon, Myanmar

During 3 - 5 November 2014, the 13th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA2014) was held at Sedona Hotel Yangon and Technological Yangon University (YTU) in Myanmar. The Symposium was jointly organized by YTU and ICUS with four sponsors and three supporting organizations (see Table below). Since SATREPS in Myanmar has been temporarily accepted by the government of Japan, a special session was set in the symposium to announce

that both Myanmar and Japan have been working together to launch the project officially in 2015. The symposium was opened with addresses from H.E. Dr. Ko Ko Oo, Union Minister of Science and Technology, H.E. Mr. Tateshi Higuchi, Ambassador of Japan to Myanmar, and Prof. Kimiro Meguro, Director of ICUS. During the symposium, a total of eleven keynote/ plenary speeches, and seventy four papers were presented. The symposium was successfully closed with the giving of Excellent Young Researcher Awards to five researchers who gave excellent presentations. We hope that you will join us for USMCA2015 scheduled for Oct. 29-31, 2015 in Kathmandu, Nepal.

Table: Sponsors and supporting organizations of USMCA 2014

Sponsor	Myanmar Engineering Society (MES)/The Foundation for the Promotion of Industrial Science/Nippon Koei Co., Ltd./Suntac Technologies Co. Ltd.
Supporting	Embassy of Japan in Myanmar / Japan International Cooperation Agency
Organization	(JICA) Myanmar Office / Japan Society of Civil Engineers (JSCE)

## 2015.1.12

# Title: Prof. Taikan Oki of ICUS was elected as the first Japanese AGU Fellow in Hydrology Section!

By Dr. Kei Yoshimura, IIS/AORI, The University of Tokyo

#### Contents:

Prof. Taikan Oki of ICUS was elected as an AGU Fellow of 2014, and was awarded with 61 other new AGU Fellows on December 17th 2014 during the AGU Fall Meeting at Moscone Center in San Francisco. Women wore evening dress and men wore tuxedo for the Ceremony and during the Honoree Banquet, like at the ceremony for the Academy Awards. There were more than 80 tables, 10 persons per table, at the spectacular Honoree Banquet, and several Ph.D. graduates under supervision of Prof. Oki gathered from various parts of the world and cerebrated the honor together (Photo 1).

Photo 2 is from the webpage of Prof. Steve Burges, Professor Emeritus at The University of Washington, Seattle, of his retirement. During the Honoree Banquet, Prof. Burges and Prof. Soroosh Sorooshian, currently at UC Irvine, remembered the photo, came to our table, and took another photo (Photo 3) a quarter of a century after the first photo. Prof. Oki said "When I took the first photo, I had not yet decided to go for the Ph.D. course, and I was not sure what I'll be. It was the opportunity when Soroosh was the Chief Editor of WRR and suggested me to submit my research results of Master's thesis. The article was published in 1991, and I was firstly invited by Prof. David Turboton and



Photo1



Photo2



Photo3

participated in the AGU Fall meeting in the same year. I don't remember how I spent AGU week in 1991, but still remember I felt so lonely and very much alienated. Nor I did not know the section lectures, section luncheon, and awards ceremony at that time. This time, I was feeling very much comfortable to be with my colleagues, friends, and students, including those not in SF. I herewith sincerely thank for your outstanding services in advancing global hydrology that enabled my career as a hydrologist at the international level and led to the approval as an AGU Fellow this time".

The honor of AGU Fellow is given to individual AGU members who have made exceptional scientific contributions and attained acknowledged eminence in the fields of Earth and Space Sciences. Since the establishment of the AGU Fellows program in 1962, and in accordance with AGU bylaws, no more than 0.1 percent of the total membership of AGU is recognized annually. There are only 2% of AGU Fellows even now among AGU membership of more than 62,000.

Prof. Oki's citation for this award is "For interdisciplinary research and leadership bridging hydrology, climate, and sustainability through numerical modeling and scientific analysis", and the honor reflects Prof. Oki's extraordinary achievements in hydrological science, climate change research, and sustainability studies, and also his leadership pioneering a new academic field, such as global hydrology and world water resources.

Prof. Oki is the first Japanese AGU Fellow in the Hydrology Section. It is an honor for his research group - current and alumni members, and also for ICUS.

See more at: http://honors.agu.org/honorsfellow/ 10591-oki/ http://onlinelibrary.wiley.com/doi/10.1002/2014EO300008/pdf http://news.agu.org/press-release/american-geophysical-union-announces-2014-fellows/ http://honors.agu.org/fellows/class-of-2014/page/3/