

Special Talk

Outlook for Sustainable Cities that Will Raise Residents' Hopes



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While developed economies including Japan are facing aging and shrinking populations, emerging economies in particular are experiencing a wave of urbanization that is growing in strength. Meanwhile, the planet as a whole is facing the problem of global warming. These social changes and related challenges are starting to change the nature of cities. A variety of different developments are taking place around the world including the redevelopment of cities to cater for aging populations, large-scale developments for the purpose of investment, and eco-cities able to coexist with the environment. What philosophies, technologies, and other elements will these cities need? And what form will urban development take if we look 100 years into the future? In this article, these questions are discussed by Professor Takashi Onishi of The University of Tokyo and former Hitachi Executive Vice President and Executive Officer Takashi Hatchoji (currently Group Chairman for the Americas)*. Professor Onishi's specialties include environmental systems for cities and he is an opinion-leader in the field of next-generation urban development with involvement in planning discussions for national and city planning in Japan. Former Vice President Hatchoji managed Hitachi's Urban Planning and Development Systems business and was responsible for coordinating global environmental strategy at Hitachi.

* The discussion was held in September 2010.

Concepts behind Urban Planning

Hatchoji: According to statistics from the United Nations, approximately half the world's population currently lives in cities but this is expected to increase beyond 70% by 2050. In emerging economies especially, the number of city-dwellers is predicted to overtake the rural population in 2020 and by 2050 three-quarters of the population will be living in cities. The growth of cities can be seen as proof of the prosperity of human society. Particularly when one considers the economic progress being made by emerging economies in recent years, it is clear that cities are taking on an even greater role.

Onishi: As indicated by its name, my International Development & Regional Planning Unit attracts many foreign students. We typically have about 30 enrolled at any one time and most come from emerging or developing economies. This fact alone is an indication that questions such as what form cities should take in the 21st century and how to respond to greater urbanization are being taken increasingly seriously in emerging economies in particular.

Hatchoji: Hitachi celebrates the 100th anniversary of its founding this year (in 2010) and the group intends to operate its businesses in all different fields based on a vision for the next 100 years. One key word that cannot be ignored when considering the next 100 years is "city." In particular, for a company like Hitachi that is built around infrastructure businesses that support the functioning of society, this is an important topic for many of our business fields.

If I may give a personal perspective, speaking of

cities reminds me of when, at the age of 19, I moved from my home in Nagano Prefecture to the big city of Tokyo in order to attend university. Although the suburb of Kunitachi City where my alma mater Hitotsubashi University is located lies away from the center of Tokyo, I can clearly remember how it made me feel the truth of something I once read about "cities being built on a paradox of hope and destruction."

I remember being strongly moved by coming into contact with the things that gave me hope: freedom, progress, civilization, an international outlook, and the latest technology. Regarding the things that lead to destruction, on the other hand, I was left trembling by dangers such as the risk of an accident on the traffic-filled roads, vulnerability to a natural disaster, and the intensity of the friction and competition that came from having so many people living in close proximity.

Onishi: Certainly it can be said that cities bring together contradictory elements. Coincidentally, I happen to live in Kunitachi City, not far from Hitotsubashi University. In fact, Kunitachi provides an ideal example for talking about urban development as the area around Kunitachi Station was originally developed as a new town in the later part of the Taisho Era (1912–1926) based on the idea of a combined garden city and academic city. It is said that this concept had its roots in two different cities. The first was Letchworth in the UK which was developed in the early 20th century as the world's first garden city. This idea subsequently had a major influence on town planning and the development of new towns all over the world. The other was Göttingen in Germany, an





academic city that grew up around a university.

What we can learn from the development of Kunitachi is which elements are needed to increase the value of a city. Although the garden city concept of blending an urban area into the natural environment appears to be a contradiction in terms, it has become one of the ideals for city living that is likely to persist into the future. In addition to this, the idea behind Kunitachi was to lure Hitotsubashi University so that it could take on a central role in the area. This suggests that cities require not only infrastructure but also some form of purpose and social function. In fact, Letchworth where the garden city idea originated is more than just a city well-endowed with greenery and is also characterized by the fact that factories are located centrally so that residential areas and employment can be in close proximity.

Hatchoji: Certainly Kunitachi has established an identity as a picturesque university town and this has created value for the neighborhood.

Onishi: On the other hand, the architect Le Corbusier in the early 20th century came up with the concept of a modern city that took a rigorously rational approach in which urban areas consisting of ultra-high-rise buildings are surrounded by park land. This is one way of achieving proximity of housing and employment and the idea has influenced subsequent town planning.

Two trends in how people think about cities are evident when one looks back over examples like these from the history of town planning. The first takes as its starting point the simple idea that contact with nature will lead to a prosperous lifestyle. The other approach focuses on the value of providing cities with the latest

services by relentlessly keeping up with ongoing progress in technology. Although they may occasionally conflict, it can be seen that both of these trends have coexisted over time. I also expect that these trends will continue essentially unchanged over the next 50 to 100 years.

Deurbanization and Mega-cities

Hatchoji: Following on from what we were saying earlier about hope and destruction, the problem of the environment has arisen as one of the factors associated with destruction in recent years. Although environmental problems can be thought of as an external influence on cities, when one looks ahead to the next 100 years it seems likely that they will cause major changes in the form that cities take.

Onishi: That is right. However, in the next 50 years at least, it is forecast that Japan will be influenced by two other major changes. They may also have a bearing on what form cities take 100 years from now. The first is that Japan will enter a phase of declining urban populations. I use the term “deurbanization” to describe this phenomenon and it represents a change in urban development from expansion to contraction. How can we utilize and maintain urban areas with lower population densities? In seeking answers to such questions we also need to deal with environmental problems and encourage the transition to a low-carbon society.

The second change is growing urbanization in the region from Eastern to Southern Asia as well as in the Middle East and especially in China. Although like Japan, their population will also start shrinking,

changes to the residential registration system have the potential to unleash rapid growth in city populations. It is believed that they will require several mega-cities each with populations in the 50 million range. As the population of the Tokyo region at about 34 million is one of the largest in human history, the idea of several urban areas of 50 million people seems inconceivable. Japan, meanwhile, which already has experience in building an urban region of 34 million people, has built up many technologies and other know-how for planning mega-cities and for dealing with their environmental problems. The emergence of mega-cities is a major issue for humanity and something it has not previously experienced, and while it is a challenging field, the value that can be produced by engaging with it is likely to be great.

Although these two changes are in different directions, the answer to both is the same. That is, how do we go about creating cities that are people-friendly and in which people can feel secure in their way of life.

Tokyo's New Urbanism

Hatchoji: I believe that Japanese experience and technology can help in many ways to create such cities. What do you think?

Onishi: I agree. The know-how that Japan has acquired in the past through the use of technology to compensate for its lack of resources is likely to prove essential in the world of the future. One example that I believe can make a particularly valuable contribution is public transport. Japanese cities, especially Tokyo and Osaka, built railway networks that included their suburbs from an early stage and grew to become large cities through a process of development that centered on the stations located along these railway lines. It seems impossible that these potential future cities of 50 million people could come about by relying on automobiles alone for transport. Instead, establishing a framework of railway lines along key travel routes is essential. For this to happen, the sequencing is important and this means that the railway network needs to be built first. Unlike in the past, however, cars have now become so ubiquitous that it may be difficult to plan for both railways and roads.

Hatchoji: The concept and planning are important, aren't they?

Onishi: A town planning movement called New Urbanism emerged about 20 years ago, primarily in North America. The idea was to eliminate the reliance on cars and aim for compact city layouts based around

railway stations and in which housing and employment were in close proximity. Urban developments based on this idea went ahead in various parts of America. Although town planning in Japan was also influenced by this approach, the advocates of New Urbanism admitted that the concept was directly inspired by the urban layout of Tokyo. So while we were grateful for this new concept from overseas, in fact its roots were much closer to home.

While there are some cases where New Urbanism was unable to be implemented in America because dependence on automobiles was already too far advanced, I believe it is an idea that will be adopted around the world in the future. In Japan, it is important that we remind ourselves that this idea had its roots in Tokyo and start by promoting the conceptual aspects of the movement. In terms of the products and other technologies that support New Urbanism, it is also clear that things like Japan's sophisticated and highly reliable railway technologies and advanced elevator and escalator technologies will be needed if trouble-free transport is to be achieved in these urban regions of 50 million people.

Hatchoji: In addition to marketing its rolling stock globally, Hitachi also has significant experience in the field of operation management systems. In the field of elevators and escalators, we already supply these to ultra-high-rise buildings in Asia and the Middle East, and we have constructed a new 213-m high elevator research tower and are working on developing moving technologies that are fast, safe, and have a high capacity. We are also utilizing ICT (information and communication technology) to develop a variety of urban transport technologies including technologies that make it easy for passengers to transfer between different transport operators.





Urban Transformation through ICT

Onishi: I am also interested in the use of ICT in cities and about 20 years ago I proposed the idea of a telework-oriented city and set up academic societies and other organizations to perform research and education on the subject.

As you know, telework involves giving people the means to use ICT to work from outside the office. If you only have to commute to the workplace once or twice a week, for example, it may be practical to live in the countryside while still continuing to work and this can help mitigate problems such as traffic congestion and the commuting rush. This is likely to change the nature of the city. The government has also shown an interest in telework and the objective of encouraging its widespread adoption was included in documents such as the 2003 e-Japan Strategy and 2006 New IT Reform Strategy. Thanks to this backing, its use has steadily grown.

Hatchoji: Regarding the promotion of telework, the question of how to think about work-life balance raises issues from a very wide range of perspectives and is ultimately linked to issues such as urban design and measures for dealing with global warming. The field of green IT (information technology) is attracting considerable attention at the moment and, in the future, telework will have an important role to play as a way in which use of IT can conserve energy. Hitachi also provides a wide range of solutions that support telework including video-conferencing systems and secure PCs (personal computers) that prevent data leaks.

Onishi: Although ICT, depending on how it is used, has the potential to strengthen control over working

practices, if used in conjunction with well-thought-out policies it should be able to improve work-life balance as well as providing other major benefits in the area of human resource utilization. I believe this technology holds the key to performing urban planning in a way that deals simultaneously with both deurbanization and global warming, two problems that will intensify in the future.

Hatchoji: In addition to railways, elevators and escalators, and ICT, Hitachi also has a wide range of other technologies that support the urban infrastructure including electric power, water supply and sewage, energy conservation, and recycling. We are utilizing these technologies to participate in numerous next-generation urban development projects such as the Tianjin Eco-city project being run jointly by the Chinese and Singaporean governments. We hope to be able to contribute as a supplier to the construction of low-carbon and futuristic green cities like those you have advocated.

Onishi: Certainly, I hope you will have an active involvement and act as a driving force behind the technical aspects of these developments. I have high hopes for the various individual technologies in which Hitachi has expertise. As we discussed earlier, the idea of cities pursuing Le Corbusier's rational and functional objectives will remain important in the future and this will require leading-edge technologies in various different fields. Indeed, it is inevitable that these technologies such as renewable energy and fuel cells will be put to use in ordinary households before too long.

What does "Hope" Mean in an Urban Context?

Hatchoji: These leading-edge technologies include CEMSs (community energy management systems) that coordinate, administer, and operate various supply-side and demand-side energy systems in a community; BEMSs (building and energy management systems) that optimize the management of equipment, power generation, and storage batteries in buildings; and HEMSs (home energy management systems) that perform the same function in the home. You have written about the necessity of this in your book "Tei-tanso Toshi" (Low-carbon City).

Onishi: When you look at environmental problems from the perspective of the general public, it can be difficult to envisage the extent to which one's own lifestyle is impacting the environment. What is needed for future low-carbon cities is to make energy

consumption in offices, homes, and other places visible to consumers in great detail together with mechanisms for controlling this consumption that include distributed electricity generation powered by renewable energy. From a long-term perspective, this has the advantage of reducing energy costs as well as the burden on the environment. However, impediments such as the large up-front investment required mean this approach has not yet been widely adopted.

Hatchoji: Large-scale adoption is likely to come in the future. Demonstrations that are already underway include smart houses that incorporate solar and wind power generation and battery storage into their HEMS with the aim of achieving zero emissions and smart communities in which the CEMS and HEMSs are linked. One example is Rokkasho Village in Aomori Prefecture in Japan where Hitachi in collaboration with Japan Wind Development Co., Ltd. and Panasonic Electric Works Co., Ltd. commenced a smart house and smart grid trial in September 2010. In addition to trialing this technology in preparation for its commercialization, our aims include working toward international standardization so that it can be used in urban developments overseas as well as in Japan.

Following on from these low-carbon developments to look ahead to the next 100 years, what form do you think future cities should take?

Onishi: Looking 100 years into the future is very difficult. It may be that sustainable development will become a key concept. Although sustainable development involves placing an emphasis on environmental considerations, its original meaning

referred to undertaking development in a way consistent with three different objectives; namely, maintaining economic growth while protecting the environment and also achieving a fair distribution of the fruits of progress.

Some of the students from emerging and developing economies who are enrolled at my International Development & Regional Planning Unit have chosen slum improvement as their research topic, this being a problem in their home countries. I myself am also interested in the problem of slums and this is not an issue that can be resolved simply by demolishing the slum itself. In other words, economic growth and improvements in living conditions need to go hand in hand. Accordingly, broad-based planning that also considers how to create industry and other forms of employment is essential.

Also, because urbanization involves the consumption of massive amounts of energy and other resources, we need to do a good job of minimizing this by using the latest technology. The model of a sustainable city that achieves a well-balanced combination of the three objectives of establishing industry and other forms of employment, creating a fair society even if it may involve interference in the nation's domestic affairs, and a low-carbon society that uses resources efficiently can, I believe, create and foster hope in the long-term view. What I consider is needed from Japanese companies is an approach that promotes the growth of cities in a way that is in step with the rate of growth of the countries in which they are located.

Hatchoji: You mean that, rather than just building urban infrastructure, what is needed is ongoing



growth, a long-term vision for progress, and sustainable actions. Because this sort of sustainable development cannot be achieved by individual organizations, partnerships are important. What is needed is to build a framework for urban development in which groups work together with each partner playing their own role, including researchers such as yourself who have an understanding of the big picture, suppliers like Hitachi who possess the technology, and local governments and corporations.

Onishi: In October 2007, we started the Master's Program in Sustainable Urban Regeneration, an adult education graduate school course in sustainable urban regeneration. Although the course is a full master's program and only open to people who have had experience outside academia, it has attracted students from a diverse range of backgrounds, not just from the corporate sector. After graduating, some of these students have utilized what they learned from the course to start their own businesses. If

initiatives like this spread, it may well be that the academic discipline of urban engineering can progress in ways that incorporate business-oriented perspectives and the viewpoint of ordinary citizens, and I hope that this influence will be apparent in urban development 100 years from now. This can perhaps be thought of as another form that can be taken by these urban partnerships.

Hatchoji: I can truly feel how cities engender hope. Cities embody the feelings of their residents and diverse relationships. What arises out of this is certainly not destruction but hope, regeneration, and growth. But having said this, it is in the nature of cities that they include destructive aspects such as environmental problems and those of us involved in urban development need to always keep in mind the hopeful aspects. While drawing on your knowledge, Hitachi intends to work on the urban developments that will characterize the next 100 years and bring hope to the people who will live in them. Thank you for your time today.

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Graduated from the Department of Urban Engineering, Faculty of Engineering, The University of Tokyo in 1975 and completed a doctoral program in urban engineering at the Graduate School of Engineering in 1980, graduating as a doctor of engineering.

After positions as an Associate Professor at the Nagaoka University of Technology and Associate Professor and later Professor at the Faculty of Engineering, The University of Tokyo, he took up his current position in 1998.

His appointments include Chairman-elect of the Japan Association for Planning Administration, board member of the International Federation for Housing and Planning (IFHP), Board Chairman of the Japan Center for Area Development Research, Acting Chairman and Policy Committee Chairman on the National Land Development Council, and member of the Industrial Structure Council and Chairman of its Regional Economy and Industry Committee.

His major publications include "Perspectives on Urban Transport," "Toward a New Approach to Decentralization" (co-author), "Local Government Concepts 1 - Issues" (co-author), "The Era of Deurbanization," "What is a City" (co-author), and "Low-carbon Cities - Urban Development in the Future" (co-author).

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Joined Hitachi, Ltd. in 1970, appointed General Manager of the Corporate Planning & Development Office in 1997, joint COO and CTO of the Information & Telecommunication Systems Group in 2002, Vice President and Executive Officer in 2003, Senior Vice President and Executive Officer in 2004, Representative Executive Officer, Executive Vice President and Executive Officer in 2006, President of Hitachi Research Institute, Ltd. in 2007, Chief Environmental Strategy Officer in 2007, Representative Executive Officer, Executive Vice President and Executive Officer of Hitachi, Ltd. in 2009 and has held his current position as Group Chairman for the Americas since April 2011.