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 EDITORIAL

The story of how cities evolve and transform continues to captivate and inspire. While we marvel at the strength and power of cities in shaping the world economy and influencing societies, we also wonder what the next generation of cities will look like. The key challenge for policymakers and those who govern cities is how to enable sustainable renewal and re-invention so that these cities remain as unique urban centres, resplendent in wealth, culture and creativity, while functioning as attractive and practical homes for an increasingly diverse and well-travelled community.

In conjunction with the inaugural World Cities Summit 2008: Liveable and Vibrant Cities, this special issue of Ethos features thoughts and ideas from experts who have been involved in the development of cities. One of the determinants of success for any great city is how well it prepares for the next generation. In an interview with Harvard University's Professor Alan Altshuler, he reaffirms that the age of the city is far from being over. He outlines seven factors that make a successful city. More than just physical infrastructure, a city's success and longevity are also dependent on intangibles such as security, equity

and democracy. Professor Altshuler also compares Singapore's development with that of the United States and discusses some of the urban innovations in both countries. Bruce Katz and Julie Wagner from the Brookings Institution look at how a new class of urban interventions in the United States, which they term as *transformative investments*, is helping to change downtowns, neighbourhoods, corridors, parks and open spaces, and waterfronts. These investments are making a significant impact on markets, people, city landscapes, and spinning off other urban possibilities.

Even as American cities seek to re-invent themselves, cities in Asia continue to grow exponentially. Statistics show that Asian cities would have to accommodate an additional 44 million people every year. Some of the key factors that can effectively enhance and transform Asian cities are good urban governance, participatory decision-making processes, effective urban management, and environmental consciousness. Dr Bindu Lohani of the Asian Development Bank cites United Nations' estimates that by 2010, 14 of the world's 25 megacities will be in Asia and most will be in the developing countries of Asia. One of the challenges for these

rapidly developing Asian cities is to ensure that the city infrastructure keep up with the economic and population growth in cities. Similarly, Dr Richard Leete, former Resident Representative of the United Nations Development Programme for Malaysia, Singapore and Brunei Darussalam, describes the urban population growth of cities in Southeast Asia and urges those in urban governance to have planning horizons that extend beyond current needs, in anticipation of expected change.

With a relatively young history as a nation, Singapore has its own unique challenges in city-making. For an insight into its urban development, chief executive officers of five Singapore public sector agencies share their policy challenges and experience. Cheong Koon Hean of the Urban Redevelopment Authority explains the policy decisions and trade-offs in the city's planning and development. The balance between central planning and organic growth, or between redevelopment and conservation, should ultimately serve Singapore's development for the next 40 to 50 years. The city's physical limitations require different ways of thinking and planning. Discussions on the city's key infrastructural developments such as housing and land transport policies are helmed by Tay Kim Poh of the Housing & Development Board and Yam Ah Mee

of the Land Transport Authority. Mr Tay recounts why and how the strategies of upgrading and redevelopment are used in the rejuvenation of housing estates in Singapore, while Mr Yam highlights some of the key strategic thrusts that shape the city's land transport development and policies, where land transport has a social role in meeting the diverse needs of people who live in the city.

At the same time, environmental sustainability of the city is critical. Lee Yuen Hee from the National Environment Agency proposes that a city's economic development does not have to mean generating more waste. He describes some of the strategies that the Agency has taken to reduce waste volume, recycle, and minimise waste. Besides, environmental consciousness has substantial soft power—greenery as an urban strategy can transform an entire city and help shape a city's identity. Ng Lang of the National Parks Board reflects on Singapore's green policy experience by reminding us that a city's greenery plan, through the conservation of the natural heritage and biodiversity, is one of the ways to develop the soul and character of a city. The same philosophy on the importance of the environment is echoed by Professor Dodo J. Thampapillai from the Lee Kuan Yew School of Public Policy, who advocates that environmental

economics should play a key role in public governance as well as the training and education of policymakers so that they can make substantial contributions to the development of urban policies of cities.

A city that is energetic, inspiring and vibrant also has an equally gregarious and enthusiastic community—one that comprises people from a variety of nationalities and diverse backgrounds. London School of Economics' Philippe Legrain reminds us that the richness of cities derives not just from their locations but also from the interaction of their diverse populations. Cities are appealing for many because of the sense of future and opportunity that they present. He believes that migration into cities is a source of new ideas and innovation which ultimately contributes to the city's economy. Furthermore, diversity begets cultural variety which adds to a city's vibrancy. Professor Bruno Frey of the University of Zurich explores the relationship between cities, culture and happiness, and the implications for policy. Research has shown that people who are active consumers of the arts are those who are more satisfied with their lives and how they spend their leisure time.

We are grateful to all our contributors who have devoted time and effort to share their research, insights and ideas

with us. They have shown that we remain at the tip of the iceberg in our understanding and discoveries about city-making. The next chapter in the history of cities will demand just as much grit and imagination, and how the narrative will unfold is very much in our hands.

We hope that you will enjoy this special issue.

June Gwee
Special Edition Editor
World Cities Summit Issue



Alan Altshuler

Planning and Innovation for City Success

In this interview, Professor Alan Altshuler of Harvard University discusses the attributes of a successful city and compares the city success of Singapore with US cities.

What makes a city successful?

The first step toward answering this question must be to specify what we mean by success for a city. My own starting point is that cities are for their residents, and consequently that a successful city is one in which the great majority of residents feel very fortunate to live, and in which they would happily think of their descendants continuing to live for generations to come.

In comparing cities with reference to this definition of success, I find it most useful to focus on seven criteria. In no particular order, these are Prosperity, Personal Security, Sustainability, Equity, Liveability, Liberty and Democracy (see box story for elaboration).

Cities vary in the challenges that they find particularly hard. Singapore is notable for the rationality and long-

term vision that has guided its policy-making since its independence, enabling it to make remarkable gains in terms of prosperity, health, safety, liveability and sustainability. Cities in the United States (US), by contrast, tend to be plagued by short-term perspectives and policies driven by narrow interest groups. On the other hand, US cities are remarkable for the liberty and democracy they afford their citizens, their overall prosperity—although with wide variations—and their liveability.

Master planning of land use and public investment has played a large role in Singapore's development. You have commented elsewhere on tensions that may exist between key attributes of Planning, Democracy and Capitalism. Can you elaborate on this?

First, let me emphasise that Singapore's planning has been truly exemplary in terms of its comprehensive, well-conceived vision, its integration of the parts, its analytic rationality, and its actual impact on the ground. Nonetheless, intrinsic tensions exist between the imperatives of planning, democracy and capitalism. Planning, for example, is most centrally about rational analysis and long-term, integrated perspectives. Democracy is about responsiveness to constituencies and tends toward a multiplicity of discrete, short-term perspectives.

Capitalism is about private property rights, business competition and consumer sovereignty. Quite a few countries have reconciled two of these three themes at a very high level, but very few indeed have managed to do so for all three.

Singapore, for example, has been highly successful in reconciling the tension between planning and capitalism, primarily by making the attraction of international capital the highest priority—along with national security—of its planning. The US has been highly successful in reconciling capitalism with democracy, mainly because Americans are so committed to private property rights and business is so influential in US politics.

Singapore's planning success has been significantly attributable, on the other hand, to its political continuity and unitary structure (just a single level of government), which has enabled a highly stable leadership to develop and pursue its long-term vision without interruption for nearly half a century. In the US, by contrast, broad governmental planning is generally impossible because electoral competition is so intense, leadership turnover is so frequent, and public authority is distributed among a vast array of governments—not just federal, state, and local, but also within each metropolitan area.

What Makes a City Successful?

Prosperity: All cities with a serious claim to world-class success seek to provide their residents with full employment and continuous improvement in their material circumstances. Since cities are very small units in a global economy, this means that they must be highly competitive for international capital and that their enterprises must be highly competitive in trade.

Personal Security: Material wealth does not mean a great deal if one's family is highly vulnerable to crime, disease or corrupt, self-serving government officials. So the cities that people with a choice find most attractive are notable for their safety, the overall good health and longevity of their residents, the relative incorruptibility of their governments, and a general sense that their laws are just, humane and binding on government officials as well as the public at large.

Sustainability: There has been a revolution in consciousness over the past several decades about the importance of leaving our descendants a natural world providing at least a comparable set of opportunities to those that we enjoy. There are many dimensions to

sustainability and it has global as well as local components. It seems to me, however, that no city can be counted truly successful today if it is despoiling its own environment or acting heedlessly with respect to the effects of its activities on the global environment.

Equity: In order to achieve prosperity, every city must provide strong incentives for investment, hard work and entrepreneurship, and it must be open to the world economy. So a significant degree of inequality is inevitable. Extreme inequality is a social cancer that devastates the lives of those at the bottom and eventually threatens those higher up the economic scale as well—due to its effects on health, crime and community spirit (or lack thereof), and the justifications it may provide for repressive government measures to combat these social ills. So the successful modern city, in my view, is one with a genuine safety net for the victims of misfortune and other effective programmes to mitigate extreme inequality while maintaining strong work incentives. Getting the balance right is far from easy, but one can certainly compare cities, and nations, in terms of how well they do it.

Liveability: I don't really like this term because it is so amorphous. It usefully conveys, however, that the localities in which people most want to live are notable for the excellence of their public services (which are typically supplemented by superb private opportunities in such domains as education and the arts), the range and quality of the recreational opportunities they offer, and the sheer pleasure that people take in the environments that they provide. Taken together, these elements of the good city seem reasonably captured by the term "liveability".

Liberty: People yearn to make their own life choices, formulate and express their own views, and explore the world. Really successful cities today are those that can attract and retain their fair share of the most talented, highly trained and freest thinking people in the world. So a high degree of personal liberty is today not just essential for the good life of people in cities, but also for achievement of the highest levels of economic competitiveness.

Democracy: Finally, the successful modern city is one in which the government is highly responsive to citizen views. Viewed internationally,

this appears to be most likely where citizens can formulate their views in a system of free public speech, reasonable opportunities for interest group and electoral mobilisation, and genuinely free and fair elections. The most important element, of course, is responsiveness, whatever the mechanisms by which it is achieved. Can this occur without a high degree of electoral democracy? Clearly the answer is yes, at least in some circumstances and for substantial periods of time. It is also true that the world's indisputable democracies vary widely in their specific arrangements, and that electoral competition may in some circumstances intensify social conflict and/or seriously impede rational decision making. So I do not take a doctrinaire position about the forms of democracy that may be suitable for countries with various cultural traditions and at different stages of economic development. Other things being reasonably equal, however, as they often are in comparing the world's most successful cities, I believe that highly trained and talented people, those with the widest choices in today's global economy, will gravitate toward cities that breathe both free and democratic.

– Alan Altshuler 

It is similarly interesting to compare the nature of business power in the US versus Singapore. In the US, business has traditionally had enormous direct influence on the political process—via its financing of political campaigns, its lobbying prowess, and its great public communications resources. In Singapore, by contrast, business seems to have little direct capacity to influence policy decisions, but since the central thrust of government policy is to attract and retain capital, the effect is similar. And indeed we see the same trend in the US. The great majority of local businesses that used to influence city politics have now been absorbed into national and international corporations. These corporations have little interest in the details of local politics, but they make clear that their investments will go where they deem conditions most favourable for their pursuit of profit. So, while they are far less visible than before in day-to-day local politics, they are in some respects more influential than ever.

Are there countries that are terrific in all three?

There are a few, I believe, most notably small countries in north-western Europe, such as the Netherlands, Sweden and Finland. Of these, I am most familiar with the history of planning in the Netherlands. Like Singapore, it is a

small trading country without natural resources, mainly capitalist in its economic organisation, and very open to the world. It has a tradition of strong, very thoughtful planning, though, which goes back hundreds of years, primarily because it is a land reclaimed from and constantly threatened by the sea. So its people have always understood the imperatives of collective action and have never become imbued with the extreme reverence for private property and individualism that developed in the wide open spaces of early America.

What do you consider as innovations in urban policy?

Some of those that have struck me here are Singapore's policies for balancing car ownership and usage with road capacity, for achieving a high level of self-sufficiency in water supply, and for both liquid and solid waste disposal. In each of these domains, Singapore is either the world leader or one of two or three. Each of these policies is not just innovative but highly conducive to sustainability and environmental quality.

As an American, I am struck by the fact that many of the ideas and technologies underlying Singapore's innovations originated in the west, and often indeed in the US. But they have, in general, been far more difficult to implement in the west, and particularly in the US. The idea of congestion

pricing, for example, was originated by an American, William Vickrey, who won the Nobel Prize largely for having done so. For political reasons, though, it has proven impossible to implement congestion pricing (except on a few stretches of privately managed expressway) anywhere in the US. My key point is that a fresh idea or invention becomes an innovation only when it is put into practice, and in this regard, Singapore is truly a world leader.

The US is terrific at generating ideas and private sector innovations, but generally a bit of a laggard among highly developed countries in public sector adoption. Where the US has innovated in public policy, on the other hand, it has most typically been as a result of bottom-up pressure. During the 1960s and 1970s, the US pioneered in the area of citizen participation and environmental protection. Mass motorisation was also a US (and partly urban) innovation, but like many other innovations of great importance for American cities, it was driven mainly by private business and consumer decisions. The government participated, but reactively: by investing in roads and urban renewal schemes to accommodate motorisation, and helping to finance new private housing attractive to the new auto-owning public. If we look back further, the US led the way in developing mass public

education, likewise in response to strong grassroots pressures.


A fresh idea or invention becomes an innovation only when it is put into practice.

Some other important innovations in the US, not purely urban but of great urban significance, have involved a mix of public and private sector initiatives. Think, for example, of America's great non-profit universities, hospitals and cultural institutions, encouraged by the tax system and specific public grants but overwhelmingly the products of private initiative. Similarly, America led the way in the development of air transportation, with a mix of private entrepreneurship, public subsidies and infrastructure investments. More recently, it pioneered the Internet, which started as a public sector project but was later developed mainly by the private sector. We don't normally think of these as urban innovations, but they have had, and still have enormous impacts on urban development.

Does the Internet threaten the existence of cities? Human interactions have moved into a different space where physical boundaries no longer exist.

Everybody has been predicting for decades that cities would decline with

the progress of telecommunications. In practice, however, cities are growing everywhere. In countries with lots of space relative to the population size, like the US, Canada and Australia, modern cities can be more spread out than those of yesteryear, but they are no less cities for that. Urbanisation is about opportunities for face-to-face interaction rather than specific spatial patterns, so as travel and communication speeds increase, land use densities can decrease significantly with little or no loss of agglomeration benefits.

As for communications specifically, the late Ithiel de Sola Pool, who was my colleague at the Massachusetts Institute of Technology, discovered in the wake of the 1973 oil shock that when travel was curtailed, the volume of telecommunications fell as well. His conclusion: a great deal of telecommunications is about planning for trips and following up on them. It seems that communications and face-to-face interaction are complementary activities far more than alternatives. And this seems to be true of email as well. We phone and email most frequently those whom we also see a lot. With a falloff in face-to-face interaction, electronic communications tend to fall off as well. So there is no indication that the age of the city is passing. 

Alan Altshuler is the Ruth and Frank Stanton Professor of Urban Policy and Planning at Harvard University with a joint appointment in the John F. Kennedy School of Government. He has taught at Harvard since 1988 and was most recently Dean of the Graduate School of Design from July 2004 through December 2007. His research and teaching focus on the politics of decision-making about the built environment and transportation. His most recent book, co-authored with David Luberoff, is entitled *Mega-Projects: The Changing Politics of Urban Public Investment* (Brookings Institution Press, 2003).

This is an excerpt of an interview conducted on 18 February 2008 by June Gwee, Senior Researcher at the Centre for Governance and Leadership, Civil Service College Singapore, when Professor Altshuler was visiting the Lee Kuan Yew School of Public Policy, National University of Singapore.



Bindu N. Lohani

The Growth of Asian Cities

As the main economic engines of growth, Asian cities are increasingly challenged to ensure sustainability while reaping the benefits of urbanisation.

In Asia, cities are the backbone of economic growth and central to the effective running of the country. Asian cities in particular have achieved remarkable growth in the last couple of decades, by any standard. There have been several connected drivers that have fuelled this growth. For one, urbanisation brought more and better infrastructure that are vital for business and trade. Urbanisation also set the stage for enormous economic growth for Asian cities. Economic growth

meant that more opportunities for employment were available for millions of people, thus reducing the absolute levels of poverty in many cities, as well as the developing country as a whole. In Asia, agriculture-based economies like India have transformed into industrial and service-oriented economies within a span of thirty years, which is half the time it took for economies in large western countries.

The rapid economic growth and urbanisation of Asian cities is expected

to continue over the next two decades. As Asian societies and Asian people change their lifestyles, culture and social structures, it is important to keep in mind that cities are, after all, built on natural ecosystems. The soil beneath the concrete buildings, the streams flowing beneath the asphalt roads and the vegetation alongside buildings are all essential parts of a city's infrastructure. Environmental sustainability should be at the heart of urban management.

THE IMPORTANCE OF ASIAN CITIES

To put into perspective, Asia was predominantly rural in the mid 1960s, with a population of about 1.7 billion, of which only 20% lived in cities. Since then, there has been a massive increase in the number and proportion of Asians living in cities. It is estimated that by 2030, 55% of the regional population will be living in cities.¹ Currently, some 40 million people are being added to Asia's urban population every year, which is equivalent to 120,000 people a day. The trend is expected to continue. Furthermore, we in Asia have witnessed the emergence of very large urban areas, the megacities, with populations of 10 million or more. It is estimated that by 2010, 14 of the world's 25 megacities will be in Asia and most will be in the developing countries in Asia. In addition to the megacities, a

significant portion of the population will be living in thousands of towns and cities throughout the region where there could be between 50,000 to 10 million people in these towns and cities.^{2,3}

The importance of Asian cities is evident. They are (i) the focal points of economic activity and the engines for economic growth; (ii) the centres of excellence for education, healthcare, innovation, entrepreneurship, business, commerce, industry, culture and social services; (iii) large markets for all types of products, goods and services; (iv) well-connected with the wider world through all types of transportation, telecommunications and information technology systems; and (v) the primary centres for jobs, employment and livelihood opportunities.

There is strong evidence to suggest that urbanisation enhances productivity and countries with higher levels of urbanisation enjoy higher gross domestic product (GDP) per capita than countries with lower levels of urbanisation. For example, the ratio of city GDP per capita compared to national GDP per capita was found to be 1.9 for Metropolitan Manila, 2.5 for Calcutta, 3.5 for Bangkok, and 3.7 for Shanghai.⁴

In all countries, cities have a greater output per capita than other areas. This explains why income is higher in urban areas, the reason for the mass rural-

urban migration, which in turn is good for economic development. Workers moving from low productivity rural areas to higher productivity urban areas increase the average productivity of the country and, consequently, its wealth. However, the ratio of city GDP per capita as compared to national GDP per capita could be even higher if cities could be made to function more efficiently. Higher productivity ratios for cities would bring substantial benefits to the national economies and make major inroads against poverty in both urban and rural areas.

Urbanisation enhances productivity and countries with higher levels of urbanisation enjoy higher gross domestic product per capita than countries with lower levels of urbanisation.

OPPORTUNITIES AND CHALLENGES

Rapid urbanisation has brought huge opportunities and benefits to Asians. However, city infrastructure has not been able to keep up with the tremendous economic and population growth in cities. This has brought significant resource constraints, difficulties in access to basic resources, inadequate

housing and sanitation, negative impacts on human health, and environmental degradation. These issues have been neglected and underfunded for a long time. For example, Asia's cities must accommodate an additional 44 million people every year.⁵ However, the unmet urban infrastructural needs in Asia are estimated to be over \$60 billion per year for water supply, sanitation, solid waste management, slum upgrading, urban roads and mass transit systems.⁶

Urban activities generate close to 80% of all carbon dioxide (CO₂) as well as significant amounts of other greenhouse gases which contribute to climate change.⁷ Direct sources of greenhouse gas emissions include energy generation, vehicles, industry and the burning of fossil fuels and biomass in households. Let us take a look at one of these sources: vehicles. Even under the most optimistic current scenarios for managing the expansion of road traffic, CO₂ emissions from the transport sector will triple in Asia over the next 25 years.⁸ The main reason for this increase is the increase in the number of vehicles currently evident and expected in Asian cities over the next two to three decades. Emissions from vehicles and transport equipment contribute not only to CO₂ emissions, but also to local and regional pollution problems through the emission of

carbon monoxide, lead, sulphur oxides and nitrogen oxides. Transport is not simply the largest source of greenhouse gas emissions, it is also the fastest growing source. With the vehicle fleet in Asia doubling every five to seven years, there is an urgent need to come up with cost-effective CO₂ emission reduction measures for transport. The current trend is neither manageable nor sustainable.

If we look at other environmental issues such as water and wastewater, solid waste management, slum management and air pollution control, we will come to the similar conclusion that there needs to be a change in thinking, and in some cases, even a radical shift in the management of cities. Only then can Asian cities be sustainable and liveable. Hence the question: how can we turn Asian cities into environmentally sustainable cities?

SUSTAINABLE DEVELOPMENT

The future growth of Asian cities is largely dependent on the actions of policymakers and planners of these cities. The Asian Development Bank's (ADB) approach to urban development focuses on improving quality of life, reducing urban poverty, maximising economic efficiency of urban areas, and achieving more sustainable forms of urban development.⁹ ADB's 2006

report on *Urbanisation and Sustainability in Asia* highlighted some of the good practice approaches in urban region development. Research found that there were seven criteria for sustainability. These are good governance, improved urban management, effective and efficient infrastructure and service provision, financing and cost recovery, social and environmental sustainability, innovation and change, and leveraging international development assistance.

Here are some thoughts which the policymakers and planners may need to consider. First, the vision of the city government should be to promote safe, liveable, well-managed and environmentally friendly cities that are free of poverty. Solutions must be designed for sustainability and with the highest level of urban governance.

Second, funding needs of the cities for infrastructure should be adequately provided for. However, such development should consider an integrated approach combining energy, water and wastewater into a "neighbourhood" system with every possibility for reuse and recycling, and sustainability should be the overall goal.

Third, a societal commitment for a low-carbon lifestyle and low-carbon city that uses fewer inputs (water, energy and food) and produces fewer outputs (waste, heat, air and water pollution) needs

to be made. Cities need to minimise the ecological impacts created by its inhabitants, while providing them with a healthy and comfortable environment, attending to their health, comfort, safety and life quality needs. Energy conservation measures, the substitution of renewable energy sources for fossil fuels, and new technologies such as hydrogen power, fuel cells and biofuels could also be considered.

Fourth, special attention should be given to the development and servicing of semi-urban areas and more attention needs to be given to rural/urban linkages, land management and resources allocation.

Fifth, efforts should be made to develop cities beyond work or commercial living and enjoyment, but to make them complete in all means so that those who live in cities feel that they are self-sufficient, empowered and safe and enjoy a clean environment.

The above actions are “doable”, if there is a will. 

Bindu N. Lohani is Vice President (Finance and Administration) of the Asian Development Bank (ADB). Prior to this, Dr Lohani was Director General of the Regional and Sustainable Development Department; concurrently, he was ADB’s Chief Compliance Officer and Special Advisor to the President

on Clean Energy and Environment. Dr Lohani is an elected member of the National Academy of Engineering (NAE) of the United States—the highest professional distinction accorded to an engineer—for his work on an economic-cum-environmental approach to sustainable development. The views expressed in this article are those of the author and do not necessarily reflect the views and policies of the ADB, or its Board of Governors, or the governments they represent.

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Cheong Koon Hean

Achieving Sustainable Urban Development

Singapore's urban future hinges on making tough choices that seek to balance economic growth with societal well-being and environmental quality.

The issue of sustainable development has taken centre stage in recent years. Government agencies, non-governmental organisations and private companies alike are busy drawing up plans and promises for greater sustainability. In 2004, the Mayor of London announced “The London Plan”, which sets out a framework of policies to accommodate London’s growth in a sustainable way.¹ In 2007, it was New York City’s turn to unveil

its comprehensive plan, “PlaNYC”, which pledged to remake New York into a more sustainable metropolis.² In particular, the potential impact of global warming has captured the world’s attention.

Today, much of the public debate on sustainability centres on reducing carbon emissions and mitigating the effects of climate change. There is much emphasis on using green technology to help reduce energy usage and keep our air and water clean.

Indeed, technology is important and will continue to be a key enabler to solve many of the technical challenges associated with sustainable development. However, what may be less visible and less appreciated is the fact that sustainability can be attained only when we take a holistic and comprehensive approach. This starts with making strategic planning choices that cascades to the formulation of innovative policies, and subsequently implementing technologies to tackle urban and environmental problems. At the top end of the continuum, sustainable development involves generating economic growth and societal well-being without exhausting our limited natural resources. Keeping every tree and shrub in Singapore untouched does not constitute sustainable planning. Neither does building as many petro-chemical plants as we can qualify as sustainable, even if this creates jobs and income for our people. Sustainable development requires a careful balancing of different demands and differing priorities. Within this broad planning framework, we develop good policies and tap on technology to find the best ways to deal with issues on protecting the environment, climate change, clean energy use, and effective waste and water management.

Singapore has recognised the need for such a comprehensive approach. Since our Independence,³ we have taken on the challenges of providing for a nation in a city-state environment with virtually no natural resources. Today, ensuring sustainable development in Singapore has taken on greater impetus with the formation of an Inter-Ministerial Committee on Sustainable Development (IMCSD), chaired by Ministers of both the Ministry of National Development (MND) and the Ministry of the Environment and Water Resources (MEWR). The IMCSD looks at sustainability from both a national development and an environmental perspective. An Inter-Ministerial Committee on Climate Change will also study what Singapore can do to reduce carbon emissions and mitigate the effects of climate change.

THE TRADE-OFFS

Planning for sustainable urban growth within Singapore's borders is the priority of the Urban Redevelopment Authority (URA). In fact, it is crucial for the country's survival. A city-state without hinterland, we face the challenge of ensuring we have sufficient land for housing, recreation and business. At the same time, we have to set aside land for defence, power generation, waste disposal and water catchment—all

within 700 square kilometres of land. With one of the largest container ports in the world, our sea-space is limited by our international boundaries. As a regional air hub and with five airports and airbases, building skywards is also constrained. Deciding on one land use over a myriad of other possibilities inevitably involves making trade-offs. For example, having more parks and open spaces means that more of us will live in high-rise housing. Allocating more land for industries could mean loss of waterfront and heritage areas. Having more roads and a smoother drive to work may result in smoggier air and more noise pollution.

As URA's decisions affect many people, we cannot afford to go it alone. We have to make these evaluations and trade-offs together with our partner agencies like the Land Transport Authority, the National Parks Board, the Housing and Development Board, the Public Utilities Board (PUB), the National Environment Agency, economic agencies as well as various other stakeholders. The result of many hours of discussions and consultations are consolidated into our long- and medium-term land use plans. One product of many such debates and decisions is the Master Plan 2008 which was unveiled to the public in May 2008. This Plan guides Singapore's development over the next 10 to 15 years in a sustainable manner.

These land use plans cater to multiple needs. For example, they try to facilitate economic growth by providing more industrial land for petro-chemical and aeronautical industries, hotel and tourism projects, as well as an expanding financial sector. These are then balanced with social considerations for achieving a high quality living environment to meet rising aspirations. We will provide more variety of good quality housing, more greenery and more leisure choices.

The challenge is to fit it all in. Planners overcome our land constraints by developing innovative solutions. We work towards ensuring that business activities use land optimally. For example, factories built with ramps allow trucks to access every floor, hence they function effectively as flatted factories. Where possible, facilities such as polyclinics, libraries and community centres are co-located to maximise land space. Additional structural loading is also provided over Mass Rapid Transit (MRT) stations and underground roads so that we can build above them. To create a greater sense of space, our major parks and coasts are linked up using park connectors.⁴ Cycling and jogging routes will increase more than four-fold from 100 to 400 kilometres eventually. We also provide incentives for developers to develop more vertical greenery like

skyrise gardens⁵ to mitigate the dense built-up space. In addition, we work closely with PUB to utilise canals and inland reservoirs to create beautifully landscaped “lakes and streams” that integrate with developments. As a result, more leisure space is created, built-up areas are “softened”, and we have been able to increase real estate values.

Various agencies also work together to harness new technologies to optimise the use of land. For example, the development of the Deep Tunnel Sewerage System by PUB replaces the existing six water reclamation plants and about 130 pumping stations. This frees up approximately 1,000 hectares of land occupied by the existing facilities and buffer zones around the plants. Incinerating and recycling our wastes reduce the need for waste disposal sites. The JTC Corporation⁶ is piloting a project to use subterranean rock caverns for storage. All these initiatives work towards making the most of what we have.

CENTRAL PLANNING OR ORGANIC GROWTH?

A common question is “Should the Government leave things more organic and unplanned, or should it play an active role in shaping the urban landscape?”

Supporters of a more market-led approach often argue that top-down,

government-led planning is overly rigid; centralised planning cannot create places with sufficient character, identity and vibrancy. They see unplanned growth and a more laissez-faire approach to urban planning as the preferred alternative.

On the other hand, unplanned growth, especially in fast growing and densely populated Asian cities, can lead to disastrous consequences. Market fluctuations can be very rapid, and private sector short-term responses may have very long-term repercussions. Once an office tower or factory is built, it is difficult, if not impossible, to “undo” the development. We cannot just walk away from mistakes made in our existing city and plan a new city. There is simply no room to do so. Furthermore, the market cannot ensure that infrastructure keeps pace with development. We have to make sure that our city works. It must accommodate a high population density while minimising the usual urban problems.

A responsible government that is far-sighted must have the ability and capacity to make decisions that may not necessarily pay off in the short term but will reap benefit in the longer term. For example, setting up MRT transport networks require high upfront costs that the private sector often shies away from. Sustainable development

ultimately means keeping an eye on our future.

As a planning agency, URA makes strategic decisions with years ahead in mind. The Concept Plan is a strategic, long-term land use and transportation plan to guide Singapore's development for 40 to 50 years. In the 1991 Concept Plan review, it became clear that we would face the potential problem of massive traffic congestion in and around the Central Business District (CBD) during peak hours. To tackle this problem before it came to a head, a long-term strategy to decentralise commercial activities to commercial centres outside the central area was adopted.

By distributing commercial activities throughout the island and bringing jobs closer to homes, travel into the central area would be reduced, and so would both peak-hour congestion as well as

vehicular emissions. Decentralisation would also offer businesses alternative and more affordable office locations. This decision could only come about through top-down planning (see box story on "Why Jurong?"). Conversely, left on its own, the market would likely continue to develop and expand the CBD—an unsustainable plan for the long term.

Another key consideration in our planning is to provide crucial facilities and amenities that will improve the quality of living, but which through normal market forces, would not be provided by the private sector. Would the private sector build parks, park connectors and community facilities instead of alternative, higher value uses? Similarly, who will ensure that there will be a buffer shielding our homes from industrial developments,

FIGURE 1. AN IMPRESSION OF THE MARINA BAY WATERFRONT



Photo: URA

or sheltered walkways and universally accessible public facilities? The role of URA as a central agency ensures that the liveability of Singapore will not be left to chance. Through comprehensive planning, residents can still trek through the Sungei Buloh Wetlands or climb Bukit Timah Hill to enjoy the sunset.

Planning also creates business opportunities and protects real estate values. Through the planners' vision, new opportunities are created for the private sector to invest and to creatively transform dilapidated areas or virgin land into highly valuable assets. The Government supports the private sector with timely land release and infrastructure. Today, the Singapore River, Tanjong Rhu and Marina Bay (Figure 1) areas are examples of this successful public-private sector collaboration. Transparent plans and orderly development also give certainty and protect the value of homes and business investments.

REDEVELOPMENT OR CONSERVATION?

Another dilemma in planning is deciding between developing or retaining buildings and areas. Safeguarding our built and natural heritage is undeniably important. Physical reminders of our past help tie our people to the country and, at the

same time, create a varied and appealing urban landscape. Similarly, protecting areas rich in flora and fauna is critical to ecologically sustainable growth. Today, we have a well-established programme to conserve Singapore's historically and architecturally significant buildings, as well as legislation and programmes to protect our nature areas from commercial development.

However, conservation of our built heritage and nature areas comes at a price—the opportunity cost being the higher value alternative use that such land can be put to. A careful balance has to be struck.

The conservation of buildings found in the historical districts of Chinatown, Kampong Glam, Little India and Boat Quay are good case studies. These districts are all located within the Central Area, and occupy prime land that can potentially be redeveloped into Grade A offices or hotels. As our economy expands, so does the demand for prime land. Nevertheless, a deliberate decision was made to safeguard these areas because of their tremendous architectural, historical and social significance. At the same time, we took the pragmatic decision to allow conserved buildings to be adapted for modern-day and higher value uses such as offices, shops and hotels, whilst retaining the spirit of the building's

Why Jurong?



FIGURE 2. AN IMPRESSION OF JURONG LAKE DISTRICT IN THE FUTURE

To mitigate congestion within the city area and to bring jobs closer to homes, URA proposed a strategy to develop more commercial centres outside of the central area. We had identified several locations that were strategically well-spread throughout the island and well-served by MRT stations. Of these locations, the Tampines Regional Centre in the eastern part of the island and the Novena Fringe Centre nearer the city have already been developed into successful office clusters supported by retail, food and beverage (F&B), and entertainment amenities. As part of the next phase of this development strategy, plans are being rolled out for Paya Lebar sub-regional centre (located between Tampines and the city centre) and the


Jurong Regional Centre (a commercial hub around the Jurong East MRT station on the western part of the island).

Some may ask: Why Jurong? To many people, the Jurong of today is a suburban residential area located far away from the city centre. It is also perceived as an industrial area.

Most businesses would likely prefer to continue to expand within the established office hubs in Tampines and Novena as they are better established and more familiar with these areas. However, the planners took a longer term view, that there is a need to establish a large commercial centre to serve the western region. They recognised that Jurong had a huge untapped potential.

Jurong is located within the heart of a population of 1 million residents. It has ready access to a large talent and labour pool. It is central to an established cluster of multinational and global businesses, ranging from the high-technology sector around the International Business Park to biotechnology, pharmaceutical and chemical industries in Jurong and Tuas. Hence, there are vast opportunities for business and commercial services to serve these companies. Jurong is also a major transportation hub. It is well-connected to the city and the rest of Singapore by rail and expressways.

Creating a major commercial centre would also help create extra buzz in the western part of Singapore. Jurong will be

transformed into a vibrant hub with an eclectic mix of office, retail, residential, hotel, entertainment, F&B and other complementary uses. However, Jurong will not be a duplicate of Tampines Regional Centre or Novena. Its proximity to the beautiful Jurong Lake presents a huge opportunity to transform Jurong into a unique lakeside destination for both business and recreation. Lakeside, which is located near to Jurong, is envisaged to be a key leisure destination for families and visitors, with exciting attractions as well as a mix of complementary retail, F&B, hotel and other lifestyle developments. This will make the Jurong area appealing, attractive and exciting for residents, workers and visitors. 

original design. Such an approach helps to ensure that old buildings do not become just hollow historical relics, but remain economically viable and relevant. Another way in which we safeguard the twin objectives of heritage and value preservation is to allow for “old and new” development combinations in selected areas. Where appropriate, we have kept parts of the old buildings fronting the street, thus preserving the streetscape and sense of scale, but allow new and higher buildings at the rear.

There are times when halting development of an area is not feasible

even though there is pressure to do so. When it was announced that there were plans to redevelop Seletar and its surroundings, residents and members of the public who enjoyed the lush greenery and old colonial architecture of the area were unhappy. However, developing the area into an aerospace hub would enable Singapore to capitalise on the strong growth in the global aerospace industry and create an estimated 10,000 jobs.

In order to best balance both concerns, inputs from the different stakeholders were sought and their considerations incorporated into the plans. The new

Seletar Aerospace Park will now conserve a cluster of colonial bungalows, which could be used as training facilities or to provide amenities, as well as retain areas of greenery and significant biodiversity. This way, the development would cater for economic growth while retaining Seletar's distinctive charm.

When citizens are given a chance to voice their needs and concerns, the likelihood that these needs are appropriately addressed increases.

Therefore, when it comes down to deciding whether a building should be conserved or an area safeguarded from development, we try to ensure a balanced evaluation of the social, environmental and economic factors. We are glad that our efforts have been recognised. The Urban Land Institute conferred its Global Award for Excellence on URA's Conservation Programme in 2006. This reaffirms Singapore's conservation approach which "... has achieved a balance between free-market economics and cultural conservation".⁷

MAKING CHOICES TOGETHER

While there are merits to a more centralised approach to planning, we

certainly recognise that planners do not have all the answers. We need to tap on the private sector for its market knowledge and enterprise, and there must be provision for the natural evolution of places and buildings. Have we struck the right balance between planning and organic development? Some critics think not, lamenting that Singapore has become a too-clean, too-efficient urban entity that lacks the pizzazz to make it a truly great city. At the same time, others have lauded Singapore's transformation into one of the world's most liveable cities precisely because we offer an irresistible combination of orderliness and fun.⁸

To strike the right balance, we need to engage the public in our planning. When citizens are given a chance to voice their needs and concerns, the likelihood that these needs are appropriately addressed increases. Having a say in planning also creates a greater sense of ownership and responsibility within the community. Businesses are in the best position to give feedback on market needs and changing trends. The collective experiences will yield important insights that might elude a policymaker without similar intimate knowledge of the ground.

During consultation, it is natural that interest groups lobby for their specific interests. These interest

groups could range from nature and conservation champions, business groups, to real estate developers and architects, as well as residents. The challenge is to weigh these comments and ideas before incorporating them into our land use plans.

The Master Plan 2008 is one example of such a consultation. Part of the Master Plan process involved the formulation of a new Leisure Plan. To develop the Leisure Plan, focus group discussions were held with leisure business providers, group representing the interests of the aged, handicapped, nature-lovers, sports enthusiasts, as well as local stakeholders. An interesting outcome of putting everyone together was that the different interest groups had a chance to hear occasional opposing viewpoints from one another. URA then incorporated the focus groups' inputs into the Leisure Plan, balancing the needs of the various stakeholders.

We listen to both accolades and criticisms, and continue to tweak the equation by offering the market more flexibility where possible. For example, URA has introduced more flexible "white" zoning, which allows all uses except pollutive ones. Developers can decide on different combinations of residential, commercial or recreational uses based on their own market outlook (see box story on

"Working with the Private Sector"). We have also taken a more "hands-off" approach for selected areas of Singapore like Holland Village and Joo Chiat. These are neighbourhoods that have grown organically with interesting clusters of eateries and shops which Singaporeans and visitors love. We should allow these areas to continue to develop their own identity. At the same time, we will plan for the necessary infrastructure, such as car parks and utilities, to support these areas.

We listen to both accolades and criticisms, and continue to tweak the equation by offering the market more flexibility where possible.

Regulation is practised with a "light touch", with risk management considerations built in. This can be seen in the relaxation of rules on home offices which has enabled small businesses and consultancies to be set up within the home, resulting in reduced business costs. We have put in place mechanisms which allow the private sector to challenge existing guidelines and to put up new ideas, with their views heard by panels comprising private sector representatives. We hold regular dialogues with various

Working with the Private Sector

South Beach and Orchard Turn are two government land sales sites that will feature prominently in Singapore's urban landscape. The South Beach project which is located along Beach Road, a highly strategic nodal location between Marina Centre and the Civic District, will offer a mix of prime office space, luxury hotels, retail and residences. Orchard Turn, located on bustling Orchard Road, will be a luxury retail and residential development right in the heart of our prime shopping area. Given their strategic locations, it was critical to incorporate urban design guidelines into the tender conditions of these sites to ensure that the resulting developments would be attractive, and would incorporate features that meet the public's needs.

The tender conditions for Orchard Turn require the successful company to upgrade the underground link between Orchard MRT and Wisma Atria, a private mall, to create a better pedestrian experience. In addition, the development has to include a public plaza space at the popular Orchard Road/Scotts Road junction and an art exhibition space to allow for the showcase of artworks and sculptures.

FIGURE 3. AN IMPRESSION OF ORCHARD TURN



Photo: Orchard Turn Developments Pte Ltd

For South Beach, a “two-envelope system” was adopted to evaluate the tenders for the site. The “two-envelope system” is an approach within the tender process where price bids and concept proposals are submitted under separate envelopes and evaluated separately. The concept proposals are first evaluated, and only tenders that meet the concept criteria will be considered for award. This approach ensures that only the better designs and concepts are shortlisted, before the land is awarded based on the highest bid. Interested developers of the Beach Road

site had to submit a design that provided for good pedestrian connectivity and public spaces. They also had to ensure that conservation buildings within the site would be sensitively adapted for new uses of office space, luxury hotels, retail and residences. A high bid tender submission in this instance would not have been sufficient.

In both developments, the URA's role and objective are to engage the private sector towards achieving a high quality urban environment. 

FIGURE 4. AN IMPRESSION OF SOUTH BEACH




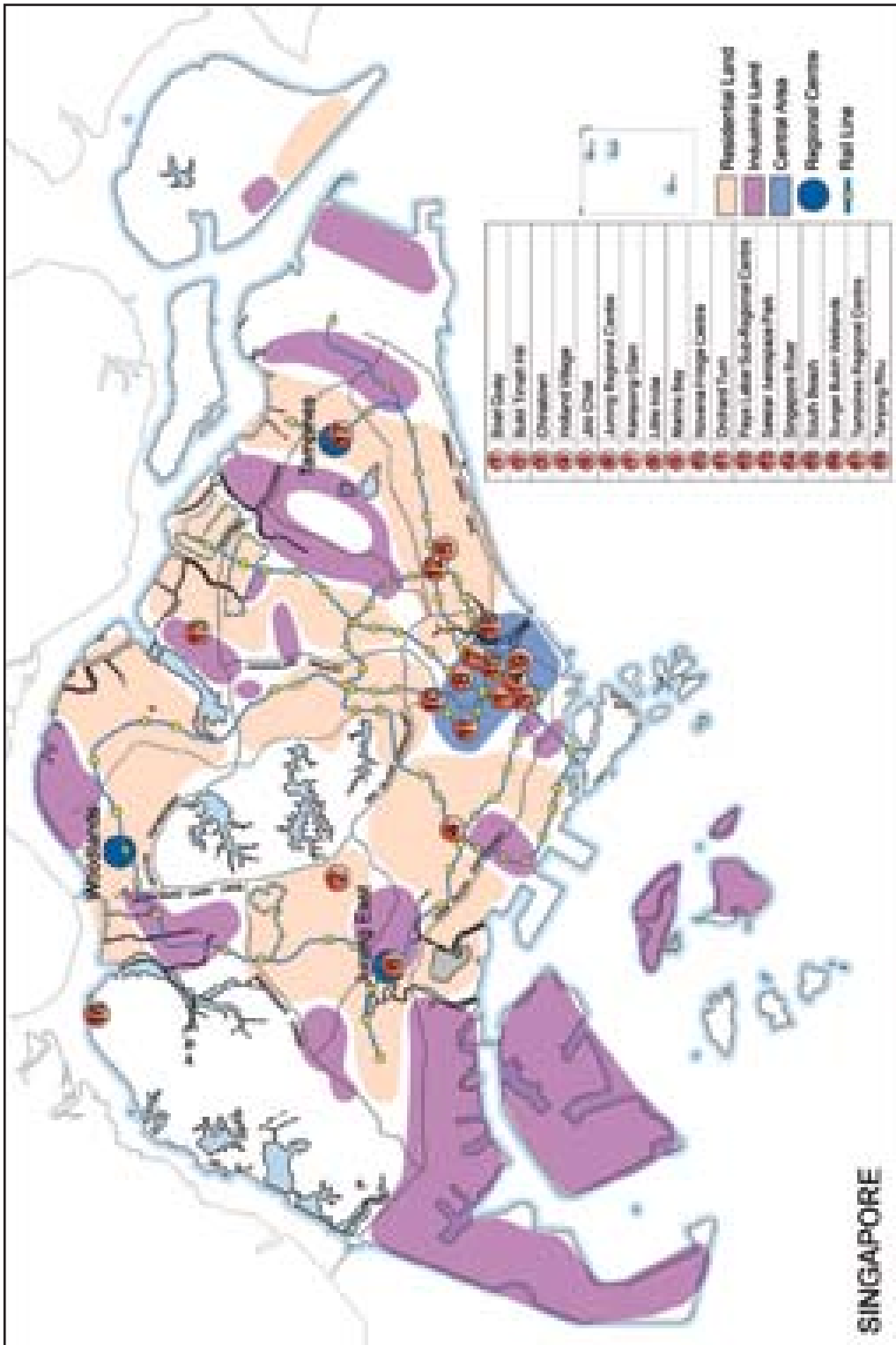
Photo: City Developments Limited

stakeholders and interest groups, and remain open to new ideas and suggestions.

LOOKING AHEAD

Singapore's brand of sustainable development is unique. We have already established a good foundation by institutionalising a planning process that takes a long-term view. Our comprehensive and integrated urban planning framework ensures that all development needs are considered, and the necessary trade-offs are debated and decided upon. A pragmatic approach is taken—one which recognises the need to generate economic growth yet, at the same time, safeguards social and environmental considerations in a balanced way. Planning is not done in

isolation but through a consultative process with a Whole-of-Government approach and in collaboration with the private sector. We value public-private sector partnerships in developing our city. Collectively, the Government has started to pursue innovative and state-of-the-art green technologies to deal with issues of environmental protection, energy usage and urban management. All these initiatives will stand us in good stead by giving us more room to manoeuvre within our tight land constraints. We are optimistic that this comprehensive approach can work towards achieving a sustainable Singapore where we can have both economic growth and a high quality environment for all who live here. 



Map: UPA

Cheong Koon Hean is Chief Executive Officer of the Urban Redevelopment Authority (URA). She is also concurrently the Deputy Secretary (Special Duties) in the Ministry of National Development, as well as a board member of the JTC Corporation and the National Heritage Board. Mrs Cheong has held several portfolios in the URA and has extensive experience in both strategic and local planning as well as in urban design and conservation. As Chief Executive Officer of the URA, her role is to plan and facilitate the physical development of Singapore.

NOTES

1. *The London Plan: Spatial Development Strategy for Greater London (Consolidated with Alterations since 2004)* (London, UK: Greater London Authority, 2008). <http://www.london.gov.uk/thelondonplan/thelondonplan.jsp>
2. *PLANYC: A Greener, Greater New York* (New York, USA: City of New York, 2007). <http://www.nyc.gov/html/planyc2030/html/home/home.shtml>
3. Singapore became an independent nation on 9 August 1965.
4. The Park Connector Network is an island-wide network of linear open spaces that link up major parks, nature sites and housing estates in Singapore. They are usually found alongside the many rivers and canals that flow through the island and are often used as convenient shortcuts to housing estates, MRT stations and schools.
5. Skyrise gardens refer to gardens on rooftops and sides of high-rise buildings. Skyrise gardens help to optimise land use while improving the environment for quality living.
6. JTC Corporation is one of Singapore's leading provider and developer of industrial space.
7. Urban Land Institute Global Awards for Excellence: Singapore Conservation Programme. http://www.uli.org/AM/Template.cfm?Section=Global_Awards_for_Excellence&Template=/CM/HTMLDisplay.cfm&ContentID=71891
8. In 2008, Singapore was listed by the Hub Culture Zeitgeist Cities Ranking as one of the top 20 global vibrant cities and was also voted as the best city to live in for Asian expatriates 10 years running according human resources consultancy ECA International.



Tay Kim Poh

The Twin Pillars of Estate Rejuvenation

To renew public housing estates in Singapore, upgrading and redevelopment are key strategies in revitalising and remaking the older estates.

Soon after Singapore attained self-government in 1959, one of its key challenges was to ease a severe housing shortage. The Housing and Development Board (HDB), which was set up a year later to handle this task, opted to provide small and utilitarian flats, which it was able to build quickly and at low cost to house a fast-growing population. Once the housing shortage eased, the Board's challenge was to


keep up with the changing needs and aspirations of the people, who were beginning to seek bigger and better flats, and more comprehensive facilities. This is a critical challenge since living in HDB flats is a way of life for most Singaporeans. Today, some 900,000 HDB flats across the island house 8 out of every 10 Singaporeans, where 95% of all HDB dwellers own the flats they live in (see box story on The Home Ownership Programme).

The Home Ownership Programme

The Home Ownership Programme is the cornerstone of Singapore's public housing. Started in 1964, the programme aims to give Singaporeans a stake in the country and its future, and promotes rootedness and a sense of belonging among Singaporeans, which contributes to the overall economic, social and political stability of the country. It also provides Singaporeans with an asset and a store of value that can be monetised in times of need.

Today, a framework of housing and mortgage subsidies and the availability of Central Provident Fund (CPF)¹ savings to aid housing payments, make HDB flats affordable for Singaporean families. Together with comprehensive land use planning, cost-effective design

and construction, and responsive public housing policies, HDB has achieved near full home ownership for Singaporeans. This common experience of HDB living thus bonds Singaporeans of different ethnic and socio-economic groups, fostering community cohesion.

For its achievement in the development and administration of the Home Ownership Programme that has benefited Singaporeans and improved their quality of living, HDB received the 2008 United Nations Public Service Award. This Award is given to public institutions for their creative achievements and contributions that lead to a more effective and responsive public administration in countries worldwide. 

For many Singaporeans, the HDB flat is the single biggest asset they own. Hence, HDB has to continuously rejuvenate and renew its public housing estates to ensure that they remain vibrant and meet the changing lifestyles and growing affluence of Singaporeans. Where functionality was the focus in the building of housing estates in the early days, design and quality have become equally important considerations in HDB's planning efforts today.

KEEPING UP WITH AFFLUENT CITIZENS AND CHANGING LIFESTYLES

Public housing in Singapore has been well managed and maintained. Daily cleaning and conservancy works carried out by local town councils, together with regular maintenance and repairs to the buildings, have ensured good standards of upkeep. Nonetheless, more had to be done for the older public housing estates built between the 1960s and the early

1980s. In terms of design, fittings and facilities, they were lagging behind the newer estates. For example, residents living in residential blocks built before the 1990s did not enjoy the convenience of having lifts serving every floor, while residents living in flats completed during the peak construction years from 1981 to 1986 faced maintenance issues such as spalling concrete and water seepage.

Apart from the physical ageing of the flats, there was also the greying of the population in these older estates. As younger residents formed their own nuclear families and moved out, attracted to the latest designs and modern facilities of newer towns, they left behind not only their older folks but also a vacuum in the social and economic life of the estates. Without the economic pull and dynamism of a younger population, the vibrancy and sustainability of older towns were affected. It became urgent to improve the living environment and inject new life, as well as to find a suitable mechanism to effect the needed changes.

CHOOSING AN OPTIMAL SOLUTION

An optimal solution is one that is able to meet and balance key needs. There are two practical options for rejuvenating older estates. The first is upgrading. Upgrading involves improving the physical conditions of the precinct, the

building blocks and the interior of the flats to a standard comparable to those found in newer estates. It enhances the living environment for HDB residents and helps to sustain the value of their flats, without uprooting them from their familiar environment and community.

Upgrading has inherent advantages as the affected residents are not required to move out and it is less disruptive to the social and economic life of the community. The relatively minimal displacement involved makes upgrading a less costly and more affordable measure. The results of upgrading are also more immediate and highly visible, which significantly improves the quality of life and well-being of the residents.

Without the economic pull and dynamism of a younger population, the vibrancy and sustainability of older towns were affected.

However, upgrading cannot fully address the needs of some older public housing estates. For example, due to their inherent design, some old housing blocks cannot be retrofitted with lifts which stop on every floor. Residents, including the elderly and the handicapped, would still need to climb some flights of stairs to reach their flats. Upgrading also does

not help to improve the population make-up in the estate.

The second option is redevelopment. This involves redeveloping an existing housing precinct by relocating its residents and demolishing the existing flats. Some of the older precincts were built in the earlier years at lower density. Preserving them in their existing layout would perpetuate the sub-optimal use of land. Redevelopment allows the use of land to be intensified—a clear strategic benefit, given Singapore’s land scarcity. Moreover, the land freed up through the clearance of aged blocks enables more flats to be built so that the existing residents can upgrade to new and better homes, and younger families and more activities can be brought in to revitalise the estate.

However, redevelopment may not be financially viable for all old housing precincts. In some cases, there are no suitable replacement sites nearby to resettle affected residents. Redevelopment is also an exercise requiring sensitive handling as it involves major displacement and uprooting. Care has to be taken in planning and implementation to ensure that residents are properly re-housed and existing community ties are not severed along with the demolition of the flats.

Both upgrading and redevelopment have their benefits and shortcomings.

Depending on the circumstances, one could yield greater benefits to the city-state and the community than the other. HDB has therefore relied on both approaches to regenerate its older public housing estates.

MAIN UPGRADING PROGRAMME

The most comprehensive form of upgrading implemented by HDB is the Main Upgrading Programme (MUP). Launched in 1989, the MUP is targeted at blocks more than 20 years old and aims to improve the interior and exterior of the flats to standards comparable to those in newer estates.

Under the MUP, the improvement items comprise a Standard Package of basic works that help to lengthen the lifespan of the flat, such as upgrading toilets/bathrooms, repairing spalling concrete, and improvements to the blocks and precinct, such as lift upgrading and the provision of linkways and drop-off porches. For certain blocks, residents can also opt for additional space or room of about 6 square metres, to be attached to each flat (Figure 1).

As of March this year, 137 precincts involving 946 blocks and a total of about 136,800 flats have been announced for MUP. The acceptance rate of the programme has been high. Of the 137 precincts, 129 have already conducted polling exercises, where 127 precincts

or 98.4% have opted for the upgrading programme.

Whether a precinct is upgraded is a collective decision made by the residents. At least 75% of flat owners in a precinct must agree to the programme before upgrading can proceed. This high support threshold is necessary as the MUP requires significant financial commitment from residents and may take up to 2½ years to complete, during which residents will have to bear with noise, dust and other forms of inconvenience.

To ensure affordability, a large share of the cost of upgrading is borne by the Government. Flat owners are asked to bear a small portion, ranging from 10% to 25% of the total cost, depending on flat type. The cost-sharing policy helps to moderate the demand for improvement works and ensures that only essential works are undertaken. To ensure that

even those with limited financial means can afford upgrading, flat owners are allowed to make use of their CPF savings to pay for their share of the cost of upgrading and to stretch their payments over a 10-year period.

As upgrading is done with residents continuing to live in their flats, ensuring their comfort and convenience is an important factor in the implementation stage. The latest construction technologies are employed to reduce the negative impact of upgrading works. Pre-cast or dry construction techniques are used wherever possible to hasten construction works and keep noise and dust levels within tolerable ranges. Additional measures are taken to provide alternatives for residents when the upgrading works are done within their flats; for example, temporary air-conditioned study rooms and rest

FIGURE 1. EXAMPLE OF THE MAIN UPGRADING PROGRAMME



a) Before upgrading



b) After upgrading: An additional study cum utility room for each flat and a drop-off porch for the block

Source: HDB

areas, toilets and washing facilities are provided on site for their use.

The Main Upgrading Programme is an investment in housing infrastructure that enhances the environment and provides a better quality of life for residents.

At the point of inception, the Government noted that the programme would substantially increase its expenditure on public housing over the next 20 years. Nevertheless, it supported the programme, viewing its share of the upgrading cost as a transfer of its budget surplus to the flat owners. It also recognised that the upgrading programme would enhance the market value of the flats—the single biggest asset for most citizens. The programme is also an investment in housing infrastructure that enhances the environment and provides a better quality of life for residents.

The most important element for the success of the upgrading programme is the commitment by both the Government and residents. Firstly, the Government must be prepared to provide the necessary funding support for the programme to be carried out. Although the pace of MUP is dependent on the

economic performance of the country and the availability of budget surpluses to fund the programme, the Government ensured that the programme did not grind to a halt when the country was facing an economic slowdown. When the economy improved, it stepped up the programme to enable more residents to benefit from upgrading. Up until 2007, it has spent about S\$2.7 billion on MUP.

Secondly, residents must get a real sense that upgrading is meeting their needs. Feedback on their needs and preferences is imperative so that the programme can be tailored accordingly. A working committee for each MUP precinct oversees the project to ensure that the upgrading package is aligned with residents' expectations before taking it to the poll. HDB also carries out regular surveys of completed MUP precincts to gauge residents' satisfaction and identify improvement areas. The feedback is used to further fine-tune the programme in subsequent reviews to ensure continued support for the programme.

Finally, for the programme to be sustainable over the long term, consideration has to be given to the costs involved. The costs must be affordable to both the residents and the Government. Over the years, HDB constantly reviews the MUP budget and scope of works to ensure that only essential items that meet

the needs of the residents are included. Non-essential items are omitted. The tight control over the improvement items under MUP not only meets the Government's goal of fiscal prudence but also benefits the residents who co-pay the upgrading costs. It also stretches every dollar of the upgrading budget, so that as many residents as possible can benefit from the programme.

SELECTIVE EN BLOC REDEVELOPMENT SCHEME

The Selective En bloc Redevelopment Scheme (SERS) was introduced in 1995, as part of the Government's plan to rejuvenate and intensify development in older estates. Precincts selected for SERS are those where there are clear economic benefits to the city-state. This is assessed by considering the redevelopment potential of the site, taking into account the cost of acquisition and reconstruction, as well as other related costs. Up until March this year, 71 precincts involving some 32,700 sold flats in various old estates have been announced for SERS.

As SERS serves the national strategic objective while optimising land use, the flats identified for redevelopment under SERS are compulsorily

acquired under the Land Acquisition Act. The older flats are demolished to make way for new developments after residents from these older flats are resettled into replacement flats (Figure 2). The implementation of SERS is handled with sensitivity because of the resettlement of residents. It has been found that this sensitivity during implementation helped to achieve positive ground support for the programme. HDB surveys showed that most of the affected residents appreciated the programme. Support for SERS increased further after residents moved into their new flats. A majority reported being highly satisfied with their new homes and surroundings.

FIGURE 2. EXAMPLE OF THE SELECTIVE EN BLOC REDEVELOPMENT SCHEME



a) Then: SERS site at Toa Payoh Central



b) Now: New high-rise modern public housing

Source: HDB

Since residents are uprooted under SERS, care is taken to minimise the inconvenience caused and also to share with them the benefits of SERS. A generous benefits package for affected flat owners helps secure better buy-in. Owners are offered compensation for their existing flats based on the full market value of their flats and an assured replacement flat at affordable prices. They only need to move out of their existing flats after the construction of replacement flats has been completed. By trading their old flats with shorter leases for new ones with fresh 99-year leases, SERS residents get to enjoy new flats with the latest designs and amenities and at enhanced market values.

Understanding residents' needs and convincing them of the benefits of the redevelopment scheme are key to gaining their commitment and confidence.

In many countries, relocation is often met with apprehension and resistance from affected residents because of the uprooting and break-up of existing community ties. Cognisant of such fears, HDB has taken due measures in the planning for SERS to ensure that residents can continue living in familiar neighbourhoods with minimal disruptions to their daily routines. HDB builds a wide range of new

replacement flats at nearby sites to re-house the affected residents. Through joint selection exercises, neighbours get to choose flats where they can continue to live close to one another in the new precincts. The assured allocation of new replacement flats within close proximity of their existing flats and neighbours preserves the existing community ties.

HDB also builds more new flats than required for the re-housing of SERS flat owners in replacement precincts. The surplus new flats are then sold to other applicants, with priority given to young married couples. This helps to bring in younger residents to improve the demographic and socio-economic profile of the residents in the new precincts. To encourage married children to take care of their aged parents, applicants from outside SERS precincts who apply to stay with or near their parents in replacement precincts are offered additional priority in the allocation of flats under a "Married Child Priority Scheme". This further helps to attract young married couples to move back to the old estates to live near their parents, helping to strengthen family ties. Hence, besides the quantifiable gains from intensified redevelopment of the cleared sites, SERS helps to enhance both the physical and social fabric of older estates.

At the launch of SERS, the affected residents are consulted on the types of flats they want, the precinct name and the location and type of common facilities they wish to have at their replacement precincts. Feedback from SERS residents shows that they found the consultation exercises to be useful and effective in promoting community bonding and instilling a greater sense of ownership of the new precinct.

Overall, SERS presents a win-win solution for all the parties involved. For the city-state, SERS enables valuable land in prime areas to be redeveloped for optimal land use. For the community at large, older estates are given new leases of life through the modernisation of the physical environment and the injection of younger residents. As for the affected residents, they get to move into brand new flats with fresh 99-year leases and in better living environments without having to move away from their familiar surroundings and neighbours.

The main challenge in implementing SERS lies in gaining residents' acceptance and support. Understanding their needs and convincing them of the benefits of the scheme are key to gaining their commitment and confidence. Hence, before any SERS project is announced, HDB carries out detailed studies of the residents' profile, and structures the benefits packages and replacement

housing to best meet their needs. Besides generous benefits packages, a comprehensive communications plan is critical in rallying residents to accept SERS. At the launch of every SERS, an exhibition is held to explain to residents what the scheme entails. HDB officers also conduct house-to-house visits to explain and provide financial counselling on the various re-housing options, and to address other concerns. Some residents, especially the elderly and less literate, will need more "hand-holding" during the implementation phase. Such personal interactions allow residents to give feedback on their individual concerns and ensure that residents are able to fully understand the basics of SERS.

A BLUEPRINT FOR RENEWAL AND REMAKING

Going forward, while upgrading and redevelopment will continue to be a part of HDB's estate renewal strategy, they will take on different emphases. For example, lift upgrading will be accelerated to prepare for a rapidly ageing population. The MUP will be replaced by a new programme called Home Improvement Programme (HIP). Unlike the MUP which offers only the Standard Package and space-adding options, the HIP is more affordable and flexible as it allows residents of flats that

have not undergone MUP to choose the improvement works they want in their flats and co-pay only for those items. Residents will also be called upon to decide on the type of facilities to be provided in their precinct through a Neighbourhood Renewal Programme (NRP). With emphasis on resident engagement, NRP's consultative approach will help create a stronger sense of community ownership over the precinct and facilities. Similar to MUP, the HIP and NRP will be collectively decided by the residents and will proceed only if at least 75% of the flat owners in the block and neighbourhood respectively vote for the programme.

Beyond the upgrading/redevelopment


of individual housing precincts, HDB has also drawn up a blueprint to renew and remake the HDB heartland. Under the blueprint, Singapore's public housing estates will be totally transformed over the next 20 to 30 years. Different development strategies will be adopted for each category of estates. New estates like Punggol² will have more attractive housing forms such as waterfront housing, and the full slate of commercial and recreational facilities, to realise the vision of "A Waterfront Town of the 21st Century". For middle-aged estates like Yishun,³ where redevelopment potential is relatively lower as they were built at higher densities than the older towns, the key thrust is rejuvenation

FIGURE 3. NEW GENERATION PUBLIC HOUSING IN DAWSON ESTATE: HOUSING IN A PARK



Source: HDB

through the enhancement of facilities, the environment and flats. Hence, more recreational facilities will be added, and the housing precincts will be rejuvenated under the new HIP/NRP.

For old estates like Dawson⁴ where large tracts of vacant land are now available through earlier clearance programmes, a new generation of public housing with exciting design concepts like “Housing in a Park” (Figure 3) and Sky Gardens⁵ will be introduced. Singaporeans can therefore look forward to living in even more vibrant and sustainable communities in the coming years. 

Tay Kim Poh is Chief Executive Officer of the Housing and Development Board (HDB). His role is to lead HDB to develop affordable homes, vibrant towns and cohesive communities. Mr Tay joined HDB in 1986 and took on various management positions, including Deputy Chief Executive Officer of HDB’s Estates & Corporate Groups, before he was appointed Chief Executive Officer in 2006. Prior to his current role, Mr Tay was also Deputy Secretary in the Ministry of National Development where he was in charge of housing and strategic planning.

NOTES

1. The Central Provident Fund is Singapore’s social security savings plan for working Singaporeans.
2. Punggol town, where development started in 1998, is one of the youngest HDB towns. Located in the northeastern region of Singapore, it is bounded by water bodies on three fronts—the north, west and east.
3. Yishun falls under the category of middle-aged towns that were largely developed in the 1980s.
4. Dawson estate is located in the central region and where development started as early as the 1950s.
5. The concept of “Housing in a Park” sets public housing within a scenic park-like environment, where residents can enjoy lush greenery close to home. It complements Singapore’s vision of “City in a Garden”. The provision of Sky Gardens enables residents to enjoy greenery at mid-level of residential blocks, and helps to soften the urban built environment.



Yam Ah Mee

Designing Urban Journeys

Social inclusion, a shift in mindset and a holistic strategy are the necessary ingredients in improving Singapore's land transport system.

In “Transportation for Livable Cities”,¹ Vukan R. Vuchic described a liveable city as one that is human-oriented and environmentally friendly; economically viable and efficient; and socially sound. An efficient land transport system plays a critical role in developing a liveable city. Over the next few years, Singapore will see developments such as the Youth Olympic Games, Formula One Grand Prix, the Integrated Resorts and the Singapore Sports Hub. The city's transport policies have to consider the new demands and anticipate future needs in order to

support the sustainable development of the city.

So far, Singapore's land transport policies have established an efficient and extensive transport network. Increasingly, the Land Transport Authority (LTA) recognises the social role of transport: it has to be accessible and meet the diverse needs of our people, including the lower-income groups and the physically-challenged.

Like other cities around the world, developing transport policies in Singapore has its challenges. Daily

travel demand in Singapore is projected to increase by 60%, from the current 8.9 million journeys a day to 14.3 million by 2020. This is due to an increase in population and tourist arrivals, as well as increased economic activities generated by a buoyant economy. As Singapore is a small and densely built-up city-state with limited land, it is not sustainable to build more roads indefinitely to cater to the increased travel demand. At the moment, roads take up 12% of our land, compared with 15% for housing. Hence, our transport policies have to make the best use of limited resources to meet the additional demand, using existing infrastructure.

Like most developed cities, the Singapore population is ageing. At the same time, rising affluence means that expectations of people have changed. While public transport has to be fast and efficient to cater to the masses, it also has to remain accessible and affordable to the less privileged. In addition, given the negative impact of transport on the environment, our transport policies should also give due emphasis to protecting the environment. For a city to be liveable, vibrant and attractive to its residents, a well-planned and accessible land transport system is fundamental to the city's sustained growth in the future.

Public transport in Singapore has to be fast and efficient to cater to the masses, and also remain accessible and affordable to the less privileged.

As the result of a year-long comprehensive review of the 1996 White Paper on Land Transport and in light of the new challenges ahead, LTA released the *Land Transport Master Plan: A People-Centred Land Transport System*² in January this year. The Master Plan outlines three strategic thrusts which will shape the land transport development and policies over the next 10 to 15 years. These are: Making Public Transport a Choice Mode; Managing Road Usage; and Meeting the Diverse Needs of the People. The objective of the Master Plan is to build a more people-centred land transport system that supports a vibrant and liveable city.

MAKING PUBLIC TRANSPORT A CHOICE MODE

To make public transport a choice mode of travel requires a change in will and mindset. Based on load analysis, public transport is the most efficient people-mover and also an environmentally sustainable mode of travel. A Mass Rapid Transit (MRT) train carries an average of

1,100 passengers at any one time during the peak period, while a single deck bus can carry about 80 passengers—contrast this with the average occupancy of about 1.5 persons per car. This means that it will take more than 50 cars to move one bus-load of passengers, and more than 700 cars to move one train-load of passengers. For a city like Singapore, it would put a tremendous strain on the road network if everyone were to choose to travel by car.

A survey by LTA showed that between 1997 and 2004, the number of car trips increased by 23%, more than double the 10% increase in car population over the same period. This increased propensity to drive means that the public transport mode share has been declining over the years, from 67% in 1997 to 63% in 2004. We believe that the increase in travel demand must be met by public transport. Hence, in the Land Transport Master Plan, we aim to reverse this decline. The target is to achieve a public transport mode share of 70% for the morning peak hours by 2020, up from 63% today.

Our transport system must constantly evolve to cater to the changing demographics and the higher expectations of

the population. However, public transportation cannot be solely designed from the policy vantage point. It must be planned and built from the commuter's point of view. This means understanding and catering to commuter needs from the moment they leave their homes to the time they reach their destinations. This is the only way to ensure that transport is human-oriented. For instance, to enhance the overall journey experience, more covered linkways and overhead bridges will be provided so that commuters can enjoy a pleasant walk to the bus stops, bus interchanges or MRT stations. To complement this, more integrated transport hubs like the ones at Ang Mo Kio or Toa Payoh bus interchanges will be created (Figure 1). By co-locating bus interchanges with MRT stations and commercial development, transfers between bus and train will be more

FIGURE 1. IMPRESSION OF ANG MO KIO HUB



Photo: LTA

convenient. Commuters can shop or pick up a drink while waiting for their buses or trains, all in air-conditioned comfort. The aim is to transform these transport nodes into fun and exciting places, create more buzz and provide greater comfort and convenience for the commuters. Similarly, providing more real-time public transport travel information would allow commuters to better plan their journeys even before they leave their homes. It is the entire experience of the journey that will help make public transport an attractive mode of travel.

In Singapore, we adopted the hub-and-spoke model for our public transport network. This essentially means relying on buses or Light Rapid Transit (LRT) to serve as feeder services, bringing commuters to MRT stations or bus interchanges. The rail network will remain as the backbone of our public transport system given its higher speed and capacity. To increase its coverage and availability, the rail network will be doubled by 2020 where existing lines will be extended, and new lines added (Figure 2). This will benefit commuters in areas currently not served by the MRT.

While the hub-and-spoke model is more efficient in land-scarce Singapore compared with direct services for

FIGURE 2. EXISTING AND FUTURE RAIL LINES BY 2020



Photo: LTA

every origin and destination, transfers are inevitable in such a system. Today bus routes are planned by the two public transport operators: the SMRT Corporation Ltd (SMRT) and the SBS Transit Ltd. Being profit-driven companies, their decisions are largely based on commercial considerations. There is little integration between the systems run by the SMRT and SBS Transit as there is no incentive for them to do so. This has led to a situation where buses are less frequent than they should be, and feeder buses run long and circuitous routes before getting to the MRT station or bus interchange. This results in longer waiting and transfer times for commuters. Thus, to enhance the hub-and-spoke model, the LTA has decided to take over the planning of bus routes so that a more commuter-centric approach is taken when bus routes are

planned, with due consideration given to other transport infrastructure such as the rail and road network. With better integration between bus and rail, commuters will be able to experience an overall improvement in journey time.

While public transport has to cater to the masses, we recognise that commuters have different needs. For example, some prefer taxis which provide personalised door-to-door service. More can be done to attract those who have higher expectations of the public transport system. LTA will be working closely with the public transport operators to offer more public transport choices to this group of commuters. It will also be promoting and facilitating niche services such as the premium bus services, which provide greater comfort and more direct journeys to those who are willing to pay a higher price.

MANAGING ROAD USAGE

Roads are the arteries of our economy. Everyday, nearly 9 million journeys are made, with about 40% in private vehicles—and this number is growing. Our roads have to remain smooth-flowing to support economic activities so that goods and people can reach their destinations on time. If demand for road usage is not managed well, traffic congestion will become commonplace, as seen in other major cities in Asia.

Road congestion results in economic loss as well as externalities such as noise and air pollution. Quality of life will be affected if daily commute turns into long, arduous journeys with constant gridlock amidst noise and air pollution.

Congestion needs to be managed in a holistic manner. While improving public transport is key to managing demand on our roads, this alone is not sufficient. Where feasible, the road network will be expanded to serve new developments but we are mindful that additional lanes and new roads inevitably attract more traffic which eventually leads to congestion. At the same time, technology will be leveraged to maximise existing road capacity. The LTA is expanding the coverage of electronic Junction Eyes³ and the Expressway Monitoring and Advisory System (EMAS)⁴ to more junctions and arterial roads. These surveillance systems allow LTA to monitor traffic conditions on the roads and deploy measures to rectify causes of traffic congestion expeditiously. Some people have argued that these measures are enough to manage congestion and that road pricing is unnecessary. However, after studying the experience of other cities, it has shown that even with a first-class public transport system, people will continue to drive unless there are measures (for example, implement

high parking charges in the city) which discourage them from doing so.

In Singapore, we rely on policy tools such as the Vehicle Quota System to control the growth in vehicle population, and the Electronic Road Pricing (ERP)⁵ system to manage demand on congested roads. We have found that ERP is by far the most effective and direct means of managing congestion because it requires motorists to take into account the cost of congestion to others as a result of their driving. The aim of the system is to influence the motorist's decision, so that he may consider driving during off-peak hours or even motivate him to use alternative modes of transport.

The ERP scheme has remained largely the same since it was introduced 10 years ago. As part of the development of the Land Transport Master Plan, the LTA also conducted a review on the ERP system to enhance its effectiveness so that it is more responsive to changing traffic conditions. As a result of the review, it was decided that the method of measuring traffic speeds on ERP-priced road would be refined to assure that at least 85% of motorists travelling on these roads will be assured of smooth travel; the ERP rate structure needs to be updated in order for it to make a significant difference in influencing motorists' behaviour; and the congestion in the city area have to be managed

through the introduction of additional ERP gantries.

Yet, even through the enhancement of ERP, the current vehicle growth rate of 3% is not sustainable and we will lower it to 1.5% from May 2009.

MEETING THE DIVERSE NEEDS OF THE PEOPLE

While public transport has to cater to the masses, the system must also remain accessible to others with special needs, such as the elderly, wheelchair-bound commuters, and parents with infants or young children. Wheelchair-accessible buses and barrier-free facilities in MRT stations are already available, but more will be done to improve accessibility. By 2010, pedestrian walkways, access to MRT stations, taxi and bus shelters, and public roads across the island will be barrier-free; by 2020, the public bus fleet will be fully wheelchair-accessible. Additional lifts will also be installed at MRT stations so that commuters need not make long detours to look for an entrance with lift.

As we enhance the quality of our public transport services, we are mindful that public transport should remain affordable to the masses. The Government's policy is to regulate fares to ensure public transport remains affordable to the majority. Instead of keeping fares at artificially low levels,

they are allowed to go up in small regular steps to keep pace with inflation. For the lower-income groups who need financial assistance, help is available through various government assistance schemes or community schemes such as public transport vouchers, which is a joint effort by the National Trades Union Congress (NTUC),⁶ public transport operators and the Government.

Initiatives to promote public transport and manage congestion on the roads are key steps towards sustainability. LTA works closely with the Ministry of the Environment and Water Resources as well as the National Environment Agency (NEA) to encourage motorists to choose cleaner and more energy-efficient vehicles, such as hybrid cars, and adopt environmental-friendly practices.

LTA also adopts environmentally sustainable practices in planning and developing land transport infrastructure. One such initiative is the use of recycled municipal, road and building waste materials currently being disposed of at the Pulau Semakau Landfill⁷ in road resurfacing works and road pavement construction. This measure, which is being jointly undertaken with NEA, SPRING Singapore⁸ and industry players, will potentially extend the lifespan of the Pulau Semakau Landfill by another 25 years. This is a significant contribution

to protect our environment, especially in land-scarce Singapore. Going forward, we will have to think of new ways to support environmental goals.


A PEOPLE-CENTRED SYSTEM

Transport affects people in different ways. To have a people-centred land transport system, LTA engages the public to understand their needs and expectations. As part of the year-long Land Transport Review that was conducted while developing the Master Plan, an extensive public consultation exercise was conducted through various channels over several months. Focus group discussions were held where members of the public and other stakeholders were invited to discuss and share their views. LTA also went online to seek feedback via the Talk2LTA portal and created an online game called the “Great Transport Challenge 2020”. More than 4,500 people gave their views and feedback.

Engaging the people has to be a continual effort. LTA actively engages residents and communities who are affected by our infrastructure works. These stakeholders are frequently updated on the progress of the projects and how they might be affected. At the same time, LTA would seek their understanding for inconveniences caused by existing works as well as

ask for feedback. LTA recently set up a Land Transport Community Partnership Division where dedicated teams from this Division are assigned to each constituency to handle the day-to-day road and traffic management issues more effectively, and to establish a closer relationship with the community. To foster stronger rapport, the Community Outreach Programme will periodically share and discuss LTA land transport policies and plans with grassroots leaders.

In January this year, LTA opened the Land Transport Gallery which showcases the development of the Singapore land transport system since 1945. This Gallery helps to promote better awareness of the intricacies and challenges of land transport policies and encourage an open exchange of ideas to improve the system. Through the various engagement efforts, we hope that there will be greater ownership of the land transport system.

By 2020, Singaporeans will have a more advanced public transport system. Our continual goal is to manage road usage and protect the environment. Land transport plays a critical role as Singapore strives to be a city that is human-oriented and environmentally friendly, economically viable and efficient, and socially sound—a truly liveable city. 

Yam Ah Mee is Chief Executive of the Land Transport Authority (LTA). He led the Authority in the Land Transport Review which unveiled major initiatives to enhance the land transport system in Singapore over the next 10 to 15 years. Under his leadership, LTA has embarked on many initiatives to improve public transport, such as the expansion of the rail network, the introduction of wheelchair-accessible buses, barrier-free accessibility around train stations and bus interchanges, and the implementation of real-time bus arrival information. Mr Yam was previously Deputy Secretary (Sea & Air) in the Ministry of Transport.

NOTES

1. Vuchic, Vucan R., *Transportation in Livable Cities* (New Brunswick, New Jersey: Center for Urban Policy Research, 1999).
2. The full report may be viewed online at <http://app.lta.gov.sg/ltmp/index.asp>
3. Junction Eyes is a system of surveillance cameras at signalised junctions to spot and rectify causes of traffic congestion.
4. EMAS performs live-video traffic surveillance, incident and violation detection, and traffic advisory functions.
5. ERP is an electronic system of road pricing based on pay-as-you-use principle. Motorists are charged when they use the road during peak hours.
6. The NTUC is a national federation of trade unions of workers in the industrial, service and public sectors.
7. The Pulau Semakau Landfill is Singapore's offshore landfill for waste disposal.
8. SPRING Singapore is the agency for enterprise development. It aims to grow competitive and innovative enterprises.



Lee Yuen Hee

Waste Management and Economic Growth

Cities as the engines of economic growth are also the highest producers of waste and pollution. Find out how economic development does not have to mean more waste generated.

Having developed its industrial base and achieved high economic growth in the last four decades, current day Singapore is highly urbanised and industrialised. This has had a major impact on the environment—more pollution and waste generated.

The challenge is especially great for Singapore as it is an island city-state with an area of only 704 square

kilometres and a population of 4.59 million people. Its population density of over 6,500 persons per square kilometre is the fourth highest in the world, after Monaco, Macao and Hong Kong. To remain attractive, it is essential for Singapore to maintain a good quality living environment, where standards of public health meet the growing expectations of our local population as well as those of investors, tourists and

a highly mobile international and local talent pool of people.

Thus, Singapore is highly conscious of the environmental pitfalls of industrialisation and, since the early days of industrialisation, had developed its own integrated approach to environmental protection and management with the aim of ensuring that industrial development was not at the expense of the living environment. The key strategies are prevention, enforcement and monitoring.

Firstly, great emphasis is placed on judicious land use planning and development and building plan control for housing, commercial, industrial and recreational uses as well as water catchments. Secondly, investments in waste collection and treatment infrastructure are made in tandem with industrial and urban developments to minimise pollution to our land and waters. Thirdly, legislation enacted to control pollution is applied judiciously. This is complemented by close monitoring of ambient air, inland and coastal waters to assess the adequacy and effectiveness of the environmental pollution control programmes and by strict enforcement to ensure that waste collection and treatment facilities are properly operated and maintained, and the standards and requirements complied with.

In addition, public awareness and education programmes are conducted to educate the public on the protection of the environment. This multi-pronged approach has enabled Singapore to achieve and maintain a clean and healthy environment, even as the economy continues to grow.

THE SINGAPORE GREEN PLAN

The need for a fresh approach to environmental management was felt towards the end of the eighties. Over the years, there has been a shift of emphasis from a “top-down” approach towards self-regulation by the industries through various incentive schemes; the traditional “command and control” approach, although proven useful, has become increasingly costly to both government and industry.

By then, basic infrastructure for the removal and disposal of solid waste, sewage and wastewater were in place. Air and water pollution were regulated through planning controls and emission standards. However, an increasing population with higher expectations and growing appetites continued to exert pressure on Singapore’s limited capacity to cope with resource consumption and waste generation.

At the same time, there was international consensus on the need to take action on global environmental

issues, such as global warming, the protection of the ozone layer, and the preservation of wildlife and prevention of coastal pollution, in which Singapore was an active participant and advocate.

These reasons paved the way for the Ministry of the Environment (subsequently renamed the Ministry of the Environment and Water Resources, or MEWR) to draw up and publish the Singapore Green Plan (SGP) in May 1992. The SGP charted the strategic directions that Singapore would be adopting to achieve its goal of sustainable development. It was presented at the June 1992 Rio Earth Summit in Brazil.

To keep the SGP relevant amidst the changing economic and environmental landscapes, a review was initiated and the SGP 2012 was launched on 24 August 2002.

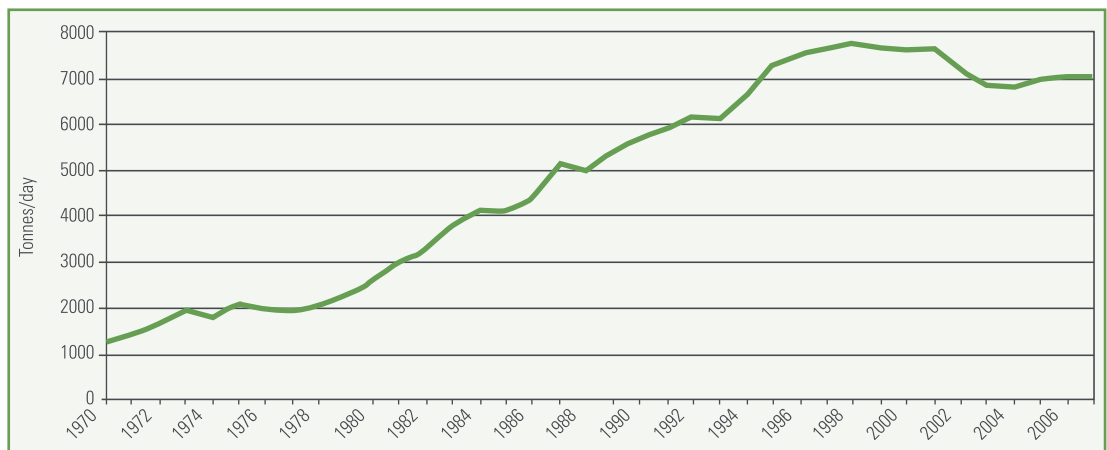
The SGP 2012 conveys the message that the new challenge Singapore now faces is no longer environmental

performance, but environmental sustainability. This updated master plan charts Singapore's approach to achieve environmental sustainability over the next 10 years and sets out the broad directions and the strategic thrusts that will help ensure Singapore's long-term environmental sustainability. The SGP was reviewed in 2005 and an updated edition was published in February 2006.

THE SOLID WASTE CHALLENGE

With limited land area and high population density, it is not surprising that the disposal of municipal solid waste poses a major challenge to Singapore. The strong economic growth achieved in the last 40 years of development has resulted in a corresponding explosion in waste generated and, if not properly managed, would have caused degradation to Singapore's environment. In 1970, about 1,300 tonnes of solid

FIGURE 1. TOTAL WASTE DISPOSED (1970 TO 2007)



waste were disposed of daily; by 2000, this had increased six-fold to 7,600 tonnes per day (Figure 1). The problem was further compounded by Singapore's warm and humid climate, which makes refuse extremely putrefiable. Refuse has to be removed and disposed of quickly, efficiently and safely before it gives rise to smell nuisance, infectious diseases and other public health hazards.

Furthermore, if the rate of waste disposal were to continue to grow as it did, scarce land resources would need to be set aside to build more expensive incinerators and landfills. This was clearly not sustainable.

SUSTAINABLE SOLID WASTE MANAGEMENT

The National Environment Agency (NEA) has, in close partnership with key stakeholders in the Private, Public and People (3P) sectors, adopted strategies and programmes to address this problem. These strategies are: Volume Reduction through Incineration; Waste Recycling and Reduction of Landfilled Waste; and Waste Minimisation.

These measures have increased the overall recycling rate from 40% in 2000 to 54% in 2007, putting the country in a good position to achieve its target of 60% as outlined in the SGP 2012.

Strategy 1: Volume Reduction

Before 1979, all waste was disposed of in landfills carved out of swampy areas on the main island of Singapore. The situation was becoming precarious—projections showed that space for landfills would run out very quickly as waste quantities grew in leaps and bounds. Studies indicated that waste-to-energy incineration plants were the way to go in our situation. Being able to reduce waste volume by a drastic 90% in a short time and in facilities requiring relatively small footprints was clearly an ideal solution to our resource-scarce situation. The first incineration plant was commissioned in 1979. Since then, three other bigger plants followed in quick succession—1986, 1992 and 2000—to meet the ever-increasing waste loads.

These four modern waste-to-energy incineration plants are fitted with advanced treatment systems to remove acidic gases, dust and other contaminants from the flue gas before it is released through the chimneys. The flue gas is closely monitored to comply with Singapore's clean air emission standards. Energy is recovered to generate electricity; scrap iron is also recovered. The resulting incineration ash, which takes up only 10% of its original volume, is then landfilled.

Strategy 2: Waste Recycling

Even as incineration offered us an effective, though expensive, technical solution to our waste situation, projections showed that we would have still exhausted all our landfills on the main island by 1999. We therefore had to look beyond, to enclose a sea space eight kilometres south of the main island, and at great expense, to build our sole remaining landfill off the shores of Pulau Semakau island (see box story).

Moving up the waste hierarchy, the second strategy was therefore to promote waste recycling in the industrial/commercial sectors and in households, to reduce the waste disposed of at the incineration plants and landfill. This was done through a three-pronged approach of engaging the industry, community and schools.

a) Industry Participation

Less than half of the waste disposed of in Singapore comes from the industrial and commercial sectors. Such waste includes metals, horticultural and wood waste, and paper waste. Recycling in the industrial and commercial sectors helps avoid the gate fees charged at the waste disposal facilities and thus contributes directly to the bottom line.

The NEA promotes waste recycling by conducting talks, running awareness programmes targeted at businesses, and

providing recycling information and data. It also worked with the largest owner of industrial land and ready-built factories, JTC Corporation, to set up recycling facilities in all its 21 flatted-factory and nine terraced-workshop industrial estates.

The Singapore Land Authority also helped by allocating some 20 hectares of land at Sarimbun for recycling activities. Sitting on a closed landfill, the Sarimbun Recycling Park (SRP) is operated by NEA. To date, the SRP has been well utilised for various recycling activities, such as composting of horticultural waste and recycling of construction and demolition waste.

NEA administers the S\$20 million “Innovation for Environmental Sustainability” (IES) Fund that was set up by the Government in 2001 to promote the adoption of innovative environmental technologies that contribute towards Singapore’s long-term environmental sustainability. In this regard, waste minimisation is one area targeted by the IES Fund. To date, 15 Singapore-based companies had tapped the IES Fund for funding of several waste management and recycling test-bedding projects. Some of these projects include the production of pre-cast concrete drainage channels using recycled aggregates; the conversion of horticultural waste into packaging

The Semakau Landfill

In order to cope with Singapore's ever-increasing amount of waste, a new landfill was created by constructing a 7-kilometre perimeter rock bund to enclose part of the sea between Pulau Semakau and Pulau Sakeng, two of Singapore's offshore islands. On-site work on the project costing S\$610 million started in April 1995, and operation began in April 1999, after Singapore's only landfill at Lorong Halus was exhausted in March 1999.

Semakau Landfill is expected to meet the country's solid waste disposal needs beyond year 2040. Presently, about 2,000 tonnes of waste, including construction

waste, non-hazardous industrial waste and inert ash, are transported daily from the Tuas Marine Transfer Station to the landfill.

Semakau Landfill is one of the few landfills in the world to be located so far away from the mainland. Landfills are usually situated close to the mainland, because it makes transportation easier and less costly. However, due to land scarcity in Singapore, locating a landfill offshore was the only possible option.

Semakau Landfill covers a total area of 350 hectares and has a landfill capacity of 63 million cubic metres. The bund is lined with a layer of impermeable

FIGURE 2. SEA ROUTE TO SEMAKAU LANDFILL




Photo: NEA

membrane and marine clay to prevent any leachate within the landfill area from affecting the surrounding environment.

During construction, silt screens were used to prevent the construction activities from contaminating the ecosystem in the vicinity of the landfill. The mangroves of Pulau Semakau which were affected in the construction process were replaced and replanted on two plots of mangroves of about 14 hectares located outside the periphery of the sanitary landfill. Over 400,000 mangrove saplings were replanted in the process.

Besides helping to preserve the rich

mangrove groves around the sanitary landfill facility, the mangroves also act as biological indicators of the water quality around the facility. With all the pollution prevention measures put in place, the mangroves have thrived and so have the biodiversity of the ecosystem around the facility.

Singapore chose to protect the environment as well as create a sanitary landfill out of two islands without impacting the surrounding environment and ecology. The rich biodiversity around the sanitary landfill shows that development and environmental protection can co-exist and need not be mutually exclusive. 

materials; and the processing of ladle furnace slag, a by-product of the steel making process, into road construction materials.

The waste recycling industry in Singapore now includes companies with the capability to recycle and process electronic waste, food waste, wood waste, horticultural waste, used copper slag, construction and demolition waste, ferrous waste and plastic waste.

The major types of non-incinerable waste sent directly to the landfill are construction waste, stabilised industrial sludge, residues and ashes, much of which has been diverted, over the years, for reprocessing into useful materials

such as aggregates for reuse. At the same time, industry best practices and “less-waste” design and construction methods have also minimised the generation of such waste sent to the Semakau Landfill.

In 2007, some 91% of ferrous metal waste, 98% of construction and demolition waste, 41% of horticultural waste and some 51% of paper waste were recycled (Figure 3).

b) Reaching Out to the Community

Changing mindsets and influencing behaviour is important for sustainability, but this takes time. To do so, NEA has been engaging residents, grassroots

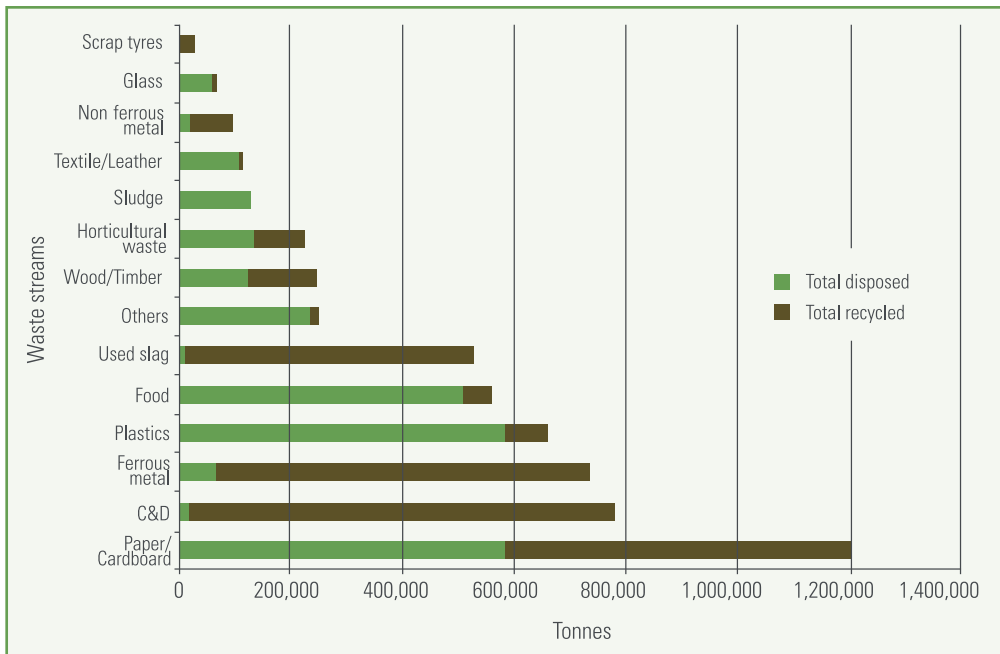
organisations, non-governmental organisations (NGOs) and schools to impress upon the community the need to practise the 3Rs—reduce, reuse, recycle—for resource conservation and to achieve a sustainable waste management system. One such awareness campaign is the annual Recycling Day, which aims to reinforce the need to recycle waste by involving schools, community, NGOs and recycling companies.

NEA launched the National Recycling Programme (NRP) in April 2001 to provide a convenient means for residents living in public and private housing estates to recycle their waste.

Under the NRP, public waste collectors are required contractually to provide recycling bags or bins to every household for storing their recyclables and to collect the recyclables door-to-door and fortnightly on scheduled days.

In addition 1,600 sets of centralised recycling depositories have been placed in the common areas of all public Housing and Development Board (HDB)¹ housing estates to complement the door-to-door collections. This covers about 85% of the population centres of the country. With approximately one set to every five blocks of flats, most residents would be able to access these centralised recycling

FIGURE 3. WASTE GENERATION IN SINGAPORE



depositories within 150 metres from their flats to deposit their recyclables at any time of the day.

This network is supplemented by another 2,200 recycling bins placed in public places with high human traffic. Such places include locations outside train stations, food courts and food centres, bus interchanges, the airport, and pedestrian malls.

c) School Involvement

Environmental awareness has to be inculcated from young. As such, Singapore's waste management story is incorporated into the school syllabus, including visits to NEA's incineration plants and the Semakau Landfill.

NEA launched the Recycling Corner Programme (RCP) for schools in September 2002 to inculcate the habit of the 3Rs in students. Recycling bins for paper, drink cans and plastic bottles are placed at Recycling Corners located within school premises. As of 2007, 95% of all schools have recycling facilities.

Under the RCP, students take charge of the Recycling Corners and put up interesting information about the 3Rs. These activities help to generate interest and foster a keener sense of ownership. Activities with recycling themes are held regularly to sustain interest, including competitions, environmental camps,

field trips, workshops, and speech writing contests on different aspects of the environment, including waste minimisation and recycling.

To instil a sense of environmental ownership of the recycling programme, students are identified and separately trained to be Environment Champions. These Champions are responsible for various environmental programmes in school such as conducting talks on the environment, and assisting in the planning, organisation and running of recycling and other environmental activities.

Strategy 3: Waste Minimisation

While incineration and recycling are end-of-pipe solutions, the third strategy of waste minimisation or reduction is aimed specifically at cutting waste at source, that is, even before it is produced. This helps close the waste loop by providing us with the means to move closer to our ideal of a zero waste society.

An initiative under this strategy is the Voluntary Packaging Agreement. The Agreement is aimed at reducing packaging waste from the producers' end. With packaging waste making up almost a third of Singapore's household waste, this initiative offers great potential for waste reduction. The Agreement is based on the principle of

product stewardship, in contrast to the legislative approach which imposes a high compliance cost on industry. This approach directly engages industry players to assume greater corporate responsibility for their packaging waste in a non-prescriptive and cost-effective way.

On 5 June 2007, NEA signed Singapore's first Voluntary Packaging Agreement for the food and beverage industry which includes five industry associations representing more than 500 companies, 19 individual companies, two NGOs, the Waste Management and Recycling Association of Singapore and the four public waste collectors. This Agreement seeks to secure the commitment of key players in the packaging supply chain, brand owners, manufacturers, importers, retailers and recyclers, and also offers industry a platform to discuss and work together on feasible, cost-effective solutions to reduce packaging waste.

Another initiative to reduce waste is the Bring Your Own Bag Day campaign, launched in April 2007. The first Wednesday of every month has been designated "Bring Your Own Bag Day". Shoppers are encouraged to use reusable bags so as to cut down on wastage of plastic checkout bags that are taken and discarded without being reused such as for lining waste bins. Shoppers

needing a plastic bag are encouraged to donate 10 cents towards the Singapore Environment Council to help finance its environmental activities. Shoppers are also encouraged to decline bags when making small purchases.

CHALLENGES AHEAD


Singapore has always placed a strong emphasis on having a clean environment and pollution-free air, land and water, and the challenges facing Singapore ahead are to maintain a clean and green environment amidst rapid economic progress. To overcome these challenges, Singapore must constantly innovate and optimise its resources.

The way forward is to reduce the waste disposal rate through waste recycling and waste minimisation at source.

As the economy and population continue to grow and consumption patterns change, waste generation is expected to increase. However, NEA is convinced that economic growth need not mean generating more waste. The per capita municipal solid waste disposed of has decreased from 0.94 kg/person/day in 2003 to 0.88 kg/person/day in 2007, suggesting that Singapore

is making progress “Towards Zero Landfill” and demonstrating that economic development does not have to mean more waste generated.

In the early days of industrialisation and economic growth, the Singapore Government adopted the most cost-effective solutions at the time to handle the increasing amounts of solid waste being generated in the country. As waste quantities continue to increase with the economy’s robust growth, the way forward is to reduce the waste disposal rate through waste recycling and waste minimisation at source. At the same time, NEA will continue to actively engage and educate the 3P sectors—People, Private and Public sectors—through various community programmes and campaigns to achieve a clean and sustainable living environment.

Through our multi-pronged strategies and sustained efforts, we hope to ensure that Singapore remains as a model of sustainable development in the region. 

Lee Yuen Hee is Chief Executive Officer of the National Environment Agency (NEA). He has led the Agency in major initiatives such as containing the outbreak of the dengue scourge, addressing climate change and promoting energy efficiency. As part of the national drive to improve energy efficiency, NEA led a multi-agency committee known as the Energy Efficiency Programme Office (E2PO) to integrate the overall efforts of the public, private and people sectors to improve energy efficiency. In his previous appointments, Mr Lee was involved in other national projects such as the restructuring of the electricity industry, implementation of Electronic Road Pricing and review of the full-time national service period.

NOTE

1. The Housing and Development Board is Singapore’s public housing authority and a statutory board under the Ministry of National Development.



Ng Lang

A City in a Garden

Singapore's greenery plan has entered a new phase of development where conserving biodiversity and involving the community will further transform the island.

In the 1960s, then Prime Minister Lee Kuan Yew mooted the creation of a clean and green environment to mitigate the harsh concrete urban environment and improve the quality of life in the city. This was the beginning of Singapore's development into a Garden City.

As a result, Singapore's clean and green environment has allowed us to meet the lifestyle and recreational needs of an increasingly affluent population, and enhanced Singapore's attractiveness

as a destination for foreign businesses and talents. Our green policies have contributed to the transformation of Singapore into a distinctive and vibrant global city.

Going forward, the plan is to evolve Singapore into a City in a Garden—a bustling metropolis nestled in a lush mantle of tropical greenery (Figure 1). To do this, we will be adding more sophistication to our greenery plan, conserving our natural heritage, and involving the community.

FIGURE 1. A CITY IN A GARDEN—A BUSTLING METROPOLIS NESTLED IN A LUSH MANTLE OF TROPICAL GREENERY



Source: NParks

A MORE SOPHISTICATED GREENERY PLAN

The challenge of greening a small city-state with a land area of only 700 square kilometres and a population of 4.6 million (and still growing) is space. However, green space need not necessarily suffer at the expense of economic and population growth. While land is scarce, with careful planning, Singapore has been able to commit 9% of the total land area to parks and nature reserves. Between 1986 and 2007, despite the population growing by 68% from 2.7 million to 4.6 million, the green cover¹ in Singapore grew from 35.7% to 46.5% (Figure 2).

The importance of greenery for a quality living environment has been underscored in Singapore's Master Plan 2003. The Master Plan, drawn up by the Urban Redevelopment Authority (URA) to steer Singapore's urban development

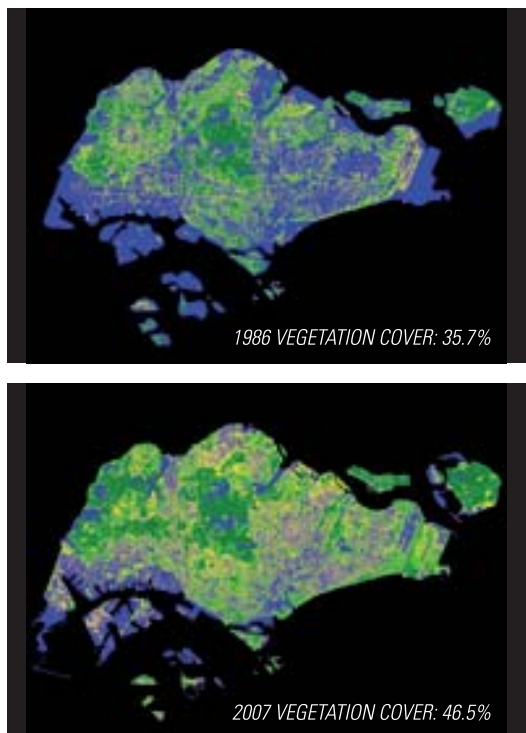
in the subsequent 15 years, incorporated a new Parks and Water Bodies Plan with these guiding principles:

- Plan for a hierarchy of parks distributed throughout the island, from larger parks with more facilities, to smaller parks near homes, with a guideline of 0.8 hectare per 1,000 population provision.
- Cluster groups of parks with complementary ecosystems and activities, like wetlands, hill parks, tropical rainforests, and connect them where possible to give a more holistic experience.
- Bring people closer to nature and, where possible, integrate nature areas within parks.
- Plan for an island-wide network of green links to connect parks and water bodies with residential areas.

The matrix of park connectors as green links and recreational corridors among parks is one of the ways to expand green space in the city. The park connector network is a series of seven connecting bikeways or green paths. Our target is to build 200 kilometres of park connectors by the year 2015, covering seven closed loops for recreational walking, jogging and cycling activities. Properly integrated with their surrounding areas, the park

connectors will enhance the sense of green space throughout the city. The first loop of 42 kilometres, which was completed in December 2007, is known as the Eastern Coastal Park Connector Network. It allows users to walk, jog and cycle through idyllic coastal areas, six parks and residential heartland areas. This park connector network has been well-received and was the venue for the first night-time marathon in Asia in May 2008.

FIGURE 2. GRADUAL VEGETATION INCREASE FROM 1986 TO 2007. DARK GREEN AREAS: TREE CANOPY COVER; LIGHT GREEN AREAS: SHRUB COVER/GRASSLANDS. BASED ON DATA FROM NORMALISED DIFFERENCE VEGETATION INDEX MAPS



Source: NParks

Similarly, the Public Utilities Board (PUB) has opened up and developed its water bodies for recreational activities. The Active, Beautiful and Clean (ABC) Waters Programme is one such initiative, where the objective is to break down some of the harsh concrete walls of water canals, and landscape them for better integration with surrounding parks and green space. The pilot project, completed in April 2008 along the Kallang River, complements a park connector, and demonstrates how such projects can dramatically transform Singapore's landscape and enhance green and water-based recreational space for the residents.

Skyrise greenery is another example of how we can add new dimensions to the green space in the city. While roof-top and vertical greenery is not a new architectural phenomenon in Singapore, the increasing adoption of skyrise greenery in new iconic buildings such as the National Library Building, and upcoming projects such as the Eco-Precinct by the Housing Development Board (HDB) and the Integrated Resort in Marina Bay augurs well for the development of skyrise greenery in the city. Ongoing research by the National Parks Board (NParks), to identify plants and planting medium to ease maintenance of skyrise greenery, aims

to contribute to developments in this area.

As the population's expectations become more sophisticated, there is a need to develop a wider range of parks and recreational amenities. An important focus of NParks has been to develop our parks into natural gravitational points for play and leisure. While ensuring that ample green space has been set aside to cater to those who seek the pleasure of a simple, idyllic green hideout from

The matrix of park connectors as green links and recreational corridors among parks is one of the ways to expand green space in the city.

the hustle and bustle of the city, we are also selectively developing parks along thematic lines. For instance, the Jacob Ballas Children's Garden at the Singapore Botanic Gardens which opened in October last year was designed as a haven for children below 12 years old. HortPark was officially opened in May 2008 as a one-stop gardening hub for gardening lovers and aspirants. Other projects such as the Fort Canning Park within the city centre will be better connected to the National Museum and the Bras Basah area to improve its vibrancy as a

venue for the arts and culture. The new Sengkang Riverside Park will feature a theme of fruit trees and water recreation, while the upcoming new Admiralty Park will have a nature appreciation and conservation component. There will also be a new extreme skate park for those seeking thrills and excitement within a green setting.

Our biggest commitment is the Gardens-by-the-Bay project. This is a plan to develop three world-class gardens on prime land around the Marina Bay waterfront. The first phase of the project, which is to develop a 52-hectare garden at Marina South, has started and is targeted to be completed by 2011. This project will incorporate groundbreaking ideas aimed at enriching the lifestyles and recreational activities of Singaporeans and tourists through edutainment opportunities in a sustainable garden environment.

So far, some 91% of park users surveyed in 2006 were satisfied with the parks in Singapore. There is also a rising trend of tourists visiting our parks and nature reserves. Surveys by the Singapore Tourism Board show that the Singapore Botanic Gardens ranked sixth in terms of local attractions in 2006. A good measure of how well we develop and manage our greenery plan will be reflected in how well we sustain, and indeed improve, these indicators.

CONSERVING OUR NATURAL HERITAGE

Singapore's rapid re-development as an urban city is matched by increasing calls for urban planners to develop a "soul" for the city. A large part of this will involve retaining the essence or heritage of the old city. Likewise, in developing Singapore as a city in a garden, we are moving beyond paying attention to mere infrastructure to conserving the natural biodiversity in the city.

Given our small land area and the need for economic growth, we have to adopt a pragmatic approach in balancing development and biodiversity conservation. Our aim has been to create a unique conservation model that champions environmental sustainability in a small urban setting. Fortunately, Singapore is a city rich in biodiversity despite our small land mass. The island has some 360 species of birds, which is slightly more than 60% of the 568 species listed in the United Kingdom or 75% of the 467 species found in France. Interestingly, some species thought to be extinct on the island, like the Oriental Pied Hornbill, are now establishing healthy colonies here because of the lush green environment. Nestled in the midst of the Indo-Malayan rainforest (one of three last remaining rainforest blocs in the world), Singapore is well-placed to showcase the richness

of the region's rich botanical biodiversity in an easily accessible urban setting.

It is in this context that the Government adopted the policy to legally protect representatives of key indigenous ecosystems. We have four Nature Reserves, namely, the Bukit Timah Nature Reserve (lowland dipterocarp forest), the Central Catchment Nature Reserve (including freshwater swamp forest), Sungei Buloh Wetland Reserve (mangroves) and Labrador Nature Reserve (coastal hill forest). The Sungei Buloh Wetland Reserve and Labrador Nature Reserve were gazetted in January 2002. Together, the four nature reserves cover more than 3,000 hectares or 4.5% of Singapore's land area. We are probably unique in being one of the few cities with nature reserves within its urban setting. In addition, one of the reserves, the Sungei Buloh Wetland, holds the distinction of being an ASEAN Heritage Park, as well as an important link in the chain of stop-over sites for migratory birds from as far as Siberia.

While the nature reserves are sustainable in terms of size, we also need to ensure their sustainability in terms of quality, that is, the species surviving within them and how they react to the long-term impact of environmental change. The Smithsonian Center for Tropical Forest Science has been conducting research of this nature in

the Bukit Timah Nature Reserve for the past decade. NParks also conducts our own periodic biodiversity surveys of the nature reserves for this purpose. Results from such studies and surveys will help us to formulate management strategies for the long-term sustainability of our nature reserves within our unique urban setting. A major project that is being planned is to create an eco-link over the Bukit Timah Expressway which is located close to the Bukit Timah Nature Reserve to mitigate the negative effects of fragmentation and genetic erosion in the Reserve.

Outside the nature reserves, Singapore's network of green space, streetscape, park connectors and water bodies covers more than 4.5% of our land areas. With proper management, these areas can also be optimised to enhance our urban biodiversity. We have programmes such as the Heritage Tree Programme and Heritage Road Programme to conserve mature trees in the city. One of the projects in the pipeline includes widening the diversity of regional native plant species used in roadside, park and park connector planting. The most recent initiative is a project to set up a dipterocarp arboretum in an urban setting at Yishun Park. We will also need to better build up expertise to create eco-habitats within our urban green space. It is envisaged that with

the right planting schemes, the park connectors can form a matrix of green links for bird movement within our urban setting. Likewise, PUB's ABC programme will provide new opportunities to create water-based eco-habitats in the city.

INVOLVING THE COMMUNITY

To truly realise Singapore's vision of a City in a Garden, it is important that the community shares and takes ownership of this vision and is actively involved in the greening efforts. Many efforts have been made to ensure that NParks' work is supported by the 3P sectors: people, public sector agencies and private corporations. In 2006 alone, more than 1,000 guided walks, educational talks, events and programmes were conducted as part of our outreach efforts in this area.

We are seeing increased public interest and participation in community gardening efforts. The Community-in-Bloom (CIB) programme, which seeks to cultivate a culture of gardening in Singapore, has received very good support. Since its inception in 2005, the programme has inducted more than 250 gardening groups in the community. What has been most rewarding is how this programme has helped to promote gardening as a hobby as well as build friendship and the spirit of sharing in the community. Our next step is to


introduce the CIB-Kids programme. Through partnerships with educators, we hope to inculcate an appreciation for gardening in our young. The Plant-a-Tree programme has also been well-received. Large numbers of individuals and corporations have stepped forward to donate a nominal sum of \$200 to plant a tree and contribute towards the wellness of our living environment.

Within the public sector, the Garden City Action Committee has been the main coordinating vehicle for ensuring that public sector agencies such as the URA, HDB, PUB and the Land Transport Authority are well coordinated in their developmental projects and are aligned to the City in a Garden vision.

In the private sector, the global climate change agenda has also seen more corporations take up environmental programmes as part of their corporate social responsibility. The Garden City Fund was set up in 2002 to allow individuals and corporations to donate to the greening efforts of the Singapore. Increasingly, we have been seeing more private sector companies contribute to this Fund which promotes the environmental cause among consumers.

CONCLUSION

New initiatives to energise Singapore's green space, balance economic development

and environmental conservation, and engage community participation at all levels, will further enhance the vibrancy and soul of our City in a Garden. We can look forward to greener days ahead.² 

Ng Lang has been Chief Executive Officer of the National Parks Board (NParks) since 2006, where he has led the growth of Singapore's garden infrastructure and spearheaded developments in nature conservation and biodiversity. Mr Ng has previously served in various capacities in the Singapore diplomatic service and the public healthcare service.

NOTES

1. This refers to the area covered by greenery. This is based on a study conducted by the Centre for Remote Imaging, Sensing and Processing (CRISP), National University of Singapore.
2. This article was written in April 2008 and since then, our City in a Garden has been further augmented via the release of the draft Master Plan 2008 on 23 May 2008. The key thrusts look towards a transformation into a City of Gardens and Water, where greenery and blue spaces would be increased, extended and pervasive. As outlined in the new Master Plan, greenery will be significantly increased, with proposed park areas being upped from 3,300 to 4,500 hectares, which include new major parks as well. The park connector network will be increased to 360 kilometres of park connectors, inclusive of a 150-kilometre round-the-island loop. A significant proposal will be the harnessing of rustic farmland areas like Kranji and Lim Chu Kang as nature refuges, featuring nature trails, educational programmes, and even waterway boating.



Bruce Katz and Julie Wagner

Transformative Investments: Remaking American Cities for a New Century

“Transformative investments” is a class of urban interventions that is making an impact on markets, people, city landscapes and urban possibilities.

At the dawn of a new century, broad demographic, economic and environmental forces are giving American cities their best chance in decades to thrive and prosper. The renewed relevance of cities derives in part from the very physical characteristics that distinguish cities from other forms of human settlement: density, diversity of uses and functions, and distinctive design.

Across the United States (US), a broad cross section of urban practitioners—private investors and developers, government officials, community and civic leaders—are taking ambitious steps to leverage the distinctive physical assets of cities and maximise their economic, fiscal, environmental and social potential.

A special class of urban interventions—what we call “transformative investments”—is emerging from the millions of transactions that occur in cities every year. The hallmark of transformative investments is their catalytic nature and seismic impact on markets, on people, on the city landscape and urban possibilities—far beyond the geographic confines of the project itself.

Recognising and replicating the magic of transformative investments, and making the exception become the norm is important if US cities are to realise their full potential.

THE URBAN MOMENT

The US is undergoing a period of dynamic change, comparable in scale and complexity to the latter part of the nineteenth century. Against this backdrop, there is a resurgence in the importance of cities due to their fundamental and distinctive physical attributes.

Cities offer a broad range of physical choices—in neighbourhoods, housing stock, shopping venues, green spaces and transportation. These choices suit the disparate preferences of a growing population that is diverse by race, ethnicity and age.

Cities are also rich with physical amenities—mixed-use downtowns, historic buildings, campuses of higher

learning, entertainment districts, pedestrian-friendly neighbourhoods, adjoining rivers and lakes—that are uniquely aligned with preferences in a knowledge-oriented, post-industrial economy. A knowledge economy places the highest premium on attracting and retaining educated workers, and an increasing proportion of these workers, particularly young workers, value urban quality of life when making their residential and employment decisions.

Finally, cities, particularly those built in the nineteenth and early twentieth centuries, are compactly constructed and laid out along dense lines and grids, enhancing the potential for the dynamic, random, face-to-face human exchange prized by an economy fuelled by ideas and innovation. Such density also makes cities perfect agents for the efficient delivery of public services as well as the stewardship of the natural environment.

Each of these elements—diversity, amenities and density—distinguishes cities from other forms of human settlement. In prior generations, these attributes were devalued in a nation characterised by the single family house, the factory plant, cheap gas, and environmental profligacy. In recent history, many US cities responded by making the wrong physical bets or by replicating low-density, suburban

development—further eroding the very strengths that make cities distinctly urban and competitive.

Yet, the US, a nation in demographic and economic transition, is revaluing the quality of life uniquely offered by cities and urban places, potentially altering the calculus by which millions of American families and businesses make location decisions every year.

DELIVERING “CITYNESS”: THE RISE OF TRANSFORMATIVE INVESTMENTS

Across the US, a practice of city building is emerging that builds on the re-found value and purpose of the urban physical landscape, and recognises that cities thrive when they fully embrace what Saskia Sassen calls “cityness”.¹

The move to recapture the American city can be found in all kinds of American cities: global cities like New York, Los Angeles and Chicago that lie at the heart of international trade and finance; innovative cities like Seattle, Austin and San Francisco that are leading the global economic revolution in technology; older industrial cities like Cleveland, Pittsburgh and Rochester that are transitioning to new economies; fast-growing cities like Charlotte, Phoenix and Dallas that are regional hubs and magnets for domestic and international migration.

The new urban practice can also be

found in all aspects or “building blocks” of cities: in the remaking of downtowns as living, mixed-use communities; in the creation of neighbourhoods of choice that are attractive to households with a range of incomes; in the conversion of transportation corridors into destinations in their own right; in the reclaiming of parks and green spaces as valued places; and in the revitalisation of waterfronts as regional destinations, new residential quarters and recreational hubs.

Yet, as the new city building practice evolves, it is clear that a subset of urban investments are emerging as truly “transformative” in that they have a catalytic, place-defining impact, creating an entirely new logic for portions of the city and a new set of possibilities for economic and social activity.

Across the US, a practice of city building is emerging that builds on the re-found value and purpose of the urban physical landscape.

We define these transformative investments as “discrete public or private development projects that trigger a profound, ripple effect of positive, multi-dimensional change in ways that fundamentally remake the value and/

or function of one or more of a city's physical building blocks”.

This subset of urban investments share important characteristics:

- On the economic front, transformative investments uncover the hidden value in a part of the city, creating markets in places where markets either did not exist or were only partially realised.
- On the fiscal front, transformative investments dramatically enhance the fiscal capacity of local governments, generating revenues through the rise in property values, the growth in city populations, and the expansion of economic activity.
- On the cognitive front, transformative investments redefine the identity and image of the city. They effectively “re-map” previously forgotten or ignored places by residents, visitors and workers. They create nodes of new activities and new places for people to congregate.
- On the environmental front, transformative investments enable cities to achieve their “green” potential by cleaning up the environmental residue from prior industrial uses or urban renewal efforts, by enabling repopulation at greater densities to occur and by providing residents, workers and visitors with transportation alternatives.

- On the social front, transformative investments have the potential, while not always realised, to alter the opportunity structure for low-income residents. When carefully designed, staged and leveraged, they can expand the housing, employment and educational opportunities available to low-income residents and overcome the racial, ethnic and economic disparities that have inhibited city performance for decades.

DISSECTING SUCCESS: HOW AND WHERE TRANSFORMATIVE INVESTMENTS TAKE PLACE

The best way to identify and assess transformative investments is by examining exemplary interventions in the discrete physical building blocks of cities: downtowns, neighbourhoods, corridors, parks and green spaces, and waterfronts.

Downtowns

If cities are going to realise their true potential, downtowns are compelling places to start. Physically, downtowns are equipped to take on an emerging set of uses, activities and functions and have the capacity to absorb real increases in population. Yet, as a consequence to America's sprawling appetite, urban downtowns have lost their appeal.

Economic interests, once the stronghold in downtowns, have moved to suburban town centres and office parks, depressing urban markets and urban value.

Across the US, downtowns are remaking themselves as residential, cultural, business and retail centres. Cities such as Chattanooga, Washington, DC and Denver have demonstrated how even one smart investment can inject new energy and jumpstart new markets. The strategic location of a new sports arena in a distressed area of downtown Washington, DC fits our definition of a transformative investment. Leveraging the proximity of a transit stop, the MCI Arena was nestled within the existing urban fabric on a city-owned urban renewal site. The arena's pedestrian-oriented design strengthened, rather than interrupted, the continuity of the 7th Street retail corridor.² Today, the area has been profoundly transformed as scores of new restaurants, retail and bars dot the arena's surroundings. Residents and visitors rely heavily on the nearby transit to come to this destination.

Neighbourhoods

Ever since the physical, economic and social agglomeration of "city" was established, the function of neighbourhoods has remained relatively untouched. While real estate values of neighbourhoods have shifted over

time in response to micro- and macro-economic trends, a subset of inner city communities have remained enclaves of poverty. Victims of earlier urban renewal and public housing efforts, millions of people are consigned to living in neighbourhoods isolated from the economic and social mainstream.

Cities such as St. Louis, Louisville and Atlanta have been at the forefront of public housing (and hence neighbourhood) transformation, supported by smart federal investments in the 1990s. For example, the demolition of the infamous high-rise Vaughn public housing project in St. Louis enabled the construction of a new human scale, mixed-income housing development in one of the poorest, most crime-ridden sections of the city. This redevelopment cured the mistakes made by failed public housing projects, by restoring street grids, providing quality design, and injecting a sense of social and physical connection. Constructing a mix of townhouses, garden apartments and single family homes helped catalyse other public and private sector investments.

What made this investment transformative was that it included the reconstitution of Jefferson Elementary, a nearby public school. Working closely with residents, and with the financial support of corporate and philanthropic interests, the developer helped

modernise the school, making it one of the most technologically advanced educational facilities in the region. A new principal, new curriculum, and new school programmes helped it become one of the highest performing inner city schools in the state of Missouri.

Corridors

City corridors are the physical tissue that knit disparate parts of a city together. In the best of conditions, corridors are multi-dimensional in purpose, where they are destinations as much as facilitators of movement. In many cities, however, corridors are simply shuttling traffic past blocks of desolated retail and residential areas or they have become yet another cookie cutter image of suburbia—parking lots abutting the main street, standardised buildings and design, and oversized and cluttered signage.

Cities like Portland, Oregon and urban counties like Arlington, Virginia have used mass transit investments and land use reforms to create physically, economically and socially healthy corridors that give new residents reasons to choose to live nearby and existing residents reasons to stay.

Portland conceived a streetcar to spur high density housing in close-in neighbourhoods that were slowly shedding old industrial uses. The

streetcars traverse a three-mile route through residential areas, the water front, to the university. Since its construction, the streetcar has not only expanded transportation choices, it has helped galvanise new destinations along its route—including new neighbourhoods, retail clusters, and economic districts.

Parks and Open Space

City green spaces (such as parks, nature trails, bike paths) were initially designed to provide the lungs of the city and an outlet for recreation, entertainment and social cohesion. As general conditions declined in many cities, the quality of urban parks also declined, to the great consternation of local residents. Green spaces were turned into under-used, if not forgotten, areas of the city; or worse still, hot spots of crime and illegal activity. Such blight discouraged cities to transform outmoded uses (such as manufacturing areas) into more green space. In cities with booming development markets, parks failed to be designed and incorporated into the new urban fabric.

Across the US, cities are pursuing a variety of strategies to reclaim or augment urban green spaces. Cities like Atlanta, for example, have created transformative parks from outmoded economic uses, such as manufacturing land along urban waterfronts or by

converting old railway lines into urban trail-ways.

Cities like Scranton have reclaimed existing urban parks consumed by crime and vandalism. This has required creative physical and programmatic investments, including: redesigning parks (removing physical and visibility barriers such as walls, thinning vegetation, and eliminating “dark corners”); increasing the presence of uniformed personnel; increasing the park amenities (such as evening movies and other events to increase patronage);³ and providing regular maintenance of the park and recreational facilities.⁴

City corridors are the physical tissue that knit disparate parts of a city together. In the best of conditions, corridors are multi-dimensional in purpose, where they are destinations as much as facilitators of movement.

Conversely, cities like Austin, Albuquerque and San Antonio have prodded private sector developers to create new parks as the prize of new residential development. These development exactions represent a stark departure from past practice where new housing subdivisions and commercial strips were constructed at a rapid pace, with little thought of parks and open space preservation.

Waterfronts

Many American cities owe their location and initial function to the proximity to water: rivers, lakes and oceans. Waterfronts enabled cities to manufacture, warehouse and ship goods and products. Infrastructure was built and zoning was aligned to carry out these purposes. In a knowledge-intensive economy, however, the function of waterfronts has dramatically changed, reflecting the pent-up demand for new places of enjoyment, activities and uses.

As with the other building blocks, cities are pursuing a range of strategies to reclaim their waterfronts, often by addressing head-on the vestiges of an earlier era.

New York has overhauled the outdated zoning guidelines for development along the Brooklyn side of the East River, enabling the construction of mixed-income housing rather than prescribing manufacturing and light industry uses.

Pittsburgh and many of its surrounding municipalities have embarked on major efforts to re-mediate the environmental contamination found in former industrial sites, paving the way for new research centres, office parks and retail facilities.

Milwaukee, Providence and Portland have demolished the freeways that separated (or hid) the waterfront from the rest of the downtown and city,

and unleashed a new wave of private investment and public activities.

Transformative investments are reclaiming the true urban identity by strengthening aspects of the ‘physical’ that are intrinsically urban—be it density, rehabilitation of a unique building or historic row, or the incorporation of compelling, if not iconic, design.

WHAT IS THE RECIPE FOR SUCCESS?

The following are underlying principles that set these diverse investments apart from other transactions:

Transformative Investments advance “cityness”: Investments embrace the characteristics, attributes, and dynamics that embody “city”—its complexity, its intersection of activities, its diversity of populations and cultures, its distinctively varied designs, and its convergence of the physical environment at multiple scales. Project by project, transformative investments are reclaiming the true urban identity by strengthening aspects of the ‘physical’ that are intrinsically urban—be it density, rehabilitation of a unique building or historic row, or the incorporation of compelling, if not iconic, design.

Transformative Investments require a fundamental rethinking of land use

and zoning conventions: In the midst of massive economic global change, 21st century American cities still bear the indelible markings of the 20th century. In the early 20th century, for example, government bodies enacted zoning to establish new rules for urban development. While originally intended to protect “light and air” from immense overbuilding, later versions of zoning added the segregation of uses—isolating housing, office, commercial and manufacturing activities from each other. Thus, transformative investments require, at a minimum, variances from the rigid, antiquated rules that still define the urban landscape. In many cases, examples of successful transformative investments have become the tool to overhaul outdated and outmoded frameworks and transform exceptions into new guidelines.

Transformative Investments require innovative, often customised financing approaches: Cities have distinctive physical forms (e.g., historic buildings) and distinctive physical visions (e.g., distinct districts). Yet private and even public financing of the American physical landscape, for the most part, is standardised and routinised, enabling the production of similar products (e.g., single family homes, commercial strips)

at high volume, low cost and low quality. Transformative investments, however, require the marrying of multiple sources of financing (e.g., conventional debt, traditional equity, tax-driven equity investments, innovative financing arrangements, public subsidy, patient philanthropic capital), placing stress on project design and implementation. In addition, achieving social objectives often require building innovative tax and shared equity approaches into particular transactions, so that appreciations in property value can serve higher community purposes (e.g., creating affordable housing trust funds). As with regulatory frames, the evolution from exceptional transactions to routinised forms of investments is required to ensure that transformative investments become more the rule rather than the exception.

Transformative Investments often involve an empirically-grounded vision at the building block level: While a vision is not a necessary prerequisite for realising transformative investments, cities that proceed without one have a higher probability of making the wrong physical bets, siting them in the wrong places, or ultimately creating a physical landscape that fails to cumulatively add up to “cityness”. It is easy to find such examples around the country, such as isolated mega-projects

(a new stadium or convention centre) or waterfront revitalisation efforts that constructed the wrong projects, having misunderstood the market and the diversifying demographic.

Telescoping the possibilities and developing a bold vision must be done through an empirically-grounded process. A visioning exercise should therefore include: an economic and market diagnostic of the building block; a physical diagnostic; an evaluation of existing projects; and the development of a vision to transform the landscape. From here, disparate actors (public, private, civic, not-for-profit) will have the best instruments to assess whether a physical project could meet specific market, demographic and physical needs—increasing its chances of becoming truly transformative.

Transformative Investments require integrative thinking and action: Transformative investments are often an act in “connecting the dots” between the urban experiences (e.g., transportation, housing, economic activity, education and recreation), which are inextricably linked in reality but separated in action. This requires a significant change in how cities are both planned and managed.

On the public side, it means that transportation agencies must re-channel scarce infrastructure investments to leverage other city building goals

beyond facilitating traffic. It means that agencies driving a social agenda, such as schools and libraries, have to re-imagine their existing and new facilities to integrate strong design and move away from isolated projects.


Transformative investments are often an act in “connecting the dots” between the urban experiences, which are inextricably linked in reality but separated in action. This requires a significant change in how cities are both planned and managed.

In the private sector, it means understanding the broader vision of the city and carefully siting and designing investments to increase successful city-building and not just project-building. It means increasing their own standards by using exemplary design and construction materials. It means finding financially beneficial approaches to mixed income housing projects and mixed use projects instead of just single uses.

In all cases, it requires holistic thinking that cuts across the silos and stovepipes of specialised professions and fragmented bureaucracies.

BUILDING GREAT CITIES

For the first time in decades, American cities have a chance to experience a

measurable revival. While broader macro forces have handed cities this chance, city builders are also learning from past mistakes. After investing billions of dollars into city revitalisation efforts, the principles underpinning particularly successful and catalytic projects—transformative investments—are beginning to be clarified. The most important lesson for cities, however, is to embrace “cityness”, to maximise what makes them physically and socially unique and distinctive. Only in this way will American cities reach their true greatness. 

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The authors want to thank and acknowledge Andy Altman for his intellectual insights on developing this topic.

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 Opinion

Dodo J. Thampapillai

The Environment as Capital

Following the 2006 Stern report,¹ global warming, climate change and the scarcity of basic resources have become dominant themes in policy forums concerning sustainable development. There is now widespread consensus that these environmental challenges must be explicitly acknowledged in the formulation of development policies. Therefore, the sustainability of cities will very much depend on policy and planning practices that address environmental concerns.

In the case of existing cities, there is a need to modify prevailing practices and in some instances, adopt drastically different practices. With regard to the development of new cities, the objective should be to recognise mistakes made in previous planning and development practices, and adopt governance regimes that offer due recognition to environmental challenges.

Environmental economics plays a fundamental role in developing environmentally-conscious public governance. The central theme of

environmental economics is that nature is capital and that without nature, an economy will not exist. This is because while nature acts as a source of an economy's basic resources, it is also a sink for the economy's wastes. This principle explains why environmental economics is centred on the bio-physical realities of the natural environment. While all standard economics texts confine the concept of equilibrium to and within the economic system, environmental economics takes this concept beyond the economy and exposites the need for a perpetual equilibrium between nature and the economy as the basis for sustainability. The analytics of a sustainable equilibrium does not simply rest on a derived game theoretic bargaining solution, as some might suggest. Instead, it is based on internalising the laws of thermodynamics into frameworks in economics that permit the maintenance of a permanent stock of environmental capital (sources and sinks).

The challenges posed by the scientific realities of the natural environment are

real and formidable. At the risk of oversimplification, these challenges stem from the diminution of nature as both a source and sink. Hence, the survival of cities and communities will depend on how well the sources and the sinks are managed. In most instances, the source and the sink are one and the same. For example, the air-shed provides a community with clean air. At the same time, it is also a sink for the emissions that stem from a wide range of economic activities. Yet the source-sink role of nature is not clearly understood by many policymakers—especially those trained as professional economists. The result: a mistaken set of ideologies and premises that can frustrate meaningful approaches to sustainable development.

IDEOLOGICAL CHALLENGES

The ideological challenges stem from the fact that environmental economics began as a peripheral area of study within the discipline of economics—which is the training ground for a significant proportion of individuals who are tasked with the role of governance. Besides, important frameworks in economics, especially those dealing with production and economic growth, fail to account for the vital role of environmental capital (KN).

In almost all standard economics texts, such as Frank and Bernanke² and

Pindyck and Rubinfeld,³ production is attributed to the role of labour (L) and manufactured capital (KM). However, early neoclassical economics, such as Jevons,⁴ Marshall⁵ and Fisher,⁶ explicated production in terms of not only L and KM but also KN. Marshall's explanation on the role of KN was profound: "... *man does not create things but only rearranges matter*".⁵ Fisher, who was instrumental in setting the stage for the development of capital theory on stocks and flows, relied on the premise that nature is a capital stock that provides a flow of services.

The survival of cities and communities will depend on how well the sources and the sinks are managed.

The omission of KN from the explanation of production in contemporary economics is perhaps due to two sets of reasons. The first is that the formalisation of a theory of economic growth by economists such as Harrod,⁷ Domar,⁸ Samuelson,⁹ Swan¹⁰ and Solow,¹¹ confined the explanation of growth (expansion of production) to L and KM. This simplification—the omission of KN in the explanation of growth—was perhaps premised on the assumption that KN is infinite. The second set of reasons

stem from the belief that technology can persistently offset the scarcity of KN. When the Malthusian notion of “Limits to Growth” surfaced in the 1970s to discuss the consequences of a rapidly growing world population in a world of finite resources, overwhelming counter evidence on the role of technology was presented by the World Bank¹² and Samuelson and Nordhaus.¹³

For instance, Samuelson and Nordhaus stated that:

“The dour Reverend T. R. Malthus thought that population pressures would drive the economy to a point where workers were at the minimum level of subsistence... What did Malthus forget or at least underestimate? He overlooked the future contribution of investment and technology. He failed to realise how technological innovation could intervene—not to repeal the law of diminishing returns but to more than offset it. He stood at the brink of a new era and failed to anticipate that the succeeding two centuries would show the greatest scientific and economic gains in history—a chastening fact, and one to keep in mind while listening to modern Malthusians sing on their baleful dirge.” (pp 854-5)

The net result of these two sets of reasons has been the development of an economics curriculum that

offered very little space for the study of environmental economics, let alone giving it the recognition it deserves. This applies to almost all contemporary economics texts as well. For example, Frank and Bernanke² and Pindyck and Rubinfeld³ devote no more than a few pages to a discussion of environmental issues. As the appreciation of the scientifically-driven linkages between KN and the economy is limited within the economics curriculum, this can lead to mistaken premises which give rise to the emergence of ineffective policies and policy tools. This can be seen in the period between 1970 to the 1980s where the World Bank funded several forest clearing programmes¹⁵ on the premise that growth needs only L and KM. Since then, there has been a reversal of this ideology and the World Bank has subsequently undertaken reforestation programmes accompanied by a transmigration programme for people.

In addition, the Environmental Kuznets Curve (EKC) offers a mistaken premise—namely that continued growth would eventually lead to lower emission loads that demand the sink services of KN. Grossman and Krueger¹⁶ and Shafik¹⁷ have observed that the EKC is an inverted U-type relationship between income levels and the emission of specific pollutants. This suggests that

environmental damages which tend to increase with the onset of economic growth begin to diminish after a certain threshold level of income—estimated to be a per-capita income of between US\$5,000 to US\$6,000¹⁸—is reached. This gives the misguided idea of growth first and the environment later.

The objective is to prevent pollution loads from entering environmental sinks so that the sinks have sufficient time to heal and re-commence the provision of service flows.

Related to the EKC observation is the growing belief that emissions trading markets will reduce pollution levels to acceptable ones, such as those dictated by the Kyoto Protocol. It is certainly desirable, if not essential, to work towards much lower pollution loads compared to present levels. But to contend that emissions trading will resolve global environmental problems and deliver the sustainability of economies is too ambitious and foolhardy. Both the EKC observation and the Kyoto Protocol overlook an important bio-physical reality, which is that the restoration of environmental sinks will not depend on the reduction of marginal pollution loads but a reduction in the cumulative

pollution loads. Global warming and climate change are manifestations of the fact that cumulative pollution loads exceeded threshold levels of environment sink capacities. The implication of this is that governance regimes must seek very different types of policies and practices. It is equally important to appropriately train those who will govern.

CLOSED LOOP SYSTEM

When the importance of cumulative pollution loads is acknowledged, then closed loop production systems will begin to figure prominently in public policies. A closed loop system is one where waste is either recycled as an input into another process or returned to nature as harmless material. The objective is to prevent pollution loads from entering environmental sinks so that the sinks have sufficient time to heal and re-commence the provision of service flows. At least four areas of closed loop production options are evident in many city/urban areas. These are: Sewerage Treatment Systems; Air Conditioning and Heating Systems; Energy Supply Systems; and Innovative Methods of Commodity Development.

Sewerage Treatment Systems

Sanitation and hygiene are not the only issues that surround sewerage treatment. Because this activity eventually relies

on a variety of environmental sinks—oceans, lakes, rivers and subterranean ecosystems—efficient methods of sewerage treatment have far reaching implications for sustainability. In this context, Singapore’s Public Utilities Board (PUB) offers a framework which other cities can emulate. In this city-state, every home is connected to a system where the treatment is so advanced that the recovered water is reusable for both industrial and potable purposes.

The oceans are the world’s largest naturally occurring carbon sink. The sink capacity of the oceans, when restored, could in turn restore balance to the carbon cycle.

Besides the issue of water conservation, it is equally important to note that the extent of treatment renders the residues that get deposited into the ocean sink to be inert. Most coastal cities in the world deposit untreated sewage into ocean sinks on the grossly mistaken assumption that the ocean is an infinite sink. For example, Sydney, Australia pumps out at least 12 million litres of untreated raw sewage into the Pacific Ocean each day.¹⁹ Imagine the cumulative load of pathogenic material that would have accumulated if one tallies all other

coastal pumping stations in Australia and the number of years of this activity. Some would argue that the ocean is not a static body of water and that wave actions and oceanic movements will render the deposits harmless. This may be true if the loads of deposition are small and not continuous over time. However, scientific evidence now indicates that the quality of the Pacific Ocean on the Eastern seaboard of Australia could be seriously compromised. It is this type of practice (amongst others) that has rendered nearly half the Baltic Sea (below a certain depth) to be lifeless.

It is plausible to argue that the sink capacity of all oceans in all continents is compromised owing to improper methods of sewerage treatment. The oceans are the world’s largest naturally occurring carbon sink. The sink capacity of the oceans, when restored, could in turn restore balance to the carbon cycle.

Air Conditioning and Heating Systems

Compared to 20 years ago, every home and building in almost every city is now equipped with either an air conditioner (in tropical countries) or a heat pump (in temperate countries) or a reverse-cycle unit (mainly in temperate countries). Air conditioners generally pump out hot air—depending on the indoor temperature setting—and hence raise the outdoor ambient temperature. Heat

pumps in winter drives out colder air and thereby lower the external ambient temperature.

The sceptics' response would be that the change in temperature prompted by each unit is miniscule relative to the volume of the earth's troposphere. However, if one were to add up the number of homes across the globe and across a period of time, then the cumulative effect is significant. Using the closed loop production system (or at least partially), it would mean searching for home/building designs that would reduce the demand for heating and cooling while at the same time enable the capture of the heat/cold emission for reuse within the home/building. For example, in a shopping complex, the building could be designed such that dry-cleaning establishments receive the hot air exhausts (in tropical countries) and cold rooms for refrigeration receive the cold air exhausts (in temperate countries). In both cases, the partial loop closure reduces the energy demand imposed on the grid.

Energy Supply Systems and Commodity Development

Greenhouse gas concerns have already ushered in several alternative energy initiatives which range between energy saving devices and the development of alternative energy sources to replace

fossil fuels. For example, the Australian firm Oceanlinx has developed a device that converts wave energy into electrical energy; it currently has in place about six urban energy supply projects, each delivering between 5 to 15 megawatts of peak capacity. Entrepreneurs based in the United States (US) are attempting to popularise electric cars that utilise recharging stations on the mobile phone model.

Greenhouse gas concerns have already ushered in several alternative energy initiatives which range between energy saving devices and the development of alternative energy sources to replace fossil fuels.

The closed loop manufacturing model has already permeated business and is reported to have generated revenues amounting to US\$53 billion in 1996 within the US manufacturing industry. There are numerous other examples of environmental innovations. One of the more prominent ones is the Hypercar which uses cheaper and recyclable material for the car exterior and interior, including a combustion system that significantly reduces reliance on fossil fuels and hence reduces toxic emissions.


The building industry has also recently proposed the manufacture of building materials from renewable sources (such as making bricks from pulp and paper) and, at the same time, designing buildings that significantly reduce the demand for heating, insulation and lighting.

ENVIRONMENTAL ECONOMICS AND GOVERNANCE

Governments must choose an appropriate mix of actions so that environmental sinks that have been damaged by years of neglect, false premises and complacency can be restored. While a zero emission regime may prove difficult in the short run, it may be feasible in the long run. The lower end of the time scale given in the Stern report for environmental repatriation is only 50 years. Although this estimate is probabilistic, it is prudent to be aggressive in the search for appropriate measures such as those mentioned in this essay. Some approaches, such as globalising the PUB model of sewerage treatment, could be put in place, perhaps much sooner than global carbon trading markets.

Equally important is the role of environmental economics in guiding the governance regime. When KN is explicitly recognised in the production function, business decisions can be altered to such an extent that voluntary

environmental stewardship by firms could be feasible.

Lastly, the theory of production involving KN must be incorporated within the economics curriculum of training institutions in order to cultivate environmental values and awareness in policymakers. 

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Richard Leete

Human Development and Urbanisation

A critical difference between past and present urban transitions is the impact of globalisation on city growth patterns.

Cities are the main beneficiaries of globalisation—the increasing integration and interdependence of the world's economies. People follow jobs, which follow investment and economic activities. Most are increasingly concentrated around dynamic urban areas of all sizes, but especially capital cities.

The nature of city growth has changed. In recent decades, two patterns

of change have been most salient: the speed of urban growth in less developed countries, and the growth of megacities. While still a major feature, megacities (those with populations of 10 million or more) have not grown to the sizes once projected, accounting for just 9% of the total urban population.¹

There is a high correlation between level of urbanisation and development. The countries and cities of Southeast Asia span a wide range, with Singapore,

Brunei Darussalam² and Malaysia³ being the most advanced, and Laos, Cambodia and Vietnam the least advanced. All countries of the region are expected to attain higher levels of urbanisation and human development. This essay reviews urban population growth and its linkages with human development⁴ and the achievement of the United Nations Millennium Development Goals (MDGs) in the countries of Southeast Asia.

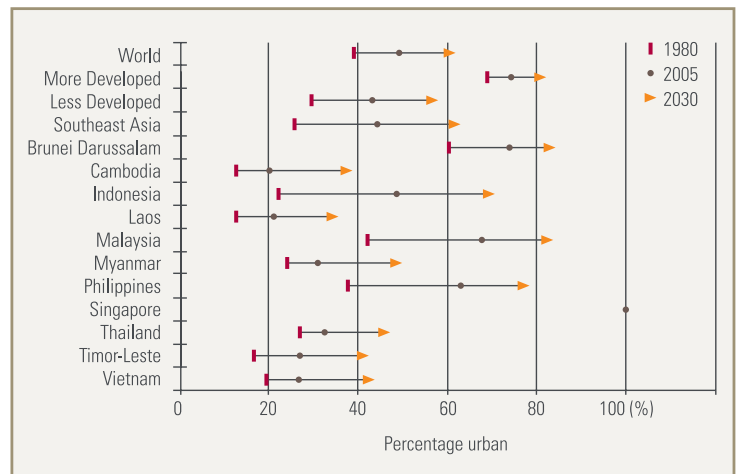
POPULATION GROWTH AND THE NEW WAVE OF URBANISATION

The world is at the point of a significant urban transition. In 2008, the world's urban population numbers, totalling over 3.3 billion, have surpassed the size of rural populations. At the global level, all future population growth will occur in towns and cities, 95% of it in the developing world. These population trends follow expectations given the structural transition of employment away from agriculture and towards urban manufacturing and service industries. Both the number and proportion of urban dwellers will continue to rise rapidly (Figure 1). By 2030, the

world's urban population is projected to grow by 48% to 4.9 billion. In contrast, the world's rural population is expected to decline.¹

Within Southeast Asia, levels of urbanisation have grown sharply over the past 25 years and are expected to continue to rise, particularly for Malaysia, Indonesia and the Philippines (Figure 1). The increases in urban population in the countries of Southeast Asia are part of a second wave of demographic, economic and urban transitions, much bigger and faster than the first in Europe and North America that began in the 18th century. These latter two regions experienced the first demographic transition, the first industrialisation and the first wave of urbanisation.

FIGURE 1. ESTIMATED AND PROJECTED URBANISATION, SOUTHEAST ASIAN COUNTRIES, 1980, 2005 AND 2030. (SOURCE OF DATA: UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, WORLD URBANISATION PROSPECTS: THE 2005 REVISION⁵)



In the past half-century, the less developed countries have begun similar transitions. In both instances, population and economic growth have propelled the urban transition, but the speed and scale of urbanisation today are far greater and the challenges more daunting. Rapidly expanding cities require new infrastructure and communications—including power, water, roads, and commercial and productive facilities—more urgently than cities during the first wave of urbanisation did. Economies must be competitive in terms of infrastructure and technology if they are to succeed in the globalised world of the 21st century.

The second wave of urbanisation is also differentiated by the diminished role of international migration that, in the first wave, had relieved the pressure on cities in the developing countries. Contemporary urbanisation, this time in less developed countries, is driven primarily by natural increase and rural-to-urban migration.

CITIES AS CENTRES OF ECONOMIC AND POPULATION GROWTH

No country in the modern era has achieved significant economic growth without urbanisation. Southeast Asian cities are playing an ever-increasing role in creating wealth, attracting investment, enhancing social development, and

harnessing both human and technical resources for achieving gains in productivity and competitiveness. Urban settlements tend to account for a larger share of national income, outpacing national economic growth. For example, Bangkok, which comprises just over 10% of the total population of Thailand, accounts for more than 40% of the country's gross domestic product.⁶

It is relatively small cities that will absorb the bulk of urban population growth in the foreseeable future.

Cities are key to globalisation, a state of interconnectedness around the globe that transcends and, for many purposes, largely ignores national boundaries. The shrinking of the globe through the continuing technological revolution makes it possible for business enterprises to utilise services from anywhere in the world. Global urban economies rely on advanced knowledge-based services, such as finance, insurance, management consultancy, education, media and advertising.

The cities of Southeast Asia are increasingly providing customer services at competitive rates by drawing on a large and increasingly more educated and relatively low-cost labour force.

Three notable examples of hubs of global activity for specialised services in Southeast Asia are Singapore, which has a major role as an international finance centre, and as sea and air transport hubs; Bangkok, which hosts many regional headquarters for corporations and international agencies; and Kuala Lumpur, which has a multimedia super-corridor, with Cyberjaya and Technology Park Malaysia forming its nuclei.

Huge, sprawling conurbations—megacities and metacities (cities with more than 20 million inhabitants)—have changed the dynamics of urbanisation and the urban economy. People active in both the formal and informal sectors commute long distances to work, to and from densely populated outlying towns or suburbs. In cities such as Jakarta, Bangkok and Manila, and even in the craft and industry villages in Vietnam's Red River Delta, the economic base spreads outwards along urban corridors to peri-urban localities that are cheaper and less strictly regulated. Secondary cities and city systems, often located along these corridors, become interconnected through manufacture and ancillary business enterprises.⁷

Despite the prominence given to large cities, more than 53% of the world's urban population lives in cities of fewer than 500,000 inhabitants, and 60% in cities of less than 1 million.⁵ It

is these relatively small cities that will absorb the bulk of urban population growth in the foreseeable future. The relatively smaller cities are gaining ever more prominence, especially those in the Philippines and Indonesia.

Infrastructure investments in urban areas can be cost-effective. The concentration of population and enterprises in urban areas greatly reduces the unit cost of piped water, sewers, drains, roads, electricity, garbage collection, transport, healthcare and schools. However, the cost-effectiveness of such investments is reduced when they are made too late. For instance, when informal settlements or slums are allowed to proliferate, it becomes more difficult and more expensive to install infrastructure and services because no prior provision has been made for the settlement's development. Moreover, population densities and the spatial configuration of slums often do not allow for the subsequent development of roads, sewerage systems and other facilities that are easy to install in less dense and better-planned localities.

INCREASED HUMAN DEVELOPMENT AMONG CITY POPULATIONS

The concept of cities as islands of privilege and opportunity is supported by indicators on health, education and income, which generally reflect better

outcomes in urban areas as compared with rural areas. However, with increased globalisation, the urban transition is widening gaps between social groups and is making inequality more visible. Large cities generate creativity and solidarity, but also make conflicts more acute.

Severe inequalities within cities are exacerbated by political and social exclusion. One reality of a rapidly urbanising world is the rise in relative poverty in cities brought about by large differentials in income and consumption between the haves and the have-nots. National statistics tend to underestimate levels of urban poverty, which is often relative rather than absolute. Moreover, the measurement of poverty in both rural and urban areas is generally based on income, which does not necessarily provide an accurate picture of the scale and multidimensional nature of poverty. One view is that urban poverty is a transient phenomenon of rural-to-urban migration and will disappear as cities develop, thus absorbing the poor into the mainstream of urban society. This view is reflected in most national poverty reduction strategies, which tend to be rural-focused with the result that interventions have had limited effect in reducing relative poverty, exclusion and inequality in cities.

UN-Habitat's *State of the World's Cities 2006/7 Report*⁶ notes that it is generally assumed that urban populations are healthier, more literate, and more prosperous than rural populations, but in fact the urban poor suffer from 'an urban penalty': urban slum dwellers in developing countries are as badly off, if not worse off than their rural relatives.⁸ Some slums are much worse than others.

Large cities generate creativity and solidarity, but also make conflicts more acute.

However, slums in Southeast Asian cities are less deprived, with only 26% of the slum populations living in conditions of extreme shelter deprivation.⁶ Indeed, the proportion of slum dwellers in Southeast Asian cities has itself declined in recent years.

For example, Thailand has not only managed to reduce slum growth in the last 15 years but has made considerable investment in improving its slums through specific upgrading and prevention policies. The Philippines and Indonesia have managed to prevent slum formation by anticipating and planning for growing urban populations. They have done this by expanding economic and employment opportunities for

the urban poor, investing in low-cost, affordable housing for the most vulnerable groups, and instituting pro-poor reforms and policies that have had a positive impact on low-income people's access to services. Similarly, in Bandar Seri Begawan, Brunei Darussalam, most houses have access to piped water and electricity supplied by public utilities.

As countries become more urban, levels of human development tend to rise. This phenomenon is clearly visible for the countries of Southeast Asia (Figure 2). For example, Malaysia and the Philippines, where urbanisation levels have reached 67% and 63% respectively, have attained or are close to attaining high human development. By contrast, Cambodia and Laos, where urbanisation is just 20%, are a little above low human development.⁹

ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS IN CITIES

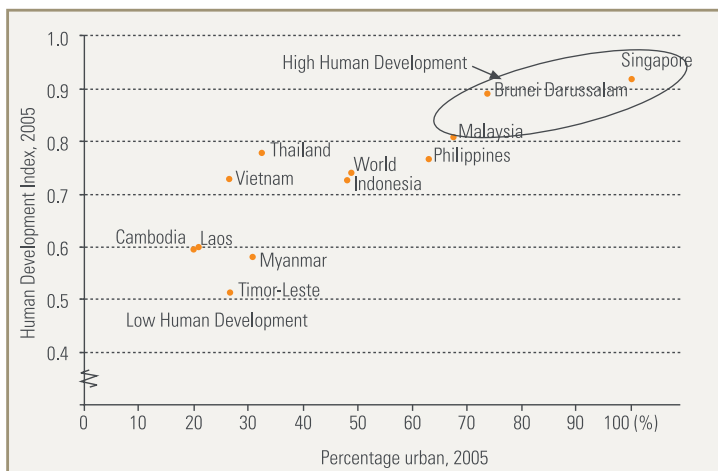
Although cash income is more important in cities than in villages, income poverty is only one aspect of urban poverty. The other indicators of poverty are poor health and lack of education, poor quality and overcrowded shelter, and lack of public services such as piped water, sanitation facilities, and garbage collection, as well as insecure land tenure.

Water, for example, is a scarce and expensive resource for the urban poor.¹¹ It is obtained in small quantities from street vendors, which entails higher unit costs than those incurred by people who have running water in their homes. If there is piped supply, obtaining it may involve long journeys to the neighbourhood standpipe

(commonly by women and girls), long waits, tiring trips back home with full containers, careful storage to minimise wastage, and reuse of the water several times, increasing the risk of contamination.

As levels of urbanisation rise and the benefits of modernisation spread, gender gaps tend to diminish. Thus, in the most urbanised Southeast

FIGURE 2. RELATIONSHIP BETWEEN HUMAN DEVELOPMENT AND THE PROPORTION URBAN, SOUTHEAST ASIAN COUNTRIES. (SOURCES OF DATA: UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, WORLD URBANIZATION PROSPECTS: THE 2005 REVISION;⁵ UNDP, HUMAN DEVELOPMENT REPORT, 2007/08¹⁰)



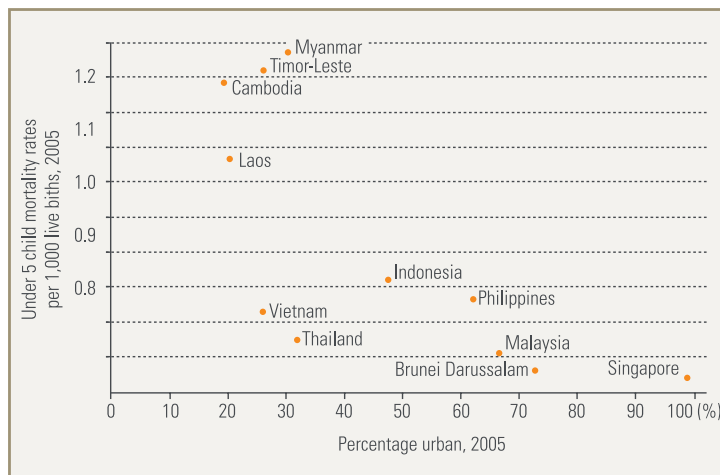
Asian countries, the ratio of girls' to boys' enrolments in secondary school is at, and even above, parity. However, where urbanisation has made limited progress, such as in Cambodia and Laos, the proportion of girls' enrolments in secondary school is much lower than that of boys.

Accessing healthcare, especially reproductive healthcare, is critical for women, not only because of their reproductive function and that they are disproportionately burdened with providing care for the elderly and the sick, but also because they do more to relieve poverty at the community level. Not all urban women have equal access to reproductive healthcare or contraceptive services. For poor women, lack of time, money and freedom to make household decisions, can negate these advantages of urban location. In Southeast Asia, for example, the estimated unmet contraceptive need is 23% among the urban poor, compared to only 16% among the urban non-poor.¹

But, in general, urban populations tend to have better health outcomes than their rural counterparts. In countries where urbanisation levels are highest,

child mortality levels are lowest (Figure 3). This is because access to health services, including clinics and hospitals, as well as the quality of care, tends to be superior in urban areas.

FIGURE 3. CHILD MORTALITY RATES AND PROPORTIONS URBAN, SOUTHEAST ASIAN COUNTRIES. (SOURCES OF DATA: UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, WORLD URBANIZATION PROSPECTS: THE 2005 REVISION;⁵ UNITED NATIONS STATISTICS DIVISION¹²)



PARTICIPATORY URBAN GOVERNANCE

Urbanisation offers significant opportunities to improve human development and achieve the MDGs. Yet, the rapid and often unplanned growth of developing world cities of all sizes poses great challenges for attaining human development goals: these cities must expand the provision of essential infrastructure and services while ensuring that such expansion does not compromise existing living conditions or generate more air pollution.

For example, in Southeast Asian cities such as Bangkok, Kuala Lumpur, Manila and Jakarta, growth of urban traffic is creating serious levels of congestion and unprecedented levels of carbon emissions and pollution. Growing affluence has led to a high concentration of vehicles in Malaysian cities, especially Kuala Lumpur. This has resulted in carbon emissions increasing by 221% from 1990 to 2004, the highest rate of increase among the world's top polluters.¹³ Some cities have implemented urban planning and greening policies aimed at significantly reducing private motorised transport and consequently air pollution.

Other countries have implemented major, long-term slum upgrading programmes. For example, Thailand has focused almost 30 years of attention on low-income housing. Most recently, the construction of 1 million low-income houses in partnership with commercial and public banks, has helped to cut the slum growth rate by an average of nearly 20% a year since 1990.⁶ In 1992, the Thai government created the Urban Community Development Office (UCDO), the largest community-driven programme for assisting the urban poor in the developing world. UCDO extends loans, grants and technical assistance to community organisations and encourages collective bargaining with city and provincial authorities.

How can cities best respond to the inevitability of growing populations and growing affluence? Improved urban governance will need to provide a large part of the answer.¹⁴ "Urban governance" denotes both government responsibility and civic engagement. Generally, it refers to the processes by which local urban governments—in partnership with other public agencies and different segments of civil society—respond effectively to local needs in a participatory, transparent and accountable manner. As urban growth continues, cities need long-term strategies for expected change. The planning horizons of good governance must extend beyond current needs.

In many developing countries, national governments are devolving some of their powers and revenue-raising authority to local governments. This opens up new opportunities for local governments to take a more active role in social and economic development. Attention to human rights and the rise of civil society, along with movements towards democratisation and political pluralism, have also given local-level institutions more responsibility. In Indonesia, decentralisation laws, approved in 1999 and amended in 2004, assign local governments responsibilities for most public functions including service delivery. These reforms promote the development of a clear mandate for

the funding and delivery of education, health services, and public works.¹⁵


Trends supporting localisation and decentralisation are significant because a large proportion of urban demographic growth is occurring in small cities of less than 1 million inhabitants. Local governments have the advantage of flexibility in making decisions on critical issues such as land use, infrastructure and services, and are more amenable to popular participation and political oversight. However, they need significant support from both the public and private sectors as they tend to be under-resourced, under-financed, and lack critical information and the technical capability to utilise it.

CONCLUSION

Continued sustained growth of the Southeast Asian economies and structural changes in the patterns of employment, from agriculture to modern sectors, will inevitably lead to higher levels of urbanisation. Further progress towards the achievement of the MDGs and high human development will require a stronger commitment to the principles

of good governance, including upholding the rule of law; promoting human rights; and transparent, participatory, and accountable decision-making processes. It also requires pro-poor and gender sensitive policies to narrow rich-poor disparities.

“Urban governance” refers to the processes by which local urban governments—in partnership with other public agencies and different segments of civil society—respond effectively to local needs in a participatory, transparent and accountable manner.

City growth provides opportunities for modernisation and cultural enrichment, and accelerates social change. Rapidly growing cities, especially the larger ones, will include various generations of migrants, each with a diversity of social and cultural backgrounds. In a diverse global network of vibrant cities, there needs to be continual adjustment and adaptation to the mix of traditional values and contemporary perspectives of communities and governments. 

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3. *Malaysia: Achieving the Millennium Development Goals: Successes and Challenges* (Kuala Lumpur, Malaysia: Malaysian Economic Planning Unit and United Nations Country Team Malaysia, 2005).
4. Human development is the conceptual approach to development that goes beyond income. Conceptualised by the United Nations Development Programme, human development is a process of increasing people's capabilities and widening choices. The ultimate aim is the realisation of human rights and human freedom.
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8. A slum household comprises a group of individuals living under the same roof in an urban area who lack one or more of the following: durable housing; sufficient living area, access to improved water, access to sanitation, and secure tenure. As the focus of poverty shifts from rural areas to urban centres, the world's one billion slum dwellers are more likely to die earlier, experience more hunger and disease, and attain less education and have fewer chances of employment than urban residents outside slums.

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Opinion

Philippe Legrain

Diversity through Migration

Cities have always been at the forefront of economic and cultural progress: they are laboratories of innovation, hotbeds of enterprise, and forums of mutual exchange. The close proximity of a large variety of other people lies at the heart of their success. Dynamic cities attract go-getting people from far and wide who together come up with new ideas, start new businesses and create new forms of cultural expression that enrich lives. It is that combination of individual self-selection and collective interaction that makes cities great, especially when those who are attracted to a city are becoming incredibly diverse. Nearly half of New Yorkers, who come from over 180 different countries, speak a language other than English at home. In the London Olympics of 2012, as in the Sydney Games of 2000, there will be a local community cheering for nearly every national team competing. In our increasingly globalised world, a growing number of cosmopolitan cities capture the whole world in one place.

NODES OF NEW IDEAS

Cities are often analysed through the lens of trade, where their role as marketplaces for products from near and far is emphasised. While the role of cities as trading entrepôts is vital—think of London or Singapore—it can be misconceived that cities live off the profits of other lands. In fact, cities do not just create value through mutual exchange; they also foster high-productivity activities. While cities do not produce food, and are not necessarily central to manufacturing, they are the birthplace of most new ideas and creative services. Thus cities are both production centres and trading hubs, and their outputs, specifically knowledge and its application, are particularly valuable. Contrary to the notion that cities remove value from rural areas, they are nodes that spread new ideas and prosperity.

The richness of cities does not derive solely from their location, but also grows from the interaction of the diverse people who live there. Cities are central to economic growth in the way they attract and breed success. This is fuelled

by migration to cities, and in turn stimulates further migration. In effect, prosperity in the 21st century derives from the convergence of a diversity of talented people in cities. Creative people are drawn to cities like London and New York because they are exciting and cosmopolitan. According to Richard Florida in *The Rise of the Creative Class*, “Regional economic growth is powered by creative people, who prefer places that are diverse, tolerant and open to new ideas”.¹

The richness of cities does not derive solely from their location, but also grows from the interaction of the diverse people who live there.

Conventional economics makes little allowance for this. Many economic models take no account of location; most derive collective outcomes from aggregating individual attributes which in effect ignore the huge gains from dynamic interactions among diverse people. Mainstream economists attribute the vast majority of productivity growth to a black box called technological change, which they do little to explain. As a result, policymakers underestimate the economic value of diversity, and focus instead on its cultural benefits,

or on second-order effects, such as how to foster increased trade with countries with which the diverse population have cultural ties. The main economic impact of spurring productivity-enhancing innovation is often ignored.

VALUE OF DIVERSITY

Migrants are a ready source of brilliant new ideas. Instead of following conventional wisdom, they tend to see things differently, and as outsiders, are more determined to succeed. A third of the US’ recent Nobel laureates in physics are foreign-born. The contribution of migrants is vast, yet inherently unpredictable. When Sergey Brin arrived in the US as a refugee from the Soviet Union at age six, nobody could have guessed that he would go on to co-found Google. Had he been denied entry, Google would not exist today; and America and the world would not have realised the opportunity that had been missed. Through strict immigration policies, governments have doubtlessly turned away many potential Brins, not to mention deter ambitious individuals from moving at all.

The collective diversity of migrants is also vital. Most innovation comes from groups of talented people sparking off each other—and foreigners with different ideas, perspectives and experiences add something extra to the

mix. A growing volume of research has shown that collective wisdom is a source of new ideas. If there are 10 people trying to come up with a solution to a problem and they all think alike, those 10 heads are no better than one. But if they all think differently, then by bouncing ideas off one another, they can solve problems better and faster. Just look at Silicon Valley: Google, Yahoo! and eBay were all co-founded by migrants who arrived in America not as graduates, but as children. Nearly half of America's venture-capital-funded start-ups have migrant co-founders.

The value of diversity does not apply only in high-tech industries; an ever-increasing share of our prosperity comes from solving problems, such as developing new medicines, computer games and environmentally-friendly technologies, designing innovative products and policies, and providing innovative management advice. In fact, Scott Page explains in *The Difference: How the Power of Diversity Creates Better Groups, Firms, and Schools*² that a diverse team of talented individuals is actually better at solving problems than a group of like-minded geniuses.


As John Stuart Mill rightly wrote this in 1848 in *Principles of Political Economy*: "It is hardly possible to overrate the value, for the improvement of human beings, of things which bring them

into contact with persons dissimilar to themselves, and with modes of thought and action unlike those with which they are familiar... it is indispensable to be perpetually comparing [one's] own notions and customs with the experience and example of persons in different circumstances... there is no nation which does not need to borrow from others."³

Most innovation comes from groups of talented people sparking off each other—and foreigners with different ideas, perspectives and experiences add something extra to the mix.

CONCLUSION

The value of diversity comes into its own in societies that are at the forefront of rapid change. When countries are technologically backward, they can make huge leaps forward simply by copying what more advanced economies are doing. They may benefit from being culturally uniform, since this makes it easier for everyone to move forward in unison. Likewise, in periods when economic change is slow, more homogeneous companies and countries may find it easier to organise themselves efficiently than more heterogeneous ones.

But in advanced economies during periods of rapid economic change such as we are experiencing now, diversity is vital because of the creativity that is generated—and the benefits of the creativity that it stimulates are mostly generated in cosmopolitan cities where different people interact everyday. The benefits of migration and diversity are significant. Ultimately, they are key factors of why cities are a catalyst for innovation and are so economically successful. Thus, countries—and cities—that do not attract newcomers increasingly risk falling behind. Their priority should be nurturing diversity, not trying to stifle it. 

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Bruno S. Frey

Cities, Culture and Happiness

The arts as a means to enhance individual well-being can have an impact on how culture should be encouraged by policy.

CITIES AND CULTURE

Cultural activities have always been closely related to urban living. While some manifestations of culture, such as churches or palaces, can be found in rural areas in abundance, most cultural activities have been undertaken in cities, often in the largest cities of the times. They are seen as loci of cultural diversity and inter-culturality, and therefore of cultural creativity. The concentration of culture in urban areas applies to culture understood in a broad and also in a more narrow sense. This

concentration has been supported by the great increase in megacities (defined as those with a population of more than 10 million people), of which there were only two (London and New York) in 1950, while in 1994 there were already 22 such cities (of which 16 were in less developed regions). In 1950, about 30% of the world population lived in urban areas; this share is expected to rise to 60% in 2025.¹

Culture in the broad sense can be defined in many different ways. It may, for example, be understood to mean an

“expansion of human capabilities and choice” as defined in the UNESCO *World Culture Report*,² or as a “common value system, viewpoints, conventions, rules, ways of life and practices of a certain group of people...”.³ Cities provide an intensive communication network for the meeting of minds; enable easy access to new technologies and the news media; and support creativity by facilitating the interaction of people with different cultural backgrounds and ethnicities.

Culture can also be understood in a *narrower sense*, namely as cultural industries comprising entertainment, the media, radio, TV, printing and publishing, design and advertising. This essay focuses on an even narrower, but generally used, definition of culture as *art* comprising the performing arts (theatre, opera, ballet) and the visual arts (painting, sculpture, music and the like).⁴⁻¹⁵ It seems that the relationship between cities and the arts has been somewhat neglected in scholarly research.¹⁶

A striking economic aspect of the performing arts is the economies of *scale* in production and consumption. In order for a ballet or opera house to be profitable, they require large audiences that are found in large cities. The larger the audience, the lower the total average costs per visitor. In other art forms such as painting or design, the economies

of agglomeration consist more in the economies of *scope* which large cities make possible. The cross-fertilisation of ideas and the creativity produced find its most fertile ground in large numbers of people with different views, interests and backgrounds.

In view of these considerations, it is not surprising that the most important opera houses are found in major cities, often the capital city or the largest city in a country, such as in Paris (Opéra de la Bastille), Vienna (Staatsoper), London (Covent Garden), Milan (La Scala), New York (Metropolitan Opera) or Chicago (The Lyric). The same can be observed for the theatre and ballet.

Painters, sculptors and writers can work in isolated rural areas. Think of Henry David Thoreau, Emily Dickinson, Glenn Gould, John Hughes, Thomas Pynchon or J. D. Salinger. However, it should be noted that they often decide to do that only later in life, after having found their individual style, and after having established themselves in the art community which is based in cities. Important art movements such as impressionism and expressionism have evolved in Paris, and more recent ones emerged in New York.

Museums and art galleries are certainly possible in rural areas but the advantages of agglomeration are nevertheless strong as the most important

museums are located in major cities, for example, the Prado in Madrid, the Louvre in Paris, the Kunsthistorisches Museum in Vienna, the Rijksmuseum in Amsterdam, the National Gallery in London, the Metropolitan Museum in New York or the J. Paul Getty Museum in Los Angeles.

Cities provide an intensive communication network for the meeting of minds; enable easy access to new technologies and the news media; and support creativity by facilitating the interaction of people with different cultural backgrounds and ethnicities.

For similar reasons, the traditional and the modern media as adduced above also tend to be concentrated in large cities. A study by Stefan Krätke on “Global Media Cities in a Worldwide Urban Network”³ analyses the distribution of 33 global media firms with 2,766 enterprise units. The most important media cities in the world turn out to be New York, London, Paris, Los Angeles, Munich, Berlin and Amsterdam; each of these cities is host to between 64 and 185 enterprise units and between 18 and 29 global firms. This set of major “Global Media Cities” is similar to the major cities with respect to the performing arts and museums.

This close connection between cities and culture, the arts more narrowly, has also been made evident by an initiative in the European Union to name each year a “European City of Culture” which, interestingly enough, since 1999 has been renamed “European Capital of Culture”. This was initiated in 1985 and has since received huge prominence. The first cities to carry the title were Athens (1985), Florence (1986), Amsterdam (1987), West Berlin (1988) and Paris (1989). In the year 2000, no less than nine cities were named “European Capitals of Culture”—Reykjavik, Bergen, Helsinki, Brussels, Prague, Krakow, Santiago de Compostela, Avignon and Bologna. This same idea has been taken up in other continents. There are now programmes naming “American Capitals of Culture” as well as “Arab Cultural Capitals”. Obviously, the choices made in Europe and elsewhere have only partially been based on artistic merit; of great importance is a politically “fair” distribution over space and countries. What matters in our context is that this programme identifies cities and capitals, with culture as a fundamental consideration.

HAPPINESS AND CULTURE

For many people, consuming art obviously provides a highly satisfactory

experience. This opinion is supported by the enormous number of people who visit museums and, above all, special exhibitions, and attend the thousands of festivals that are held all over the world. It has to be remembered that nobody is “forced” to visit such a cultural site (except perhaps school children). Rather, people do it willingly and expect to receive some pleasure from such an activity.

Individuals, who consider themselves happy, laugh more, have fewer problems and absences from their workplace, are more sociable and more optimistic.

Modern social science can help us to shed light on the relationship between happiness and the arts due to advances in survey research and statistical estimation techniques. In particular, it is possible to answer the question to what extent people derive satisfaction from artistic activities. Over the last few years, it has become possible to capture the subjective well-being of persons in a satisfactory way.¹⁷⁻²⁰ One of the ways is through large scale surveys. In the following, the German Socio-Economic Panel, generally considered to be the best data source in the world, was used. It is

based on surveying 22,000 comparable persons for their entire lives yielding 125,000 observations. These proceedings allowed changes in life circumstances and preferences of particular persons to be captured over time. To answer the question if and to what extent “art makes people happy”, two survey responses must be combined. It must measure how happy people consider themselves while establishing, at the same time, how often they attend cultural activities.

The survey question with respect to *happiness* is: “Overall, are you satisfied with the life you lead?” The answer to this question captures a long-term and deep-seated evaluation of one’s well-being, which in scientific terminology is called “subjective, self-reported life satisfaction”.²¹ It thus differs from a short-term affect. Those indicating “0” on the scale ranging from 0 to 10 consider themselves “deeply unhappy”, while those indicating “10” are “extremely happy”. Most persons are quite satisfied with the life they lead; the average person chooses values between 6 and 8. The subjective life satisfaction indicated by the respondents corresponds well to objective observations. Individuals, who consider themselves happy, laugh more, have fewer problems and absences from their workplace, are more sociable and more optimistic, and are less prone to attempt suicide.

The next question captures *attendance at cultural activities*: “How often do you attend cultural activities such as concerts or theatre performances during your leisure time?” It was found that almost half the respondents (45%) “never” attended any cultural activity. Thus, the consumption of culture thus does not seem to be very popular in Germany, a country proud to be considered a “nation of culture”. This impression is strengthened when taking into account that 44% of the respondents stated that they attend a cultural event “less than once a month”. Hence, almost 9 out of 10 Germans have little, if any, active contact with cultural activities.

15% of respondents stated that they visit a cultural occasion “once a month” and a minute 1% stated that they do so “weekly”. These figures may well be an over-estimation, as at least some of the respondents tend to state that they attend more cultural events than they actually do so as not to look “uncultured”. These figures indicate that “culture” in the sense of attending artistic activities takes place in an isolated sphere away from the interests of the large majority of the population. Great efforts are needed to change this picture.

Figure 1 shows the results of the surveys on life satisfaction and cultural attendance. Persons who attend cultural events often are more satisfied with the life they lead than those who consume art rarely or never. The positive correlation between happiness and cultural consumption is marked. Those who “never” attended any artistic manifestation have a self-reported life satisfaction of 6.7 (on a scale from 0 to 10). In contrast, those who had attended a cultural event “weekly” reveal a happiness level of 7.3, and therefore indicated that they are much more satisfied with the life they lead.

FIGURE 1. ATTENDANCE FREQUENCY OF CULTURAL EVENTS AND LIFE SATISFACTION, GERMANY 1985–1999 (SOURCE: COMPILED FROM RESEARCH FINDINGS OF THE GERMAN SOCIAL-ECONOMIC PANEL)

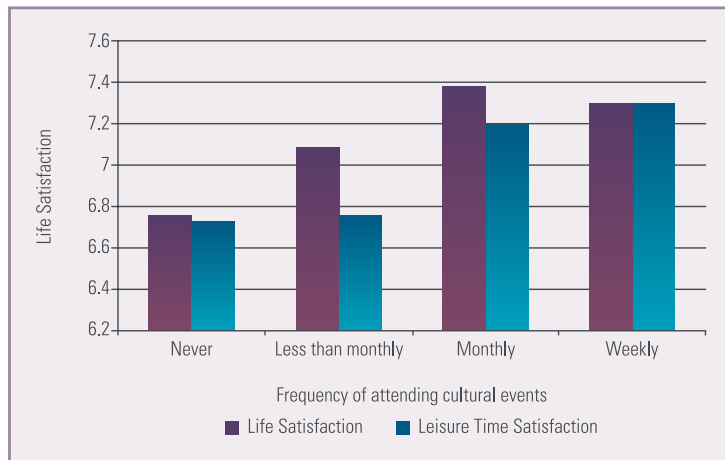


Figure 1 also shows the relationship between artistic consumption and satisfaction with leisure (instead of, as before, with life as a whole). There is again

a marked positive correlation between the two. Those who are culturally active consumers are also those more satisfied with how they spend their leisure time.

DOES CULTURE MAKE PEOPLE HAPPY OR DO HAPPY PERSONS ATTEND MORE CULTURAL EVENTS?

It might be argued that the positive relationship revealed in Figure 1 is due to quite different factors. It could, for instance, be claimed that persons with higher income are happier and attend more cultural activities because they can more easily afford to do so. Both statements are indeed in line with the results of scientific research. Persons with higher income more often report that they are happy than those with lower income. At the same time, it is well-known that mostly persons with above average income visit artistic events. The argument raised must therefore be taken seriously.

A more thorough analysis considers the relationship between artistic consumption and happiness using advanced statistical (or econometric) methods, in particular multiple, simultaneous regression estimates. The empirical results confirm that art is mostly consumed by persons with above average incomes. Even with this fact taken into account, the

relationship graphically shown in Figure 1 is supported: the more artistic events people attend, the more satisfied they are with their lives.

This positive relationship between happiness and culture is good news for the cultural sector and the cultural industries. However, the causal direction remains open. Does attending more cultural events raise life satisfaction, or is the opposite true, namely, are happy people more likely to attend cultural events? So far, scientific research has not been able to answer this question decisively, mostly because the data available are of insufficient quality. Nevertheless, various aspects strongly suggest both causal directions being relevant. Happier persons are cognitively more open, more inquisitive and socially more active, resulting in more visits to cultural venues catering to these preferences. At the same time, it is obvious that art can contribute to an individual's well-being. However, the effect does not necessarily apply to the same extent to all types of art. An individual who attends a deeply pessimistic theatrical play, or visits a museum that shows depressing or even distressing paintings is unlikely to become happier. On the other hand, a beautiful play or an attractive show of paintings is likely to raise people's well-being.

POLICY CONCLUSIONS

The empirical results have been produced with the help of data from Germany. The situation may be different in other countries. This is certainly true and must be left to future research. On the basis of what is known today, it may, nevertheless, be proposed carefully that similar relationships pertain to different countries and regions of the world: persons with higher income exert a higher demand for culture than do people with low income and, at the same time, people consuming culture tend to be more satisfied with the life they lead.

Countries experiencing successful economic development should take into account that their population will exert an increasing demand for cultural activities in the future. The decisive question is in what way culture should be encouraged by policy.

These insights are of immediate relevance for policy. Countries experiencing successful economic development should take into account that their population will exert an increasing demand for cultural activities in the future. The decisive question is in what way culture should

be encouraged by policy. As has been discussed extensively in the Economics of Art, there are many different ways for the government to support the arts. If the state supports the arts through direct subsidies, it makes a decision at the same time about *what kind* of art is supported. This would, for example, be the case if the government subsidises or fully finances the establishment of an opera house. In such a case, only this particular form of art benefits. Art can also be supported by granting *tax reductions* to patrons of the arts. In that case, the preferences of the individual

supporter, rather than those of the government, are decisive. For example, a wealthy person donates \$10 million to establish a museum for impressionist art. Assuming a marginal tax rate of 60%, the donation would cost 40% or \$4 million, but the donor can nevertheless impose his/her preferences on the museum and benefit from the social recognition

that comes with having a museum named after oneself. While the loss of tax income to the state of \$6 million must be borne by the population as a whole (since the money cannot be used for other purposes), it has no say with regard to the funds that are going to the museum. Strict regulations concerning

tax deductibility can change this outcome, but has the disadvantage of an unfortunate bureaucratic interference.


A visionary alternative to direct subsidies or tax reductions would be the establishment of a system of *culture vouchers*. The recipients of these vouchers could be anyone, for example, every resident of a country or all taxpayers; the total value of these vouchers could be freely determined. The recipients could use the voucher as if it were cash to pay for access to art institutions the government deems worthy and puts on a corresponding list. The venues can then cash the vouchers they received at the treasury. As a consequence, the suppliers of cultural services would have a strong interest to offer art experiences the population appreciates; in addition, they would be induced to advertise their services in an attractive way. In contrast to what many people believe, culture vouchers do not necessarily induce suppliers of art to cater to the masses, that is, to produce “popular” art, only. They can also offer art forms appreciated by only a minority that is prepared to spend a large part of their vouchers on these products. One of the strong points of a voucher system is that the recipients of vouchers have a strong incentive to use the vouchers and to attend cultural events rather than to let them go to waste. They serve as a welcome means to

bring the substantial share of people who admit to “never” or “rarely” attending cultural events to start engaging in it. Even if culture vouchers are passed on, culture is associated with value. This establishes a beneficial link between the “culture-absent” part of the population and the arts.

The various ways of supporting the arts differ with respect to how they take into account the increasing demand for artistic events. Culture vouchers reflect most strongly the preferences of the population, while tax reductions do this for a particular group of people, in general high-income recipients who, due to their higher marginal tax rates, profit the most. Direct subsidies shift the decision about what form of art is to be supported to politicians and public officials. The various forms of public support can well be combined, especially for art forms requiring high set-up costs—for instance, opera houses or museums; a part of the total subsidies can be given *ex ante* by a direct subsidy to mitigate the initial financing problems and to provide more planning security for the administrators of the cultural venues.

The finding that the consumption of art raises happiness also has policy implications. It adds a novel answer to the question of why government should support culture. Up to now, the literature on the Economics of Art argued that

the existence of positive externalities, in the form of education, existence, option and bequeath values,⁸ legitimises government intervention. Happiness research points to an additional reason, namely, that attending cultural events increases people's life satisfaction. The consumption of culture is, to a considerable degree, an experienced good, i.e., many persons appreciate the good only after they have consumed it. People are insufficiently aware, and perhaps some not at all, that culture is a source of happiness.²² This fact legitimises the support of the arts for a restricted period of time, until those induced to visit cultural events have become fully aware of the positive effect on their subjective well-being.

This essay demonstrates that cities, culture and happiness are closely intertwined. It also suggests direct consequences worth considering as an important element of a visionary public policy. 

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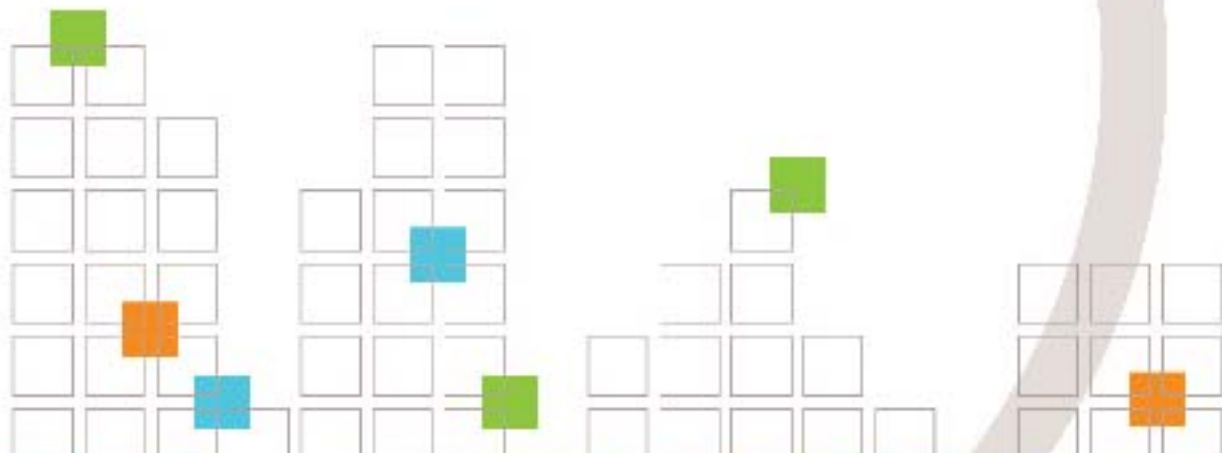
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