By Thomas N. Gladwin

The opening line of A Tale of Two Cities by Charles Dickens portraying life in London and Paris during the French Revolution—"It was the best of times, it was the worst of times"—applies equally well today to the burgeoning cities throughout much of the developing world. Whether it is Lagos, Mumbai, São Paulo, Karachi, or Shanghai, life within or on the periphery of such cities mixes economic opportunity with deprivation, social disorganization, and environmental degradation, revealing a rather doomy and gloomy picture. In the absence of radical efforts to alleviate poverty and to promote environmental sustainability, the lives of hundreds of millions of urban dwellers under the painted scenario, to borrow from Thomas Hobbes’s Leviathan (1651), could become increasingly “solitary, poor, nasty, brutish, and short.”

Urban Population Growth

UN demographers project that the world’s population will increase by 2.5 billion from today to a total of 9.3 billion by 2050, with more than 95% of this growth expected to occur in developing nations. The population living in urban areas is projected to expand by 3.1 billion during this time period due to in-migration, natural increase, and urbanization. Can the world’s cities really massively grow their population in developing countries, predominantly in the low- and middle-income countries of Asia, Africa, and Latin America, may evolve over the next few decades in regard to size, velocity, shape, and functioning.

The big question is whether the urbanization of today and that to come will lead the world toward or away from sustainability. The big question is whether the urbanization of today and that to come will lead the world toward or away from sustainability. Sustainability achieves an optimal scale of resource consumption, the regenerative and absorptive capacities of life-supporting ecosystems and optimal distribution of resources, both within and across generations, based on equity and sufficiency. With scale and distribution established, optimal allocation or division of resources can then be shaped by the logic of market efficiency.

The urban population of developing nations is expected to double to 4 billion people by 2030, increasing at the rate of 70 million per year. The influx of “climate change refugees,” as discussed below, may take these figures much higher. Only 22% of this 9.3 billion will live in cities with more than 5 million citizens; about half of the urban expansion is likely to occur in smaller and newer edge/mill/satellite cities of less than 500,000 inhabitants, which are probably least equipped to effectively manage rapid expansion. The extraordinary scale of urban growth, particularly in Africa and Asia, was recently captured by Enrique Peñalosa, former mayor of Bogotá, at the World Urban Forum 2008.

These two billion new urban inhabitants will require the equivalent of planning, financing, and servicing facilities for a new city of one million people, every week, for the next 30 years.

Population Aging

The demographic transition from high to low fertility and mortality throughout much of the world is producing unprecedented population aging, especially in urban areas. The UN projects that the proportion of people aged 60 and over will increase from about 10% today to over 20% of the total population—two billion people, nearly a third of urban population—by 2050. The aging trend is most advanced in the industrialized world, particularly Europe, but the pace of population aging is most rapid and most pronounced in the developing world. China and India together already account for one-third of the world’s older persons today, but the figure is likely to rise to 62% by 2052 as a result of increasing longevity and rural-to-urban migration. In addition to aging, many cities in Africa and Asia will also be confronting a youth bulge: some 60% of all urban dwellers are likely to be under the age of 18 by 2030. The rapidly declining worker-to-retiree and youth ratio (i.e., the dependency burden) can be expected to strain the fiscal, health, educational, and pension systems currently in operation in most major cities. We can also anticipate the necessity of radical shifts of urban social and physical infrastructure if cities are truly to become caring places for seniors and youngsters.

In this global village, someone else’s poverty very soon becomes one’s own problem. The necessity of radical shifts of urban social and physical infrastructure if cities are truly to become caring places for seniors and youngsters. We can also anticipate the necessity of radical shifts of urban social and physical infrastructure if cities are truly to become caring places for seniors and youngsters.

The Journal of the International Institute / Fall 2008

DOOMSDAY ALERT: MEGACHALLENGES

Continued on page 15

Table 1: “Business-as-Usual” Projections to 2030 and 2050

<table>
<thead>
<tr>
<th>Year</th>
<th>World population (billion)</th>
<th>World GDP (trillion US dollars)</th>
<th>World energy consumption (quadrillion British thermal units)</th>
<th>Urban population (billion)</th>
<th>Urban slum dwellers (billion)</th>
<th>Urban built-up area (km²)</th>
<th>Urban population occupying 100 km² or less (millions)</th>
<th>Urban population (millions) aged 60+ (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2005</td>
<td>6.46</td>
<td>79.1</td>
<td>462</td>
<td>3.1</td>
<td>0.94</td>
<td>400</td>
<td>2.2</td>
<td>0.94</td>
</tr>
<tr>
<td>2025-2030</td>
<td>8.90</td>
<td>117.9</td>
<td>695</td>
<td>4.5-5.0</td>
<td>2.6</td>
<td>1,000</td>
<td>2.7</td>
<td>2.6</td>
</tr>
<tr>
<td>2045-2050</td>
<td>11.2</td>
<td>150</td>
<td>1,000</td>
<td>6.4</td>
<td>5.0</td>
<td>2,000</td>
<td>3.9</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Notes:
- GDP: Organisation for Economic Co-operation and Development (OECD), million square hectometers.
- Energy: Energy Information Administration, Washington, DC.
- Urban population: UN-Habitat, billion.
- Urban slum dwellers: UN-Habitat, billion.
- Urban built-up area: World Bank, million square hectometers.
- Urban population occupying 100 km² or less: World Resources Institute, million.
- Urban population (millions) aged 60+: UN Population Fund, billion.

Urban Physical Expansion

No fewer than eight “megaforces” have been identified as the major drivers of urban growth over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.

Freshwater Stress

The world’s freshwater resources are under rapidly growing pressure. Global freshwater use has tripled over the past 50 years, and demand for water resources is growing at twice the rate of population growth. Long-term per capita water availability has dropped by a third since 1960, and two-thirds of humanity inhabit areas that today would be termed arid in terms of rainfall. The UN conservatively estimates that 1.1 billion people still lack access to water service supplies, and 2.6 billion lack sanitation facilities. World population is expected to increase by 2.4 billion people by 2050, so the already severe pressures on water supplies continue, as they are sprawling throughout coastal zones creating seemingly endless urban-zone corridors, such as the Boston to Washington, D.C., corridor in the U.S. northeast. Estimates of future coastal population growth vary widely, ranging from 750 million to over 4 billion by the next two decades. As explored below, the potent mix of climate change-induced storms and sea-level rise, along with severe water scarcity (coastal zones currently have less than 10% of global renewable freshwater supplies) and exponential degradation of fragile coastal ecosystems, could profoundly reduce the attractiveness of coastal living in the near future.
New Mobility Solutions continued from page 7

Fuel taxes, car-share or bike-share vehicles, and in some cases, day care, satellite offices, cafés, restrooms, showers, shops, and entertainment. In some regions this is all brought together for you by a cell phone or PDA that offers real-time information on arrival and departure times and availability, as well as access to information on local restaurants, shops, services, maps, and guides. The PDA might also allow you to quickly and easily pay for these affordable modes and services with just a single wave past the reader.

The beauty of the hub network is that you can transfer seamlessly from one mode of transportation to the other, informed of schedules and options all the way, either by public kiosks or through your cell phone, or even through better signage in areas that are not fully technologically served. The approach favors use of the best mode for the purpose, gaining access to car share at one hub and dropping it off at another to pick up a waiting bus or train or bike.

The Ford/SMART hub network pilot programs build on a foundation developed and applied by Michael Glotz Richter in the city of Bremen, Germany. Although each pilot program has its own special needs and advantages and may be more or less technologically based at present, there are also common benefits across pilots.

For the user, hub networks connect a convenient and integrated set of services, products, and technologies door to door. For the developer of the system, unlike traditional transportation mega-projects, hub networks are scalable, starting with what already exists and connecting the dots as budget and inclination materializes. Since the key is connecting rather than competing interests, the process and the product includes rich and poor, a range of backgrounds and needs, urban and suburban, policy and practice, public sector and private sector, and short- and long-term timescapes. Thus, while land use and policy can benefit hub networks, they are not a prerequisite for getting projects off the ground. Hubs can be located at parking lots, train stations, condos, churchyards, or on public land, a great deal can be done with very little recourse to urban grid. As with the energy grid and the information technology network, the hub grid provides resilience and redundancy in the event that part of the system goes down, whether due to climate change, a terrorist event, or a smaller-scale system failure.

For the collaborative owners and operators of the system, hub networks—new Mobility in general—offer a wide range of business and innovation opportunities and foster new roles for business and government, moving from public-private partnership to a flatter public-private innovation. This approach brings all the relevant players to the table from the beginning to foster a collaborative problem and solution definition in addition to collaborative implementation. Therefore, while the Ford/SMART pilot projects aim to address transport challenges locally, they also provide opportunities for local entrepreneurs and businesses to identify and develop innovations that can be exported globally.

Mooting Minds

New Mobility can substantially support and shape urban revitalization and significantly improve quality of life and environment in cities around the world. At the same time, it can open up a wealth of business and employment opportunities—locally and globally. But this evolution is not without obstacles. Increased motorization and the high social and spatial status of vehicles in developing countries, along with seemingly unstoppable urban sprawl in the West, are challenges that need to be tackled on psychological and cultural as well as infrastructural and economic levels. Progress toward a positive, integrated, and sustainable future for urban transportation will require more than moving people and goods. It will also involve the complex task of moving hearts and minds. In partnership with SMART’s growing global learning community, its leaders are committed to bringing their unique multi-disciplinary systems- and solution-based expertise to the challenge of moving people, moving minds, and moving cities of the future.

Susan Zelnik is Managing Director of the University of Michigan’s SMART program, a project of CARSS, and a Lecturer in Urban Planning for the Taubman College of Architecture and Urban Planning. David Berdish is Manager of Sustainable Business Development at Ford Motor Company.

To see a complete reference list for this article, please visit the website of The Journal of the International Institute at http://quod.lib.umich.edu/