

UNECE RPM for Rio+20, Geneva, 1–2 December 2011
Agenda item 5 (panellist)

Living Cities for Sustainable Development

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I am pleased to speak today about our sustainable cities research program at Harvard Business School. We have collected data from government, financial, philanthropic, academic, non-profit, and technology organizations. From this, we conclude that sustainable urban development must be a top priority area for the UN Conference on Sustainable Development in Rio.ⁱ It is urgent that we focus on improving the sustainability of the built environment in cities. Failure to do so will result in an accelerating consumption of scarce resources as well as an accelerating degradation of the quality of life on our planet. In support of this, we must also engage in inclusive, life-affirming discussions of these opportunities. Language matters and I will argue that the currently popular term “Smart Cities” is profoundly limiting and should be replaced with the term “Living Cities.”

Why Cities Matter

The Earth Summit in 1992 set sustainable urban development as a priority. Today, it is more important than ever. Urbanization and environmental threats have both accelerated. Progress in sustainable development since 1992 is tangible but by no means fast enough. In particular, construction substantially lags other industries in achieving productivity gains. This is a wasted opportunity. A 2011 McKinsey study on resource productivity placed improved building energy efficiency **first** in the top 15 of 130 opportunities. The report identifies the potential to save almost \$700 billion by 2030 by implementing energy efficient buildings.

Meanwhile, United Nations (UN) forecasts have predicted that most new building will occur in or near cities. Global population is expected to grow to 9.1 billion in 2050, and to grow increasingly urban, shifting from 50% today to 70% urban in that time. This implies a staggering 2.9 billion new urban residents.ⁱⁱ At nearly 3.4% of United States GDP in 2010ⁱⁱⁱ, construction is a large industry and is likely to grow globally to accommodate new urban populations. Cities – and their constituent buildings – encompass the largest and fastest growing concentration of natural resource consumption and are, consequently, a natural place to focus sustainability efforts.^{iv}

In sum, it is increasingly clear that cities will play a central role in sustainable development. Against this backdrop, the notion of “Smart Cities” has achieved growing awareness in the technology and business communities. I offer an alternative term, along with a taxonomy of four types of infrastructure to engage a

wider and more diverse conversation about the future of sustainable urbanization.

Why Language Matters

What's wrong with the term "Smart Cities"? Our informants believe the term is too restrictive; it fails to convey the aspirational and human aspect of sustainable cities. It connotes efficiency but not humanity. It conveys an overly "top-down" command-and-control approach to change.

Research shows that language shapes meaning and compels (or inhibits) action. We believe that inclusive shared terminology to discuss more viable cities can be a stabilizing force in a fertile environment filled with noise. Simple terms will promote positive attention and growth in this critical sector – building confidence in financial markets, and helping to build a shared vision among diverse players from the government, real estate, construction, banking, scientific, urban planning, and technology sectors. How we talk about cities influences the kinds of cities we build. Global technology companies have used terms such as, Smart + Connected Communities (Cisco), Smarter Planet (IBM), and Livable Cities (Phillips).

We offer the term "**Living Cities,**" to convey dynamic, evolving, connected, open, inclusive, efficient, resilient cities. These concepts guide our thinking with respect to four key infrastructures -- **social, economic, environmental, and technological** -- that are integral to building, retrofitting, and managing cities in the 21st century. "Infrastructure" refers to both physical and organizational systems needed for a community to function. The first three comprise the so-called triple bottom line of sustainable development – social, economic, and environmental. The fourth, the technological infrastructure, is a relative newcomer to the discussion of sustainable development.

Social Infrastructure requires innovative approaches to creating thriving communities that maximize **human capital** (education, expertise, knowledge, and skills) and **social capital** (meaningful, vital relationships among people that comprise cultural resources).

Economic Infrastructure thrives when jobs are plentiful and diverse and markets function well. Successful economic infrastructures require government participation, and innovation.

Environmental Infrastructure is strengthened by density. The literature recognizes the importance of proximity in urban design. Greater density leads to efficiencies in energy, water, and transportation. Innovative mixed-use designs allow people to live, shop, and work proximally, reducing commuting costs and time, and increasing social connectivity.

Technology Infrastructures are developing rapidly. Innovation is transforming the performance of materials, communication, data use, and energy. Since 1992, the

ability to monitor the built environment with sensors and use data analysis to make decisions has grown by leaps and bounds. This has the potential to influence all aspects of future life in cities: the ability to respond to emergencies; better and more fair law enforcement; monitoring energy consumption; offering efficiencies in water use, building management, and creating transportation grids that enable mobility without fossil fuels.

An innovative approach to developing the technology infrastructure of future cities was recently prototyped by European technology company, Living PlanIT, as the Urban Operating System (UOS). The UOS is a system of networked sensors and software intended to improve performance and efficiency in the built environment by reducing waste, improving safety, and enhancing the quality of life in cities. It brings information technology to the challenges of connecting the social infrastructure; enhancing the economic infrastructure, and supporting the environmental infrastructure. In doing so, it improves quality of life and makes cities more livable.

These four infrastructures present vital areas of overlapping concern among them. Consider the three intersections that involve technology, the infrastructure that I emphasize here because of its role in transforming urban possibilities.

(1) Economic and technological infrastructures share the goal of promoting innovation to produce new technologies and services, and corresponding new jobs.

(2) Environmental and technological infrastructures intersect in the development of green technologies – for example new, better ways to generate, capture, and use energy; to reduce carbon; and the invention of new materials that dramatically lower the energy use of buildings.

(3) Social and technological infrastructures intersect with the use of social media, such as blogs and crowd-sourcing. Distributed technologies engage citizens in reporting problems and offering solutions to the community. Increasingly, the new information technologies are all about participation.

In closing, we believe that discussions of sustainable urbanization will benefit from the incorporation of a shared vocabulary that reflects urban concerns with energy, light, water, well-being, creativity, sufficiency, and happiness. For this, we propose the term “Living City” which is based on four infrastructures and the application of emerging technologies for the design and operation of new and existing cities be fully evaluated for their potential to contribute to sustainable urban development in the framework of UNSCD. The potential for **Living Cities** to learn from each other is enormous. Sustainable development can give rise to interconnected cities in an encircling necklace of sustainability around our magnificent planet.

I would also like to invite delegates to the side event about smart cities this afternoon.

NOTES

ⁱ Sustainable Development is defined by the World Commission on Environment and Development's (the Brundtland Commission) report *Our Common Future* (Oxford: Oxford University Press, 1987) as "*Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"

ⁱⁱ "World Urbanization Prospects: the 2009 Revision." (New York, NY: United Nations, 2010), 1.

ⁱⁱⁱ Due to the construction industry's inherent fragmentation, the percent of U.S. GDP it comprises is difficult to determine. Regardless of the inclusivity of figures, however, construction as a percent of GDP has steadily declined since 2006, when it was 4.9% of U.S. GDP. "Gross-Domestic-Product-(GDP)-by-Industry-Data" U.S. Bureau of Economic Analysis. June 2011. Available at http://www.bea.gov/industry/gdpbyind_data.htm

^{iv} David Dodman. "Blaming Cities for Climate Change? An Analysis of Urban Greenhouse Gas Emissions Inventories." International Institute for Environment and Development, (California: Sage Publications, 2009) 3-4.