

NEW MOBILITY SOLUTIONS FOR URBAN TRANSPORTATION

By Susan Zielinski and David Berdish

In the summer of 2007, the Tate Modern's Global Cities exhibit in London publicly marked an urban threshold recently crossed: for the first time in history, one out of every two people on the planet is living and moving around in cities. This already proves challenging for those whose job it is to make sure the urban half can move around and gain access to their daily needs, preferably safely, sustainably, equitably, and affordably.

But some time leading up to 2025 when that figure climbs to two-thirds of a significantly larger population and when at least 35 world cities have a population of more than 10 million, things begin to get really interesting.

The implications and opportunities of this transformation for cities, transportation, and business were the impetus behind the University of Michigan's SMART/CARSS¹ teaming up with Ford Motor Company in 2005 to focus on integrated, multimodal transportation in cities, otherwise known as New Mobility. Since that time, SMART and Ford have catalyzed pilot "hub network" projects in Chennai and Bangalore in India, as well as in Cape Town, South Africa, and are currently developing projects in a number of U.S. cities. Working with the University of Michigan, Ford started by transforming its own business model, moving from selling cars and trucks to selling cars, trucks, and urban mobility (Ford Urban Mobility Networks). As Bill Ford, executive chairman of Ford Motor Company, put it:

Don't assume we're always going to be in the car business. We're going to be in the transportation business, and it's going to look very different 20, 30, or 50 years from now. The notion is you don't have to have ownership of a vehicle, you just want to get from point A to point B. You may have a car, a bicycle, a moped, and we at Ford and others are going to help you do that.

Sue Cischke, senior vice president of Ford Sustainability, Environment and Safety Engineering, put it this way:

How are we going to move these people? I see that as one of the things I'll be working closely with Bill on, because it is a societal issue that will factor in how Ford Motor can be positioned for the next 100 years or so.

But beyond its own transformation, Ford is playing a leading role in accelerating the development of an emerging global New Mobility industry that embraces and connects a much wider range of sectors beyond manufacturing, including IT and geomatics, energy and utilities, logistics, real estate and design, finance and venture capital, and retail, tourism, and new entrepreneurial services.

Where Need and Opportunity Meet

It might seem odd at first that one of the world's leading automakers would want to engage in an effort aimed at curbing the use of single occupancy vehicles, and then share a major emerging market with other, seemingly disparate sectors and businesses. But on closer examination, learning and developing a new urban market to complement vehicle manufacturing begins to make sense, especially now, not only in terms of future business opportunity but also in terms of survival.

Ford's interest in urban mobility challenges is consistent with its legacy—the company that transformed personal mobility in the twentieth century wants to influence how it will be made available in the twenty-first century. Ford is a solid citizen in the communities where it operates: it provides employment and local economic development, and this work is an extension and enhancement of its sustainability efforts. What's more, Ford's history, tradition, trustworthiness, experience, and competencies in vehicle manufacturing, logistics planning, IT, and global infrastructure challenges make it uniquely qualified to play a leadership role in the development of urban transportation solutions.

More broadly, the fast-growing need and therefore market for innovative, integrated urban mobility and accessibility solutions are no longer in question. A recent study by the National Academy of Engineering (NAE) looked at the "grand challenges" of engineering for the twenty-first century and placed urban infrastructure, in particular transportation, high on the agenda:

Engineers of the 21st century face the formidable challenge of modernizing the fundamental structures that support civilization. The problem is particularly acute in urban areas, where growing populations stress society's support systems, and natural disasters, accidents, and terrorist attacks threaten infrastructure safety and security. . . . Furthermore, solutions to these problems must be designed for sustainability, giving proper attention to environmental and energy-use considerations (though cities take up just a small percentage of the Earth's surface, they disproportionately exhaust resources and generate pollution), along with concern for the aesthetic elements that contribute to the quality of life (NAE 2008).

But it is becoming more universally clear of late that the most commonly pursued solutions don't fully address urban transportation's increasingly complex human, physical, and political context. For example, alternative fuels alone, while focused on environmental concerns, do not address the land-use, health, infrastructure supply, or safety implications of strictly single-occupancy auto-based approaches. Pricing alone as a disincentive to car use without providing affordable and practical options only adds to the economic burdens of the working poor and elderly on fixed incomes. In this context, NAE emphasizes integrated "systems-based" solutions:

Streets and highways will remain critical transportation conduits, so their maintenance and improvement will remain an important challenge. But the greater challenge will be engineering integrated transportation systems, making individual vehicle travel, mass transit, bicycling, and walking all as easy and efficient as possible. An increasingly important question is the need to provide better access to transportation for the elderly and disabled (NAE 2008).

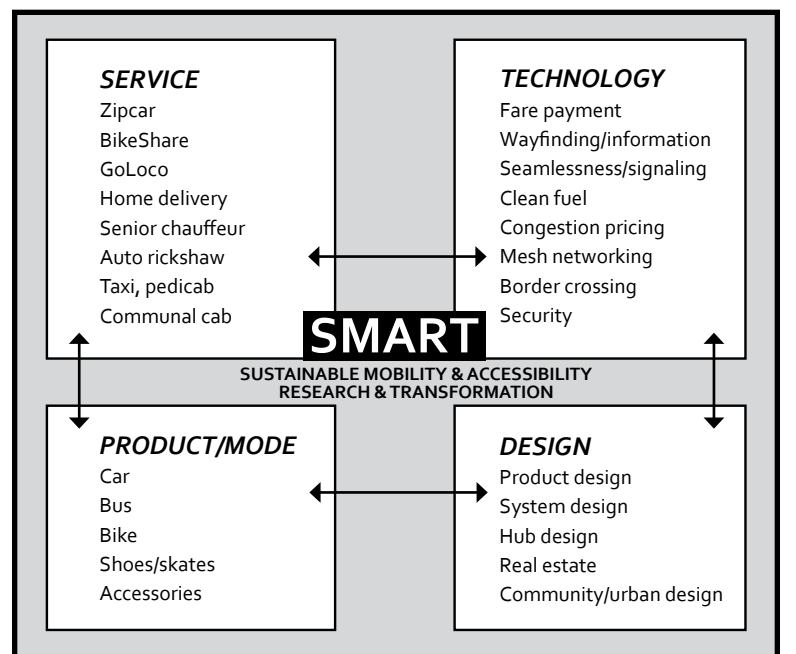
In response to these more complex and multifaceted needs, there is no shortage of innovation. In fact, a groundswell of innovation is arising worldwide to go beyond conventional solutions to address the gap with new services, products, transport modes, technologies, and designs.

Connectivity is Key

Despite the proliferation of possible solutions, these innovations are too rarely linked in a way that can provide a convenient, practical door-to-door trip for the user. The next generation of urban transportation is about connecting the dots, bringing these diverse innovations together in ways that actually work better for users than the single-occupancy vehicle, whether they live in a context of rapid economic growth or instability and decline. What will these new systems look and feel like? Much like our personalized telecommunications portfolios have evolved to connect iPod, laptop, desktop, search function, GIS, cell phone, and more, the next generation of urban transportation is about seamlessly linking different modes of transportation, services, IT technologies, and designs and infrastructures to provide integrated "open source" urban transportation portfolios.

Imagine a day when, steps from your door, or even inside your home or office, you could enter a vital network of New Mobility Hubs, places near you that connect a whole range of transport amenities including buses, trains, streetcars, clean-

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From top: Population density molds designed by Pentagram at the Global Cities exhibit, Tate Modern, summer 2007. The models compare the number of people living within the administrative boundaries of Cairo, London, Mexico City, and Mumbai. They range from the high-density of Cairo (upper left) and Mumbai to the more dispersed, but bounded London and the sprawling Mexico City. BEN TERRETT/www.benterrett.com. Auto rickshaws jostle for position on the roads outside of a crowded downtown bazaar in Hyderabad, India. DAVID LAI. U-M's SMART/CARSS teamed up with Ford in 2005 to focus on integrated multimodal transportation, connecting technology, services, products, and design (diagram). Hub networks link different modes of transportation services, allowing consumers to transfer seamlessly from one mode to another. KYLE LAWSON

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MEGACHALLENGES CONFRONTING URBAN MODERNITY *continued from page 15*

charted in figure 1 highlight the extraordinary dynamic complexity (i.e., separation of cause and effect in time and place) at work in the forces of global urbanization. While detailed analysis lies beyond the scope of this brief article, the “patterns that connect” suggest some foundational insights about the probable future of developing nation cities. First, while every megaforce in the system is both causal and consequential, some of the forces appear to be more potent in driving system behavior. The interactive forces of urban population and physical growth approaching or exceeding the limits of freshwater availability, carbon sequestration capacity, and ecosystem integrity emerge as the fundamental drivers of the fate of the whole system. Other forces such as population aging, slum growth, and coastal densification are largely consequences of the driving forces or other variables lying outside of this eight megaforce system, such as medical care improvements.

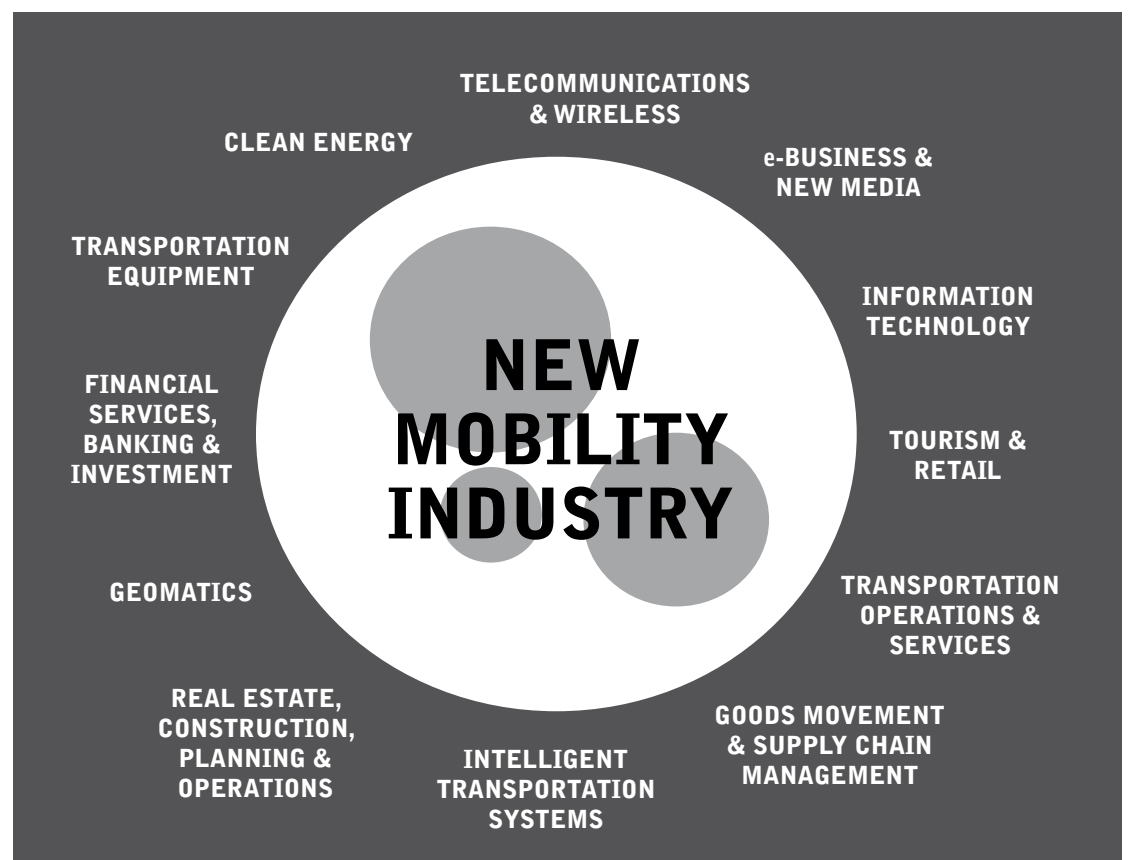
A major implication is that long-lasting improvements in the healthy functioning of a complex system rarely emerge from palliative solutions targeted at consequences, for example, boosted social safety nets for those in poverty, while the fundamental drivers of such consequences are still exponentially in force. Secondly, some two-thirds of the relationships and derivative causal loops portrayed in this system move in the same causal direction, implying a very powerful, self-reinforcing, accelerating, and policy-resistant vicious cycle of dysfunctional and unsustainable urbanization. The only substantive balancing or regulating causal loops bringing stability to the system are either weak or quite delayed in effect, such as long-term increases in environmental stress-associated mortality or morbidity, reducing aging and population size, and therefore urbanization.

Our cursory trend and systems analysis, in the absence of profoundly pro-poor/female/youth/livelihood/renewable energy/compactness/eco-efficiency/self-sufficiency/adaptive-capacity policies and interventions, portends cities of “darkness rather than light” as once imagined by urban futurists. Under this scenario, cities in the urban world over the next few decades will grow older, younger, poorer, and more divided, and the resources available to city dwellers will grow more scarce and costly. The physical structure of cities will simultaneously grow more sprawled and crowded, and the living conditions in cities will become much hotter, drier, contagious, insecure, and conflictive. With substantial delays, as illustrated in figure 1, the forces of devastating climate change and explosively unstable slum growth could combine to radically reduce livability in coastal urban regions, leading to pressures for a massive migratory shift toward more climate-resilient, water-plentiful, socially secure, and economically prosperous inland and higher ground . . . such as Ann Arbor! Whether the world permits or attempts to block this rational and powerful search for human security will surely induce a wave of unanticipated consequences. Moving forward, our only hope as citizens and scholars is to abide by the wisdom suggested by Antonio Gramsci, the Italian philosopher and revolutionary: “The challenge of modernity is to live without illusions and without becoming disillusioned.”

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This article is adapted from an academic address at the June 2008 “New Mobility” conference organized by the University’s Sustainable Mobility and Accessibility Research and Transformation [SMART] project.



The emerging New Mobility industry comprises a range of sectors, beyond what is traditionally considered the transportation industry, including IT, clean energy, logistics, real estate, financial services, and more. This approach offers a wide range of business and innovation opportunities and fosters new roles for business and government, bringing all the relevant players to the table to foster a collaborative problem and solution definition in addition to collaborative implementation. SUSAN ZIELINSKI

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-fuel taxis, and 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 megaprojects, 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 timescales. 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, but not a great deal of land is required for each hub. 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—and 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.

Moving 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 status it represents 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 multidisciplinary systems- and solution-based expertise to the challenge of moving people, moving minds, and moving cities of the future.

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