CONNECTING AND TRANSFORMING THE FUTURE OF TRANSPORTATION:

A Brief and Practical PRIMER For Implementing Sustainable Door-to-Door Transportation Systems In Communities and Regions World-Wide

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SMART Sustainable Mobility & Accessibility Research & Transformation

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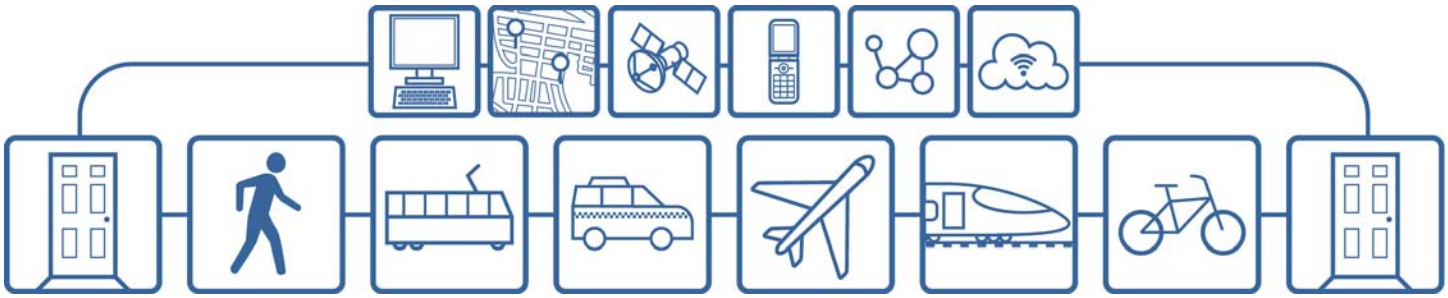

SMART Sustainable Mobility & Accessibility Research & Transformation

RESEARCH
EDUCATION
COLLABORATION

advancing next generation sustainable transportation systems and the emerging global New Mobility industry

um-smart.org & um-smart.org/blog

SMART is a project of the University of Michigan Transportation Research Institute (UMTRI) and the University of Michigan Taubman College of Architecture and Urban Planning (TCAUP)

Sustainable Mobility and Accessibility Research and Transformation (SMART) undertakes research, demonstration projects, education, and global learning exchange on a range of issues related to the future of transportation in city regions around the world.

Action for sustainable transportation is especially important now, as accelerating urbanization, population growth, globalization, and demographic shifts reinforce transportation and development patterns that threaten climate, environment, biodiversity, energy security, social equity, productivity, urban economies, and the quality of our lives. Recognizing the complexity of the challenge and the sophistication of the innovation required, SMART takes a systems approach to urban mobility and accessibility. We work with local and international partners from diverse sectors and disciplines to understand and develop new theoretical perspectives, and to generate practical, innovative solutions that tell a holistic and hopeful story for the future of communities and regions and the people in them.

For more information, see http://um-smart.org/blog and smartumich@ning.com

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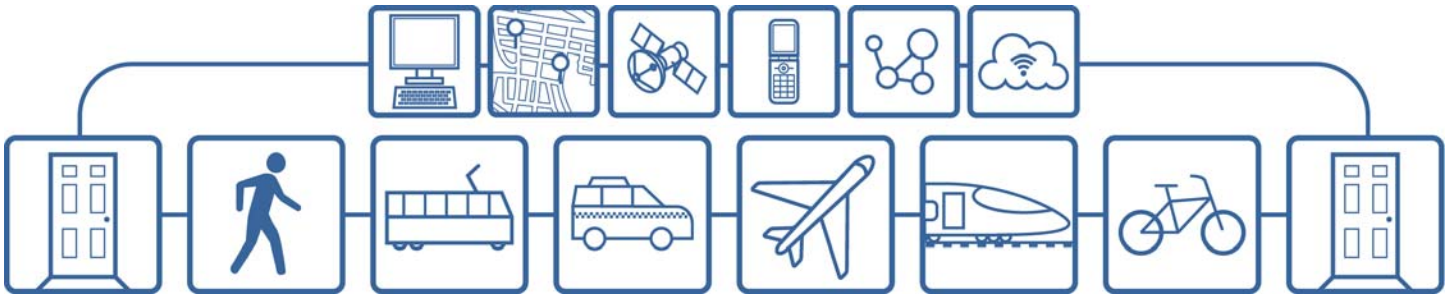

CONNECTING AND TRANSFORMING THE FUTURE OF TRANSPORTATION:
A Brief and Practical PRIMER for Implementing Sustainable Door-to-Door Transportation Systems in Communities and Regions Worldwide

INTRODUCTION

Recognizing that no single solution will save the day for transportation in this rapidly urbanizing and increasingly complex world, a groundswell of transportation innovation is arising worldwide. However, these innovations are rarely linked and optimized in a way that can provide a convenient, practical, affordable and sustainable door-to-door trip for the user. The next generation of urban transportation is about connecting transportation modes, services, and technologies, bringing diverse innovations together in ways that favour accessibility (meeting needs) over mobility (moving for the sake of moving), and that work significantly better for people, economies, and the planet. This Primer has been written in response to demand by project partners of the SMART initiative at the University of Michigan. Developed with the benefit of knowledge, experience, and new discoveries gained from groundbreaking projects in cities around the world, it remains a live discussion document, allowing for new learning as the network of SMART Living Labs grows.

The purpose of the Primer is to describe and document new integrative approaches, guiding principles, and living examples that will serve SMART partner communities. It is also meant to serve businesses, community leaders, transportation practitioners and policymakers who are interested in improving and transforming their transportation systems (and related economies) as whole systems. While there is a growing number of excellent publications and web-based resources listing and describing specific innovations, few of these describe how to bring these innovations together optimally for both the user and the community. This Primer aims to contribute to a growing literature of integrative and practical approaches for implementing multi-modal, “next generation” transportation and transportation infrastructure. More broadly, it aims to contribute to advancing livability, sustainability, and economic vitality in communities and city regions of the world through systems-based transportation.

To provide an ongoing space for global learning exchange on this topic, this Primer links to two web-based resources that have evolved in parallel. See SMART’s blog feed at http://um-smart.org/blog and SMART Exchange at smartumich@ning.com. In the meantime, any feedback that might serve to improve subsequent versions of this and related web-based resources is embraced and appreciated. Please contact Susan Zielinski (susanz@umich.edu) with comments and questions

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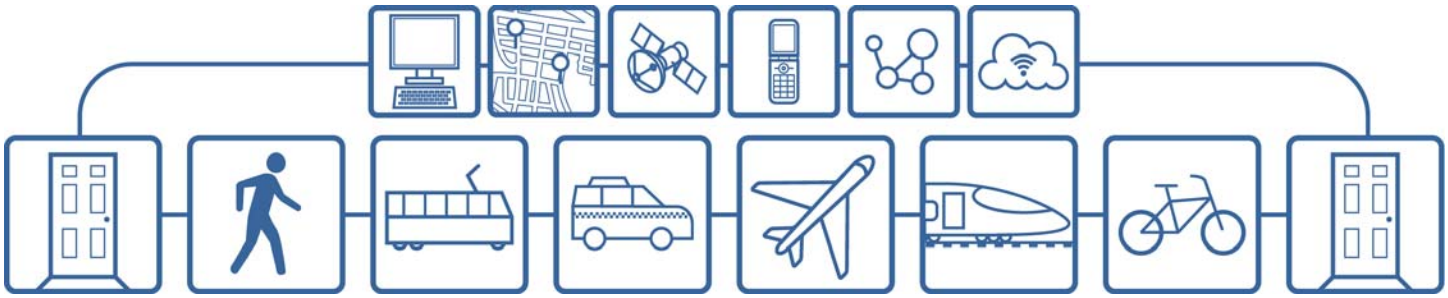

CONTEXT: NEW REALITIES

Unprecedented Urbanization

The world is urbanizing at an unprecedented rate. Currently, half the world lives in cities and soon that proportion will rise to about two thirds. So we can no longer think of experiencing or implementing transportation the way we used to. Dramatic change demands paradigmatic shifts. It is becoming universally clear 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 issues of land use, health, infrastructure supply, or safety implications associated with single occupancy personal vehicles. Similarly, applying pricing mechanisms alone as a deterrent to car use without providing affordable and practical options only adds to the economic burdens of the working poor and elderly on fixed incomes.

Other Driving Forces

In addition to urbanization, the challenges of globalization, a rapidly increasing aging population, congestion and sprawl, climate change, global economic uncertainty and hardship, and increasing social disparity, all affect and are affected by transportation in a fundamental, ground-shifting way.

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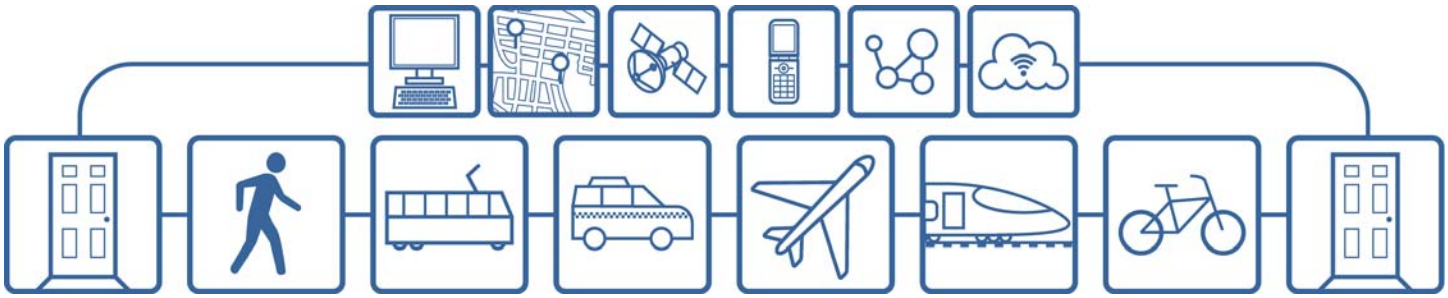
- WBCSD (World Business Council for Sustainable Development). 2001. Mobility 2001: World Mobility at the End of the Twentieth Century and Its Sustainability. Available online at: http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=MTg1.
- WBCSD (World Business Council for Sustainable Development). 2004. Mobility 2030: Meeting the Challenges to Sustainability. Available online at: http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=NjA5NA.

It's Not Just About Moving People. It's Also About Moving Goods and Moving Less

It is often overlooked that transportation is about moving goods as well as moving people. With urbanization, globalization and increasing telecommunications traffic, the volume of goods moved has increased and the process has become more complex. Similar to people movement, goods movement innovations abound, ranging from vehicle design and fuel technologies, to intermodal freight movement, to local production and distribution, to innovative supply chain management. Goods movement can offer some lessons to people movement because it achieves multi-modal, door-to-door, IT-supported transportation, to a certain extent. We would be farther ahead by providing "just in time" people movement akin to "just in time" goods movement.

Transportation is also about moving less, and even not moving. Reducing travel for people and goods through wise land use and urban design, telecommunications options that replace trips altogether, and local production and distribution are increasingly significant considerations as complexity and congestion rise.



CONTEXT: EMERGING INNOVATIONS AND OPPORTUNITIES

In response to these complex and multi-faceted trends, there is no shortage of transportation innovation. In fact there is a groundswell of new modes, services, technologies, and designs being developed and applied worldwide.

Modes:

New advances are being made on a diverse range of transport modes including bus rapid transit, high speed rail, trains, non-motorized modes for moving people and goods (bicycle and pedestrian innovations), innovative freight vehicles, marine travel, automobile transportation, personal rapid transit, and more.

Services:

The last decade has seen a significant increase in service orientation to transportation, including fixed route and on-demand shuttles, as well as "fractional use" options like car sharing and shared bike programs. There has also been a recent increase in the use of social networking tools to support shared car use.

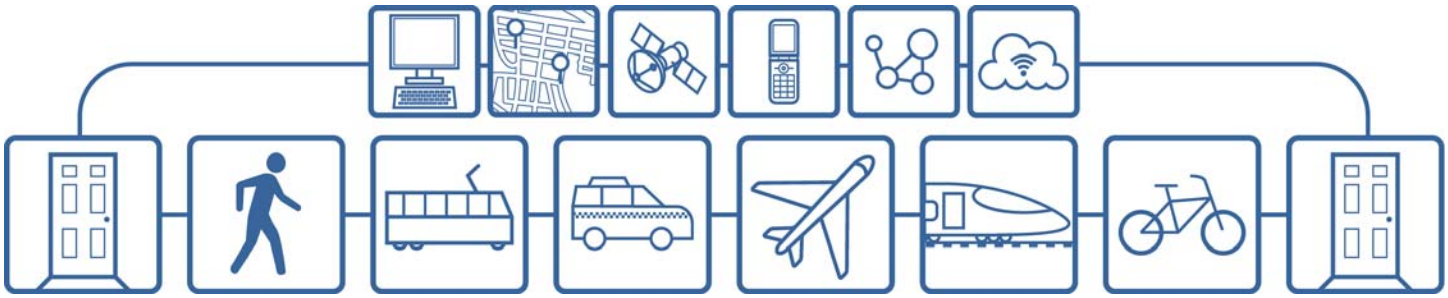
Technologies:

While fuel and vehicle related improvements have been the predominant technological focus of transportation innovation, a more recent and perhaps more significant shift is towards telecommunications technology. "Intelligent Transportation Systems" form the basis of a comprehensive transportation-related infrastructure that includes:

- journey planning and way-finding
- fare collection
- road pricing and congestion pricing
- traffic management that makes use of "mesh networking" or "the cloud" to facilitate both real time information gathering for the operator and real time information dissemination for the user
- telecommuting and other telecommunications options to reduce or replace trips altogether
- transportation-related decision making
- safety and security
- automated vehicles

Design:

New approaches to product and vehicle design are improving safety, sustainability and comfort as well as transportation efficiency. Usability and universal design can improve the user experience, making next generation transportation more convenient an feasible. Urban and community design can reduce trips by bringing key elements of day-to-day living closer together, improving safety, and building a foundation for multi-modal transportation and more broadly, livability. Transit Oriented Development and traffic calming are some of the more common urban design applications to transportation.



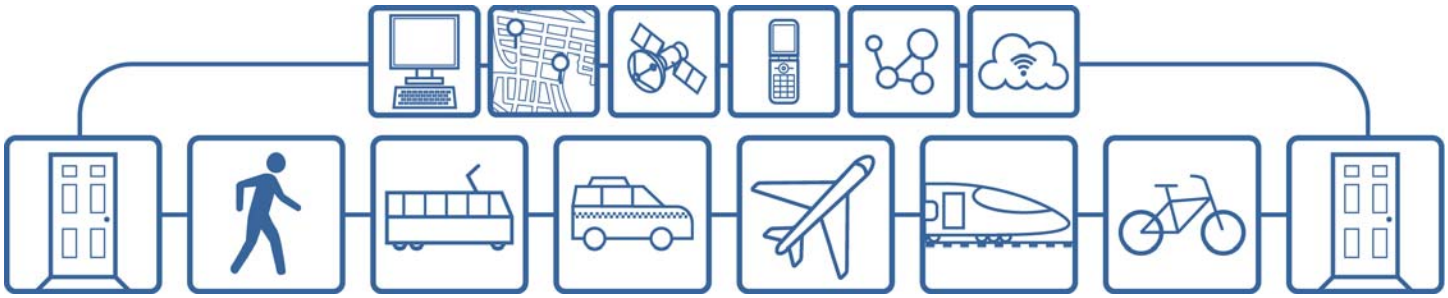
THE CHALLENGES:

THERE IS NO SINGLE SOLUTION…

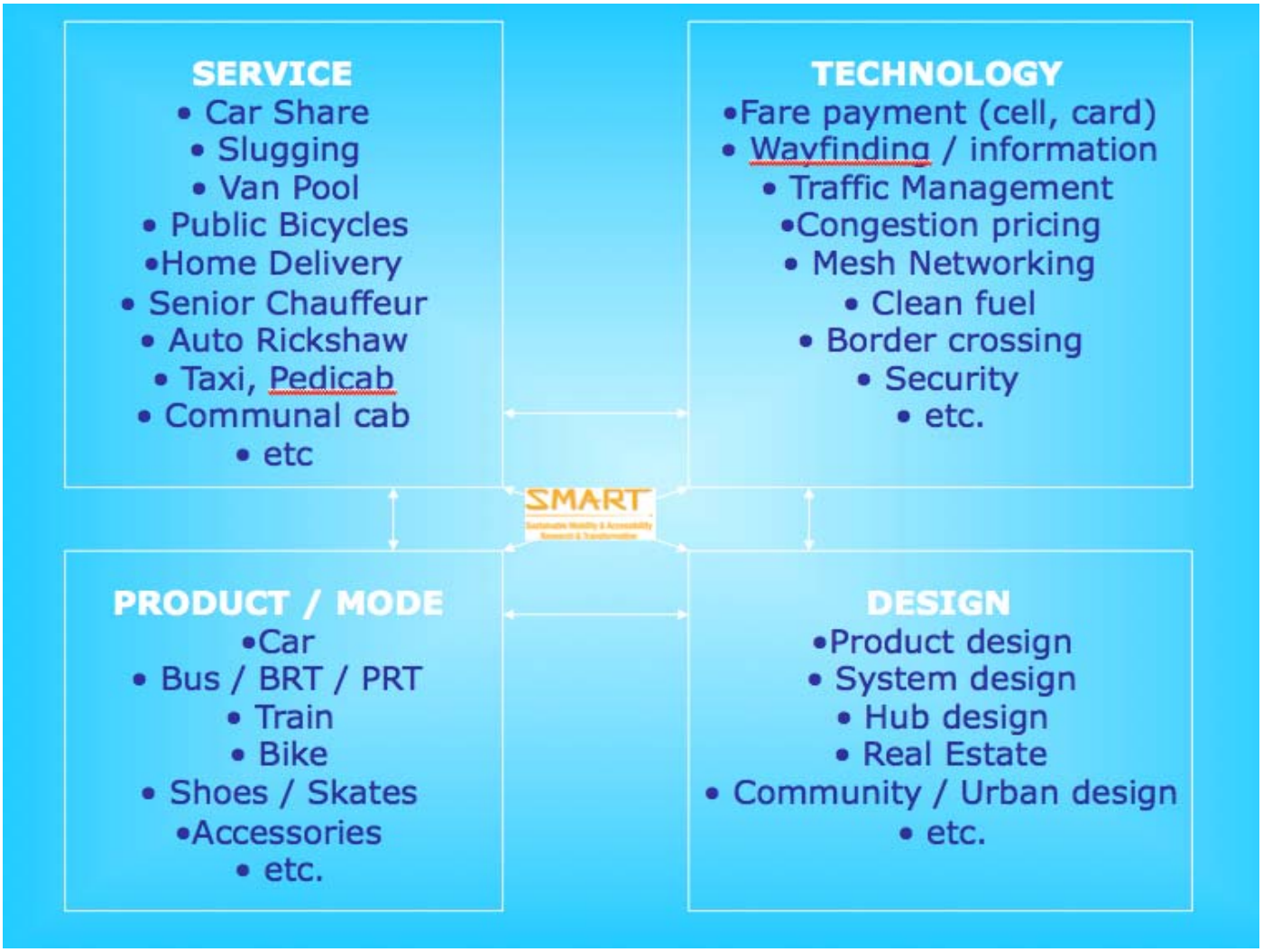
As complexity increases, the notion of a single solution to solve transportation challenges decreases. And as new challenges and new paradigms emerge, the innovations developed to address them tend to bundle into distinct fields or categories yet can remain isolated from each other. For example, an engineer may envision solutions that involve infrastructure or fuels but not link them enough to urban design and policy. An innovative urban planner, on the other hand, may develop a groundbreaking approach to land use and urban design, without paying too much attention to new services like car sharing, free bikes, shuttles and on-demand taxis that form a missing link in a door-to-door trip. An IT developer may come up with an unique approach to fare payment, journey planning, or traffic management, but may not spend much time thinking about the kinds of land use policies that are beneficial to sustainable transportation.

AND THE DOTS ARE NOT CONNECTING

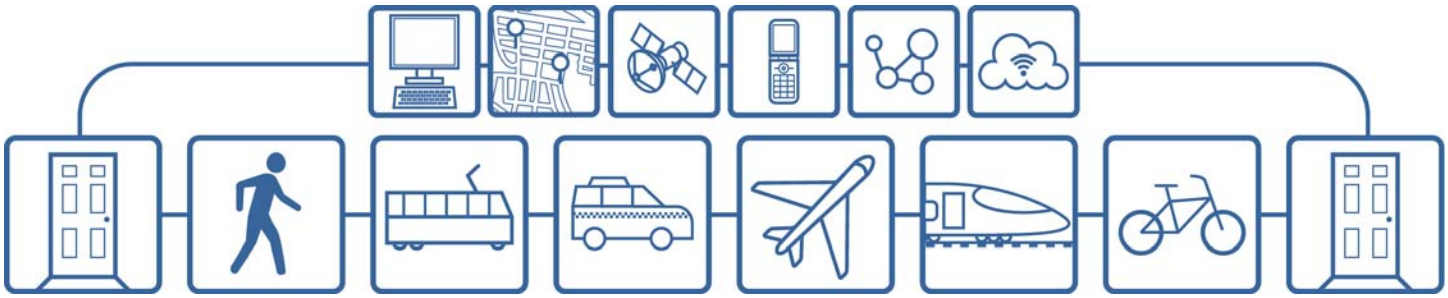
As a result, despite the proliferation of innovation across all quadrants in the illustration on the next page, holistic solutions are just not coming together in a way that works for the user door–to-door. A community may have a state of the art rapid transit system, but if it leaves riders stranded in the middle of the night, with no way of continuing on the “last mile” or more home, to their door, it becomes less practical for the user. Another community may have every transportation mode and service one can think of, but if those modes and services are not physically connected, or if people don’t know about them, and if they’re not scheduled properly to support and complement each other door-to-door, users will be unable to put together a trip that combines them efficiently. Another community may have the most robust urban design and transit system, but it may not be making full use of telecommunications technologies that could support awareness of the options, integrated way-finding and fare payment, seamless traffic management and telecommuting to reduce or replace trips altogether.



THE FOUR SOLITUDES:



People working in the quadrants shown above tend to work in their own sector and too rarely link with other quadrants to work on linking the innovations to provide a seamless door-to-door trip for the user or for the purpose, whether it be moving people, moving goods, or moving less.



CONNECTIVITY IS KEY

Transportation is not simply one mode that moves a person or a good from A to B. It is much more interesting and useful than that. It is a system, or rather a "system of systems" connecting modes, services, technologies and designs according to the best option for a specific purpose. In this way transportation systems are beginning to interact much like our now ubiquitous and customized portfolios of "plug and play" telecommunications technologies that connect desktop with lap top with printer with camera with the internet and more.

Back in the 50s, the developer and programmer of huge mainframe computers that took up entire rooms might never have imagined that his I-pod nano would one day connect with the internet or that she would one day remotely program her DVD player to record a football game. Who would have thought that these many technologies would aggregate into one of the largest and most powerful infrastructures, and therefore markets, in the world. This kind of sophistication takes time to evolve. The migration from typewriter or light bulb to an advanced and customized telecommunications portfolio, or from personal auto predominance (and aspiration) to more sophisticated, multi-modal systems and infrastructures can be compared to the evolution of natural systems. Explains Peter Newman, a leading thinker in the field of transportation:

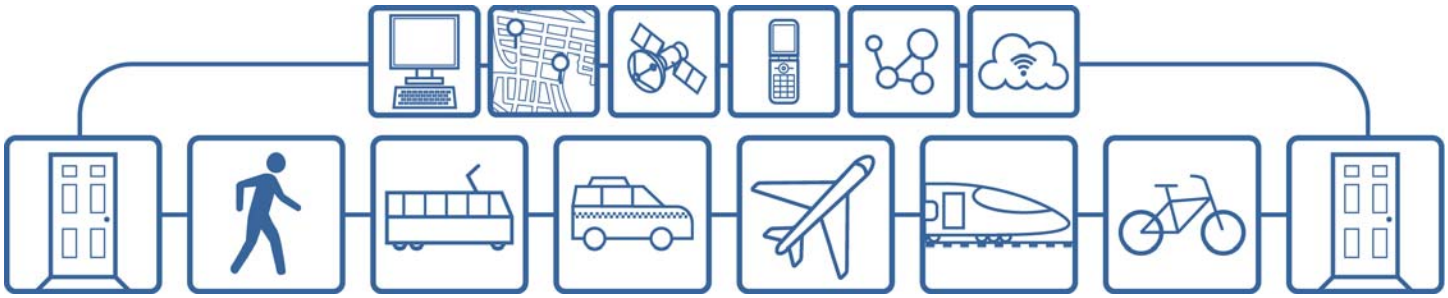
> "In ecological terms, it should come as no revelation that as cities grow and become more complex and diverse, they begin to create more efficiencies. Ecosystems grow from simple systems with a few pioneering species to more mature ecosystems with diversity and interconnection. Thus, after a fire or flood, or some other disturbance, a cleared piece of land will begin developing the structure of its ecosystem with an emphasis on rapid simple growth. After a period it becomes more diverse and more efficient as it establishes a more complex network of interactions".

While it is tempting -- especially when confronted by increasing and accelerating complexity -- to seek simple or singular solutions, these approaches don't generally play out well. One could imagine in the process of the creation of the human body saying "it's all too complex – you have a choice – it's going to be a heart or lungs - what's it going to be?" Obviously the human body needs a heart AND lungs AND a pituitary gland, and a few other things, and it needs them all to work together seamlessly. The same is true with transportation

ACCESSIBILITY IS THE GOAL

Mobility is a Means Not An End

When we envision our future transportation systems it is important to ask: "why we are moving in the first place?" We often forget that transportation is not an end in itself, rather it is a means to an end: meeting our needs. Our aim with transportation is not to move for the sake of moving, it is to help us live our lives and carry out our business – to live, love, work, and play. Thinking of it this way opens up new options. For example if we wanted to improve mobility, we may think solely of vehicles and infrastructure to support those vehicles. But if we wanted to improve ACCESSIBILITY, or having access to our needs, we could also do this with proximity, bringing things closer together and organizing them more efficiently to reduce the length of trips and the time they take. Or we may eliminate the trip altogether using tele-work, tele-commerce, tele-medicine, or tele-education. A three year study led by Jonathan Levine at the University of Michigan has developed a comparative index for measuring accessibility in cities as a way to inform policy and motivate action towards more accessibility-oriented approaches. For more information, see http://terpconnect.umd.edu/~cliu8/



WHAT DOES THE FUTURE LOOK LIKE?

In Some Places It's Almost Here.

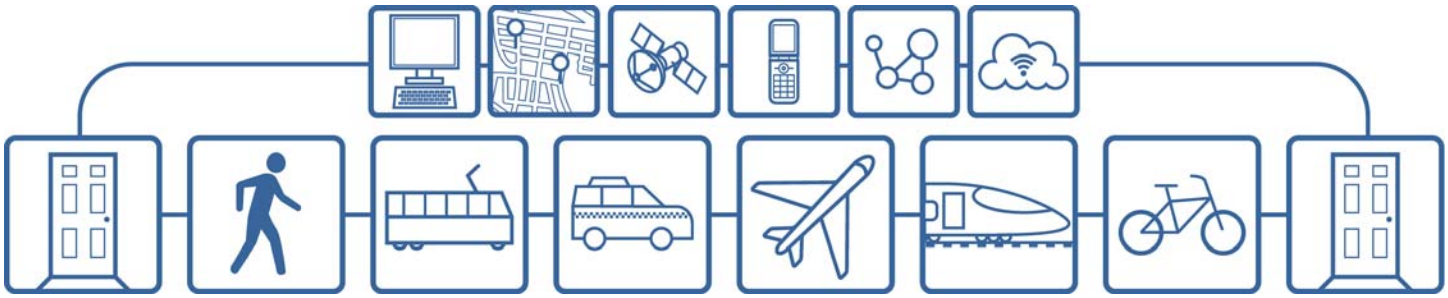
Imagine a day, when steps from your door, or even from inside your home or office, you could enter a vital network or grid of New Mobility Hubs, connection points, or places that connect a whole range of transport amenities including buses, trains, streetcars, clean fuel taxis, auto rickshaws and car share or bike share vehicles, and in some cases, day care, satellite offices, cafes, shops and entertainment.

At its most basic level, a New Mobility hub network is simply a grid of connected places in a community where transportation modes and services physically connect. In more technologically advanced communities, this is all brought together by a telecommunications framework that offers real-time information on arrival and departure times and availability and other information. This information may be available through kiosks at hubs, or through mobile phones or PDAs (Personal Digital Assistants).

The telecommunications framework also allows you to pay quickly and easily for these affordable modes and services with a single click, or a wave at the reader (the processing machine?), through a mobile phone or a card, or use a kiosk. This way you can transfer seamlessly from one mode of transportation to the other, informed of schedules and options as you go, using 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. It's easy, convenient, affordable accessible, and very 21st century.

For the user, hub networks connect an integrated set of services, products and technologies door-to-door, addressing the "last mile" challenge and the connectivity gap throughout the trip. For the developer and operator, hub networks are scalable, starting by first linking what exists and then adding and enhancing as budget and political will materializes. Since the key is connecting rather than competing modes and services, the process and the product includes rich and poor, a range of backgrounds and needs, and urban and suburban dwellers.

For government leaders, this begins to address social, environmental, and economic goals, fostering livability, social equity, green industry and green jobs. For businesses in the emerging New Mobility Industry, this offers an opportunity to generate a new "open source" (or perhaps more appropriately "open systems") transportation infrastructure, as well as spur "Public-Private Innovation", and to supply the emerging and rapidly growing global market for sustainable urban transportation.



OPTIMIZING REALITY: MANY WAYS TO CONNECT THE DOTS …

New Mobility applies at least five kinds of optimization, or "dot connecting":

Spatial:

Physically linking the full range of transportation modes, services, and design elements to support door-to-door seamlessness through a grid of connected hubs or "switch points" across a community or region.

Component Enhancement:

Enhancing or optimizing each component of the system, for example, improving the buses in the system with clean fuels, "low floor" adaptations, and other accessibility capabilities, or with electronic ticketing options; or enhancing the non-motorized component of the system with improved infrastructure such as bike parking and advanced lane design. And improving auto-based options to make them safer, more sustainable and better connected to the rest of the system.

Virtual / Technological:

Applying a full range of telecommunications technologies to support multi-modal seamlessness, system-wide transport information gathering, management and way-finding, multi-service fare collection and payment, trip replacement, security, enforcement, and more.

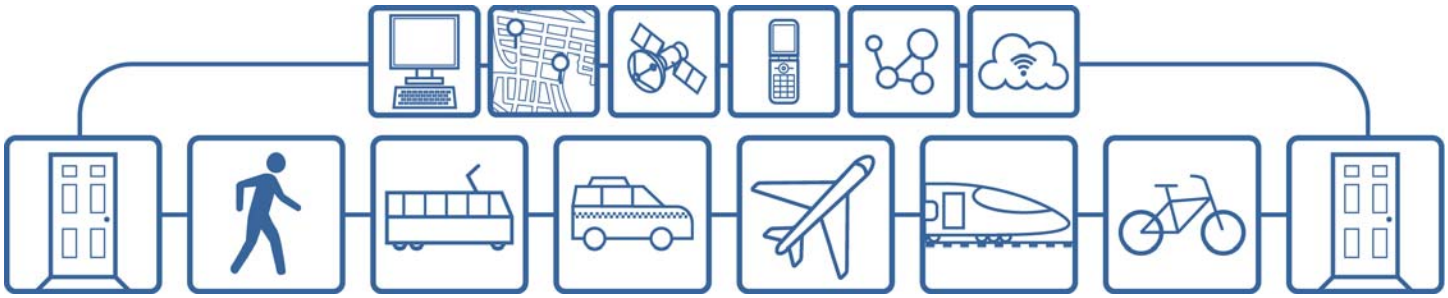
Institutional:

Connecting urban planners, engineers and city leaders, with business leaders and innovators, entrepreneurs, community leaders, and researchers, to map and transform the infrastructure based on local and regional goals, needs and strengths, and local and global market opportunities. This is a vigorous form of Public-Private Innovation.

Economic:

New Mobility brings together a range of economic benefits; it creates jobs, saves money, boosts business, revitalizes local economies and spurs urban competitiveness. It does this by:

- expanding the range of transport-related industries and enterprises to include IT, real estate, tourism, planning, retail, new services, energy & utilities, entrepreneurial ventures and more (New Mobility industry cluster)
- innovating for local application (and urban competitiveness) as well as for global export; and
- developing new business models that address and capture the growing urban transportation market and employment base.



… AND THE MANY BENEFITS OF A SYSTEMS (of Systems) APPROACH

Though the original intent of New Mobility hub networks and evolving the next generation multi-modal grid in general was to support convenient and sustainable door-to-door transportation, many "co-benefits" have since been observed.

* They connect mode, service, product, technology, and design, seamlessly, with a focus on the user, and the user's various and complex needs over the course of the day

* They are designed to support door-to-door, sustainable, safe, equitable, affordable, and customized travel for ALL users, including low income, senior citizens or disabled. At the same time, the system is convenient and appealing to those who do have the resources for other options.

* For the developer or operator of the system, they are scalable and often immediately implementable. Sometimes it is even simply a matter of making users aware of connections that are already there, or simply putting signs up or distributing maps showing where connections already exist.

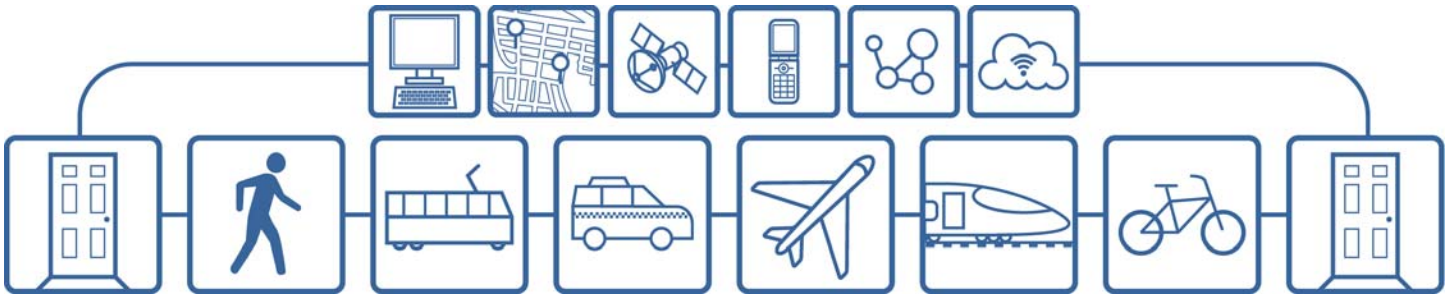
* They are cost-effective – because they optimize rather than duplicate benefits of the existing system and they identify gaps that need to be filled more directly. They also often call for solutions that are generally less intensive in terms of physical infrastructure and capital investment.

* They are appealing, hip, and "next generation" providing more seamlessly connected options, more appealing physical spaces, and more opportunity for connectivity through social networking and telecommunications-based platforms particularly appealing to the younger generation.

* They are resilient and robust, contributing to both personal safety and national security. More options, and more connected options mean that there is greater backup in the case of an emergency such as a climate change or terrorist event, supporting both personal safety and system resilience or redundancy. This is much like the energy or IT grid providing resilient and precautionary backup systems. Based on sustainable transportation and ideally powered by green energy sources, they can also contribute to the prevention or mitigation of such events.

* They generate business, innovation & employment opportunities providing:

- entrepreneurial spaces for mobile applications, IT innovations, shuttle and last mile services, new products, and venture opportunities. For example, William Clay Ford, Chair of the Board of Ford Motor Company, recently launched a Limited Liability Company to support "transformative" transportation innovations.
- new market opportunities for major companies. For example: Cisco Systems' Connected Urban Development, IBM's SMART Cities and Ford Motor Company's megacity mobility initiative
- job access and job creation related to integrated mobility systems
- cost savings both for individuals and for city regions related to optimizing the system



SEAMLESS DOOR-TO-DOOR MOBILITY, STEP BY STEP

SMART collaborative Living Lab projects have generally begun by bringing together a small number of committed leaders representing a range of sectors and roles in a particular community or region that has expressed a need. Their purpose for working together is:

- to identify practical, feasible, integrated transportation goals for the future as well as the challenges that need to be overcome to accomplish those goals
- to map the existing system (overlaying modes, services, infrastructure, technologies, amenities)
- to identify and implement a pilot integrated network
- to progressively involve others (including citizens) in the roll-out of a full system over time.

Though this simple and somewhat intuitive methodology is still relatively new, it has had surprising results in terms of catalyzing collaborative innovation, creating wider multi-sector networks, evolving cost-effective public and non-profit solutions, and generating new business, regional competiveness and employment opportunities.

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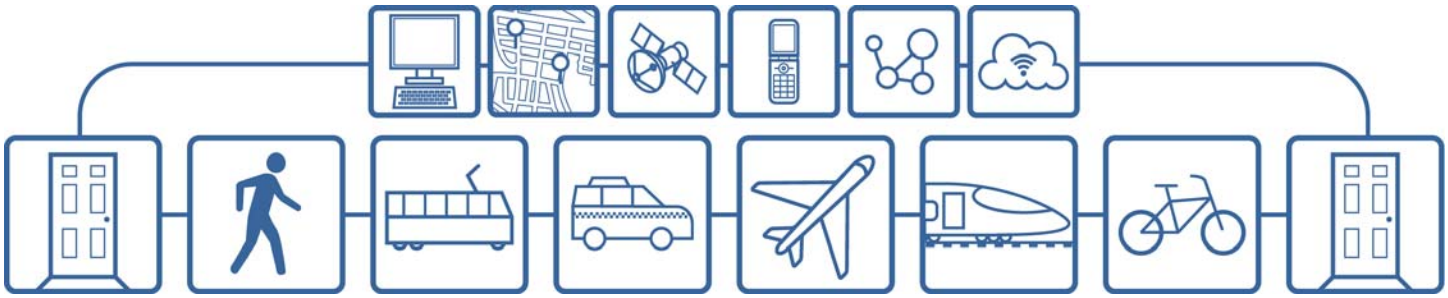


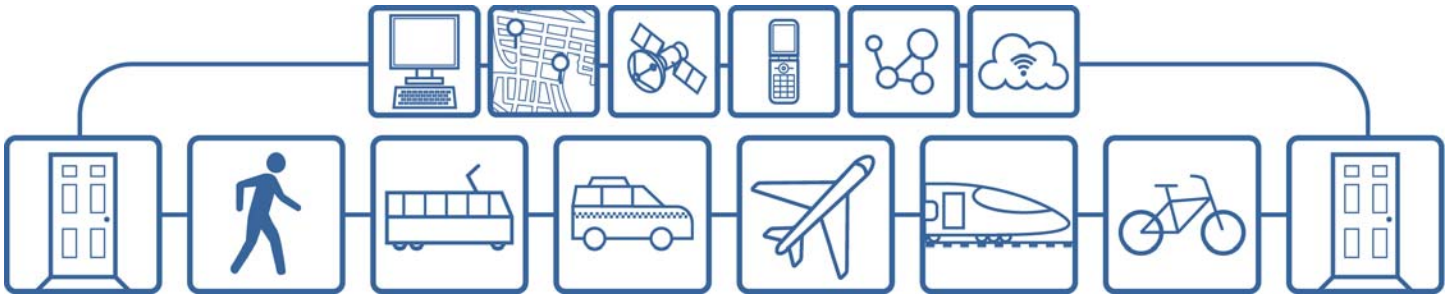
FOUR SIMPLE (THOUGH NOT GUARANTEED TO BE EASY) STEPS

If you are interested in setting New Mobility in motion in your community, here are four simple steps that can help get you started:

1. **Convening – The Crucial and Often Under-Rated First Step**
2. **Mapping - An Engaging and Tangible Catalyst for Action**
3. **Piloting (and Roll-Out) – Creating a Hologram for Wider Spread Roll-Out**
4. **Moving Minds – Telling the New Story**
5. **(Bonus Step) NETWORK with other Living Labs and Living Lab leads**

   http://um-smart.org/blog and http://smartumich@ning.com

Though these steps are simple, they are not guaranteed to be easy. However they are likely to be rewarding, at times fun, and unquestionably helpful in some (at times surprising) ways for your community, depending on what you have to work with from the outset and the extent to which you engage in the process.



(1) STEP ONE: CONVENING -- The Crucial and Often Under-Rated First Step

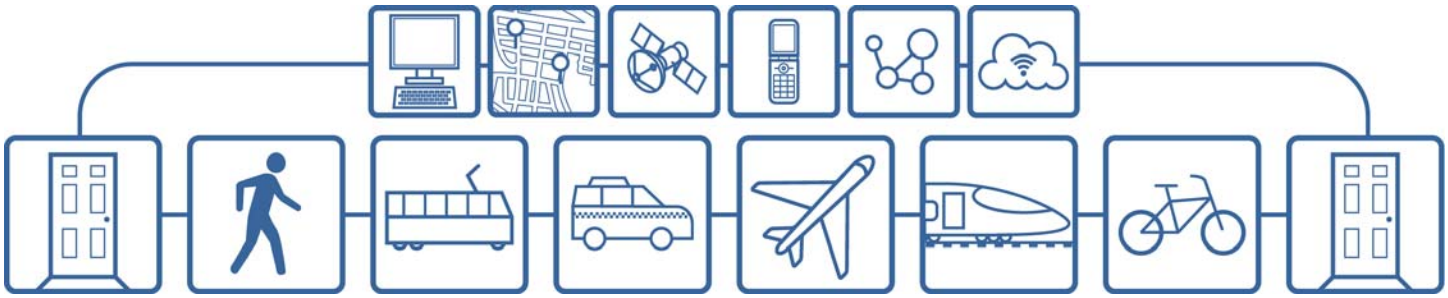
The first step in this journey is essential because it ensures the presence of the right people and sectors needed. Moreover, it sets the stage for the magic of collaborative and integrative action. All too often the groundbreaking work that is being done on sustainable transportation happens in isolation, focusing on one particular mode, technology, service, sector or policy, partly because the innovators and operators just don't connect with each other. As a result, in the absence of a "link tank" to bring the innovations (and especially the innovators and leaders) together, implementation of these innovations is fragmented, costly, at times duplicated, and altogether less practical and pleasant for the end user. No one individual or institution or innovator is at fault for this, it is just that too often there is no one specifically charged with the pivotal task of connecting the dots.

Who should be the convenor(s)?

Who should initiate the "Link Tank"? In SMART's experience to date, this role does not require technical transportation knowledge per se. It has more to do with the desire and need to take a systems approach to transportation solutions, combined with the capacity and skills for bringing diverse interests and skills and resources together and developing partnerships that will work to identify and meet common goals. Leaders of SMART partner community "link tanks" represent wide-ranging backgrounds. For example, the kinds of people who have taken on this role to date include a physicist and entrepreneur in Chennai, a regional director of planning in Washington DC, a Mayor in Corvallis, a project director at a major academic institution in Atlanta, two leaders of a non-government organization in Seattle, an advertising executive and film-maker and a Department of Transportation Lead in Los Angeles, a transportation policy institute director in Cochin, India and a group of entrepreneurs in Cape Town, South Africa.

Who should be at the table for the first meeting?

The very first meeting generally works best when it involves a small group of key people representative of a range of roles and sectors who are keen to make something happen, and who have a predisposition to "thinking in systems". From the beginning it is very important to include, but also to go beyond the "usual suspects", (city planners and transportation planners) and to involve innovators, entrepreneurs, big business, NGOs and researchers (see next page for a listing of suggested sectors to involve). Until now "urban" transportation, in particular transit, has been regarded predominantly as a public sector concern. As a result, substantial responsibility falls on urban and transportation planners to frame the challenges, identify the solutions, and assign or contract the implementation of those solutions. In this context there is very little space for the kinds of innovation and best practices that the private sector, NGOs, and researchers can bring to the table.



(1) STEP ONE (CONVENING) CONTINUED…

Some Helpful Hints: Make Space for Public-Private Innovation.

SMART has created the term "public-private innovation" to describe the approach of involving a range of different sectors in collaborative solution building from the outset. The process demands collaboratively describing and defining the needs, goals, visions and challenges, and then setting a framework to develop the solutions. This is distinct from but complementary to the more formalized and generally later stage "public private partnerships", which establish specific partnerships to develop components of the overall system. These more formal and specific partnerships, need to come in at a later stage to develop components of the overall system.

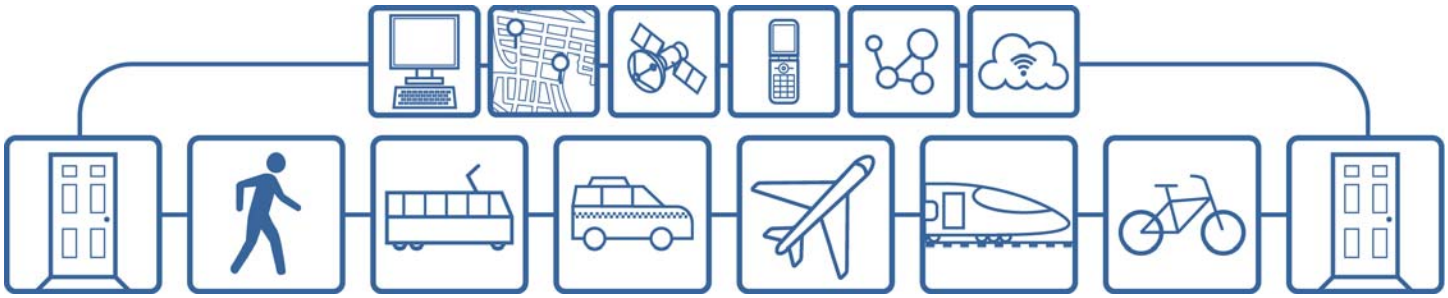
Start the conversation with the Vision, the Hope and the Solutions -- Not the Problem.

Because transportation is so complex and multi-faceted, meetings related to it can quickly begin to focus on the problem and stay focused there for most of the time or even most of many meetings, sometimes years! This leaves very little time and energy for solution development.

The SMART approach has generally involved starting out with some simple goals that involve working together on connectivity, accessibility, livability and economic opportunities. Both the framework and the goals need to be customized to the community and its context. The main "rules of the game" are to focus on connecting the dots. From there, the work can begin to improve, enhance, innovate, and build on what is already there, to fill needed gaps, and to generate exciting innovations that emerge by looking at the "whole picture" together.

Initial meetings (usually a few hours or a day) will often begin with a check-in where each member will say who they are, and what they are proud of or hopeful about with regard to transportation and related issues in their community or region. It is important to start on a note of vision and hope. It should be emphasized that this approach is not an expression of denial or avoidance of the many deep and complex problems of transportation, but rather, it places the emphasis immediately on solution building and action, recognizing the importance of each representative around the table in contributing to the development and implementation of those solutions. Building on existing strengths and hopeful signs, discussion begins by linking the positive aspects based on what is already there, making the whole better than the sum of the parts. Then the challenges and gaps can be more positively addressed with greater energy.

Initial meetings also usually involve a presentation of the basic context and opportunity of connected urban transportation (often drawing on concepts and living examples from this Primer and the SMART experience) so that everyone is on a similar page about the active solution development part of the meeting or the process.



(1) STEP ONE (CONVENING) CONTINUED…

Invitation List

The following list suggests categories of participants who are important to include in both the first and second meeting. In addition, there will often be very special people who may not fit in any of these categories, but who should be included because of their systems approach, their influence on or contribution to the context, their special skills and connections, or all of the above. It's very important to start with the mix first rather than starting with the traditional government leads and then adding others later. It can also be helpful at least to start with participants who are positive and committed to the process. Critics are very important, but they are best brought in later after the creative process has been nurtured.

BUSINESS

- entrepreneurs (especially related to IT, new services, new modes or products) (Note: the entrepreneurs usually bring a specially positive and motivating action-focused attitude to the table and to the timeline, which is why it is important to have them there from the beginning.)
- big business – IT, Telematics, manufacturing, energy, utilities, real estate, planning, architecture, tourism, logistics (not covered under planning?) and whatever might be relevant in your context
- venture capitalists or other financiers if appropriate to the community and process

GOVERNMENT

- representing areas including but also beyond the "usual suspects" (planning and infrastructure) like telecommunications, innovation, economic development and employment, finance, environment and energy, tourism, housing, social services, agriculture, and whatever might be relevant in your specific context

NGOs AND CIVIL SOCIETY

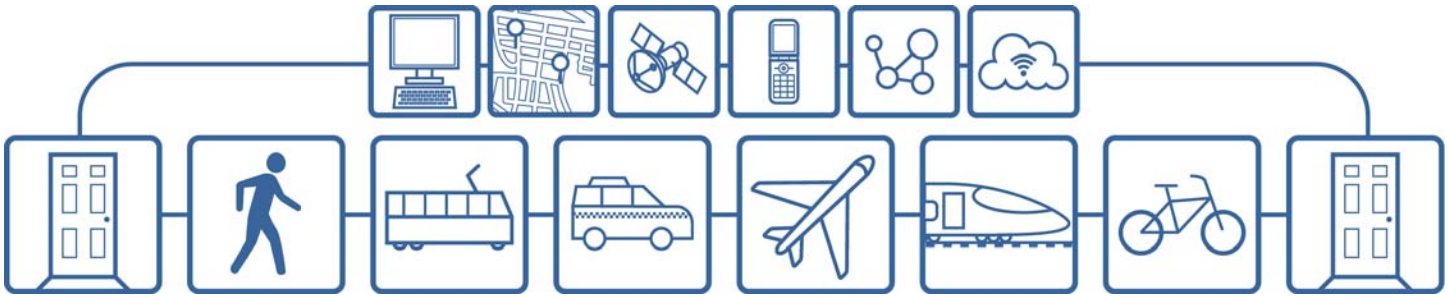
- representing sustainability, accessibility, transportation, environment, energy, social services, human rights, specific populations, and whatever might be relevant in your specific context.

ACADEME

- research leads and students interested in systems, applied research, new technologies, new social development patterns, transportation, land use, new business models, values and culture, social equity and sustainability, global trends and demographics, emerging markets, economic conversion, labour and employment, innovation, and whatever else is relevant to your particular context. The key is that the researcher and student involvement focuses on developing and applying solutions rather than stopping at an analysis of the problems and the contexts.

CITIZENS

- depending on the particular context, selected citizen involvement can vastly enrich the development of hub networks by bringing the localized needs and the experience-based innovation that often comes from people who know their own community deeply.



(2) STEP TWO: MAPPING -- An Engaging and Tangible Catalyst for Action

Step two often exponentially advances the cross-sector connectivity dialogue that began in step one. SMART has found there is nothing quite like the birds eye view that a large, table-sized, partially "pre-loaded" map of the community or region can provide, and the engaged interaction that brightly-coloured magic markers, tracing paper, and post-it notes can enable.

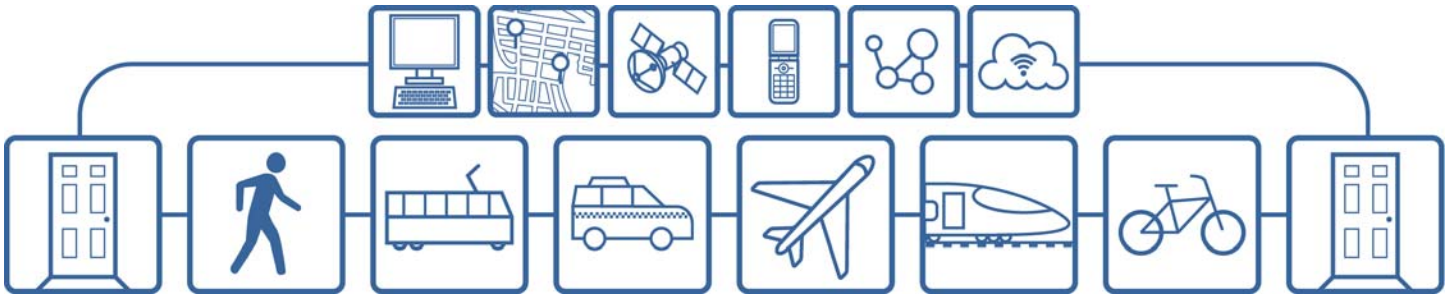
Here's how it works:

As many existing transportation systems, services, corridors, amenities and densities as possible are pre-mapped and overlayed on a large, table-sized map to identify already existing points of intersection, or hubs, that, taken together, make up the existing regional New Mobility grid. What often emerges from this pre-mapping is an actual multi-mode, multi-service grid that even the transportation professionals and operators didn't know existed. This is the grid that provides the basis for seamless, door-to-door mobility and accessibility for the user, region-wide.

The scope and scale of the mapping can be customized. Sometimes it makes sense to start region wide to get a big picture and focus in on specific pilot areas later. Other times it makes sense to start with a specific area so as not to be overwhelmed, and then move out to the regional scale, to identify the connections of the pilot area to the function of the entire region. Occasionally, the mapping process has had a transformative effect, first (and very importantly) by bringing a diverse group of mappers – city leaders, businesses, politicians, entrepreneurs, developers, transportation practitioners, NGOs and academics - to the table for the first time. In SMART's experience the participants on the invitation list have very often not even met each other, let alone mapped together, even though they may have many common goals and they live in the same community or region. This usually relates back to the busy pace of life keeping people in their own silos, combined with the absence of the "link tank" role in most cities to fill a mandate that no one department, company or organization has.

With the help of brightly coloured markers and post-it-notes on a large collaborative canvas, the process offers a big picture regional view as well as local level zoned-in views of transportation and land use connectivity. In this way it quite quickly identifies the system that is already there (even if no one, not even transportation professionals, knew about it). It also fairly quickly highlights gaps in services, amenities, locations and populations served. Occasionally the process shifts paradigms altogether, bringing people from a single mode to a multi-mode, multi-service, accessibility-focused reality. Other times it sparks new ideas for businesses and innovations that can serve the needs of connectivity. In our experience so far, this is a hands-on catalyst or accelerator, not only for discussion, but to concretely engender new partnerships, pilots and solution-focused research.

The process can take three hours or a whole day. The more time you can devote to it the better, and the more "pre-loading" preparation you can do, the better. This pre-loading process usually needs to start well before the first meeting (sometimes weeks) because contacting data sources and merging them when they are often based on varying software can be more time consuming than anticipated. On the other hand, try not to obsess about creating a perfect map for the first meeting, and never delay the mapping process in order to get the perfect map. Whatever is missing can be drawn in at the meeting by people who know particular areas or functions well. People like to have things to add, and perfection makes the gods angry. This collaborative process to fill in the map reinforces the benefits of many brains and knowledge bases around the table and fosters team spirit. Overall, it's important to start small, bring positive, innovative, diverse systems thinkers and influencers to the table, and then follow up with meeting notes, materials, and web supports to keep the cadence of the meetings and the communication going. The nature of a link tank is that it needs to stay linked. Though this seems obvious, it is sometimes forgotten.



(3) STEP THREE: PILOT AND ROLL-OUT

The pilot phase can take many forms. Usually it involves identifying the pilot focus and the geographical area or corridor that will most likely show success quickly, and provide a hologram framework for the rest of the community or region. The factors involved in deciding on what and where to pilot can include:

- existing conditions (i.e. an already established foundation of modes, services and amenities to connect)
- the presence of champions (political and operational) for a particular area or community
- particular need in an area or community (though need is sadly not always the factor that most determines immediacy of implementation)
- profile and cue-giving potential of a particular community (for example, a well-known or prominent community or neighbourhood adopting this approach may make it more appealing for others)

(4) STEP FOUR: MOVING MINDS: Telling A New Story.

"Speak a new language so that the world will be a new world" – Rumi

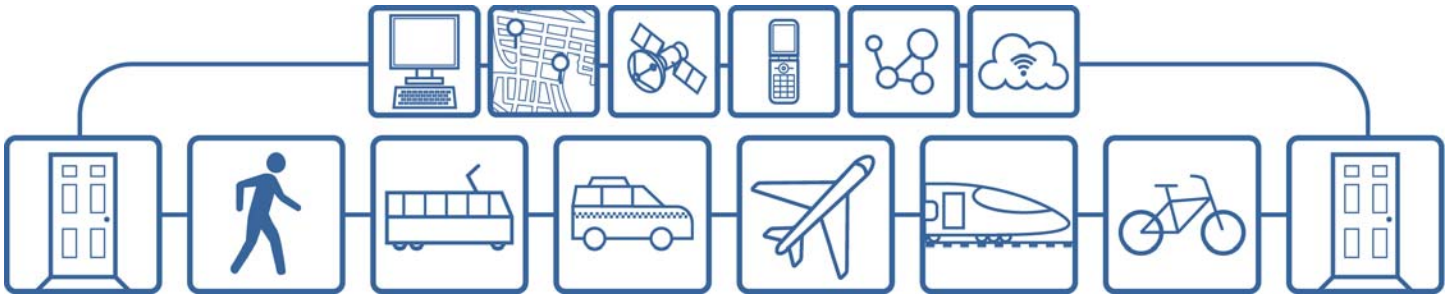
New Mobility can substantially support and shape urban revitalization and significantly improve quality of life and environment in cities around the world. At the same time, it can open up a wealth of business and employment opportunities - locally and globally. But this evolution is not without obstacles. Increased motorization and the high social status it represents in developing countries, along with seemingly unstoppable urban sprawl in the west and increasingly in the developing world 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 more complex task of moving hearts and minds.

At the same time, new social trends that support the new approach are emerging. These include:

- the phenomenal rise of social networking
- a growing concern about environmental problems in many communities
- a greater service orientation leading to increased "fractional use" such as, car sharing and bike sharing
- a "plug and play" portfolio approach to day to day technologies

All these trends bode well for the psychological success of integrated, multi-modal, IT-enhanced transportation portfolios. In fact, recent trends show interest in early car ownership dropping in some areas because it interferes with texting!



(4) STEP FOUR (MOVING MINDS) CONTINUED…

New Mobility hub network development provides a unique opportunity to learn about the cultural, psychological and aspirational underpinnings of our relationships to our transportation choices. It also reveals ways to respond with innovative approaches, marketing, policies and business models that recognize and address these dimensions more sustainability, equitably and compellingly. The development and implementation of New Mobility hub networks and integrated infrastructure in general offer opportunities to move the minds and change behaviour of decision makers and transportation users, in a number of ways:

Through the concept itself:

A grid of many, connected choices and a sophisticated multi-faceted personal portfolio is a paradigm-shifting way of looking at transportation choices for both decision makers and end users

Through the process of mapping:

By bringing decision makers and innovators together across disciplines and sectors, the mapping process starts to tell a new story based on the inclusion of a full range of options and priorities (and players), right from the beginning

Through research:

Each component mode has psychological and value associations that can be examined and included in the development of solutions, that will as a whole, meet new needs in a more sustainable way. Academic research and corporate focus group work can support this understanding

Through language:

Our language reflects clearly how we see transportation – words like “alternative” transportation paint a future picture in which sustainable transportation will always be secondary to the mainstream. Planning words like “captive” and “transportation disadvantaged” associate a certain negativity with transit. Even terms like “transportation demand management” communicate a message of constraint related to the future of transportation. If we are to move minds we will need to move our language and our stories to reflect the exciting, hip and future that is in store with the emergence of more transportation options, and more customized, IT-enhanced portfolios that allow us to use the best mode for a purpose, seamlessly. And, most of all, that confer “next generation” status and freedom. It is even more effective if public figures, celebrities and media speak this language and walk this talk.

Through marketing:

As a new integrated infrastructure evolves and as increased understanding of psychological and cultural underpinnings emerges, more targeted, customized, and effective story telling and marketing can be developed through a range of media beyond traditional advertising, including social networking, new media, special events and user group-focused communications.

(5) STEP FIVE: Share Learning through the SMART Network.

See http://um-smart.org/blog and smartumich@ning.com

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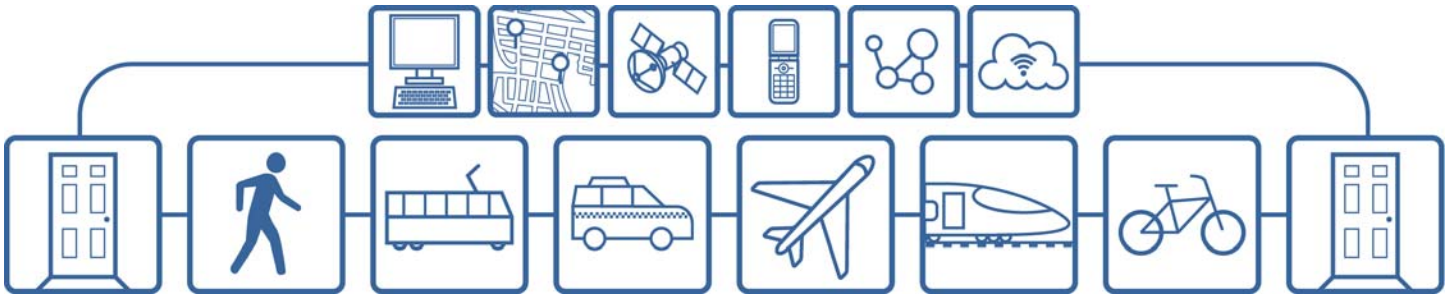


NEW KINDS OF LEADERSHIP

Ushering in the next generation of transportation infrastructure - sophisticated, sustainable, integrated multi-faceted systems with accessibility as the goal- will require new kinds of leadership in the private and public sector, academe and civil society.

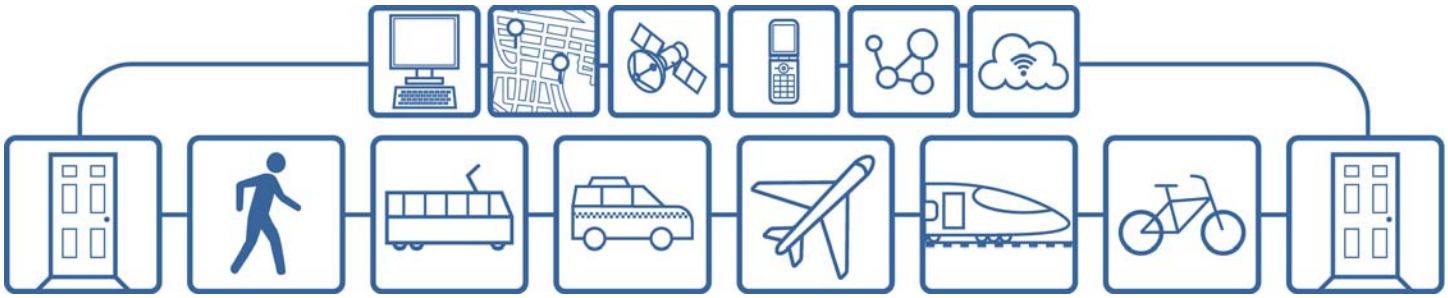
Traditionally, governance (and therefore innovation) of urban transportation has fallen predominantly to the public sector, in particular planners and infrastructure engineers. But as the world urbanizes, as economic, environmental and space constraints render current approaches less tenable, and as new and innovative technologies and services emerge; livability, economic competitiveness and even survival depend more on how resilient a system is. A resilient system combines strength, safety and reliability with nimbleness, dynamism and flexibility. As such the most effective transportation leaders are both demonstrating and demanding resilience and dynamism in planning and practice.

Business

While innovators and entrepreneurs have been breaking ground in the New Mobility space for well over a decade now, only recently have major multinational corporations begun to conceive of convincing business models related to the now rapidly growing urban transportation / New Mobility market. Ford Motor Company's commitment to the Megacity Mobility initiative, Cisco Systems' Connected Urban Development program, IBM's SMART cities initiative, Ashok Leyland's work on IT-enhanced mobility products and Google transit maps, are just a few indicators of the emerging significance of this sector in the global market. They are also indicators of the urgent need to solve serious and growing transportation challenges, if businesses and regions are to remain productive in a rapidly urbanizing world.

As such, within the urban sphere, business leaders are moving far beyond responding to Requests for Proposals issued by city leaders, and into the public-private innovation realm. Hence the need to ensure their involvement early on in the process, so that they can not only collaborate on developing solutions, but also invest in describing the challenges. In this context they can transform products, services, technologies and markets into solutions that will supply the emerging New Mobility market and meet human and societal goals at the same time.

In partnership, business can innovate and commercialize new and more sustainable ways to move people, move goods, and even move less. Based on their long standing market research expertise, they can develop solutions that meet psychological and cultural, as well as practical needs related to transportation, and they can craft new stories and apply new approaches to marketing New Mobility culture, shaping both demand and policy. Finally, they can work together across diverse industry sectors to grow a multi-sectoral New Mobility industry cluster that meets both social and business goals, locally and globally.



NEW KINDS OF LEADERSHIP (CONTINUED)

Government

Though emerging urban and transportation trends pose increasingly complex challenges, they also shape new and interesting roles for federal, state and local government. Including but moving beyond legislation and policy making, progressive city leaders and government agencies have begun to expand their scope beyond transportation, land use and infrastructure to include a wider range of public sector players not traditionally linked with transportation. They represent housing, environment, telecommunications, innovation, economic development and employment, social services, energy, tourism, agriculture, finance, and more.

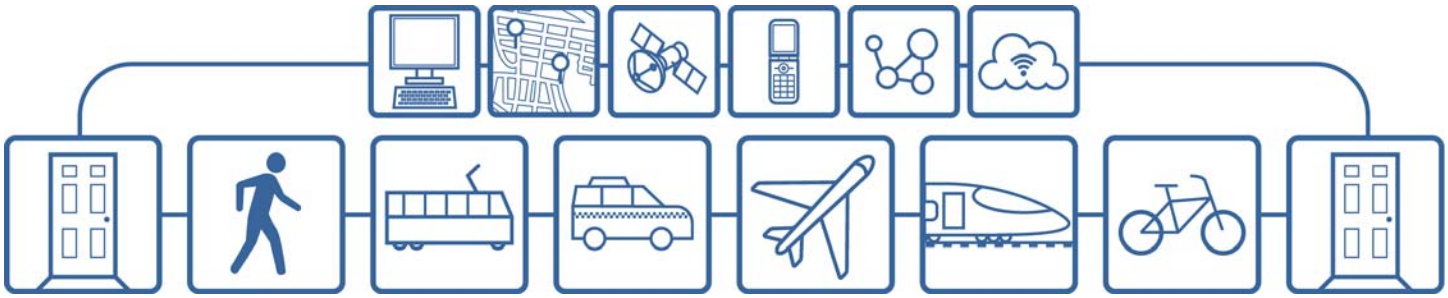
Meanwhile, new policies and funding initiatives are beginning to demand integrated approaches and optimization of resources and systems that transcend silos. Many government representatives have also expanded their roles to that of convener or "link tank" across sectors to ensure that a full range of key players is involved, and that plans and budgets are optimized, inclusive and cost-effective. They are also working with all sectors to find ways to provide incentives and remove barriers to New Mobility innovation and economic development. Finally, some are working to support and facilitate relevant research, data sharing, promotion, and training to accelerate implementation of integrated sustainable transportation.

Academia / Research

New Mobility research – both academic and corporate -- is moving increasingly in the direction of direct "living laboratory" work with transportation leaders and practitioners, where real challenges and opportunities in specific city regions can inform the kind of knowledge and conceptual frameworks developed, and can support both specific local solutions and more general principles common to more than one region. Listening to local experience and undertaking solution-focused, user focused, integrative research requires asking new questions and finding new kinds of data, approaches and language, related to transportation. It also involves work with a range of disciplines, sectors and academic institutions related to the increasingly complex field of transportation. And finally, this involves developing new opportunities for the next generation of transportation thought leaders through systems-focused education and capacity building.

NGO's / Civil Society

A considerably more collaborative and positive set of relationships and working partnerships across all sectors, including business, has evolved amongst NGOs and civil society agencies focused on transportation-related issues. In many cases NGOs are leading the charge in providing the link tanks needed to tackle this complex challenge.



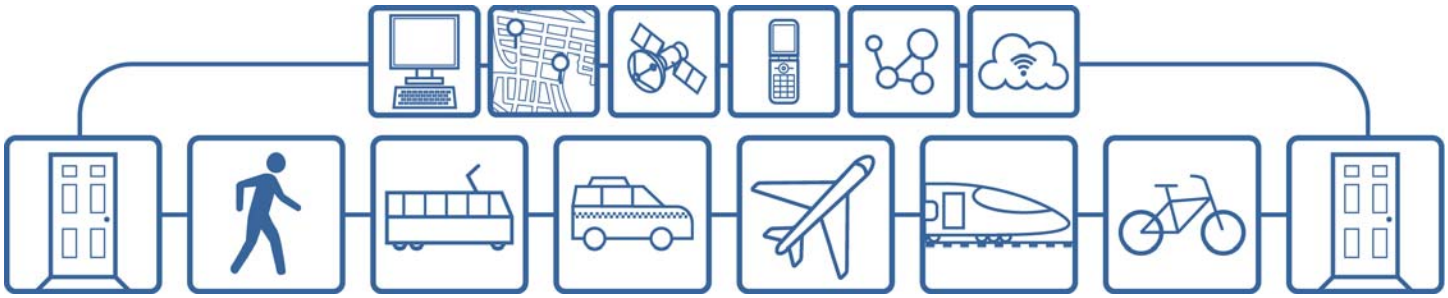
A BRIEF HISTORY OF SMART'S SYSTEMS-BASED TRANSPORTATION WORK

The concept of multi-modal "mobility points" began with Michael Glotz-Richter in Bremen, Germany, in the mid 1990's. Across the city of Bremen, "Mobil Puncts" were established, where transit, taxi services, and bicycle amenities were connected with a new car share service network called Cambio. They then linked all this together with a multi-modal fare card and called it (translation) the "Egg Laying Wool Milk Sow", which signifies something that brings together many unlike elements in a positive way. Finally they established multi-modal way-finding through electronic kiosks.

Around the same time, the City of Toronto's Moving the Economy (MTE) initiative was seeking examples of cities or communities that had successfully integrated transportation modes, services and technologies door-to-door, with the user in mind. Eric Britton of EcoPlan in Paris led them to Michael Glotz Richter. Inspired and impressed by Richter's work, Moving the Economy began to identify opportunities to adapt and pilot "mobil punct"-like initiatives, which was then translated into "New Mobility Hub Networks" for application in Toronto.

The Hub Network approach has since become a well-resourced priority of the first official strategy of Toronto's relatively new Regional Transportation Authority. Related to this, a priority of Toronto's new regional plan is also Sustainable Transportation (or New Mobility) industry cluster development related to systems-based sustainable transportation. Regional government support for New Mobility business development, innovation, economic development and related job creation builds on MTE's early work in this area and is summarized in a 2002 MTE / ICF report called "Building a New Mobility Industry Cluster in the Toronto Region". This is the first known report to explore the emerging New Mobility industry cluster as a whole, and related innovation and employment opportunities.

Meanwhile, as the 21st century dawned, the early seeds of SMART were being sewn at the University of Michigan. In Ann Arbor, Directors and Deans from a number of different departments and institutes, as well as Ford Motor Company (see http://www.um-smart.org/people_partners/people/), saw the need to understand and address transportation from a complex systems perspective. After two (well received) conferences on the topic of transportation, accessibility and complex systems, founding SMART leaders engaged Moving the Economy's former director (Sue Zielinski) to be Managing Director of SMART and to galvanize projects, research, education, and global learning community development related to systems-focused sustainable transportation. In the early days, within the CARSS incubator under David Featherman's leadership she worked with David Berdish of Ford Motor Company and Tom Gladwin of the Erb Insitute and the Ross Business school to establish the initial collaborative Living Labs in India and South Africa and then the US. For more detailed background, go to http://www.um-smart.org/about/.



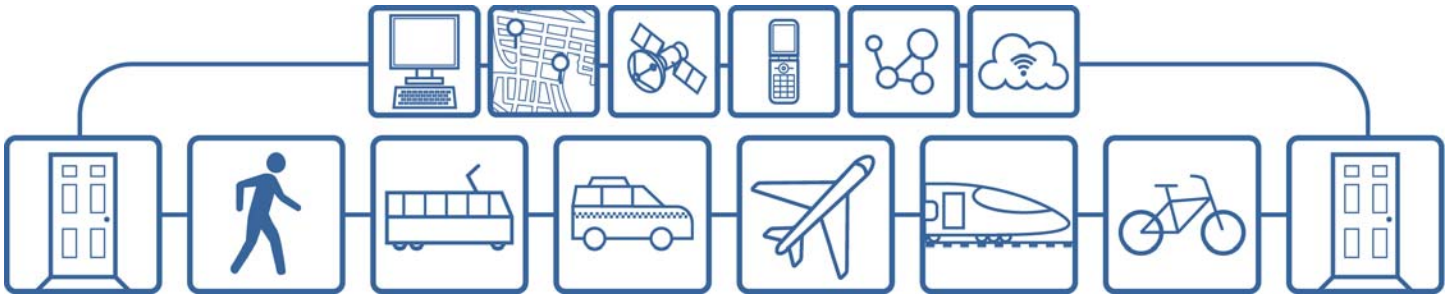
LIVING LESSONS

New Mobility Hub Networks Around the World

SMART's first order of business in 2006 was focused strategic planning – establishing the priority to advance sustainable transportation solutions for global urban regions in response to growing challenges in an urbanizing world. It was decided that SMART would take a systems approach to both analysis and solution building, and would have accessibility, not simply mobility, as the overarching goal. David Berdish of Ford Motor Company, a member and sponsor of SMART, was also interested in understanding the new opportunities, markets and business models for supplying integrated, sustainable, equitable transportation in this new context. And finally, there was interest (particularly by SMART co-founder Irv Salmeen) in understanding the social and psychological underpinnings of our relationship to our transportation choices, and how we can develop and market new innovations and approaches that address them, more sustainably.

As soon as SMART declared its priorities, invitations to visit and collaborate started to flow in from regions and communities around the world that were facing transportation challenges. This was the origin of another rather unusual and unanticipated approach to SMART's work. Academic institutions generally start with research, then involve students, and then test the research on the ground. SMART has taken quite the opposite approach, starting by learning from and collaborating with local city leaders, transportation professionals and businesses. SMART and partners then work together to establish frameworks (both conceptual and practical) that can accelerate both customized and more general solution building and implementation.

Starting with an initial invitation to Bangalore, India, SMART has continued forward, learning deeply from partners and innovators in all corners of the world through "Living Laboratories", collaboratively developing and adapting conceptual frameworks to meet local needs in an integrated way, establishing pilots and research to advance implementation of city project leaders and practitioners, and in this way accelerating shared learning across all the projects. Visit http://www.um-smart.org/blog/ for more detail on these cases and to view an evolving body of related information. Go to http://smartumich@ning.com for online collaborative opportunities.



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NOTE: This list is not exhaustive. Apologies for omissions

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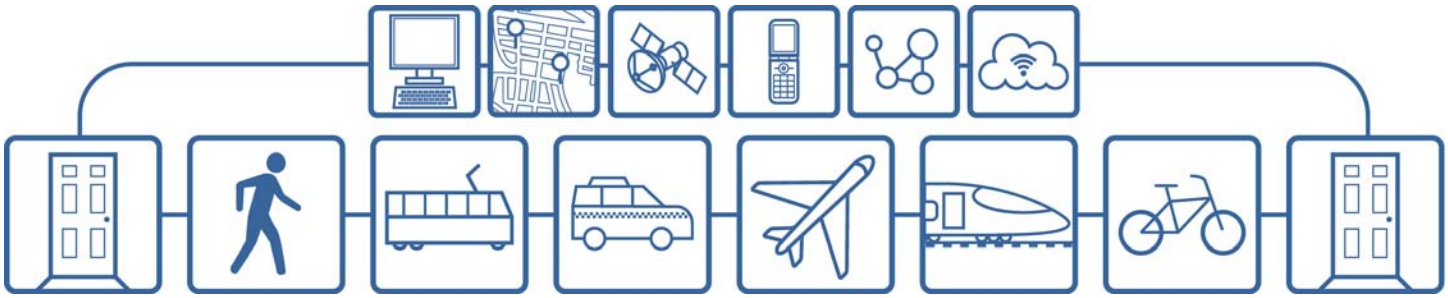

WITH SINCERE THANKS

Since 2005, Ford Motor Company has been a profoundly committed partner and sponsor in developing and advancing the SMART New Mobility Living Lab projects, and SMART's directions generally. More recently, the FIA Foundation has come forward to support the development of this Primer to accelerate implementation of existing and new city projects. This Primer is made possible by the generous support of the FIA Foundation and Ford Motor Company, and for this, SMART expresses deep thanks. More recently, the Confederation of Municipalities of Brazil (CNM International) has joined the effort by translating it into Portuguese.

The FIA Foundation is an independent UK-based Charity, which specializes in issues around safe and sustainable mobility. We are engaged on a wide range of issues from the promotion of greater fuel economy in cars, to the development of safer and more sustainable roads, and much more. Please visit our website www.fiafoundation.org for more information. We are really excited to be engaged in the important work, which SMART is undertaking across the globe, and in particular to be supporting the exchange of good practice across the SMART network, and beyond, through the development of an interactive SMART primer. This project, by providing a tool to implement integrated, multi-modal, sustainable mobility and accessibility (New Mobility) in cities, specifically meets the FIA Foundation's goals of disseminating the results of research, and providing information in a matter of public interest, in particular protection and preservation of public health, transportation and public mobility, and the protection of the environment.

Sheila Watson, The FIA Foundation

Ford Motor Company. Our world is changing. Population growth, urbanization, congestion, increased energy use and socioeconomic disparity are influencing behaviors and regulations like anti-congestion policies, increased use of public transportation, and strategies to reduce VMT (full form). But we welcome the change. And through our ongoing collaboration with University of Michigan Sustainable Mobility and Accessibility Research Transformation, we have been able to integrate mobility solutions necessary to address these signals. Because of Sue Zielinski and her team, Ford is leading—not following. The team at SMART and the wonderful community of mobility thought leaders can help determine the rules and dynamics of a new and growing market segment and innovate to address global problems. SMART provides thoughtful approaches to help understand environmental impact, ways to lower green house gas emissions, reduce vehicle miles traveled, and make a positive impact on the social side of sustainability. The ideas generated by the SMART community will improve safety and quality of life throughout the world; increase credibility, knowledge and perspective; influence policy that will shape future mobility and close the "mobility divide." Please join me and other passionate people in collaborating with SMART. When you work with Sue, SMART and the rest of our community, you will be amazed by the opportunities for proactive engagement and partnership with a wide range of influential and innovative stakeholders and entrepreneurs.

David Berdish, Ford Motor Company

The National Confederation of Municipalities of Brazil (CNM) is responsible for promoting Brazilian municipalities internationally. Launched in November 2006, it is a representation that is gaining ground through CNM's role to mobilize delegations of mayors and municipal specialists to participate in congresses and international missions at which Brazilian models will be presented and lessons will be learnt with visions from throughout the world. Municipalities and municipal associations can therefore count on support from CNM in sending their projects for analysis, in priority areas. For affiliated municipalities, CNM also offers technical advice in obtaining international resources, in addition to the logistic support needed. The opposite is also occurring so as to identify projects and international cooperation programs.

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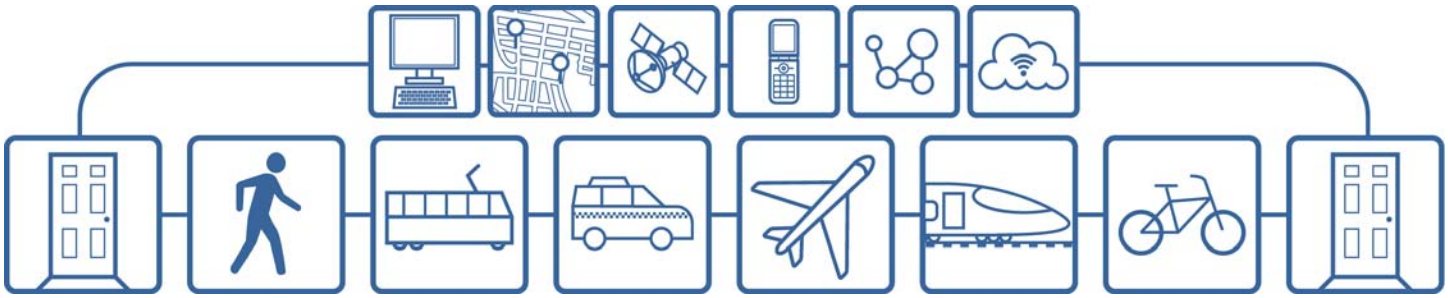

This is an evolving document.

Please send comments, ideas, facts and suggestions to:

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FIA Foundation for the Automobile and Society

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