

Meeting of the Minds

The Annual

Selected blog posts

CityMinded.org

Volume 3



Seven Factors Behind the Rise
of the Smart City Era
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As the editor of the CityMinded.org blog, my favorite time of year has to be the annual group blogging event, and this year was no exception. The premise of a group blogging event is this: a prompt question and an event date are chosen by Meeting of the Minds and our organizing partners. Then, on the event date, participating bloggers publish their responses to the prompt on a website of their choosing.

This year's prompt asked participants to pretend as if they were in 2050 and to write a letter back in time to the citizens of their city in 2015. Tell them what the future was like, and give them advice on the next 35 years.

The responses were playful, creative and—more than anything—revealing. To me, it was almost more revealing to see what people think will happen in the future than to hear about what they are doing today.

Two of the event responses, from Anthony Flint and Richard Mitchell, are included on pages 25 and 27. I encourage you to sift through the full list of participating bloggers on our website. Visit CityMinded.org/cal/dear-2015 to see.

Best,


DAVID FELLER

*Spotlighting innovations in
urban sustainability & connected technology*

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Boston is at a Crossroads. Can Bus Rapid Transit Work Here?

By Mary Skelton Roberts

This past winter, the worst snowstorms in Boston's recorded history hammered the city, crippling our transportation system for weeks, and driving home what many of us knew on some level about Boston transit—the status quo is not an option.

The winter underscored the fact that much of our public transit, as proud of it as we are, is woefully outdated, overloaded, and in need of billions of dollars worth of backlogged repairs. Add the fact that Boston is experiencing record growth, and it's clear we need to do better.

Back in late 2012, the Barr Foundation first convened a study group of diverse stakeholders from across Greater Boston to examine bus rapid transit (BRT) as a possible solution for the city, motivated by these issues and the need to dramatically cut greenhouse gas emissions. But the so-called “snowmageddon” of 2015 punctuated just how important this moment is for the city.

So when the study group released a final report on its findings this past July, we were excited to share that they found BRT holds significant potential for modernizing transit in the city and surrounding region.

The group's analysis, with technical support from the Institute for Transportation and Development Policy, found that BRT—a form of rapid transit marked by physically separated lanes, off-board payment, and enclosed stations—not only could work in Boston, it could cut travel times, relieve congestion, and improve rider experience.

BRT is not a silver bullet for Boston's problems, nor will it be for most cities. But we're encouraging communities here to pursue it, and we think some of the lessons from the process will be useful for other cities. Here's some of what we learned:

**BRT is more than skeptics
perceive it to be**

Bus Rapid Transit is becoming more common globally, with ITDP finding that BRT has nearly quadrupled in the past 10 years. But this is less the case in the United States, where the corridors we do have tend to be less advanced than the best in Latin America, Europe, and Asia.

As a result, members of the public, even city officials, have a limited understanding of BRT's potential. In meetings with stakeholders, I've often come across people who think of BRT as painted bus lanes or conventional service with modest improvements. Sadly, buses also carry a stigma in this country as a lesser transit option, and BRT gets lumped into that prejudice.

As part of the study group's analysis, we made a trip to Mexico City in 2013 to tour its Metrobus system, which has revolutionized public transit in the metropolis of 9 million. Seeing well-executed BRT in person is sort of a surreal experience. Physically separated transit lanes carve through busy streets, and level boarding platforms, enclosed stations, and prepaid fare vastly improve waiting and boarding. We also saw how the Metrobus system seamlessly integrates with pedestrian walkways and bike lanes, even using the same payment method for its bikeshare system.

This collection of seemingly small features combine to create a beautiful experience, which led the Boston study group to embrace the BRT Standard, a bronze-silver-gold rating system used internationally to assess the quality of BRT corridors. One of the pitfalls of BRT is how easy it is to plan a corridor and have it turn out like “just another bus,” fueling skepticism.

In our report, we strongly encourage using this standard to ensure future

BRT projects don't backslide on what they promise.

**BRT can work here, even in a
crazy city like Boston**

One of the biggest challenges for us, and sources of skepticism we worked through during the study period, is Boston's one-of-a-kind cityscape. Boston is very small and compact compared to Mexico City and other places well known for their vast BRT systems. Our city streets, especially downtown, often make up a tangle of narrow pathways.

We also have some rocky history with BRT projects, including one that only partially succeeded as BRT, and another that fell through in the planning stages. But when the Barr Foundation set out to assess BRT for Boston, nobody had ever taken a citywide look at whether and where it might even be a good option for us.

We found more potential than we anticipated. Working with ITDP to compare ridership data, congestion, wait times, and future growth, we found 12 potential corridors, then narrowed down to five, that could benefit from Gold Standard BRT. The process went so far as to draft how the vehicles and stations might fit into existing roads and neighborhoods.

BRT could cut trip times here by as much as 45 percent. It could also serve a diverse cross-section of Greater Boston, including developing university and medical areas, burgeoning housing developments, and lower-wealth communities looking to spur economic development.

Other U.S. cities are steadily coming to similar conclusions, as one by one they recognize potential benefits. Varied cities such as Los Angeles, Eugene, OR, and Las Vegas have improved transit



for their residents. The statewide poster child has been Cleveland, which leveraged its HealthLine BRT corridor into \$6 billion in private investment.

Communities need to make courageous choices for BRT to succeed

Over the course of this process, the study group, myself included, developed a real enthusiasm for the possibility of BRT in Boston. But none of us are naive about what is required to make it work, especially at a high standard.

There would be hard fought tradeoffs. Some of the scenarios in our analysis involve devoting narrow stretches of road entirely to BRT and pedestrian traffic. Often, corridors would absorb a lane or two of car traffic, or on-street parking, a precious commodity here.

Such sacrifices require a strong vision, and a community that values smart development, reduced GHG emissions, and a de-emphasis on car travel.

I've come to believe the benefits outweigh the sacrifices. But a major take-home point of this analysis is that the communities involved need to drive these decisions. A past effort at a BRT corridor in Boston failed to materialize, largely because the community felt officials foisted it upon them.

Given past skepticism around BRT

and neighborhood cultural and political dynamics, we recognize that success is entirely dependent on whether a community demands the service and is willing to make the tradeoffs.

It's time to give BRT equal footing alongside rail

With a substantial body of data about its advantages and feasibility, it's time to stop thinking of BRT as a second-tier mode of transit.

The fact that BRT generally costs much less than light rail is clear, with ITDP's analysis finding that in the United States, it can be up to seven times less expensive. But that doesn't mean it's "transit on the cheap." BRT can be comparable in speed and capacity to light rail. And we've witnessed BRT corridors where cost savings were invested in superior infrastructure, rider experience, design, and interactive features.

There's also a flexibility and resilience that adding BRT to a transit system can provide. During the 2015 winter storms, our rail system struggled, with busy lines locking down and sending more cars out into nightmarish street traffic. BRT corridors can be easily plowed and used by multiple bus lines, and even emergency vehicles, providing a pressure release valve during shocks

to the system.

But the key to all of this, as the study group and I learned in the past couple of years, is that BRT must be viewed as a component of a multifaceted transportation system.

The last thing we want to come out of this report is a local feud between light rail advocates and bus rapid transit advocates. Instead, we need to be collectively thinking of how to move more people in the fastest, most comfortable, and most exciting way possible, using multiple modes of transit. BRT should be one of them.

BRT is not a cure-all to Boston's transit woes, nor will it happen overnight. But like so many other cities with aging infrastructures, growing populations, and tight budgets, we're at a crossroads. It's time to break out of the old paradigms and take courageous steps that use all the tools at our disposal. ■

Mary Skelton Roberts is a Senior Program Officer for Climate at the Barr Foundation, where she focuses on transportation and land use. Mary's grant making aims to maintain and modernize our transit systems and to help communities transform themselves into more walkable, connected places.

Seven Factors Behind the Rise of the Smart City Era

By Rick Azer

The future urban infrastructure is intelligent, connected, and aware. Today's wireless networks and data platforms play an ever-increasing role in the integrated infrastructure landscape and provide momentum to the rise of the Smart City Era. Several familiar factors are converging to produce effective operations of decentralized infrastructure and provide new opportunities for efficiency, control, and situational awareness. While each factor has been around for some time, the combination of these factors is enabling rapid change to smart city infrastructure and services. This swift transformation is extending the edge of the industrial network, creating new terrain for engineering and IT companies. The industrial network is adapting beyond its traditional boundaries of transport. As these new layers become accessible, engineers are deriving value and intelligence from products and services related to implementation of edge devices, and the collection and interpretation of endpoint data.

These seven factors interweave to form a communication fabric that is transforming our cities:

1. Pervasive wireless coverage.
2. Transformation of public carrier business plans to accommodate the Internet of Everything.
3. Miniaturization of processors and the integration of communication modules into intelligent devices.
4. Abundant cheap data storage and processing power.
5. Rise of cloud computing and edge computing.

6. Access to vast data streams enabling potential for rich analytics.

7. Extensive improvements in application development and visual display capabilities.

Coverage, Coverage Everywhere!

Public carriers spend billions of dollars each year to expand and improve their network coverage. Until recently, the cost and complexity of connecting end devices via point-to-point links or SCADA connections limited the number of connected devices. Most cities now have 4G LTE system upgrades optimized for high speed data. This extensive public carrier coverage provides a backbone of transport for sensors and control elements and vastly reduces the cost of establishing a data link between a remote device, its data repository and its control source. Optimized, pervasive wireless coverage means more people will have smarter field devices, which vastly expands the opportunity for rich awareness of field conditions.


Expanding the Internet of Everything

Public carriers realize that sensors and other machine-to-machine (M2M) wireless endpoints are a unique class of devices that should be distinguished from other types of data plans. Carriers are embracing the idea that cheaper data plans enable more M2M devices. While these devices are network-connected most of the time, they generally transmit only small amounts of data at any given time, which adds negligible marginal traffic to the network. As a result, carriers earn more revenue with

no additional network expense. These two factors, cheap data plans and pervasive wireless coverage, help push the idea that everything that can be connected will be connected—a basic tenant of the Internet of Everything. The evolutionary upgrade of device addressing from IPv4 to IPv6 also generates Internet growth by vastly increasing the number of connected hosts and the amount of data traffic transmitted. Advanced features like quality of service and auto-configuration make it even easier to add wireless endpoints into a network.

Big Processing in Small Packages

Today's wireless device platforms, like Qualcomm's Gobi, offer multi-radio communication modules and high-speed processing within a single chipset. Processors continue to shrink in size and increase in capacity, and many are designed specifically for power efficiency that remote sensors and other battery powered equipment require. The miniaturization of these modules allows their integration directly into edge devices. Moreover, the processors already within these chips render those devices intelligent for a fraction of the cost of traditional system integration. The integrated communication module facilitates rapid expansion of the Internet of Everything, as the cost of connected, intelligent devices becomes marginal. Toasters, refrigerators, pressure relief valves, streetlights and parking meters can be network-connected without a separately powered communications device. Today's M2M chipsets can process, store and transmit data independent of additional computing hardware, and independent battery



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powered sensor devices can now be configured to transmit data for a period of years.

Cheap Bytes

Each year storage and processing becomes cheaper and more abundant. Consumers can purchase an external hard drive with two terabytes of storage for a fraction of historical storage costs, and online products, like Dropbox and iCloud, provide cheap storage in the cloud. Commercial versions of these devices and online services can store massive amounts of data facilitating greater degrees of processing and analytics. Products like OSIsoft's Pi system serve as depositories and data historians for archived data received from the field.

Computing on the Edge...and in the Cloud

As data usage explodes exponentially, cloud computing grows as well. Today, everyone with a smart phone or tablet uses cloud computing when they open apps as they surf the net. Large amounts of data are securely transmitted and stored at remote data centers, allowing cheap, widespread use of information. Many companies cannot keep up with this big data explosion and look to automation guided by established rules to manage the blasts of data. The processing power now embedded within sensors and devices allows rules to be delegated downstream; data that meets conditions can be edge-processed locally, greatly reducing the amount of data that needs to be transmitted back. Both edge and cloud computing allow for exponential growth of field devices

through more efficient data processing. They pave the way for alternate business models such as Software as a Service and the rise of artificial intelligence.

Vast Data Streams and Rivers of Rich Analytics

Supported by pervasive wireless coverage and robust processing power, the number of devices and frequency at which they collect data is ever-increasing. The time slices of information are becoming narrower. With edge processing, when certain conditions are met, devices can be instructed to collect and transmit data in a timescale closer to real-time, allowing for greater awareness and situational understanding of field conditions. This capability can greatly reduce operational costs by eliminating truck rolls to understand a remote issue. A wider set of data with more granular information allows analytic engines like Black & Veatch's Asset360™ platform to create operational intelligence and facilitate adaptive planning to maximize system operations. Analysis of performance data can reveal operational trends that can reduce the likelihood of equipment failure.

There's an App for That (and for THAT, too!)

Smart phones, tablets, conventional laptops and work stations are sources for interface, display and control. At home, people use them to access a wide array of services and information from fitness devices to alarm systems. The application development process has become simplified, and visual display capabilities have improved. With the advent of HTML5, application deve-

lopment opportunities will evolve even further. Our smart devices have morphed into a combination remote control-information display-social media communicator. With applications like the traffic navigator WAYZ, users help gather near-real-time traffic information, layering dynamic situational awareness on top of static sensors. In some cities, citizens can use their smart devices to photograph and report potholes and other street maintenance issues directly to municipal operations for repair.

Smart Integrated Infrastructure

These seven factors converge to become part of a smart integrated infrastructure that is more distributed, connected and intelligent. This infrastructure allows access into new network terrain where previously inaccessible endpoint data can now be captured from the network edge. Engineering companies can derive greater value from this widespread connectivity and can be involved with application layer systems that ride across the network. Engineering and IT companies can provide richer service offerings and greater operational insight for customers who want to improve performance or sustainability. Cities and utilities want to capitalize on emerging analytics to become more aware, linked, efficient and resilient—capstones of the Smart City revolution. As the infrastructure evolves, so must approaches to design, engineer and operate this infrastructure to gain full benefit that these converged capabilities and emerging technologies provide. ■

Feel that Funky Beat

The Sound of Converting Dreams of Community into Reality



Photo by AJ Glover

By Blair A. Ruble

*Blair Ruble is the Woodrow Wilson Center's Vice President for Programs and Director of its Urban Sustainability Laboratory. His most recent book, *Washington's U Street: A Biography*, examines the challenges of gentrification in Washington, D.C.*

Saturday, May 2, 2015 dawned beautifully in Washington, D.C.; warm but not hot, breezes gentle not strong, skies azure blue not cloudy or gray. The dozens of businesses, artists and neighborhood groups behind the city's Second Annual Funk Parade could not have asked for a more perfect day for their celebration of community in D.C. An estimated 50,000 Washingtonians agreed, seizing on the opportunity to enjoy local musicians and each other's company.

Washingtonians of all ages, sizes, shapes, colors, genders—both native and newcomer—descended on U Street NW, the venerable main street for

African American Washington, to catch musicians ranging from school kids to veteran celebrities strut their stuff on eight performance areas throughout the neighborhood. When cocktail hour arrived, hundreds—including Mayor Muriel E. Bowser—gathered in front of the historic Howard Theater to fall in behind the Batala D.C. all-female drumming ensemble, the Eastern High School marching band, skateboarders, and an impromptu platoon of children in robot costumes and paraded their way to the iconic corner of 14th and U Streets.

As afternoon turned into evening, the magic of community embrace

Community, like a parade, is a process, not an object; a verb, not a noun.

encompassed the heart of Washington, a city perhaps better known for division, tension, and distrust. Meanwhile, a couple dozen miles up I-95, neighboring Baltimore struggled to find calm following an ugly outburst of civic unrest in the wake of the death of Freddie Gray while under police custody a few days before.

The Funk Parade did not just happen. The celebration is the product of determined community organizing and collaboration among local businesses, clubs, arts and neighborhood organizations in and around Washington's U Street and the surrounding Shaw neighborhood. The proud center of African American Washington during decades of Jim Crow racial segregation, the area entered into a long period of decline starting in the 1950s.

In April 1968, civic unrest following the assassination of the Reverend Dr. Martin Luther King, Jr. devastated the area. Over the course of three days of destruction followed by nearly two weeks of military intervention, the city suffered twelve deaths, 7,600 arrests, more than 1,000 fires, nearly 700 destroyed businesses leading to the permanent loss of 5,000 jobs and the destruction of nearly 700 apartments and homes. Much of the carnage—estimated to cost the city and its residents over \$27 million—occurred along and around U Street. By the time the metro system expanded into the area in 1991, the streets around U Street had become among the poorest and most crime ridden in the city.

With the opening of several metro stations in May 1991, the U Street area began to attract new investment and residents, leading to dramatic changes throughout the neighborhood. Over time, this once proud center of African American culture in Washington was no longer predominantly African American. If, in 1990, residents in the

census tracks surrounding U Street were 77% African American, they were just 22% African American two decades later. In light of the startling earnings gap between D.C. African Americans and whites (the median income of the city's black residents is between a quarter and a third that of whites), this extreme makeover exacerbated long festering tensions.

The vision of Funk Parade came in a dream to U Street resident Justin Rood, a D.C. native who had observed the growing tension in his neighborhood with concern. With local music advocate Chris Naoum, the two reached out to neighbors, local business and civic leaders to collaboratively produce an event in which all Washingtonians could create together a celebration of “the spirit of funk,” U Street, and the city of D.C.

Funk turned out to be a remarkable vehicle for bringing Washingtonians together. It's hard not to dance and feel good when you hear it: the genre is intensely rhythmic, mixing elements of soul, jazz, rhythm and blues surrounding a powerful electric bass grove that came together in African American communities during the 1960s. With its deep musical history and strong Black culture, Washington emerged as a major center for Funk, eventually producing its own distinctive sound originated by local music legend Chuck Brown that became known as “Go Go.”

The First Annual D.C. Funk Parade on May 3, 2014 attracted an estimated 25,000 participants. With a city administration more concerned about traffic control than community amity, the procession were forced to march from the historic Howard Theater through small streets ending in an alley behind the Lincoln Theater and Ben's Chili Bowl several blocks away. A year later, a new mayor relented to allow marchers to move along U Street, recognizing

that the event already had become a D.C. tradition.

The Funk Parade and the positive shared emotions it engenders did not happen by chance. They are the result of the hard work of community residents, business owners, civic and religious leaders, and politicians to create a moment encouraging everyone in the city to transcend the travails of daily life in a long divided city. “The Funk Parade—free your mind and your city will follow,” read the original flyer which Rood and Naoum distributed to organize local businesses and community groups behind the event. By strengthening shared community identity, the Funk Parade promotes the deep social capital that expands community resilience.

Community, like a parade, is a process, not an object; a verb, not a noun. Uneasy relations still mark Washington's sharp urban edges as the city grows and changes. Tensions run deep among old-timers and new comers, between African Americans, African immigrants, Latinos, Asians and whites, and between rich and poor. Parading together, dancing to the same rhythm, making music on a pleasant Spring afternoon cannot heal decades of conflict. Sustained work is required, which helps to explain why Rood has quit his job and is forming All One City, an organization which will use public art and collaboration to build resilience in D.C. and beyond.

But a parade on a lovely afternoon can begin to create bonds between neighbors through music and a shared love of place. Such connections are a key ingredient in making city culture sustainable through upheaval and change. In the words of Parliament Funkadelic's George Clinton, everybody's got a little light under the sun. ■

Cities Power the Sharing Economy

By Nicole DuPuis and Brooks Rainwater

So much of the news we read these days is peppered with the words Uber, Lyft, or Airbnb. With the swiftness of their rise in cities nationwide and globally, city leaders and policymakers are scrambling to find out how to best approach this new economic model—the sharing economy. At some point in the last five years the word ‘Uber’ transitioned from a catchy company name to a household verb, and the sharing economy became a game changer.

People think of a lot of things when they hear the term “sharing economy.” The rapid diffusion and evolution of this new economic model has left people with a variety of feelings, most of which fall somewhere in the realm of ambiguity and utter confusion. And that’s reasonable, given the warp speed at which the sharing economy thrust itself into our everyday lives, becoming commonplace in cities large and small around the world.

Furthermore, the vast difference in types of sharing economy platforms can be mind-boggling and often times policymakers are solely aware of what is happening with ridesharing or ride-hailing and homesharing, not realizing the vast array of goods and services that can be shared from food to ones time to tools and even municipalities sharing heavy equipment.

The common theme within this space is that cities make the sharing economy work. With the unanticipated surge in sharing or collaborative consumption companies, there has been what is commonly referred to as ‘disruption’ of existing systems. Traditional industries are being upended with the growth of innovative sharing economy models that do not neatly fit into existing local regulatory environments.

Residents both expect on-demand services and crave collaborative opportunities. City leaders must walk a fine

line, embracing change and innovation while simultaneously prioritizing safety and market fairness. As they grapple with this, they find that there is no best practice or one-size-fits-all solution, but rather an opportunity to experiment, to find a unique, context-sensitive answer that works for their community.

When it comes to cities and the sharing economy the legislative and regulatory system has been most affected by ridesharing and homesharing, and emerging models for how to incorporate these services are developing, but the newness of this issue still precludes long-term tested best practices. Additionally, there is no one-size-fits-all regulatory solution, because one of the true innovations in cities is always the ability to experiment and come up with solutions that work best for the local context.

At the National League of Cities, we conducted a study to measure the sentiment and direction of the sharing economy in the 30 largest cities in America.

Findings are based on a content analysis of media sources covering:

- the subject of sharing-economy services
- the introduction of sharing-economy services in cities
- the overall sentiment pertaining to sharing-economy services
- policies and regulation on sharing-economy services

Because of the sheer expansiveness of the sharing economy, NLC refined this study’s scope to focus only on ridesharing and homesharing services. Part of measuring the sentiment, also included an exploration of whether each city

has or is undertaking legislative or regulatory action to address these new models.

Every city is different, have different needs, a different culture, and different existing economic conditions, and they all subsequently address the sharing economy in different ways. Even given the wide variety of responses to sharing, most of the cities in our sample are working toward accommodating or adjusting to the operation of ridesharing or homesharing companies.

Looking specifically to the 30 cities analyzed we found 9 cities that showed overall positive sentiment and 21 that had mixed sentiment to homesharing and ridesharing. Additionally, we found that 15 of the 30 cities experienced regulatory action or other intervention from state policymakers. Our analysis also found that states are playing a big role in this discussion. State level interventions ranged from legislation to regulatory rulings to state legal action.

Most mixed and negative sentiment for the sharing economy is based on concerns over safety (provider and consumer), fair business practices (equal application of regulations or “leveling the playing field”), or lost tax revenue (uncollected hotel taxes). Overall, cities are finding that there is a way to strike a balance between promoting innovation, ensuring consumer safety and addressing existing industries.

Within the study we highlighted more in-depth what is happening with the sharing economy in a number of US cities, including Denver and Portland. Denver is an interesting city for further exploration, because it is one of the cities that have seen intervention from state lawmakers. Colorado was the first state in the union to pass legislation authorizing ridesharing statewide.

While this legislation received pushback from some traditional industries, Governor John Hickenlooper



celebrated the state's move toward embracing innovation. While the state legislature made a bold move in legalizing ridesharing outright, the policy still underscores the importance of safety with provisions that require insurance and background checks. In October of 2014, the Denver City Council convened a special task force to explore the city's sharing economy, with an initial goal of understanding the social and economic effects of the city's homesharing market.

Portland, Oregon has definitely displayed mixed sentiment toward the sharing economy. Homesharing has been legalized, and the city partnered with Airbnb to launch its Shared City Initiative. Part of this will include efforts to assist Airbnb hosts collect hotel taxes on the city's behalf. Ridesharing has posed a different challenge for the city, as existing city codes prohibit the practice. Portland Mayor Charlie Hales initiated a new task force to explore the possibilities of a regulatory framework that might accommodate everyone.

In the meantime, Uber has agreed to temporarily halt operations in the Rose City, and is working with city officials to reach an agreement. An official statement from the city in December expressed optimism, and willingness to

work "with Portland's lawmakers, working to create a regulatory framework that works for everyone, not just us. Not just the taxi cabs. Not just the city officials. Everyone."

City ordinances that govern more traditional fields of commerce took decades to develop, and while the sharing economy is wildly popular and nimble, we cannot expect things to change overnight. Cities are meeting these changes with open arms, though, and committing to addressing them responsibly, with the best interests of residents in mind. The National League of Cities (NLC) is helping them navigate and prepare for this new environment with resources and the development of a Sharing Economy Advisory Network.

Because this is a rapidly changing environment our findings represent a snapshot in time. In addition to reflecting what we could see at the time of our data collection and analysis, however, our findings indicate the presence of some trends in the sharing economy. Overall, city policymakers are trying to strike a balance between promoting innovation, ensuring consumer safety, and respecting existing industries.

This is only the beginning of the sharing economy, and we will undoubtedly

continue to see more new companies, more disruption, and more social and political interplay between existing and new actors. Cities will continue to serve as the laboratories for these ever-changing technologies and business models. The best thing that city policymakers can do is keep an open mind about how the new economy might be fruitful with the right regulatory framework in place. Sharing is here to stay. ■

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Brooks Rainwater is the Director of the City Solutions and Applied Research Center at the National League of Cities. As a strong advocate for vibrant and successful cities, Brooks frequently speaks and writes on the subject, and has published numerous research reports and articles on the creation of innovative, sustainable, and livable communities.

Reinventing Energy

By John Addison



Over the next 40 years, we will progress to a better and different approach to generating, transmitting, and using energy. In some ways, the transition resembles the transformation of information technology during the last 40 years. Through the mid-seventies, over 90 percent of computing was done on centralized mainframe computers accessed by dumb terminals. Then mini-computers brought a variety of added capabilities closer to those working with the information. Software dramatically expanded what could be accomplished. Personal computers with local networks rendered obsolete most central mainframes. Now we hold in our hands computers more powerful than those ancient mainframes and access a wealth of information and applications in the cloud.

Forty years ago, if you forecasted today's mobile and cloud technology, you would have been greeted with scepticism and laughter. Yet, the transformation happened. Now, it is understandable when people are sceptical of a future of smart cities powered with renewable energy. Yet, it will happen.

Until recently, most electricity was generated in central power plants, fueled by coal, natural gas, and nuclear. Now, seven U.S. states provide over 80 percent of their energy from a mix of renewable sources: Washington, Oregon, Idaho, Nevada, South Dakota, Iowa, and Maine. Solar capacity has grown 20 fold since President Obama took office. Cities, states, and nations are racing to be one hundred percent renewable.

Future energy will be free of toxic spills into our drinking water, nuclear

disasters, and coal miners dying from lung cancer. Future energy will keep our lights on and elevators running after superstorms. Future energy will be generated within our zero net energy buildings, communities, and cities.

Distributed Generation and Microgrids

Today, central power plants still dominate, yet old ones are being shut down as distributed generation proves superior. A good example is how two nuclear power plants were shut down in Southern California, with their generation more than matched by distributed solar power coupled with innovative battery storage.

At the same time that we are more efficient in capturing wind power and

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converting solar power, we are becoming efficient in energy use. There was a time when a ten percent annual growth in electricity use was met with new centralized coal and gas plants. Now, in a more efficient United States, electricity demand is only growing one percent annually and renewables meet this incremental demand.

New buildings cut energy requirements 50 to 80 percent with green roofs, optimal insulation, smart windows, efficient HVAC, and LED lighting. Software controlled networks of sensors and controls only use energy when and where needed.

By 2020, globally solar and wind will generate the equivalent of one thousand central power plants. Energy storage capacity will be the equivalent of hundreds of power plants, using everything

from pumped hydro to thermal storage to advanced batteries.

Our aging electric grid is designed for a one-way flow of electricity from central power stations to commercial, industrial, and personal customers. Major storms have knocked out these customers for days. Generation and distribution are poorly designed for real time price signals. The aging grid is slowly being upgraded to an intelligent, resilient, two-way network of grids.

A new GTM report details 124 operational and 92 planned microgrids in the U.S. The 2,800 people in Borrego Springs, California, use a microgrid that can connect or disconnect from utility SDG&E's grid service. The 2,800 use 26 MW of solar energy. The University of California San Diego meets over 80 percent of its power needs within its own microgrid that connects onsite solar, turbines, and fuel cells with power hungry labs and hundreds of buildings. In the aftermath of Superstorm Sandy, New Jersey Transit will keep its electric rail running with a transit microgrid that includes standby generation, renewables, and the ability to run even if the utility grid fails.

Intelligent Energy Management and Zero Net Energy

Energy management is moving faster than the transformation of generation. Organizations often could not identify major costs and sources of energy use. Now GM saves over \$20 million annually using Enernoc software, by having a single system that organizes its 1,700 energy bills from 29 countries. GM can see where it achieves the fastest ROI with efficiency investments, by shifting demand, and by investing in its own energy generation.

Early energy systems managed the lighting and heat in buildings. Next generation systems respond to price

signals from utilities to downcycle air conditioning and postpone operations until off-peak pricing can be used.

I toured a National Renewable Energy Lab (NREL) zero-net-energy building for over 1,000 employees. The building generates as much power as it consumes. Energy management and the Internet of Things (IoT) use natural daylight and ventilation, and turns off lights and other energy use when people are not present. Solar, wind, and geothermal energy use is optimized.

We are progressing from hundreds of zero-net-energy (ZNE) buildings, to ZNE apartment complexes, university campuses, military bases, communities and soon ZNE cities.

Some of the companies that shaped the information revolution are now reshaping our energy future. IBM, Oracle, Google, and Microsoft are involved in many smart cities projects. Long time technology leaders like Cisco, Texas Instruments, and Qualcomm provide building blocks for the IoT. These experienced IT leaders are joined by thousands of energy technology innovators.

Uber disrupted transportation. Airbnb disrupted the lodging industry. Now, financial innovation disrupts electric utilities, leading to energy that is efficient, smart, and distributed. Major banks, pension funds, and yieldcos are investing billions to own wind farms, solar projects, and energy efficiency retrofits. They eliminate the barrier of upfront capital expenditures that formerly stopped building and home owners, and offer monthly energy payments that lower total bills.

Each day, our energy future becomes more efficient, intelligent, distributed, mobile, and sustainable. Most likely you are one of the thought leaders and innovators that are moving us in the right direction. Thank you. ■

The Alternative On-Hand

Why Isn't Propane a More Prominent Part of Our Alternative Fuels Conversation?

By Hannah Greinetz

Hannah Greinetz is currently earning her MBA from Presidio Graduate School in San Francisco, California. Her multi-disciplinary background and view of several industries from the inside, including scrap metal and the non-profit world, informs her systems approach to creating a sustainable society and urban environment. Hannah is passionate about businesses providing sustainable options, and creating a sustainable water system.

In the US, we have over 190,000 miles of pipeline devoted to the delivery of liquid oil and gas for our energy needs. Of that total, about 60,000 miles transport crude oil, another 60,000 transport refined petroleum, and the remaining 60,000 deliver natural gas liquids.

Natural gas liquids include propane, butane, ethane, isobutane, and natural gasoline, and all are produced as a by-product of natural gas processing and petroleum refining. Increased domestic oil production has created a flood of supply in the US propane market; the US is now producing a record high of about 1.6 million barrels of propane per day; the Marcellus Shale has the potential to produce up to 1.8 billion gallons of propane per year by 2020. As a result of this growth, in 2012 the US became a net exporter of propane for the first time in history.

For a country focused on energy independence as the US is, propane seems to be an extremely viable transition fuel to a cleaner economy and an economy that relies on domestic energy sources. One industry leader posits that we are sitting on 200 years of domestically produced propane consumption. The US Department of Energy has also done extensive research and released their studies on the benefits of and comparisons of propane to diesel, CNG, and gasoline; and has found, for several reasons, that propane is a top contender for the alternative fuel that we should be using in our transition to a cleaner and domestically supported energy economy. So my question is, why aren't we focused on building out the infrastructure that would support our use of propane as a transition fuel to this economy?

First, let's get some facts straight about propane. Of our total propane consumption in the U.S., we use the majority, 45%, in the petrochemical

industry, 42% for residential and commercial purposes, 5% each for industry and farming, and the remaining 3% is used for transportation. It's this last 3% of propane used to run automobiles that deserves another look. According to the US Alternative Fuels Data Center, cars run on propane emit less CO₂, less particulates and GHG's, are less expensive to fill up, and more generally, they'd be running on a domestic fuel source. They ran a lifecycle analysis on the emissions content of propane and found that, "propane use reduced GHG emissions by nearly 10%, and when derived as a by-product of natural gas production, propane reduced petroleum use by 98% to 99%." Propane is an inherently cleaner burning fuel than gasoline, due to its lower carbon content.

Roush CleanTech and Autogas for America provide the following statistics for more perspective:

- Propane autogas exhaust creates 60 to 70% less smog-producing hydrocarbons than gasoline (Southwest Research Institute).
- Compared to gasoline, propane yields 12% less carbon dioxide, about 20% less nitrogen oxide, and as much as 60% less carbon monoxide (World Liquid Propane Gas Association, January 2003; California Energy Commission, January 2003).
- Propane autogas cuts emissions of toxins and carcinogens, like benzene and toluene, by up to 96% when compared to gasoline (Southwest Research Institute).
- Propane is a low-carbon alternative fuel that produces significantly fewer greenhouse gas emissions than diesel and gasoline in a wide range of applications (Propane Education &



Research Council).

- Propane autogas has an octane rating of 106 (compared to premium grade gasoline of 91 to 92), which allows for a higher compression ratio in the engine and greater engine efficiency. This leads to significant reductions in exhaust emissions like carbon monoxide (Argonne National Laboratory).

The US currently runs about 150,000 cars and buses on propane autogas; most of that number comes from fleet vehicles and city buses; propane is also a common fuel source for heavy equipment like forklifts and lawnmowers. The US is trailing many countries who have more widely adopted propane autogas for consumer vehicles, and have invested in the infrastructure for propane autogas refueling stations. Turkey leads the world with the most cars run on propane, at 3.9 million. Russia runs

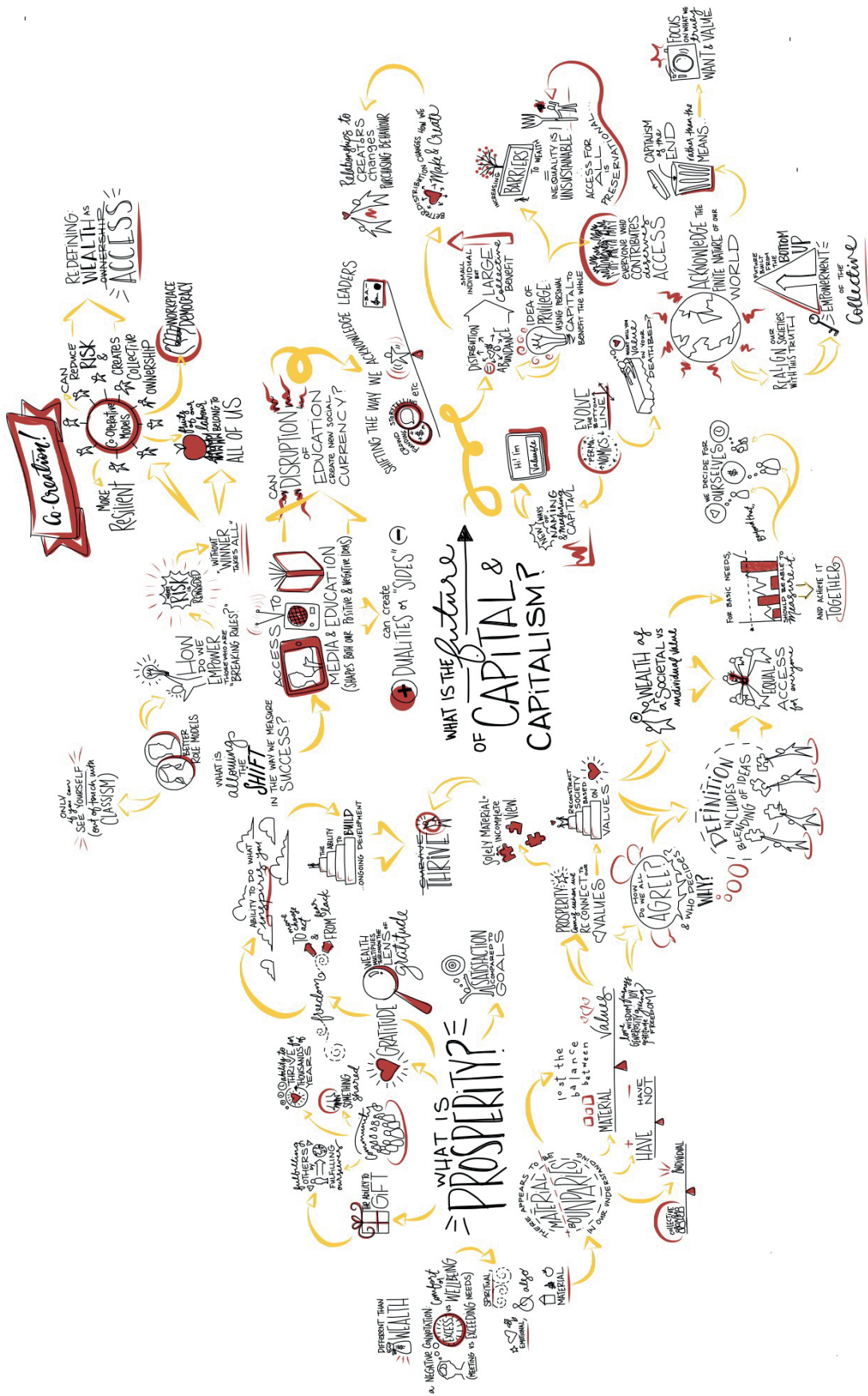
3 million cars on propane, Poland has 2.75 million, India runs about 2 million out of their total estimated 60 million vehicles, and Italy also runs about 2 million vehicles on propane out of their total 40 million.

The US Department of Energy supports a program called Clean Cities, the goal of which is to reduce petroleum consumption in transportation through local action. Clean Cities consists of a network of 100 coalitions across the country which can share best practices and pool their resources to create bigger and better impact. The program supports propane infrastructure in a move away from petroleum, and has recognized several cities and states for their transition to running fleets and school buses on propane, as well as for these cities' efforts to build out the infrastructure for refueling stations.

The most common way that this transition from petroleum to propane happens for vehicles is through a vehicle

conversion, so that the original gasoline or diesel engine is outfitted to run either solely on propane autogas, or on propane as well as gasoline so that the driver can extend the range of his vehicle. Propane is considered an alternative fuel under the Energy Policy Act of 1992, and several federal grant programs have been put in place to support the increase in number of cars on the road running on propane. Several coalitions in the Clean Cities program have received awards for their work in building propane autogas infrastructure and in providing the resources for vehicle conversions: the Alabama coalition, Indiana, Ohio, Dallas-Fort Worth, and Virginia Clean Cities.

Falling oil prices have recently dragged down the price of natural gas, and propane along with it. This makes any alternative to gasoline less attractive, since gas is the status quo, and the inertia goes something like, 'if it's there and it's cheap, why fix it?' ■



The Coin to the Kingdom

Re-THINKing Capitalism as a Key to the Housing Crisis

By Kaz Brecher

According to provocateur and THINK alumni Michell Zappa, “an industry-topping, government-shifting, sector-disrupting revolution is underway. Think Napster, but bigger.” You’ve probably felt the undercurrents. Yet as economic waves rock the boat of capitalism, many are unprepared for what’s next. Excitement and fear mix as so-called sharing economies, shifts in philanthropy and alternative currencies emerge, balancing possibilities with the untested nature of new models. Capitalism as we know it, even money itself, is one of the most complex systems mankind has ever created. And part of the problem we face, as our world is bending and breaking, is how to describe the relationships between systems—they are nested, intertwined, interdependent, and deeply emergent. From a cultural and emotional perspective, we sense the inadequacy of our financial systems but often feel powerless to change something that feels monstrous and unhakable, yet everywhere we turn our attention to we can find signs of change.

So, in my role as the Director of the Challenge track at THINK’s newly launched Vancouver campus, I couldn’t wait to dive into examining the Future of Capital(ism). THINK School of Creative Leadership is a C School that combines venture design and innovation leadership and focuses on action and implementation. We take the

best from business schools and design schools to create a greater sum: truly transformational creative leadership to build human-centered systems for a better future. Within this journey, the Challenge is a 6-month effort that takes a humble, curious, and forward-looking cohort, a global network with a shared intention for impact, and trains them in a structured approach to human-centered creativity using a topic of deep societal relevance.

Envisioning a Better Future and Orchestrating Creative Teams

We begin by co-creating a moonshot vision to align our efforts and help us determine some of the most promising areas for exploration. We tap into a diverse ecosystem, inviting subject matter experts, rabble rousers, and master practitioners to roll up their sleeves—an incredible group rallied around the Future of Capitalism, out of which emerged our Innovation Partners on this initial challenge cycle: the City of Vancouver and the Digital Finance Institute. These partners bring a rich depth of knowledge, broad networks that can be harnessed, and platforms for rolling out concepts with promise. They collaborated on shaping the brief and, after much deliberation, we decided to use the Vancouver

housing market as a petri dish for discovery, asking “how might alternative and digital currencies increase access to affordable low-carbon housing for those in need?”. The profound ripple effects from the current housing crisis are being felt well beyond Vancouver, and the aim with all of our Innovation Challenge work is to use a local context to drive global learnings.

With teams that sound like they could have been the set-up to a bad joke (an accountant, a restaurateur, and a creative director walk into a leadership school...), the cohort examined the needs of varied demographics, from vulnerable populations to mid-to-low income families. They interrogated data around perceptions of “green” housing options, changing patterns of ownership and engagement with living spaces—from co-housing to nomadic living—and the impact these shifts are having on property development. Participants from around the globe tore apart existing financial vehicles tied to earning equity in housing, models of developing and recouping energy upgrades, and assumptions underpinning ideas of community development—from the potential of smart multi-generational housing blocks to how community assets are often undervalued. The outcomes of this process are a first step towards driving breakthrough change and fashioning a future of capitalism predicated on the belief that “we’re all better off when we’re all better off,” as THINK Forum Guest, Eric Liu, so plainly remarked.

Turning One Small Step into One Giant Leap

During the next several years, across 6-month program cycles in Vancouver and Amsterdam, THINK is uniquely positioned to continue convening diverse groups of changemakers around examining, reframing, and driving societal impact. But impact is more likely when we join forces with exceptional Innovation Partners to drive new thinking around how we can become positive participants in the marketplace by harnessing the technological and complex dynamic cultural forces shaping these systems. While growing disparities in income and access cause global upheaval and strife, we see the renewed focus on our interdependent financial future as a massive opportunity for those bold enough to dive in. As encouraged as I am by the team triumphs, concepts and momentum, this is but a first milestone in service of a much larger vision—catalyzing this kind of change requires commitment, support, and evangelists. We and our Partners and Participants are in for the long-haul, and we hope you’ll join us! ■

As the daughter of two rocket scientists, Kaz founded Curious Catalyst to marry investigation with action, bringing disruptive agile approaches to urban challenges and a new take on the business of social impact through her experience with lateral thinking, rapid prototyping, and human-centered design.

Artist Workspace Prototype Rolls Down Market Street

By Krista Canellakis

Meeting of the Minds is working with the San Francisco Mayor's Office of Civic Innovation (MOCI) to bring you the Civic Innovation Spotlight, a monthly feature that shares the stories of cutting-edge and innovative civic projects in San Francisco. This series shares the untold stories of government innovation and inspiration related to accessibility, education, health, energy, and public services in San Francisco.

For more articles in the Civic Innovation Spotlight, visit:

CityMinded.org/category/civic-innovation-spotlight

Meet Studio 1, San Francisco's 2nd Living Innovation Zone and mobile art studio. Studio 1 is a 65 square foot "off the grid" solar powered studio, public art project, and micro-residency center designed and constructed by David Szlasa. Studio 1 brings artists to the streets to interact with the public—allowing the community to be part of the design and exhibition process. "It was the most exposure I've ever gotten as far as my artwork," said Andrea Bergen, the first artist taking residency in Studio 1.

"In the past few years, the City has worked with the community to revitalize Market Street by attracting new jobs to the area, building more housing

for our City's families, keeping our community-oriented arts organizations in the neighborhood and activating the street with initiatives like Living Innovation Zones," said Mayor Edwin M. Lee. "This Living Innovation Zone is a forward-thinking prototype that creates affordable space for artists to engage directly with the public on one of our City's busiest thoroughfares and ensures our local art community and everyone in our City prospers from our successful City."

Built on the back of a flatbed trailer, the Studio is made primarily of reclaimed and salvage materials with features including an integrated video projection screen and motion activated under-

carriage LED lights.

The Studio is a mobile LIZ, sited at NEMA and Mechanics Plaza during the summer of 2015. The project is one of several structures Szlasa has built for artists and creative people in response to the need for alternative models for artist work space in growing economies like the Bay Area.

According to the creator, David Szlasa "Studio 1 is a prototype for a scalable, sustainable solution for art spaces in under-resourced areas."

For a week at a time from June 17th to July 25th, artists curated by Szlasa and the San Francisco Arts Commission are occupying the Studio. Each artist-in-residence represents a mix of disciplines and will develop programming schedules to complement the natural traffic patterns of the location, scheduling open studio hours and exhibitions on a regular basis. More information on the day-to-day programming can be found here.

The project was celebrated on June 25th at an event that brought together all of the champions who made this project possible, including, David Szlasa, San Francisco Mayor's Office of Civic Innovation, the Planning Department, San Francisco Arts Commission, Rainin Foundation, Yerba Buena Center for the Arts, and of course, all the artists who are bringing the Studio to life week by week. ■

Krista Canellakis is Deputy Innovation Officer in San Francisco's Mayor's Office of Civic Innovation. She aims to build an open innovation program to make San Francisco more inclusive, diverse and responsive to citizen needs. Canellakis is building a community of civic entrepreneurs both inside and outside of government to catalyze new forms of creating solutions to civic challenges.



A new online course available at [Udemy.com/urban-innovation](https://www.udemy.com/urban-innovation)

URBAN INNOVATION

SUSTAINABILITY AND TECHNOLOGY SOLUTIONS

This course is an introduction to various innovators and initiatives at the bleeding edge of urban sustainability and connected technology. It focuses on real world examples within two key themes—smart cities and transportation—as a way to look at the challenges and practical responses related to urban sustainability.

Course material is based on case studies, seminars, and conference sessions from the Meeting of the Minds international network and annual summit. Lectures are presented by topic experts and presentation slides and other helpful resources are included.

Optional multiple choice quiz questions follow the lectures for those students wishing to test their new knowledge or obtain a course completion certificate. No commitment is required to do the entire course. Students can proceed at their own pace and may view as many - or as few - of the lectures as they choose.

This course was developed with support from Cubic Transportation Systems, a leading integrator of payment and information solutions and related services for intelligent travel applications.



A Call to Action for City Leaders

Create a Food System Resilient to Local Disruptions

By Kim Zeuli and Austin Nijhuis

In recent years, cities and regions have been looking to build resilient food systems in the face of climate change. One motivation for expanding local and regional food systems, including increasing urban agricultural production, is the fear that global climate change will disrupt reliable supplies of food from other regions and countries. A New England Food Vision, for example, explores what would be needed to produce at least 50 percent of the region's food supply in New England by 2060.

But the impact of Hurricane Sandy on New York City, and its near miss in Boston, begs a different perspective: An expanded local and regional food system could create new vulnerabilities to natural disasters. For example, if a hurricane hit Boston, it would disrupt production at 12 milk processing plants that supply the majority of Boston's milk. City officials are beginning to realize that they do not have sufficient data on the state of their food systems in normal circumstances, let alone in the event of a disaster. As reported in City Lab in 2013, "When Superstorm Sandy pummeled New York last fall, it revealed the terrifying potential for sudden food shortages."

A resilient food system—the production, processing and distribution of food—would have the ability to adapt to changing conditions, withstand disruptions such as natural disasters, and return to normal operations in a relatively short time period. It would prevent food shortages in the immediate aftermath of a disaster and ensure that food supplies and distribution are restored to all neighborhoods. As such, resilient food systems require flexibility, diversity, redundancy, and adaptability, as well as individuals and organizations with the capacity to monitor and manage risks.

Last year, Boston was selected as one of 35 cities from around the world to join Rockefeller Foundation's 100

Resilient Cities Network, and the City recently hired a Chief Resilience Officer to lead this initiative. Boston also took a major step in becoming a leader in food resilience planning. It is the first city of its size to complete an assessment of the resilience of its food system to a natural disaster. The wisdom of this effort was underscored by the unprecedented blizzards Boston experienced last winter.

Resilient Food Systems, Resilient Cities: Recommendations for the City of Boston* highlights the findings from this one-year study. Led by ICIC, the research was commissioned by the City of Boston's Office of Food Initiatives, Office of Emergency Management, Office of Environment, Energy and Open Space, and Boston's Transportation Department.

One key takeaway from our study is that if the City of Boston wants to strengthen its food system, it should focus more on improving local transportation infrastructure than on expanding local food production. Ninety-four percent of Boston's food arrives by truck. A storm surge of the same size as that created by Hurricane Sandy (7.5 feet) could flood most of the major North-South interstate in Boston and create significant barriers to the transportation of food into the city.

As we learned last winter, a major blizzard will obstruct the distribution of food within the city because the snow impedes truck access on already narrow secondary roads. As one food industry expert that we interviewed explained, "It's all about logistics. The analogy I would give is air traffic control, getting something from point A to point B. Say there's a huge storm. How do you get the trucks to a distribution center, then trucks from a distribution center to the retailer? Food may already be at the distribution center or en route. It's like planes jamming up."



A second important finding we highlight is that food availability in inner city neighborhoods will be disproportionately impacted by a natural disaster. Overall, Boston has a robust mix of food retail outlets that include large national, regional, and local grocery stores as well as many corner stores. However, the distribution of retail outlets differs by neighborhood. A few inner city neighborhoods will face a higher likelihood of store closures and diminished food supply in the event of a natural disaster because of their greater reliance on corner stores and a higher share of retail outlets in flood prone locations.

Across Boston, nine grocery stores and 59 corner stores are at risk of being flooded by a seven and a half foot storm surge. Seven of these flood prone grocery stores and 33 of the flood prone corner stores are in inner city neighborhoods. In addition to offering fewer

*Read ICIC's report, *Resilient Food Systems, Resilient Cities: Recommendations for the City of Boston*. The study was funded by the Henry P. Kendall Foundation and the Local Sustainability Matching Fund, a project of the Funders' Network for Smart Growth and Livable Cities and the Urban Sustainability Directors Network.

See: www.icic.org/research-and-analysis/resilient-food-systems



food choices to consumers in normal circumstances, corner stores and smaller grocery stores may face even more restricted supplies and longer periods of closure after a natural disaster because they do not have access to a corporate network to help them tap into alternative supply chains and other resources.

We also find that expanding and strengthening the resilience of food banks should be an important priority for food system resilience planning. In normal circumstances, food banks play a vital role in feeding food insecure households through their food pantry network. During natural disasters they also support nonprofit organizations such as the American Red Cross with emergency provisions. The Greater Boston Food Bank (GBFB) has over 500 member agencies that serve 500,000 people annually across Eastern Massachusetts. GBFB does not have

sufficient capacity or storage to meet normal demand, and the number of food insecure residents would likely increase after a natural disaster. In a survey of New York City's food pantries and soup kitchens one year after Sandy, a majority responded that they were feeding more people and that this was due at least in part to Sandy. All agencies in Staten Island, one of the areas hardest hit by Sandy, reported feeding more people.

It would be a significant challenge for the GBFB and food pantries in Boston to meet a similar increase in demand. The location of the food bank in Boston also presents critical transportation issues. During the 2015 winter storms, for example, snow buildup on the narrow access roads made it difficult for food delivery trucks and member agencies to get to GBFB.

In addition to our findings and recommendations for Boston's city lea-

ders, our study includes a framework that other cities can use to assess vulnerabilities in their food systems. Additional research is needed to identify the optimal mix of local, regional, and national food production to strengthen the resilience of urban food systems to natural disasters. As cities across the U.S. work to build resilient food systems, while simultaneously expanding local production, we believe this type of analysis is imperative. By focusing on the resilience of their food systems, cities can help to ensure that all residents have access to safe and healthy food in the event of a major disaster. ■

Kim Zeuli is Senior Vice President and Director of Research at the Initiative for a Competitive Inner City (ICIC). Austin Nijhuis is a Senior Research Analyst at ICIC.

The Berkeley Global Campus

Vision and Partnership in Richmond

By Nils Gilman

In October 2014, UC Berkeley Chancellor Nicholas Dirks presented his plans for the Berkeley Global Campus at Richmond Bay (BGC) to the Academic Senate. His vision has been described as “unabashedly bold”: to create a global campus and “living laboratory” in partnership with other great universities from around the world, as well as with private industry and the local Richmond community.

Building on University of California, Berkeley’s international reputation; Lawrence Berkeley National Lab’s groundbreaking research; the region’s entrepreneurial spirit; the unique physical setting; and key partnerships in Richmond, the new Berkeley Global Campus will be a focal point for an international coalition of leading academic institutions and private sector and community partners. BGC will bring a global community of researchers and industry innovators to Richmond.

Through a transformational model for global research integration, as well as through the expansion of educational activities, BGC will maintain and expand deep ties to the main campus and to the local community through a variety of educational, public health, community outreach, labor, and transportation partnerships. These partnerships will collaborate on research and academic initiatives addressing complex global challenges the world faces in the 21st century, including: climate change, energy development and storage, big data, precision medicine, global health, as well as associated commercialization opportunities with the private sector.

We are currently in advanced talks with a number of potential partner Universities, and hope to be able to announce these soon.

Assets on the Ground

Of course, a 21st century campus will



need a 21st century infrastructure to support it. Seeking a cutting edge infrastructure solution, we tapped the expertise of Integral Group, an engineering firm that specializes in the design of simple, elegant, cost-effective systems for high-performance buildings—their tagline is “deep green engineering.” Highlights from the resulting Infrastructure Master Plan include recycling water on the campus, which will help to avoid stressing the city’s aging infrastructure. The water will not only be used for irrigation, but for cli-

mate control and fire preparedness—it turns out that the hot water used to keep buildings comfortable during the winter is just as good at dousing fires as cold water.

We also plan to take advantage of the natural assets at the site. We will continue to protect the prairie grasslands and marshes that we have spent decades (and millions of dollars) to rehabilitate and preserve. And in exchange, these unique features of our local ecosystem will not only offer habitat to local birds and other wildlife, but also provide

Associate Chancellor Nils Gilman is a strategic advisor to the UC Berkeley Chancellor, responsible for the effective administrative organization of the Office of the Chancellor.



research opportunities for our faculty and students, add to a breathtaking tableau for the whole community to enjoy, and offer protection against tidal surges and other issues associated with climate change.

Other highlights of the master plan and illustrative design work include: distinct walkable neighborhoods; a layout that deflects wind off the Bay and creates sheltered spaces; east-west solar building orientation; diversity of open edges and public access points; and a multi-modal grid connected to

surrounding streets.

About the location

The BGC site, which has been known as the Richmond Field Station for decades, is owned by the University of California and operated by UC Berkeley. It is minutes from the main Berkeley campus and in close proximity to San Francisco and Silicon Valley. While transport connectivity to the BGC site can stand improvement (the city of Richmond is developing an area con-

nectivity plan), the site is already well served by the 580 freeway, the San Francisco/Richmond Bay Trail and two BART stations.

The site is also one of the largest developable waterfront properties left in the Bay Area. And, frankly, the views, the marshes, and the entire campus is just beautiful. Preserving that beauty while making it more accessible to a vibrant working community will be one of the main payoffs of this project. Over time—think 30 to 40 years—130 Bay front acres will be transformed into a



Left: An aerial photograph of the Richmond Field Station. Right: An artist's rendering of the Global Berkeley Campus.

5.4 million square foot global campus that is open to the community and home to academic and industry partners from around the world.

Civic Transformation and Innovation

Meanwhile, the City of Richmond is experiencing a transformation of its own.

Richmond has long been one of the most diverse communities in the Bay Area, with cultural amenities that are easily accessible by car, BART, and bike. Richmond can proudly claim such historical gems as the Rosie the Riveter WWII Home Front National Historical Park, 32 miles of publicly accessible shoreline, and is consistently at the forefront of innovative city policy making in the area of public health. Despite this, the city has struggled against a reputation as a low-income, high-crime, post-industrial suburb, stuck in the shadow of one of the country's largest refineries. Though this image might have been justified in the past, the changes the City is undergoing are creating an entirely new reality for the City and its residents. Richmond is increasingly recognized as a City that is successfully pioneering a healthy, sustainable, and economically vibrant future.

Much of the credit for Richmond's "renaissance" goes to City Manager Bill Lindsay. Crime is down, unemployment has fallen from 18.5 percent in 2010 to 5.8 percent in March 2015, the City adopted a Health in All Policies strategy

to operationalize its ground-breaking, health equity-focused General Plan, and the City is increasingly home to socially and environmentally conscious companies like Nutiva.

But Lindsay is the first to admit, that this is not a one-man show. The success of innovative policies and the successful programs in Richmond are the result years of work by community groups as well as City Hall, the school district and philanthropy, labor and business groups, and many other stakeholders, all hard at work in a complicated array of partnerships and collaborative initiatives. These partnerships draw from the experience and expertise of institutional partners, a wide cross-section of community members, high school and university students, as well as area experts to inform policy making and improvements to the built environment. Resulting innovation policies at the city level include the Health in All Policies strategy, the city's early drafts of a Climate Action Plan, the Community Health and Wellness Element of the General Plan and more. At the school district, a full-service community school initiative benefited from these partnerships. And I could go on.

This focus on partnerships as well as the university's deep history in the City, and an emphasis on innovation in public health and sustainability all make Richmond a great partner in the development of the Berkeley Global Campus.

The Chancellor's Commitment to Partnering with Richmond

For years, Richmond residents, community and city leaders have consistently participated in the development of the global campus. Hundreds participated in community meetings to learn more about UC Berkeley and the Lawrence Berkeley National Lab's research focus areas and to provide feedback on the Environmental Impact Review and Long Range Development Plan. More recently, representatives from across Richmond are deeply engaged with UC Berkeley and Lab staff in a planning process to develop a package of community benefits.

The Community Working Group, established by the Chancellor and the Director of the Lawrence Berkeley Lab, is comprised of 24 representatives from a broad cross-section of constituencies including faith-based organizations, nonprofit sector, education, the city manager's office, labor, local business, neighborhood associations, and philanthropy. The Community Working Group is empowered to develop proposals, including recommendations for legally binding agreements on community benefits, in the areas of education, local employment, procurement, and workforce training, as well as housing.

The Community Working Group kicked off in September 2014. Since then it has met nearly monthly, developed a charter, launched subcommittees to explore promising practices and recommendations, added a community co-chair, and new seats to represent nearby neighbors as well as a housing expertise seat.

Meetings are open to the public, held



An illustration of the Global Berkeley Campus Master Plan

at the site of BGC. And they are vibrant. More than 50 community members as well as elected officials and staff attended the August 2015 meeting—during which a robust debate about the definition of “local” underscored the importance of a transparent and representative process.

If all goes according to plan, the CWG will present community benefit recommendations to the Chancellor and the Director of the Lab before the end of the year.

The City is Not Sitting Idle: Planning for the South Shoreline

Much of what will make BGC a success, both in the short and long term, will be the result of parallel planning efforts that bring together diverse stakeholders working to ensure a broad distribution of benefits associated with the global campus.

As you might have guessed, our partners at the City are not sitting back and

waiting. In June 2012, the City of Richmond was awarded a Priority Development Area Planning Grant from the Metropolitan Transportation Commission and Association of Bay Area Governments to develop the Richmond Bay Specific Plan. The City has held a number of community meetings, solicited feedback on draft plans and continues to involve area experts in this process.

The Specific Plan facilitates the implementation of Richmond’s new General Plan by establishing specific planning policies, regulations, and urban design guidelines for an approximately 220-acre area located in the southern section of Richmond, adjacent to the global campus. The Specific Plan focuses on ways Richmond can take advantage of the global campus, future ferry service (expected in 2017), and other area assets to create a sustainable shoreline district, which provides jobs, housing, transpor-

tation options, and opportunities for entertainment and recreation. Projections include 6.5m SF of commercial, 750,000 SF of retail and 3,000 new housing units, with the intent to “transform this currently underutilized industrial waterfront area into a revitalized, pedestrian-oriented district that would integrate a mixture of high-intensity research and development and commercial uses with new medium-density housing options anchored by the Berkeley Global Campus.”

All told, the collaboration between UC Berkeley and the City of Richmond promises to become, as Pastor T. Mark Gandy recently commented, “the most important single development in Richmond since the World War II shipyards.” We look forward to collaborating closely for years to come with the citizens and City of Richmond in bringing this vision to reality. ■

Dear 2015: A Letter to the Past

By Richard Mitchell

Dear people of 2015,

I can't do real justice to any conversation about how your world of 2015 influenced my world of 2050. Just as you may have learned by looking back to 1980 from your vantage point, I have discovered that it was not the grand 'megatrends' that changed the paradigm, instead, it was the convergence of countless 'micro-trends' riding the magic carpet that you once called 'the internet'.

In an effort to acquaint myself with your time, I referenced your period from my *information source*....our 2050 version of your 'Ipads and tablets'. We don't use devices like that anymore because we receive our communications and information through systems and technologies that you could not have imagined. The network is always there and I connect with it at will. I cannot image how life could possibly work without the network.

Through my study of your time, I have learned that you were faced with numerous challenges and uncertainties; an extended drought threatened water supplies in California and your scientists were warning of sea level rise. Wealth and class stratification were rapidly eroding opportunity and much of the infrastructure that supported establishment of the North American economy was descending into ruin.

In reading your media, I was amazed to learn that your national debate focused on non-essential ideological issues that should have been left to personal choice, while very little appeared on gun regulation, planning for a borderless multicultural economy or building an education system that could have prepared your children for new possibilities. I am amazed and thankful that you began to realize the need to change and did so before it was too late.

I read that in 2015 you were testing driverless automobiles and debating the

pros and cons of 'ride sharing'. You would be pleased to learn that these ideas took root and changed the landscape of our cities by ending the tyranny of the automobile. Today there are a lot fewer personal cars. Electric driverless shuttles take us everywhere. Personal vehicles remain popular in the distant suburban areas, however; even there, driverless technology allows seniors to age in place because driverless vehicles provide safe mobility that was not possible in earlier times. Today, I can connect with the transportation system whenever I need it and the self-guided

and remotely piloted vehicles are always available. The end of automobile dominance freed thousands of acres of valuable urban land that had been dedicated to "parking". Old parking lots have been replaced with orchards, vineyards, gardens, plazas and apartments.

You will also be pleased to know that the wheel chair is gone. Robotics and exoskeleton technology liberated countless numbers of people by giving them independent mobility. Thank you for enthusiastically funding and supporting the development of this technology.

We continue to reap the benefits of



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your early commitment to the expansion of solar energy. This technology is now used to power desalinization plants that are providing fresh water using our vast ocean resources. Solar has allowed the dismantling of many dams and restoration of river ecosystems. We are less dependent on the “oil shortage business” that bled so much wealth during your era. The air is cleaner and the rate of global warming has slowed because so much of our energy is coming from the sun.

We applaud your early commitment to the concepts of livability and sustain-

ability, and your recognition of the need to design and build complete communities that accommodate people at all stages of life. We realize how difficult it was to achieve this, given the antiquated system of financing that consistently under produced housing. It took a great deal of determination and creativity to restructure the financing system to help build affordable, human scaled communities that serve multiple generations.

Just as you pondered the future in 2015, I ponder the future in 2050. I know that some conditions will con-

tinue to improve and others will continue to threaten our existence. Because we are so focused on determining where we are going, we often forget to acknowledge how far we have come. I hope that my descendants will make better decisions and continue the ascent to a better human condition. Thank you for your struggle and contribution. I will do my best to “pay it forward”. ■

Richard Mitchell is the Director of Planning & Building Services for the city of Richmond, CA.



To the People of Boston of 2015

By *Anthony Flint*

To the People of Boston of 2015:

I'm just coming back from a press conference for another tech start-up in Somerville—makers of a super powerful handheld solar collector and battery, yet another contribution by the region that will help complete the transition from fossil fuels and help US cities hit the climate emissions reductions all the world's nations so sensibly agreed to. The business is in a makers-space incubator re-using an abandoned building from the industrial era at the turn of the last century. The place is beautiful, and not only zero-energy but another nice example of regenerative design, which has become the building industry standard around here. The transition from making shoes and candy and textiles to the innovation economy is long since complete. And the best part is, the economic activity is marbled throughout Greater Boston, thanks to the decision to start acting like a region instead of having individual municipalities compete against each other—abandoning, for example, the practice of offering the biggest tax breaks for business location. Not only Boston, Cambridge, and Somerville, but once-struggling legacy cities such as Brockton and Lawrence are fully part of the renaissance. Regional collaboration has been aided by the use of technological tools for scenario planning, allowing communities large and small to envision the future by means of full citizen engagement.

I made the trip with ease on the Green Line extension from Lechmere to Medford, the no-brainer addition to the MBTA system that was almost abandoned because of the cost. Thankfully the region established a policy of land-based financing including value capture, a recognition of the way public investments in infrastructure, and government action such as rezoning, prompts large increases in property



value for landowners and private developers. Massachusetts wisely looked at the use of these tools for equitable urban development being deployed in Latin America. The new stations along the Green Line extension are humming with transit-oriented development, another standard practice that makes us wonder how metropolitan regions grew any other way. The private sector

was fully engaged in this transformation at the front end, realizing the win-win benefits that were in store. The T is now on sound financial footing, and the Commonwealth can continue funding its Fix it First policy, so spans such as the Longfellow Bridge didn't collapse into the Charles.

Cities here and in the rest of the country backed away from the brink of

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insolvency by promoting municipal fiscal health, and fixing the structural problems in local public finance. They made the property tax work, as a basic covenant for the provision of services—a system so foundational it was adopted for the fast-growing cities of China. The federal government stopped imposing unfunded mandates; planners and those in public finance starting talking to each

other, and started doing multi-year budgeting, long-range capital budget planning, all the while maintaining private-sector financial standards and transparency. A fiscal scorecard for every city is now standard operating procedure, so there are fewer surprises and municipalities don't find themselves thrown suddenly into fiscal crisis.

There are a lot of wealthy people

around here, but the growth of the region is more balanced and equitable than it otherwise would be, through the universal embrace of inclusionary housing, and the establishment of more permanently affordable housing in community land trusts and other shared-equity housing models. The federal government helped by getting behind loans for CLTs.

We couldn't solve every problem—like halting climate change and sea level rise. But we got busy adapting for a wetter future, by building canals and otherwise working with water, taking our cues from the Dutch. We also learned from disasters like Superstorm Sandy, focusing not only on short-term recovery but building back stronger and smarter. Resilience became part and parcel of city-building. This, too, took a regional approach and the cooperation of all levels of government, local, state, and federal.

I've got to run—off to a hands-on summit to promote better planning and balanced growth in the burgeoning cities of the developing world. After all, two-thirds of the planet's population of 9 billion lives in cities. It's been gratifying that metropolitan regions have had such a robust exchange of ideas and innovation, and continue to learn from each other. Around here, all it took was a retooling of urban policies and a little political will. Boston, well done. ■

Anthony Flint is a fellow and director of public affairs at the Lincoln Institute of Land Policy. He is a regular contributor to The Atlantic Monthly's The Atlantic Cities, as well as Citiwire, The Next American City, Planning magazine, Planetizen, Architecture Boston, and many other publications.



Meeting
of the Minds