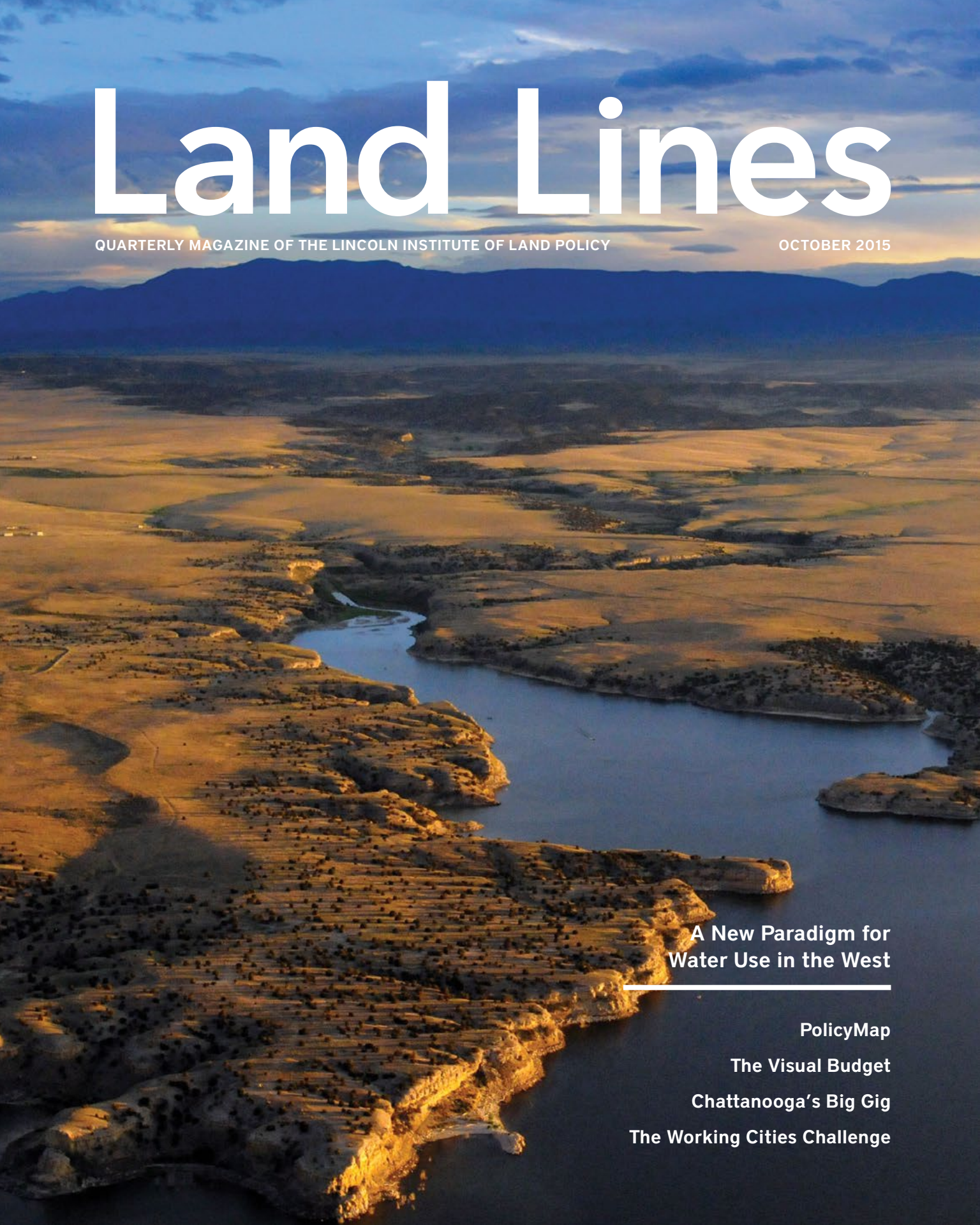
Land Lines

QUARTERLY MAGAZINE OF THE LINCOLN INSTITUTE OF LAND POLICY

OCTOBER 2015



A New Paradigm for Water Use in the West

PolicyMap

The Visual Budget

Chattanooga's Big Gig

The Working Cities Challenge

Land Lines

OCTOBER 2015 | VOL 27 | NO 4

EDITOR
Maureen Clarke

PRESIDENT & CEO
George W. McCarthy

CHAIR & CHIEF INVESTMENT OFFICER
Kathryn J. Lincoln

DESIGN & PRODUCTION
Sarah Rainwater Design
www.srainwater.com

PUBLICATIONS COORDINATOR
Susan Pace

THE LINCOLN INSTITUTE OF LAND POLICY is a private operating foundation whose mission is to improve the quality of public debate and decisions in the areas of land policy and land-related taxation in the United States and around the world. The Lincoln Institute's goals are to integrate theory and practice to shape land policy and to provide nonpartisan forum for discussion of the multidisciplinary forces that influence public policy concerning the use, regulation, and taxation of land.

We seek to inform decision making through education, research, demonstration projects, and the dissemination of information through publications, our website, and other media. Our programs bring together scholars, practitioners, public officials, policy advisers, and involved citizens in a collegial learning environment. The Lincoln Institute of Land Policy is an equal opportunity institution.

Land Lines is published quarterly in January, April, July, and October to report on Institute-sponsored programs.

Lincoln Institute of Land Policy
113 Brattle St, Cambridge, MA 02138

T (617) 661-3016 or (800) 526-3873
F (617) 661-7235 or (800) 526-3944

EMAIL FOR EDITORIAL CONTENT
mclarke@lincolninst.edu

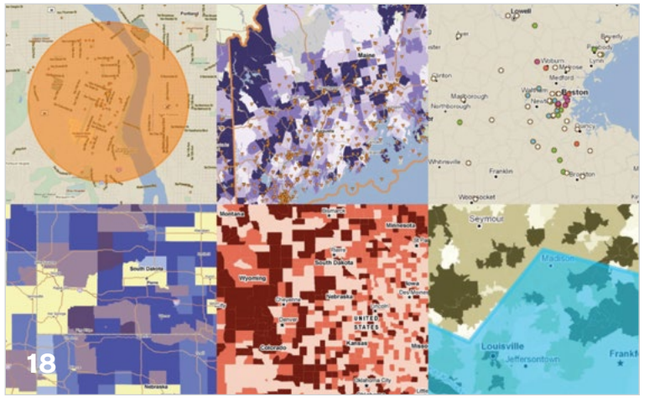
EMAIL FOR INFORMATION SERVICES
help@lincolninst.edu

www.lincolninst.edu

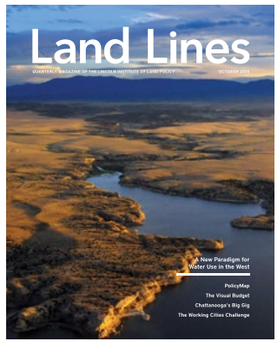
LINCOLN INSTITUTE OF LAND POLICY

Contents

FEATURES



DEPARTMENTS



The Arkansas River as it leaves the Rocky Mountains and flows into the Pueblo Reservoir before continuing its journey across Colorado's plains. Credit: John Wark/Airphoto NA

Helping Communities to Help Themselves

BEFORE JOINING THE LINCOLN INSTITUTE OF LAND POLICY, I COVERED THE DETROIT BEAT FOR ALMOST A DECADE FOR THE FORD FOUNDATION. There I was able to witness firsthand the unprecedented challenges involved in reversing the fortunes of the most powerful and important U.S. city of the mid-20th century. The enormity of these challenges called forth a coalition of some of the best and brightest community rebuilders with whom I've had the privilege to work. The quality and commitment of this strident group of public servants, civic and community leaders, and private-sector visionaries helped Detroit reclaim a bright future.

Most citizens in Detroit, who bear one of the highest property tax rates in the country, don't know that their city is leaving tens of millions of dollars of federal money on the table each and every year.

Signature efforts of this unique public-private-philanthropic partnership (a P4!) included the planning, construction, and funding of Detroit's first public transit investment in more than five decades—the M1 Rail, which broke ground in July 2014 using a pooled private investment of more than $100 million. Leadership for the effort did not simply build a symbolic 3.3-mile light rail line along Woodward Avenue, the spine of the city, it also leveraged the private investment to secure a commitment from state and national governments to launch the region's first transit authority.

Local and national philanthropic leaders also assembled more than $125 million to launch the New Economy Initiative—a decade-long effort to rekindle an entrepreneurial ecosystem in the region through strategic incubation of hundreds of new businesses, thousands of new jobs, and enduring long-term collaboration among employers and workforce developers. And, in what might be their most controversial and heroic collective effort, these philanthropies worked with the State of Michigan to assemble more than $800 million for "the Grand Bargain," which saved both the legendary collection of the Detroit Institute of the Arts from the auction block and the future pensions of Detroit's public servants.

Stunningly, while social entrepreneurs did gymnastics to bring hundreds of millions of dollars in support to Detroit, the city reportedly returned similar amounts in unspent formula funds to the federal government. A city with more than 100,000 vacant and abandoned properties and unemployment rates hovering close to 30 percent could not find a way to use funds that were freely available; the city needed only to ask for them and monitor their use. Beleaguered Detroit public servants, whose ranks were decimated by population loss and the city's fiscal insolvency, did not have the capacity or the systems to responsibly manage or comply with federal funding rules. And, in this regard, Detroit is not unique among legacy cities or other fiscally challenged places.

A March 2015 report from the Government Accountability Office, *Municipalities in Fiscal Crisis* (GAO-15-222), looked at four cities that filed for bankruptcy (Camden, NJ; Detroit, MI; Flint, MI; and Stockton, CA) and concluded that the cities' inability to use and manage federal grants was attributable to inadequate human capital capacity, staffing shortages, diminished financial capacity, and outdated information technology systems. The report lamented that not only were the cities unable to use formula funds—like Community Development Block Grants that are distributed according to objective criteria such as population size and need—but they routinely forwent applying for competitive funding, as well. A separate 2012 analysis by Senator Tom Coburn (R-OK), *Money for Nothing*, identified some $70 billion in federal funds that were unspent "due to poorly drafted laws, bureaucratic obstacles and mismanagement, and a general lack of interest or demand from the communities to which this money was allocated."

How can it be that the neediest places are unable to use the assistance that is available? It's unsurprising that a city like Detroit, which lost almost two-thirds of its population over six decades, would see diminished staffing and staff capacity in city offices. It is also unsurprising that Detroit did not have state-of-the-art IT systems. When a municipality faces fiscal challenges, infrastructure always gets short shrift. The inability to make use of allocated funding probably isn't a sin of commission, but a regrettable omission that runs deeper, and needs fixing. But where to start? Let's see what the data tells us. Which formula programs have the weakest throughput? Where are the places with the worst uptake? By all accounts, we don't know. If federal agencies know which programs and places might make the best and worst lists, they are not reporting it. Moreover, most citizens in Detroit, who bear one of the highest property tax rates in the country, don't know that their city is leaving tens of millions of dollars of federal money on the table each and every year.

Last summer, with little fanfare but great ambition, the Lincoln Institute launched a global campaign to promote municipal fiscal health. The campaign focuses attention on several drivers of municipal fiscal health, including the role of land and property taxation to provide a stable and

If we invest only a fraction of unspent funds to build the right local capacities, communities will be able to solve their own problems.

secure revenue base. In this issue of *Land Lines*, we consider ways that cities and regions are building new capacities—reliable fiscal monitoring and transparent stewardship of public resources, effective communication and coordination among local, county, state, and federal governments—to overcome major economic and environmental barriers. We focus on how places are looking inside and outside their borders to enlist the assistance of others. Hopefully, these stories will inspire us to work toward broader, deeper, and more creative ways to thrive together rather than struggling alone.

Two technology-based tools featured in this issue are changing the way municipal finance information is organized and shared. They empower citizens and voters to hold their community leaders accountable and ensure that once we throw the assistance switch, the circuit is completed. PolicyMap (p. 18) was founded with the goal of supporting data-driven public decisions. Researchers there have organized dozens of public data sets and developed a powerful interface where users can view the data on maps. It includes thousands of indicators that track the use of public funds and their impact. The city of Arlington, Massachusetts, has demystified its city finances through the Visual Budget (p. 5), an open-source software tool that helps citizens understand where their tax dollars are spent. PolicyMap and the Visual Budget have the potential to follow all revenue sources and expenditures for a city and make them transparent to taxpayers. For cities or federal agencies willing to disclose this information, these social enterprises stand ready to track and report on the use, or non-use, of public funds.

Vertical alignment of multiple levels of government toward the goal of municipal fiscal health is not only a domestic remedy. Our

Community leaders in Holyoke, Massachusetts, are collaborating with businesses, nonprofits, and citizens to repurpose the city's canals and hydroelectric infrastructure to power the Massachusetts Green High Performance Computing Center. Credit: Jeffrey Byrnes

interview with Zhi Liu (p. 30) reports on the efforts of the central government of the People's Republic of China to build a stable revenue base under local governments through enactment of a property tax law, an action to help municipal governments survive the shifting sands of land reform.

In our report on the Working Cities Challenge (p. 25), researchers at the Federal Reserve Bank of Boston identify what is possibly the most important capacity needed to promote not only municipal fiscal health, but thriving, sustainable, and resilient places: leadership. Leadership—which might come in the form of visionary public officials, bold civic entrepreneurs, or gritty peripatetic academics—is at the core of other inspiring cases reported in this issue. Leaders in Chattanooga (p. 8) made a big bet on infrastructure—low-cost, ultra-high-speed Internet, provided through a municipal fiber-optic network—to help the city complete its transition from polluted industrial throwback to clean, modern tech hub. And it's working.

The Super Ditch (p. 10) is another example of multiple governments working with private parties to forge creative solutions to joint challenges. The Super Ditch is innovating urban-agricultural water management through new public-private agreements that interrupt the old "buy and dry" strategies practiced by water-starved cities—continuing to meet municipal water demand without despoiling prime farmland.

Before we endure endless partisan bickering about whether national governments should rescue bankrupt cities, perhaps we should find a way to ensure that they don't go bankrupt in the first place, by using the help that we've already promised. Only a sadist or a cynic would intentionally dangle resources out of the reach of needy people or places. If we invest only a fraction of unspent funds to build the right local capacities, communities will be able to solve their own problems. Whether it is a P4, an innovative technology tool, or a new way of working among governments and the private sector, social entrepreneurs are amplifying human ingenuity to help us overcome the biggest challenge we face: finding new ways to work together so that we do not perish alone.

The Visual Budget Lets Taxpayers Follow the Money

AN INFORMED CITIZENRY IS AN EMPOWERED ONE, but educating taxpayers and voters can be difficult. While most people care deeply about various community issues—such as whether to build a new library branch or provide curbside recycling—very few of us spend our limited free time paging through spreadsheets to understand the specifics of a municipal budget and the likely implications of a funding decision. This disconnect is unfortunate, because buried in those reams of data is the story of our individual communities—a map of the ways in which a single decision impacts the quality and availability of the public services we rely on in our daily lives, such as road maintenance, public education, and emergency services.

"To be fiscally strong, local governments have to be in a dialogue with residents," says Lourdes Germán, an expert on municipal fiscal health and a fellow at the Lincoln Institute of Land Policy. "Residents have to know what key decisions are facing town officials, what those decisions mean financially, and how tax dollars are being used. All sorts of important things are up for a vote by the residents at town meetings, and often that meeting is the first time people hear about the issues, which is too late."

Annie LaCourt agrees. A former selectman for the Town of Arlington, Massachusetts, LaCourt came up with the idea to convert the piles of spreadsheets that constitute Arlington's municipal budget into a simple visual that could be understood by all community members, including those lacking any previous knowledge of the budgeting process.

"For Arlington, we do a five-year projection of our budget and have lots of discussions with the public around what those projections mean and how they relate to our taxes," explains LaCourt. "I wanted to make that conversation more public, more open, and more transparent for people who want to know what's going on."

Specifically, she envisioned an interactive website where residents could input their individual tax bill and receive a straightforward, graphical breakdown of how the town spent the funds. She hoped that providing taxpayers with more accessible, digestible information would encourage them to engage more fully in the critical, if seemingly esoteric, decisions that go into crafting a municipal budget. LaCourt enlisted Alan Jones, Arlington's finance committee vice-chair, and Involution Studios, a design firm that donated its services to the project. And in September 2013 the Arlington Visual Budget (arlingtonvisualbudget.org) was born.

"Arlington spent $2 million on snow removal last year, which is the most we've ever paid. Using the website, the resident with a $6,000 tax bill will see that he personally paid $90 for those services, which is a bargain."

"The Arlington Visual Budget enables taxpayers to think about the budget on a scale that is more helpful to them," says LaCourt. "Instead of trying to understand millions of dollars' worth of budget items, a taxpayer can look at the costs to her, individually, for specific, itemized public services. In Arlington, for example, we spent $2 million on snow removal last year, which is the most we've ever paid. Using the website, the resident with a $6,000 tax bill will see that he personally paid $90 for those services, which is a bargain. When you see your tax bill broken down by services, and you see that your share of the total cost for all these services is relatively low, it starts to look pretty reasonable."

Adds Jones, "It also shows people that their taxes are going to things they don't necessarily think about—things that people don't see driving

down the street every day but are important parts of the budget—like debt service on school buildings built 10 years ago, pension and insurance payments for retirees, or health insurance for current employees."

The visual budget websites show the consequences of financial decisions in a way that feels more evidence-based, and less anecdotal. We refer to them as the 'No Spin Zones.'

Another benefit of the website is that it makes it easier to see how public policy has evolved over time. "The Arlington Visual Budget has data going back to 2008 and projections out to 2021, so citizens can really understand how the budget has changed and how that impacts them," says Adam Langley, senior research analyst at the Lincoln Institute of Land Policy. "Taxpayers can see that state aid for general governments was cut in half from 2009 to 2010, and that it hasn't recovered at all since then. Because of that cut, the share of Arlington's budget funded by state aid has fallen, while the share covered by property taxes has grown from 70 percent to 76 percent. The impact of government decisions on household budgets becomes clearer."

Brendhan Zubricki, the town administrator for Essex—a community of approximately 3,500 people roughly 26 miles north of Boston—quickly understood how the interactive budgeting tool could help local residents make an important financial decision in real time. For the past hundred years, the town has leased to private leaseholders a parcel of publicly owned seaside property known as Conomo Point. Essex relies on the approximately $500,000 in annual property taxes collected on the land to help cover its $6.4 million tax-funded budget, which doesn't include the $7.4 million it pays to participate in two regional school districts. In May 2015, Essex taxpayers asked to vote on whether to continue leasing the land with improved public access to the prime strip of waterfront or take over the whole parcel for public use. Should residents vote in favor of a park, the land would no longer be taxable, at which point they would experience a tax increase to cover the $500,000 in lost revenue.

Zubricki turned to the visual budgeting tool to model the various tax scenarios at a town meeting that was called in advance of the vote. "The basic model was a visualization tool to help the average person understand the budget. But we took it a step further and used it to explain Essex's financial future as it related to this one major item. It worked well. We got a lot of positive feedback from meeting attendees," says Zubricki. Months later, in a nonbinding vote, residents overwhelmingly opted to continue leasing the land at Conomo Point and explore ways to improve access to existing waterfront parks and other public spaces (the binding vote will take place in May 2016).

In keeping with the principles of the civic technology movement—"open data, open source"—LaCourt, Jones, and the team at Involution Studios made the visual budgeting tool available to the public at no cost. Doing so enabled local government officials to repurpose the tool, free of charge, for their respective municipalities simply by incorporating their community's budgeting data, all of which is publicly available.

"By making the software open source, Annie and Alan are really helping smaller municipalities that can't afford a chief technology officer or a developer or a design firm, and have to balance competing concerns like whether to fund a school program or build a website," says Germán. "These communities can use the tool by just plugging in their own data."

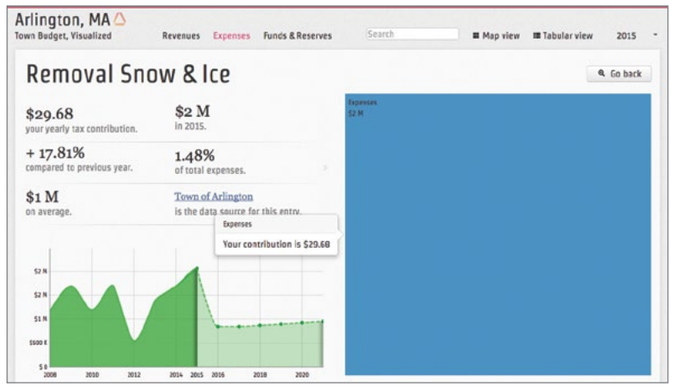
Germán goes on to say that the software also helps local officials to plan better for the future. "Visual Budget enables public officials to model multiyear scenarios. Multiyear forecasting and planning is critical for fiscal health and stability, but is not necessarily available to small towns."

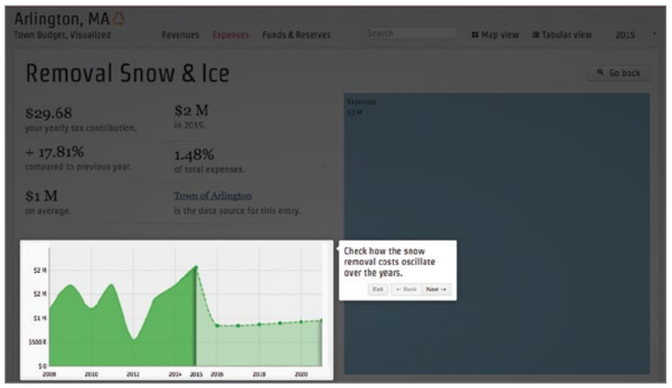
The site has won numerous awards, including the 2014 Innovation Award from the Massachusetts Municipal Association.

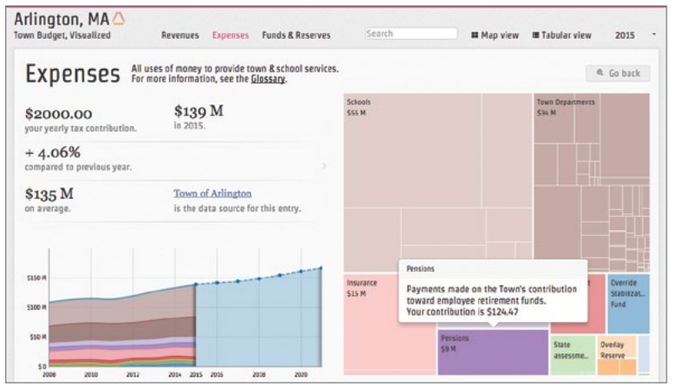
Earlier this year, LaCourt, Jones, and the Involutions Studios formed Visual Government (visgov.com) in response to growing interest in the software. Visual Government "continues the commitment to make meaningful budget presentations affordable for municipalities and civic groups of all sizes." While the software remains available for free, Visual Government also offers a consulting package, which includes building and hosting a website, and assisting the municipality to compile past, present, and future budget data. Determined to remain affordable, the package costs $3,000 and is designed primarily for communities that lack the staff to create their own website.

"The visual budget websites aren't high-volume sites," says Jones. "But they are high-value sites. They show the consequences of financial decisions in a way that feels more evidence-based, and less anecdotal. We always refer to them as the 'No Spin Zones.' "

Loren Berlin is a writer and communications consultant based in Greater Chicago.







Through the Visual Budget, taxpayers in Arlington, MA, can see how much the town spent on snow removal in the current year; fluctuations in the cost of this service over time; and payouts for other expenses, from schools to pensions.

Chattanooga's Big Gig

UNIVERSAL HIGH-SPEED INTERNET ACCESS IS A POPULAR DREAM THESE DAYS—everyone from the president to Google, Inc., has embraced it. And the tech press is full of testy critiques wondering why typical broadband speeds in the United States lag so far behind those in, say, South Korea.

Just five years ago, this wasn't such a hot topic. Back then, the discussion—and action—wasn't led by the federal government or the private sector. The first movers were a number of diverse but forward-thinking municipalities: cities and towns like Chattanooga, Tennessee; Lafayette, Louisiana; Sandy, Oregon; and Opelika, Alabama.

Chattanooga is starting to answer a vital question: once a city has world-class Internet access, what do you actually *do* with it?

Motives and solutions varied, of course. But as high-speed connectivity is becoming recognized as crucial civic infrastructure, Chattanooga makes for a useful case study. Its journey to self-proclaimed "Gig City" status—referring to the availability of Internet connections with 1 gigabit-per-second data transfer speeds, up to 200 times faster than typical broadband speed for many Americans—started with visionary municipal initiative, built upon via thoughtful private and public coordination. Most recently, this effort has even begun to show tangible effects on city planning and development, particularly in the form of an in-progress reimagining of a long-sleepy downtown core. In short, Chattanooga is starting to answer a vital question: once a city has world-class Internet access, what do you actually *do* with it?

The story begins more than a decade ago, when Chattanooga's city-owned electric utility, EPB, was planning a major upgrade to its power grid. Its CEO, Harold Depriest, argued for a plan that involved deploying fiber-optic cable that could also be used for Internet access. After clearing local regulatory hurdles, the new system was built out by 2010, and every EPB power customer in the Chattanooga area—meaning pretty much every home or business—had gigabit access. But you had to pay for it, just like electricity. And the early pricing for the fastest access was about $350 a month.

"They had very, very few takers," recalls Ken Hays, president of The Enterprise Center, a nonprofit that since 2014 has focused, at the behest of local elected officials, on strategizing around what Chattanoogans call "the gig." The head of Lamp Post Group, a successful local tech-focused venture firm, made a point of signing up immediately, Hays continues. But on a citywide level, "we didn't have the excitement" that talk of gig-level access generates today. And in 2010, he adds, "there weren't many good case studies out there."

But broader change was afoot. The announcement of Google Fiber—the Internet search giant's foray into building out high-speed online infrastructure—sparked new interest. And in 2013, Jenny Toomey, a Ford Foundation director focused on Internet rights, helped organize a summit of sorts where officials from municipalities like Chattanooga, Lafayette, and elsewhere could meet and compare notes. "It was still pretty nascent at the time," recalls Lincoln Institute President and CEO George W. McCarthy, an economist who was then director of metropolitan opportunity at the Ford Foundation. But that summit, he continues, helped spark new conversations about how such initiatives can make cities more competitive and more equitable, and less reliant on the purely private-sector solutions we often assume are more efficient than government. "And over the course of two years since, this issue has just exploded," he says.

In fact, that summit turned out to be the rare event that actually spawned a new organization: Next Century Cities, founded in 2014, now has more than 100 member municipalities. They share best practices around an agenda that treats high-speed Internet access as a fundamental, nonpartisan infrastructure issue that communities can and should control and shape.

Against this backdrop, Chattanooga was taking steps to demonstrate how "the gig" could be leveraged. The Lamp Post Group had moved into downtown space, and superlative Internet access was just a starting point for the young, tech-savvy workers and entrepreneurs it wanted to attract. "If we don't have housing, if we don't have open space, if we don't have cool coffee shops—they're going to go to cities that have all that," says Kim White, president and CEO of nonprofit development organization River City Company.

Starting in 2013, a city-center plan and market study conducted by River City proposed strategies to enhance walkability, bikeability, green space, and—especially—housing options. More than 600 people participated in the subsequent planning process, which ultimately targeted 22 buildings for revitalization (or demolition). Today, half of those are being redeveloped, says White, and more than $400 million has been invested downtown; in the next year and a half, 1,500 apartments will be added to the downtown market, plus new student housing and hotel beds. The city has provided tax incentives, some of which are designed to keep a certain percentage of the new housing stock affordable. The city has also invested $2.8 million in a downtown park that's a "key" part of the plan, White continues, to "have areas where people can come together and enjoy public space." One of the apartment projects, the Tomorrow Building, will offer "micro-units" and a street-level restaurant. "I don't think we would have attracted these kinds of businesses and younger people coming to look," without the gig/tech spark, White concludes. "It put us on the map."

The gig was also the inspiration for a city-backed initiative identifying core development strategies that led to the Enterprise Center pushing a downtown "innovation district," says Hays. Its centerpiece involves making over a 10-story office building into The Edney Innovation Center, featuring co-working spaces as well as the headquarters of local business incubator CO.LAB.

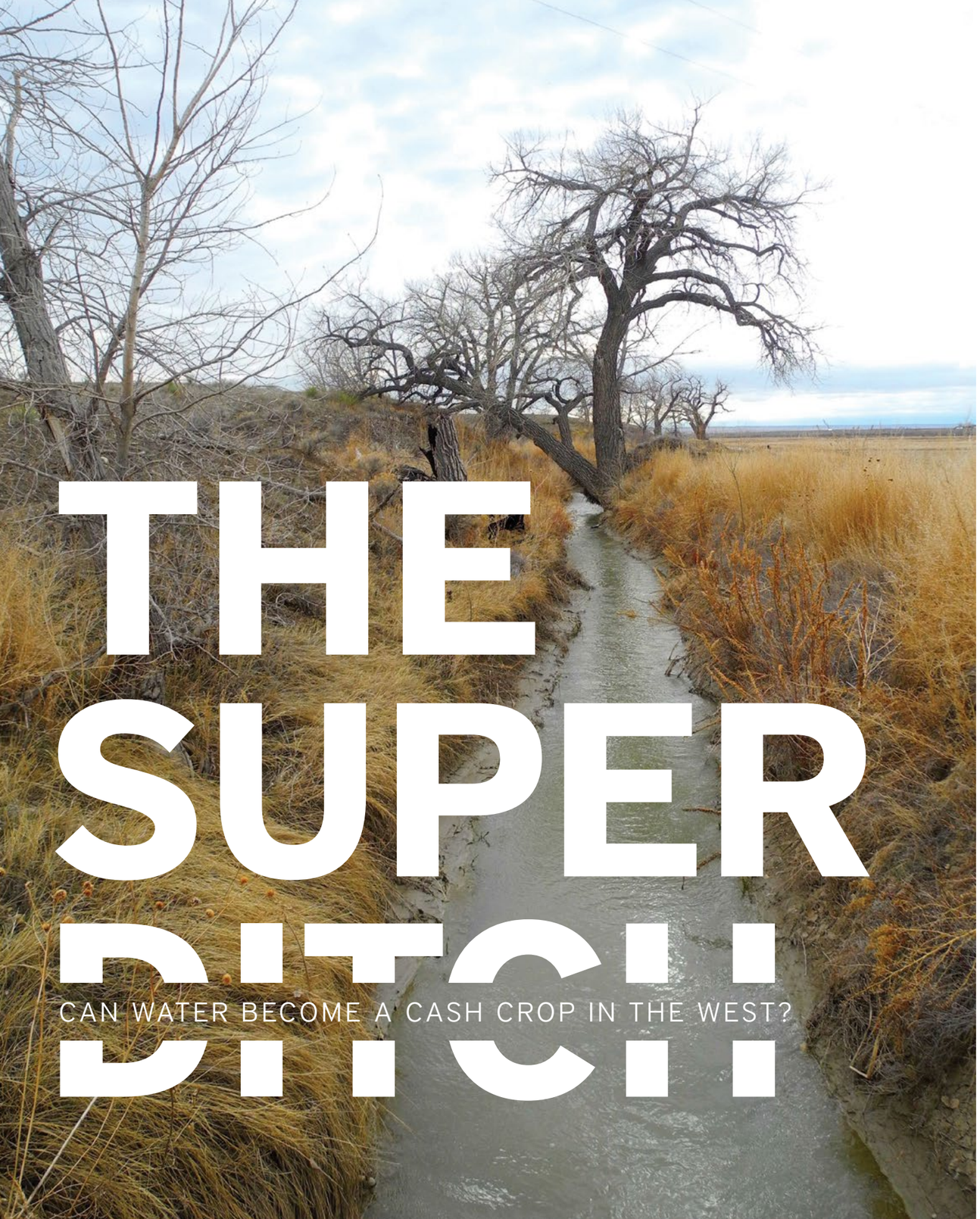
Chattanooga is leveraging universal gigabit access to revitalize a once-sleepy downtown, shown here with a view of the Market Street Bridge and the Tennessee Aquarium, designed by Peter Chermayeff. Credit: Sean Pavone

The University of Tennessee at Chattanooga has a project involving a 3D printer lab in the Innovation District, and even the downtown branch of the Chattanooga Public Library has been made over to include a tech-centric education space.

EPB, whose original fiber-optic vision set the Gig City idea in motion, has long since figured out more workable pricing schemes—gig access now starts at about $70 a month—and drawn more than 70,000 customers. More recently, it has also offered qualified low-income residents 100-megabit access, which is still much faster than most broadband in the U.S., for $27 a month. And its efforts to expand into underserved areas adjacent to Chattanooga have become an important component of broader efforts to challenge regulations in many states, from Texas to Minnesota to Washington, that effectively restrict municipalities from building their own high-speed access solutions.

In short, a lot has changed—in Chattanooga and in other cities and towns that have pushed for Internet infrastructure that the private sector wasn't providing. "Most of this work right now is happening at the local level," says Deb Socia, who heads Next Century Cities. "It's mayors and city managers and CIOs taking the steps to figure out what their city needs." The implications for crucial civic issues from education to health care to security are still playing out. And precisely because the thinking and planning is happening on a municipal level, it won't be driven solely by market considerations that favor what's profitable instead of what's possible. "The beauty of it is," McCarthy summarizes, "it's a both/and argument."

Rob Walker (robwalker.net) is a contributor to Design Observer and *The New York Times*.



THE SUPER DITCH

CAN WATER BECOME A CASH CROP IN THE WEST?

By Scott Campbell

PETER NICHOLS IS AN AVID OUTDOORSMAN AND ONE OF COLORADO'S LEADING WATER LAW ATTORNEYS. It's not uncommon to see him enter the lobby of his Boulder office at Berg Hill Greenleaf & Ruscitti—a room with stone, hardwoods, and a sharp-dressed receptionist—in wrinkled attorney attire and a pair of worn river sandals. By his own reckoning, being a water law attorney is his sixth career. "Ski bum was my first," he says. Then came a job with the Colorado General Assembly, positions helping western communities deal with rapid energy development, and water rights consulting work with energy companies themselves. In 2001, Nichols returned to the University of Colorado, where he received his M.P.A. in 1982, to earn his J.D., with a focus on water law. He has been setting precedents in Colorado watersheds ever since.

One of his proudest accomplishments, he says, was a 2013 Colorado Supreme Court case that affirmed the prerogative of conservation groups to encumber water rights in conservation easements, to address ecological and supply problems in Colorado's rivers. So was giving a presentation that inspired the Colorado Interbasin Compact Committee, which oversees development of the Colorado Water Plan—a historic blueprint for collaborative, statewide water management in the face of rapid population growth. But of all his accomplishments, his work in Colorado's Arkansas River Basin is the most important, he says. It's "the crucible" for how the West is going to handle the severe water shortages projected across the rapidly growing Rocky Mountain region.

"The problem began here," he says, "and if we're going to solve it, we're going to have to solve it here." The problem he is referring to is an urban water acquisition trend known as buy-and-dry.

One-third of historically irrigated farmland is now dry in Colorado's Lower Arkansas River Valley, where agriculture depends on ditches like this one in Pueblo County.
Credit: Sofía Viguri

Colorado's Arkansas River Basin is "the crucible" for how the West is going to handle the severe water shortages projected across the rapidly growing Rocky Mountain region.

In a buy-and-dry acquisition, a municipal water utility will meet a city's growing demand for water by purchasing interests in irrigated agricultural land, permanently fallowing that land, and diverting its water into the taps of city residents. On Colorado's Arkansas River—where no water is available for new uses and there is a constant call for additional supplies—buy-and-dry tactics have diminished farmland across the basin. In the Lower Arkansas Valley, where the Arkansas River courses through Colorado's eastern prairie, agricultural communities in some counties have been absolutely devastated.

Nichols says, "the Colorado Water Plan is very focused on eliminating buy-and-dry." The question is how to do it. "We can't stop cities from getting the water they need, but maybe we can change the rules [of the game], so it's not a free-for-all."

The most promising game changer, he believes, is the Super Ditch.

Launch of the Super Ditch

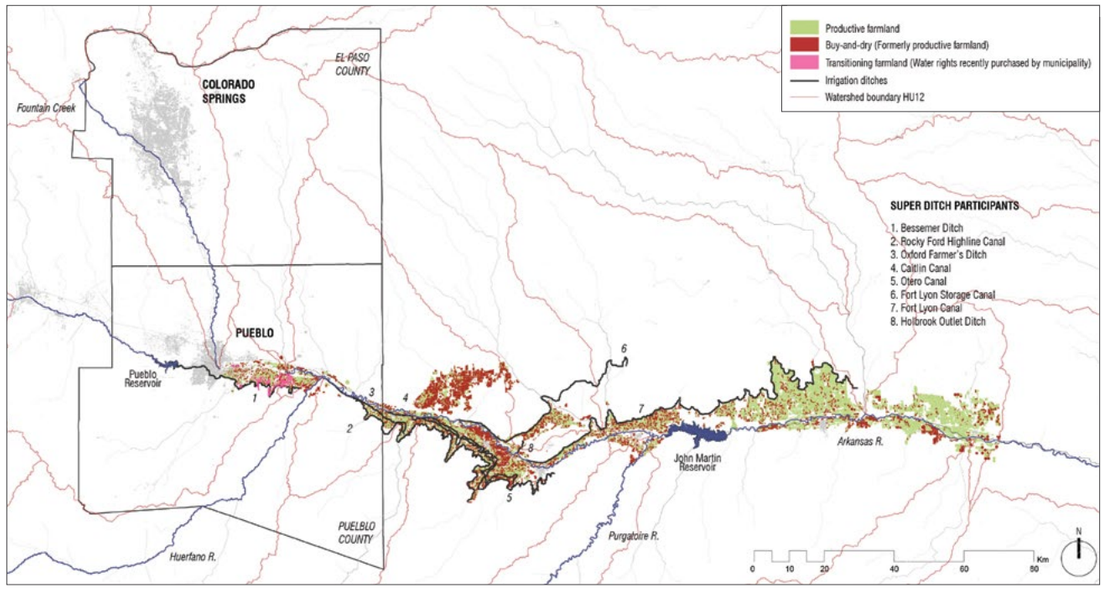
West of the 100th meridian, where supplemental irrigation is required to grow food, irrigation ditches are a common means of delivering water from a river, lake, or reservoir to users along its course. In the Lower Arkansas Valley, there are approximately 20 major mutual irrigation ditch systems. The Super Ditch, however, is not a real ditch. Rather, it's a corporation—the Lower Arkansas Valley Super Ditch Company, Inc.—set up to provide leased agricultural water to cities as an alternative to the buy-and-dry trend. It represents seven ditch companies operating eight ditches between two reservoirs, the Pueblo and the John Martin.

The Super Ditch began leasing water for the first time this year, through a small pilot project. But it was incorporated in 2008, with the assistance of the Lower Arkansas Valley Water Conservancy District (LAVWCD), a special district established by voters in 2002. Those who voted for the district, whether they owned water or not, were tired of seeing what they considered "their river" diverted to cities more than 100 miles away—some of which lay in completely different river basins. Even urban voters in the City of Pueblo, a steel town on the Arkansas River (population 108,000), sided with rural farmers in the face of economic hardships. "Not one more drop!" became a rallying cry against water leaving the valley.

Nichols serves as special counsel to the LAVWCD and helped the district develop the Super Ditch concept. Inspiration came from California, where the Palo Verde Irrigation District launched a long-term fallowing-leasing program with the Metropolitan Water District of Southern California (MWD) in 2005. The contract between the two entities seeks to supply 27 southern California coastal communities, including San Diego and Los Angeles, with 3.63 million acre-feet of Colorado River water from one ditch over a 35-year period. Participating farmers stop irrigating for a designated period of time, fallow their fields, and receive payment for their water, which bypasses their farms on its journey to MWD customers.

The LAVWCD sought to create a similar project, predicated on a rotational fallowing-leasing concept, but the Super Ditch was a much more sophisticated undertaking. Facilitating work with seven different mutual ditch companies, each with its own board and governance structure, was fraught with challenges. The cumbersome nature of Colorado water law, and the powerful market mechanisms and path dependencies that guide urban water acquisition

IRRIGATED FARMLAND IN THE LOWER ARKANSAS VALLEY



Growing cities have purchased an immense number of irrigated farms in the Lower Arkansas Valley and appropriated their water for municipal purposes. Credit: Sourav Biswas and Flavio Sciaraffia

strategies in the state complicated matters further. Colorado municipalities are hesitant to rely on water leasing, and for good reason. Certainty of supply is critical, and the temporary nature of leasing versus the permanent nature of ownership is unsettling to most urban water providers. What happens if the population grows by 50,000 people, and the leased water those people are relying upon is no longer available—or is sold to a competing water provider?

Nichols tried to develop the Super Ditch concept in ways that addressed these concerns. Supplies from different farmers are pooled by the Super Ditch, and provided to cities under long-term lease contracts. To guarantee that leased supplies are available once the lease period ends, the LAVWCD began working with farmers to place conservation easements on participating farms—protecting them from development and tying the water to the land in perpetuity to ensure future production potential. While enabling temporary transfers, the easements eliminate the possibility of any permanent water severance, diversion, or change in use. In other words: no buy-and-dry.

Conservation easements have protected the fabric of agricultural communities across Colorado and around the nation. An easement-protected land base creates assurances that the future production potential of an agricultural community will be maintained in the face of land conversion threats stemming from urban sprawl, oil and gas development, or municipal buy-and-dry. With the land base protected, related agricultural industries are able to invest in the region with confidence. That, in turn, has a net positive impact on Main Street.

In May 2015, the Super Ditch delivered its first water supplies: five farms on the Catlin Canal provided 500 acre-feet of water to the city of Fountain (pop 27,000), the city of Security (pop 18,000), and the town of Fowler (pop 1,200). Fountain Water Resource Engineer Michael Fink says, "the city took delivery without a hitch," adding that the long-term success of the program depends on ensuring that the Super Ditch doesn't advance a supply-side economic model.

By fallowing one-third of their fields three out of every ten years, farmers "rest" 100 percent of their land once in a ten-year period—a process that supports recommended practices in crop rotation and soil management, while allowing water itself to become a cash crop.

Nichols says that's not a problem. "Cities can lease [from farmers] three in 10 years or 30 percent of the time. They have the responsibility to let farmers know in advance [when they will be leasing]. But for the most part, cities don't need water in dry years, they need it the year after to refill storage [reservoirs]."

By fallowing one-third of their fields three out of every ten years, farmers "rest" 100 percent of their land once in a ten-year period—a process that supports recommended practices in crop rotation and soil management, while allowing water itself to become a cash crop. Nichols reports that with three-out-of-ten-year crop rotation, a demand of 25,000 acre-feet of water can be met by involving 40 percent of the irrigators. Some farmers believe that as many as 80 percent will want to participate. Participants will certainly be needed: the supply gap in the Arkansas River Basin is projected to grow to 88,000 acre-feet or more by 2050. The litmus test for success will be if large cities responsible for the majority of buy-and-dry activity—Aurora (population 346,000) and Colorado Springs (population 440,000)—sign on to the program. "Municipal acceptance of leasing rather than buying," Nichols says, "remains the principle challenge."

From Pioneer to Buy-and-Dry

In the Lower Arkansas Valley, water has divided communities for much of the 20th century. In the 19th century, it divided entire nations. The river here delineated three international boundaries over time: between Spain and the United States following the Adams–Onís Treaty of 1819, which codified the border of the Louisiana Purchase

An acre-foot will cover one acre with one foot (325,851 gallons) of water. One acre-foot will typically serve two Colorado households per year (four if they don't have lawns to water).

between the two countries; between Mexico and the United States following Mexican independence from Spain in 1821; and between the Republic of Texas and the U.S. before Texas's annexation in 1845. Two years after the Adams–Onís Treaty was signed, the Santa Fe Trail was established along the river's course, bringing traders, soldiers, miners, and settlers into Colorado. Those pioneers developed some of Colorado's earliest settlements—and, with them, water diversion projects along the river's banks.

The West is dry, and even though the Arkansas River is the Mississippi River's second longest tributary, it carries very little water in Colorado. Consider how quickly waters in the Lower Arkansas Valley were appropriated. Following the earliest appropriation in 1861, the Homestead Act of 1862 was enacted. More water rights were developed with settlement. By 1874, the last water rights decree still in priority 100 percent of the time (meaning there is always enough water in the river to serve it) was established—two years before Colorado gained statehood in 1876.

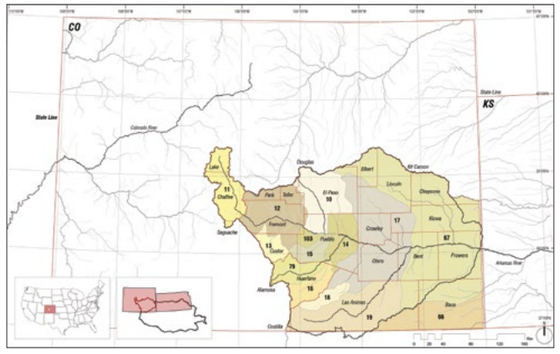
Water rights that were appropriated in 1887 are in priority less than 50 percent of the time today. Water rights from 1896 are in priority less than 10 percent of the time. This means that a modern farmer in the Arkansas Valley with an 1896 water right established by his great-grandfather will be able to irrigate just 10 percent of the time given average precipitation. The rest of the time, when there is a "call on the river"—meaning there is not enough water in the system to serve all rights holders—he must desist from diverting water to his fields, so that more senior water-rights holders can use it.

With the Arkansas River overappropriated before the turn of the century, cities began purchasing water from farmers as early as the 1890s. But shortages or conflicts were also addressed through the development of trans-basin diversion projects (which moved water from other river basins into the Arkansas) or storage projects (which sought to capture surplus water behind dams during high flow periods). These projects reached their thresholds in the 1970s. It was then that cities began seriously looking to irrigated lands.

During the 1970s and '80s, Colorado Springs and Aurora, working with corporate landholders and the City of Pueblo, acquired interests in 55,000 acres of farmland served by the Colorado Canal. The cities subsequently diverted nearly 70,000 acre-feet of water for municipal use, drying up the vast majority of Crowley County. Crowley became the buy-and-dry poster child, and continues to hold that undistinguished title today. Poverty rates exceed 35 percent. Main streets are shadows of the communities that existed there in the mid-20th century. Noxious weed infestation and dust storms are common on dried-up lands. Restoring these farms to native prairie is not only expensive but, in practice, ranges from difficult to impossible.

Today, the losses of irrigated agriculture from water sales in the Lower Arkansas Valley exceed 100,000 acres, representing more than 150,000 acre-feet of water annually. Some farms continue operations by temporarily leasing land or water

THE ARKANSAS RIVER BASIN



The Arkansas River Basin is Colorado's largest, spanning nearly a quarter of the state, but it carries the least amount of water—just 6 percent of the state's total supply. Supply issues on the Arkansas River could be a harbinger of what's to come in other Western environs. Credit: Sourav Biswas and Flavio Sciaraffia

The Catlin Canal, a large mutual irrigation ditch in the Lower Arkansas Valley, is providing leased water supplies to cities as an alternative to the buy-and-dry trend. Credit: Scott Campbell

from the cities they sold to, but those leases will soon expire, advancing even greater losses. In a region that historically irrigated 320,000 acres of farmland, one-third of the tilled ground is now dry, few if any economically viable land use alternatives exist, and people are wondering if a tipping point is coming that will mark the collapse of irrigated agriculture in the area.

"As in much of the West, agriculture is at the heart of this region's cultural heritage," says Summer Waters, director of Western Lands and Communities, a joint program of the Sonoran Institute and Lincoln Institute of Land Policy. "However, we have entered an era in which cities are becoming part of our legacy too. This leaves us with a question that we have to answer collectively: what will the new West look like?"

"Ideally, both cities and agricultural areas will be able to co-exist in the new West," Waters says. "The key to striking that balance lies in how we manage our water supplies. The Super Ditch concept is an innovative way to build flexibility into our water systems, and flexibility is critical in times when supply is uncertain."

A Promising Pepper in an Unpromising Place

Mike Bartolo is visibly frustrated. He worries that water transfers will displace agriculture. "We're losing some of the best growing land in the state," he says. "These are prime soils that don't exist in other places. How do you create certainty in the industry [when this is going on]? That's the question."

Bartolo, who holds a Ph.D. in plant physiology from the University of Minnesota, is a member of the water faculty at Colorado State University (CSU) and a senior research scientist at CSU's Arkansas Valley Research Center. He sits on the Super Ditch board of directors, representing the Bessemer Ditch (one of the eight participating ditches), where he is a shareholder. With an 1861 water right, the Bessemer provides one of the most senior and reliable sources of water to farms anywhere in the Lower Arkansas Valley, and it irrigates some of the valley's best lands. Bartolo is still grieving the 2009 loss of 28 percent of the water in the ditch—sold by farmers he knows to the Pueblo Board of Water Works (PBWW), the utility that provides municipal water to the City of Pueblo.

According to Nichols, there have been occasions when cities strategically approached farmers during the worst of times—when some combination of recession, drought, low commodities prices, overleveraging, or other factors forced their hand. But it is equally true that retiring farmers have assembled collectives to negotiate bulk water sales to cities. The Bessemer Ditch shareholders who sold 5,540 shares to PBWW for $10,150 per share (a share of Bessemer ditch water irrigates approximately one acre) were largely retiring farmers without heirs, responding to falling commodity prices and looking to capitalize on the increasing value of water following the severe drought of 2002. The eventual sale in 2009 netted them more than $56

Farmers recently sold 28 percent of the shares in the Bessemer Ditch, which irrigates this farmland east of the City of Pueblo, to the Pueblo Board of Water Works, for municipal use. Credit: John Wark/Airphoto NA

million. Consider that dry land in this region often sells for less than $300 per acre, and you get a sense of where land values lie: in the water. Wanting to protect other producers and the agricultural fabric of the communities served by the Bessemer, Bartolo tried to convince farmers not to sell—to no avail. "I said, 'let's look at other options, at conservation easements, at the Super Ditch,' but you have to realize how long these sellers had been working on this. Even if they were open to alternatives, my ideas were pie in the sky compared to the cash offer they had in hand." (The Super Ditch was established but not operational at that time.)

Growers in the region have a great deal of respect for Bartolo. He's a fourth-generation farmer, credited with developing the Mosco variety of Mirasol green chile pepper—the most popular variety of green chile grown locally and a centerpiece at the Pueblo Chile & Frijoles Festival, which draws more than 100,000 Coloradans each year. Whole Foods recently decided to stock stores with Mosco chiles from the Arkansas Valley rather than Hatch chiles from New Mexico—a blow to the pride of New Mexicans, whose state vegetable is the chile pepper.

Bartolo developed the Mosco chile from seeds his father gathered at the home of Mike's uncle, Harry Mosco, following his death in 1988. Mike planted the seeds. "One plant I grew was different," he says. "It had better yield, bigger fruit, and meatier flesh, which made it easier to roast." Mike made single plant selections beginning with that plant. He isolated the characteristics he wanted and repeated the process, developing the chile over a fifteen-year period.

Many celebrated produce items come out of the Lower Arkansas Valley, Rocky Ford cantaloupes and Mosco chiles being principle among them. Mike has grown them all. Still, when it comes to changing the playing field, as the Super Ditch is looking to do, Mike concedes there is a lot of work ahead. "It has become politically incorrect for cities to buy-and-dry, but that hasn't stopped other speculators [from playing the role municipal water utilities were playing]." Earlier this year, Pure Cycle, a water and wastewater services company that leases 14,600 acres of land on the Fort Lyon Canal to tenant farmers, sold the farms to an affiliate of C&A Companies and Resource Land Holdings, LLC. C&A is a company with plans to provide Arkansas River water to Front Range cities to the north. "These alternative transfer mechanisms have to be really well defined, and they have to have a history behind them to be able to compete," Bartolo says. They need to be, he adds, just as adept and quick at providing cash in hand as an outright water sale.

Water as Cash Crop

The value of water out West is only increasing. In the Lower Arkansas Valley, a lot of wealth is embedded in the water farmers own. It seems ironic that communities in possession of such a valuable asset are confronted with poverty and decline. More puzzling still is the fact that farmers are liquidating an asset whose value only continues to grow. Ask any investment advisor, "Would you dispose of an asset predicted to continue increasing in value?" and he or she is likely to say "no . . . unless I had no other choice, or unless there was no other way to see returns from that asset."

When it comes to water, the problem right now is that there is a strict dichotomy of choices. Farmers who own it have limited means to earn money from it except by: (1) growing food with it and planning for returns based on commodities prices, or (2) selling it and cashing out on its current value. Part of the reason choices are limited has to do with the cumbersome nature of Colorado water law. A lease of water from farm to city can necessitate a change-of-use case in the water courts. A change case involves engineering studies and legal expertise and can run tens of thousands of dollars. The change case proponent must demonstrate to the courts that third-party water rights holders, such as downstream farmers who rely on the same ditch, will not be harmed. If the courts or third parties challenge that premise, the cost of the change case can escalate into the hundreds of thousands of dollars. Going through this process for a temporary lease, coupled with cities' desires to guarantee permanency of supply in the face of growth, is another factor that has historically limited water leasing.

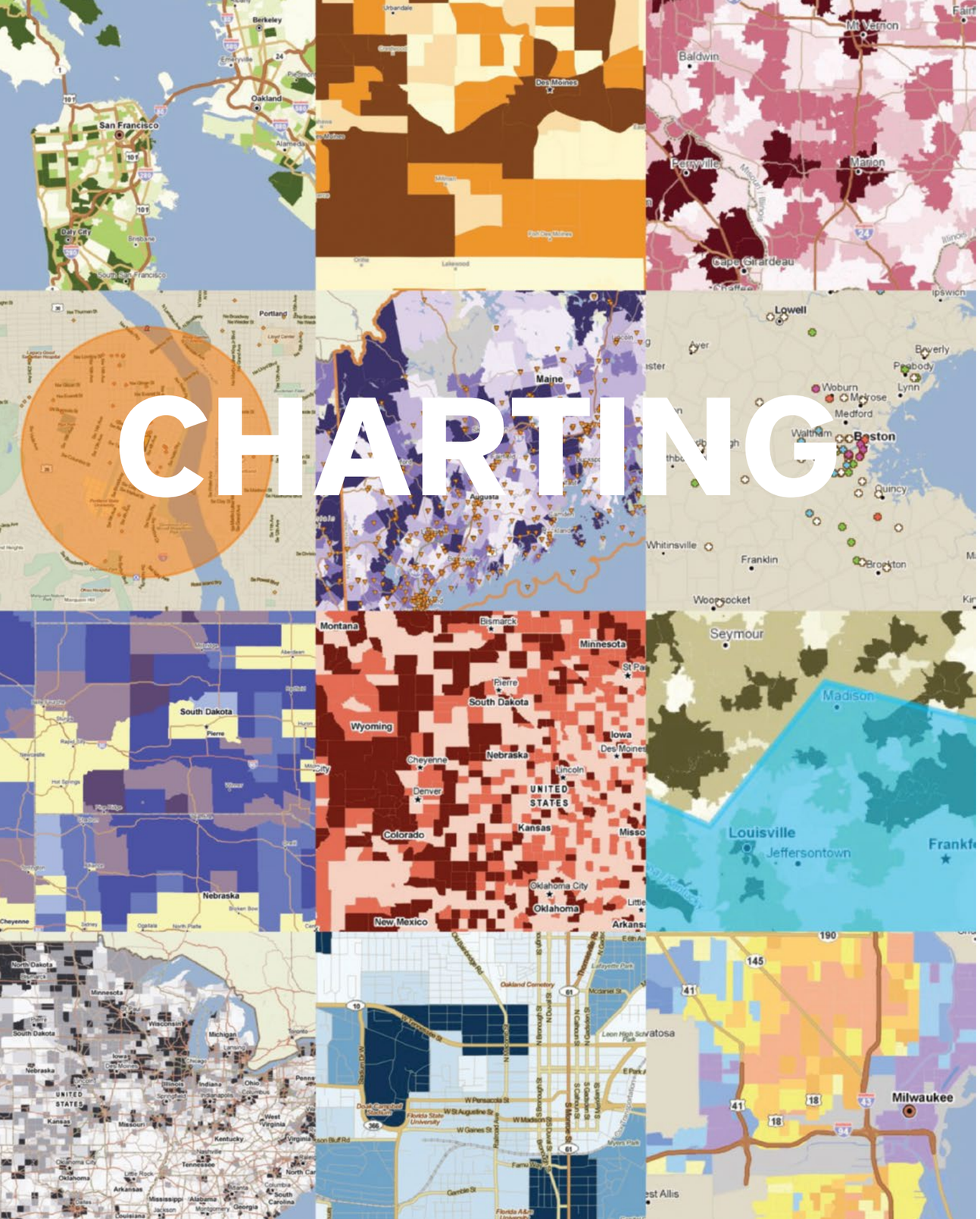
Consider that dry land in this region often sells for less than $300 per acre, and you get a sense of where land values lie: in the water.

The Super Ditch, through legislation advanced by Nichols in 2013, enabled these checks and balances to take place through a much more efficient administrative process overseen by the Colorado Water Conservation Board (CWCB). Now, Bartolo and Nichols hope to see what happens when farmers have more than two choices. Their belief is that if farmers can retain water ownership, grow food, and realize earnings from "commodity water" at the same time—as they would from other types of assets—the economic outlook for the Lower Arkansas Valley will change.

This outlook is borne out by economic studies. As the Super Ditch concept was gaining steam in 2007, CH2M Hill agricultural economist George Oamek compared different options for farmers: sell water, continue to farm, or continue to farm while participating in a rotational fallowing-leasing program. His projections indicated that, over a 40-year horizon, farmers who sold their water would earn more than farmers who continued to farm, but farmers who continued to farm and participated in the fallowing-leasing program stood to gain the most of all. In a comment to the *Pueblo Chieftain* following the study, Oamek said that the Super Ditch could ensure the best price for farmers: "In economics, you look at collaboration as a way to draw out a higher price."

For the same reason, however, the fallowing-leasing concept is a tough sell to large cities.

CONTINUED ON P. 33



PolicyMap Democratizes Data Analysis

PROGRESS

By Alex Ulam

HOUSING COSTS ARE SPIRALING UPWARD IN MANY AREAS THROUGHOUT THE UNITED STATES, cutting down on the ability of Americans to save and leading to the gentrification of formerly affordable neighborhoods. However, as with many public policy challenges, it is not always immediately apparent where problems are the most acute. This became clear to Helen Campbell, an analyst in Los Angeles's Housing + Community Investment Department, late on a Friday afternoon in July. An information request from the mayor's office led her to discover that a large part of the San Fernando Valley in L.A. was home to the nation's highest rental cost burden, which the U.S. Department of Housing and Urban Development (HUD) defines as a situation where families are paying more than 30 percent of their income on renting a home.

Los Angeles officials knew they had areas where home owners and renters were struggling to pay for housing, says Campbell, but they had no idea how severe the situation was or even where it was most pronounced. The mayor's office needed authoritative data on this troubling trend for a lobbying effort to preserve the HOME Investment Partnerships Program (HOME), the largest federal block grant program for affordable housing. Currently, in Washington, DC, lawmakers are considering a Senate bill that would eviscerate the program.

If Campbell had used conventional geographic information software (GIS), it would have taken her an inordinate amount of time to analyze the city's housing cost burden. But she was able to access the necessary information quickly by typing several simple queries into PolicyMap—a unique web-based software program that is changing the way that planning data is gathered and displayed. "If we didn't have PolicyMap, we simply would have said no to the request," Campbell says, "It would have taken too many hours to do the work."

When Campbell ran her PolicyMap search, she discovered that the 29th Congressional District, part of which is situated within the city of Los Angeles, was, out of all of the 435 congressional districts in the country, number one in terms of rental cost burden and number three in terms of home owner cost burden. Those rankings for the 29th Congressional District,

which includes a large part of the San Fernando Valley, translate into 62.9 percent of renters and slightly more than 50 percent of home owners there suffering from a housing cost burden. "We thought that South L.A. or Northeast L.A. would have higher rent burdens, but you have Valley as being the higher rent burden," Campbell says.

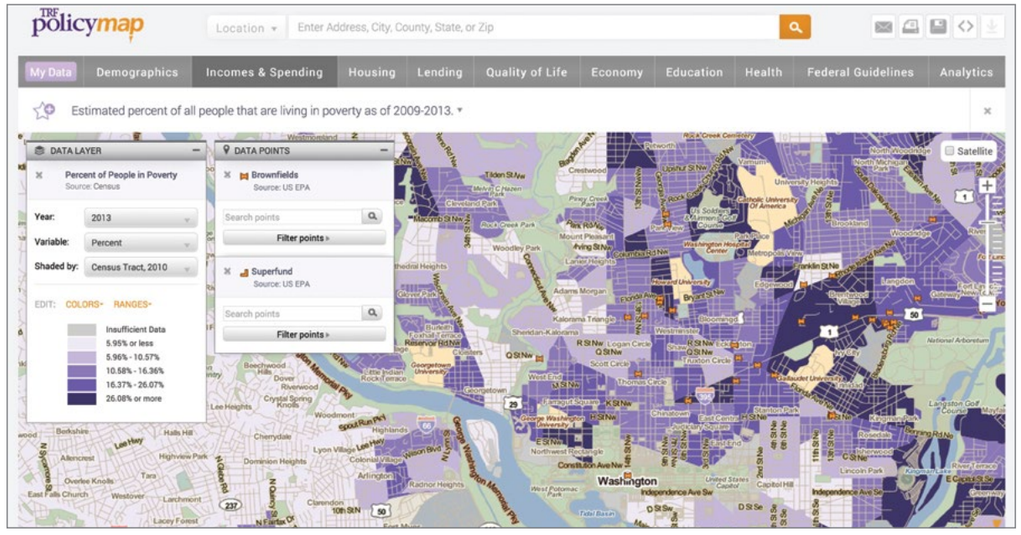
Public Data for All

Since its launch in 2007, PolicyMap has grown into the largest geographic database on the web, and become the go-to public information resource for financial institutions, universities, nonprofits, and close to 2,500 government agencies. The online tool currently has more than 37,000 indicators, on categories ranging from crime to grocery store access, making the world of public data significantly easier to parse. Last year, the site had 434,000 unique visitors. Most of the data housed on PolicyMap is free, but proprietary data is available from various providers through paid subscriptions. Overall, PolicyMap's easy-to-use mapping tools have helped democratize data analysis by making the process relatively affordable for nonprofits and local governments, which usually don't have the resources to hire teams of GIS specialists. The site can help anyone in the public policy world avoid getting stuck on the wrong side of the widening digital divide.

One of the website's most notable attributes is its capacity to simultaneously display various types of indicators, such as Superfund Sites, neighborhood income levels, or developments built with low-income housing tax credits. That capacity can facilitate contemporary planning initiatives, like the Obama administration's Promise Zone or Choice Neighborhood programs, which require interagency collaboration and emphasize coordination of various types of investments in underserved areas.

PolicyMap also allows users to chart the effectiveness of particular programs over a period of time, helping them reap rewards or cut their losses down the road. Although government money is primarily doled out through formulas, there has been a marked increase in competitive grant programs that require progress reports and data that details evidence of needs. When it comes to competitive grants, according to Lincoln Institute President and CEO George W. McCarthy, "cities that have better data, and put together more polished proposals, are obviously going to have an advantage over those that don't."

This color-coded map juxtaposes the percentage of people in poverty and the location of Superfund and brownfields sites in the Washington, DC, area. Credit: PolicyMap



The Starting Point

PolicyMap is the brainchild of The Reinvestment Fund (TRF), a Philadelphia-based Community Development Financial Institution (CDFI), which has $839 million in capital under management, and which invests in low-wealth people and neighborhoods. The organization finances a wide array of community building blocks, such as affordable housing developments, daycare centers, and grocery stores. PolicyMap was born out of TRF's need to track how these community programs were working on the ground.

In the early 2000s, TRF began exploring ways to map and understand the impact of its own investments. "We were looking at where we were making investments over time," says PolicyMap President Maggie McCullough, who was then a researcher with TRF's Policy Department. "We also wanted to know what kind of impact we were making—how we had changed the markets in which we were working."

In 2005, the state of Pennsylvania hired TRF to collect and map a vast amount of data on housing prices, foreclosures, and incomes. The project's goal was to enable officials to think more strategically about how state money was being spent on housing throughout the state. But even with a contract worth almost $200,000, there were limitations to what TRF could do. The data and maps were trapped in a fixed format on a disk. "After we handed the disk over," McCullough says, "I remember thinking that it was going to be like a paper report that sat on a shelf and was never going to get updated."

That epiphany inspired McCullough and others at TRF to brainstorm on how to build a dynamic web-based mapping platform—one that would allow datasets to be refreshed and enable users to upload their own databases. In developing PolicyMap, McCullough was able to draw on her background as one of the pioneers in designing web portals for public information. In the 1990s, she was part of the team that built the U.S. Department of Housing and Urban Development's (HUD) initial web presence. "My experience [at] HUD made me realize that if people [other than] researchers needed or wanted to understand data, we had to make it easier to understand," says McCullough. "We had to give data indicators common names and simple descriptions, just like we had to give HUD programs common names."

PolicyMap can help anyone in the public policy world avoid getting stuck on the wrong side of the widening digital divide.

McCullough wanted PolicyMap to serve the entire country, unlike other data initiatives that focused on local geographies. Upon PolicyMap's launch in 2007, "there really wasn't any online GIS," McCullough explains. "You could get driving directions and find a local restaurant with Google Maps, but a lot of that GIS software was locked on desktops. We wanted to create something that the public could access simply, over the web."

The first dataset that TRF loaded onto PolicyMap in 2007 was comprised of reports from the Home Mortgage Disclosure Act (HMDA), the government's most important data source for spotting predatory and discriminatory lending. At the time, the housing bubble was bursting, and officials from government and law enforcement were scrambling to get a grip on the burgeoning crisis; the HMDA data was one of the first places where they would look for information. But HMDA data wasn't arranged in GIS user-friendly format, making certain types of searches extremely difficult. For example, if a researcher with a background in GIS wanted to zero in on a section of Detroit where she suspected there might have been a flood of high-cost loans, there was no online tool available to extract the HMDA data for that particular area.

PolicyMap's initial success making data publicly available helped attract prominent paying customers—including the Federal Reserve Board in Washington, DC, which was

in charge of collecting the HMDA data at the time. In addition to loading all of the HMDA data for mapping purposes and making it available to the general public, McCullough's team custom-built a reporting tool within PolicyMap for the Fed that enabled its staffers to pull out HMDA data for any locale they wanted to study. Says McCullough, "We had made it easier for [The Fed] to access its own data."

Leveling the Playing Field

Big lenders and real estate investors typically have in their toolkits subscriptions that can cost in the six figures for access to services that provide proprietary information such as property evaluation reports and in-depth market research. But many community-based organizations and local governments can't afford to buy such licensed data. And even if they could afford expensive subscriptions, many community organizations and local governments lack the staffers or GIS capabilities to use it on interactive maps.

The website simultaneously displays various types of indicators, such as Superfund Sites, neighborhood income levels, or developments built with low-income housing tax credits.

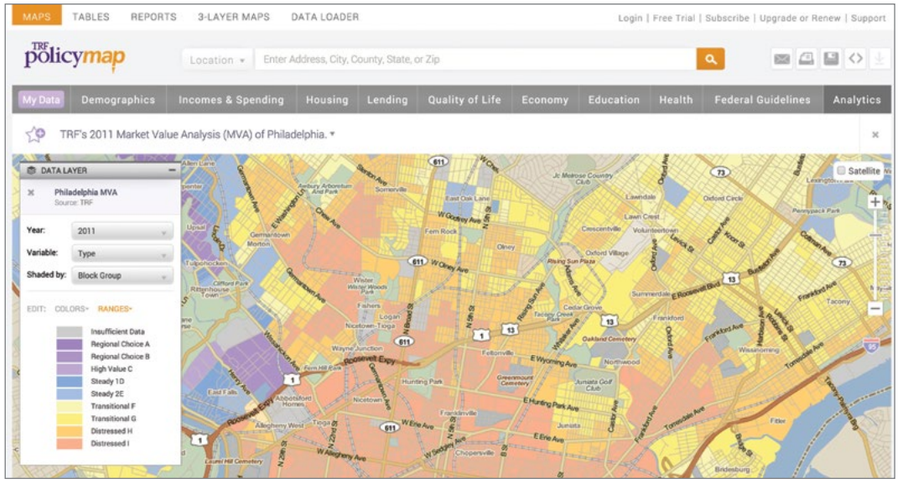
Take NeighborWorks, a national network of 240 community-based organizations that doesn't have a GIS specialist on staff. Harry Segal, a performance and planning specialist at NeighborWorks America, says that PolicyMap has changed the equation for his network by giving them access to data and mapping tools that they couldn't otherwise afford. "Any developer, public or private, trying to move into a new neighborhood has to court the powers that be and demonstrate an understanding of local market conditions," Segal says. "It's much more difficult for nonprofit organizations to compile this sort of data." Without PolicyMap, he says, "the juice almost isn't worth the squeeze."

NeighborWorks' PolicyMap subscription, which costs $5,000 per year, provides access to this kind of proprietary data and allows the organization's members to query different sections of a map for information on a variety of indicators such as the average income of residents within a certain neighborhood and the level of high-cost mortgages that have been made there. This ability to look at different geographic scales empowers local community groups that are trying to access funding or call attention to predatory lending in their neighborhoods. "We have a couple of organizations in upstate New York. If you are looking at statistics on that region, they are going to be heavily skewed by New York City," Segal says. "But with PolicyMap, we can pull up data by census tract or block group."

Some city agencies also lack the capability to design or maintain the types of databases that they can now get through a PolicyMap subscription. "I am the only person here who has GIS capabilities," says Sara Eaves, a planning and policy analyst for the San Antonio Housing Authority. She adds that PolicyMap allows many people in her office to perform tasks that would otherwise require specialized training. Through their PolicyMap subscription, the San Antonio Housing Authority also makes data publicly available about schools, residential vacancy rates, neighborhood income levels, and other information that a city resident might want to consider when deciding where to buy a house or rent an apartment. "We could maintain similar databases in-house, but we don't have the resources. PolicyMap has allowed us to put interactive maps on our website, which is making the information available not just internally, but to the general public as well."

Streamlining the Process for Cities and Community Groups

Many policy analysts use both full-blown GIS software, such as Esri, and the simplified GIS tools available on PolicyMap. Campbell from the Los Angeles Department of Housing + Community Development says that Esri offers the ability to do forecasts and run certain types of complex analyses that are not possible with PolicyMap. But she notes that PolicyMap saves her time and makes it easier to explain her research to laypeople. "I like PolicyMap because it is just based on facts and it is irrefutable," she says, whereas Esri contains predictions about the future. "Sometimes, when you hand someone a community analysis report with Esri data, it may be too much information for them to digest. There will be 2005, 2010, and 2015 information. But for the 2020 information, there is a formula for how they created that forecast, which we may not need, and which may be wrong."



The Reinvestment Fund's market value analysis map of Philadelphia evaluates census blocks according to indicators such as home sale activity, vacancy rates, and foreclosures. Credit: PolicyMap

PolicyMap is also flexible enough to respond to users' changing needs. As data requirements have become larger and more complex, long-time PolicyMap customers have requested new tools to help improve efficiency. For instance, Melissa Long, the deputy director of Philadelphia's Office of Housing and Community Development, had been using PolicyMap to display aggregated and cleaned-up census data. But several years ago, she realized that her agency needed more comprehensive analytic tools in order to apply for the increasing number of grants that are being awarded on a competitive basis.

"We needed a lot of neighborhood demographic information, and we needed to know what types of city programs were being deployed," Long says, noting that having city data available on PolicyMap has improved the coordination among different city agencies and better positioned the city to apply for competitive grants.

Long says the tools that PolicyMap has developed for Philadelphia will enable the city to monitor its progress while implementing a Choice Neighborhoods Implementation Grant, which supports locally driven strategies to address struggling neighborhoods with distressed public or HUD-assisted housing. "The grant covers a five-year period. If we look and see that our neighborhood stabilization proposal is not working," she says, "then we can make midterm grant corrections."

Being able to map different types of data simultaneously also lets researchers chart the co-benefits from a particular investment. For example, two different programs in Philadelphia involve cleaning up and greening vacant lots. PolicyMap lets users see the lots rehabilitated by both programs simultaneously, and study whether they have improved the quality of life in surrounding neighborhoods. Philadelphia's contract with PolicyMap has made it possible to overlay data from multiple studies—such as one from University of Pennsylvania's Wharton School

CONTINUED ON P. 34

In 1850, the Connecticut River fueled waterwheels for paper mills in Holyoke, MA; today, it generates clean, inexpensive hydroelectric power for a supercomputing complex. Credit: Jeffrey Byrnes

BACK TO THE FUTURE

The Working Cities Challenge Helps MA Cities Rebuild on Industrial Pasts

By Billy Hamilton

HOLYOKE, A CITY OF ABOUT 40,000 IN WESTERN MASSACHUSETTS, WAS ONE OF THE NATION'S FIRST PLANNED INDUSTRIAL COMMUNITIES. Beginning in the late 1840s, Boston investors transformed what had been a farming area into a mill town, taking advantage of its location along the Connecticut River. The investors wanted to manufacture cotton textiles. But over time an elaborate canal system was built in the city to accommodate more and more mills, and the town became known for silk, wool, and paper manufacturing as well. In time, Holyoke came to be known as the "Paper City" because of its paper mills.

As the mills developed, the city prospered. With jobs plentiful, the town attracted successive waves of Irish, French-Canadian, German, Polish, Jewish, Italian, and Puerto Rican immigrants who worked in the mills, created small businesses, raised families, and built a city that reached a population of 63,000 by 1917 (McLaughlin Green 1939).

Then it all began to come apart—slowly. From a peak in the 1920s, local industry gradually declined as companies and jobs moved overseas or migrated to the South and West to be nearer raw materials and cheaper labor. By the time of the 2000 census, Holyoke's population had shrunk to fewer than 40,000. Like other small industrial towns across the country, it was part of a fading era in the American industrial past, and the once-prosperous Paper City was fighting to keep its economic footing.

Fortunately, Holyoke had a big stroke of luck in 2009, when the city was selected as the site for what came to be known as the Massachusetts Green High Performance Computing Center (MGHPCC)—an environmentally friendly supercomputing complex intended to bolster what state officials call the Massachusetts "innovation economy." Water power was once again key to the city's success. Holyoke's location on the banks of the Connecticut River offered access to low-cost hydroelectric power, while the river and the city's many canals offered water for cooling, a major advantage in supercomputing. "Holyoke

Holyoke's location on the banks of the Connecticut River offered access to low-cost hydroelectric power, while the river and the city's many canals offered water for cooling, a major advantage in supercomputing.

has struggled after losing its industry base," says Kathleen Anderson, president of the Greater Holyoke Chamber of Commerce. "We had aging infrastructure that needed to be repurposed, loss of jobs, and other changing demographics. Holyoke had to think in creative ways and recognize the assets we had. Both human talent and the wisdom of acquiring the dam and its hydropower have been foundational to our rebirth."

When the computer center opened in 2012, it represented an important first step toward improving Holyoke's fortunes, but it wasn't enough to restore its vitality. The city undertook a planning effort that produced a 20-year renewal plan to revitalize and redevelop the area where the MGHPCC is located, in the center of town. An important step in realizing the plan was the creation of the Holyoke Innovation District—an investment the state made through the Massachusetts Technology Collaborative that brought together local officials, business leaders, and community organizations to encourage local and regional economic development. "The attraction of the computing center to Holyoke really started our planning process around the Holyoke Innovation District. Really, we say it spawned out from the computing center," Marcos Marrero, Holyoke director for planning and economic development and co-chair of the Holyoke Innovation District, said in a September interview (Desmarais 2015) with the *Bay State Banner*.

Leadership, Collaboration, Resurgence

That's when the Boston Federal Reserve Bank entered the picture. Since 2008, the bank's research staff had been studying older industrial cities like Holyoke as part of an effort to help revitalize another Massachusetts city, Springfield. Like Holyoke, it had seen better days. The bank conducted a two-year study partnership with Springfield that examined the challenges facing the state's fourth-largest city, which continued to fail even as state government and nonprofits poured millions of dollars into revitalization.

One part of the study tried to glean lessons for Springfield from the fates of 25 other small industrial cities in the Northeast, Midwest, and upper South. The Boston Fed's economists found that a handful of these cities had been able to either maintain or recover much of their economic stability, as measured by income, poverty rates, population, and economic vitality. Boston Fed researchers called them "resurgent cities," and the researchers looked for common themes that explained their success. The cities, they found, faced similar challenges—poverty, changes in racial and ethnic makeup, and the loss of their manufacturing bases. But all were fighting through their challenges and shared a key driver of success: sustained leadership and collaboration among businesses, government, nonprofits, and community groups. "Time and again, our examination of the resurgent cities' histories indicated that the resurgence involved *leadership* on the part of key institutions or individuals, along with collaboration among the various constituencies with an interest in economic development," bank researchers wrote in a 2009 report (Kodrzycki and Muñoz 2009).

A mixed-use commercial and residential project is reclaiming the former American Cubit Wire factory on Holyoke's Canalwalk. Credit: Rob Deza

The bank researchers noticed that the source of local leadership varied from place to place. In New Haven, Connecticut, local colleges and universities worked with government officials and private industry to provide workforce training and funding to attract companies. In Providence, a nonprofit foundation worked with business executives to develop ideas and a consensus on downtown development projects. In Evansville, Indiana, a mayor initiated the turnaround in the 1960s, and it continued, thanks to an aggressive economic development campaign by the local chamber of commerce later on. Despite their differences, all these economic redevelopment efforts spanned decades, implying solid ongoing leadership.

All the efforts demonstrated the active collaboration of numerous groups and individuals as well. According to the Fed's research, "Collaboration became necessary because economic transformation is complex, and because outsiders—such as state and national governments, foundations, and businesses that are potential sources of funding and jobs—often require proof of joint efforts in order to contribute to a city's development."

Rising to the Challenge

These findings led the Boston Fed to ask what it could do to help build the strong civic infrastructure that was critical to resurgence. The result was the Working Cities Challenge, which the bank created with the help of Living Cities, a New York–based collaboration of 22 foundations, financial institutions, and other partners.

The Challenge took the form of a competition among the smaller former industrial cities in Massachusetts. In the spring of 2013, 20 communities applied to participate. From the applicants, six cities were selected to receive a total of $1.8 million in grants to support projects that emphasize leadership and collaboration.

Recently restored passenger rail service in Holyoke will connect riders to Northampton, Springfield, and beyond, via Amtrak. Credit: Rob Deza

Among the first six winners was Holyoke, along with Chelsea, Fitchburg, Lawrence, Salem, and Somerville. The goal was simple: to help save these struggling Massachusetts cities by supporting development of the tools they needed to help themselves.

The program was an important and unusual one for a federal reserve bank. The banks are better known for cranking out economic research than for mounting programs in the field. However, the initiative reflected Boston Fed President Eric Rosengren's commitment to applying the bank's economic research to the real world and to improving New England communities. And the concept is scalable, with nationwide potential to bolster cities and towns across the country that have struggled with 21st-century economic realities.

Tamar Kotelchuck, director of the Working Cities Challenge, says that the bank's research on resurgent cities taught them that most struggling cities can do better. "Based on what we learned from studying resurgent cities, we got together with Living Cities and came up with the idea of a competition for multiyear funding to incentivize leadership and collaboration," she says.

She says the bank decided to start with a pilot program in Massachusetts, with a focus on small and midsize cities. The target cities range in size from about 35,000 to 250,000 and share certain economic and demographic similarities, including a large number of poor families and low median incomes. "These cities had already formed a coalition to support their interests with the help of MassINC, a local think tank,"

Kotelchuck says. "They called themselves Gateway Cities and had been working together on common economic and political problems for a few years. They had learned that working together gave them a certain amount of power that none had alone," she says (Forman et. al. 2007).

Working Cities took a singular approach in attempting to help these cities, according to Andrew Reschovsky, a fellow at the Lincoln Institute. "What is unique about the Working Cities initiative is that, unlike many other urban economic development strategies, its focus is on improving the economic well-being of each city's current low-income residents."

The federal reserve banks can't use their own funding to provide grants, but a number of willing partners stepped forward to aid Working Cities. Kotelchuck says the Fed's role in the initiative includes designing and implementing the model in partnership with a steering committee, providing technical assistance, and helping teams build capacity through expert assistance, networking, and best practices. The grants are funded by several donors, including the state government; Living Cities; the Massachusetts Competitive Partnership, an association of the 16 largest employers in Massachusetts, focused on promoting economic growth; and MassDevelopment, the state's development agency.

"Many cities chase the newest, flashiest strategy to revitalize themselves, but ultimately it's not the newest trend that revitalizes a city. It's the effects of many ideas over time... Look at what you have and build systematically on it."

Kotelchuck says that when the bank and its partners put together the first competition in 2013, they left it up to the cities to propose how the grant funding would be used. "We didn't tell cities what to work on," she says. "The challenge is designed to help build collaboration around issues that are important locally." A major requirement for a successful project, though, was that it should involve the private sector, government, and other local groups working together. "We were looking for projects that promoted systemic change," she says. "Our goal was intended to help local leaders fix things in their cities."

An independent jury evaluated the cities' proposals based on criteria that reflect the Working Cities Challenge goals of collaboration, community engagement, and the use of evidence to track progress. The projects had to make a lasting contribution to improving the lives of low-income residents.

In January 2014, the first awards were announced. Of the six cities selected, four received multiyear grants, and two received seed awards. All the cities were combatting high unemployment, low student achievement, and an uncertain future. However, Kotelchuck says, "All the winning cities had distinctive proposals. No two were alike. They all addressed specific local needs, just as we had hoped," she says.

For example, Fitchburg in north-central Massachusetts received a three-year grant of $400,000 for its eCarenomics Initiative—an effort to develop shared metrics for neighborhood health and well-being, with the goal of improving one part of town. Chelsea won a three-year grant for its Shurtleff-Bellingham Initiative, designed to reduce poverty and mobility rates by 30 percent in the struggling neighborhood. Salem received a $100,000 seed grant for its plan to bring one low-income neighborhood's economic indicators in line with the rest of the city by focusing on economic development, small business development, workforce development, and leadership development. Somerville also received a one-year seed grant of $100,000 to support a workforce training program for out-of-school "youth" aged 18 to 24.

The largest single award, a $700,000 three-year grant, went to Lawrence in the northeastern part of the state. The award was for the Lawrence Working Families Initiative, whose goal was to create a Family Resource Center designed to increase the incomes of parents of local school children by 15 percent over a 10-year period. The initiative is led by Lawrence Community Works and the local school system, with support from several employers and nonprofits in the area. "The Lawrence school system had gone into receivership in 2011," Kotelchuck explained, so focusing on families and schools was a logical choice.

The Connecticut River surges through the landscape outside Holyoke, MA. Credit: Jeffrey Byrnes

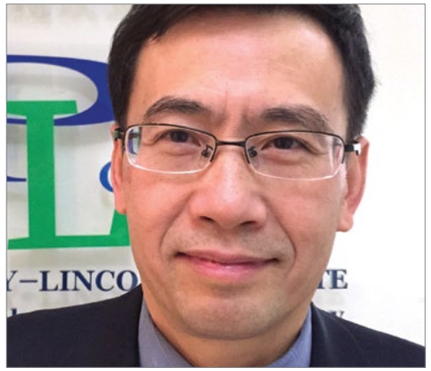
The city also had economic characteristics that fit the Working Cities' model. Its median household income was half the statewide median, and its poverty rate was almost triple the statewide rate. "The city's population is 70 percent Hispanic, and unemployment was a problem," Kotelchuck says. Many of the problems the city faced spilled over into the schools. "The goal of the Family Resource Center is to help families in as many ways as possible. It provides financial coaching, crisis support, and other services to strengthen families," she says.

Beyond the family center, a large part of the initiative is focused on what Kotelchuck calls "authentic parent involvement" in the schools. The initiative created community education circles where parents, teachers, and students work on specific problems in the schools. "The goal is to get parent buy-in and involvement in the school system," she says. So far, the program has involved 400 parents, hired a family coach, and placed more than 30 parents in jobs, according to Kotelchuck.

Holyoke received a $250,000, three-year award that is being used to implement SPARK (Stimulating Potential, Accessing Resource Knowledge). This downtown "entrepreneurship and social venture development center" aims to increase business ownership, particularly among the city's residents, including the Latino population, which accounts for 60 percent of the population. The project team that created the program is made up of representatives from the city, the chamber of commerce, the Holyoke Public Library, a one-stop employment center called CareerPoint, and the local nonprofit Nuestras Raíces.

The SPARK program is "geared toward identifying, recruiting, and stimulating Holyoke residents and organizations that have a 'spark' or desire to move their innovative projects or business proposals from concept to reality by emphasizing a whole-community approach to entrepreneurialism, individual learning, and leadership training," according to the city. In short, it's designed to help prospective business owners establish business plans and figure out how to get operating.

CONTINUED ON P. 35



Since 2013, Zhi Liu has been a senior research fellow and director of the China Program at the Lincoln Institute of Land Policy, and director of the Peking University–Lincoln Institute Center for Urban Development and Land Policy (PLC). Prior, Zhi was lead infrastructure specialist at the World Bank, where he worked for 18 years, with operational experiences in a number of developing countries.

Zhi received a B.S. in economic geography from Dr. Sun Yat-Sen University (China), a M.S. in city and regional planning from Nanjing University (China), and a Ph.D. in urban planning from Harvard University.

Strengthening Municipal Fiscal Health in China

LAND LINES: The Lincoln Institute recently initiated a global research agenda on municipal fiscal health. This effort arises from the recognition that a number of cities in the United States and in many other countries including China suffer financial hardship. What is the nature of municipal fiscal distress in China?

ZHI LIU: It's very different from the financial troubles faced by cities in the United States. The two countries are at very different stages of urbanization. While the U.S. is highly urbanized, with more than 80 percent of citizens living in urban areas, according to the 2010 census, China is only halfway through the urbanization process. Today, 750 million Chinese citizens live in cities, accounting for 55 percent of the total population. By 2050, the urban population is expected to reach 1.1 billion, or 75 percent of the total population. Over the last two decades, with the exception of a few mining cities, almost all municipalities have seen rapid population growth and spatial expansion, generating a significant demand for public investment in urban infrastructure.

In China, the main sources of funding for urban infrastructure investment are revenues from land concessions and local borrowing from commercial banks, often using land as collateral. Urban land is owned by the state, and rural land is collectively owned by villages. The Land Administration Law stipulates that only the state has the power to convert rural land into urban use. This sets the stage for the municipal governments to take rural land for urban development through the land concession process. As it goes, municipal governments expropriate rural land, service it with infrastructure, and sell the land use rights to real estate developers. The compensation to farmers for the farmland taken is low, based on the land's agricultural production value instead of market value for urban use. When the demand for real estate development is high, the land concession fees are bid high, and the municipal governments stand to collect a huge amount of revenues. For the last 10 years, revenues from land concessions have accounted for more than one-third of total local fiscal revenues.

Moreover, municipal governments further expand their financing capacity by using land assets as collateral to secure commercial loans from commercial banks. Before a recent amendment, the Chinese Budget Law did not permit local governments to borrow. However, most municipal governments bypassed the law by creating their own local financing vehicles—known as urban development investment corporations (UDICs)—that borrowed commercial loans or issued corporate bonds for the governments. The size of outstanding local debts has grown rapidly over the last few years, reaching at least one-third of the GDP now.

The land-based financing mechanism has helped municipal governments in China raise a significant amount of funds for capital investment. However, the success has also created incentive for municipal governments to rely on land concessions and UDICs too heavily. Today, China's economy is growing more slowly than before, and the mechanism is running out of steam in many localities where conversion of rural land for urban use exceeds the real demand. Some cities have borrowed much more than they can repay, leaving them heavily indebted.

Many empirical studies, including some funded by the Lincoln Institute, find that China's land-based financing mechanism is one of the main causes of other urban issues that we face today. Skyrocketing housing prices, growing local debts, excessive land-taking, growing tension between the farmers and municipal governments over land-taking, and widening gaps of income and wealth distribution between urban and rural populations are among the major issues.

LL: The international mass media has been reporting on these issues. How will China address them?

ZL: There is a high level of consensus on the root causes of the problems. In November 2013, the central government announced a set of reforms, and a few are directly related to urbanization policy and municipal finance. For example, the scope of land expropriation will be narrowed to the confine of public purposes, and villages are allowed to develop their land for urban use under the premise that it conforms to planning. The reforms also call for acceleration of property tax legislation; reform of *hukou*, the household residential registration system, to help farmers become urban residents; and government efforts to make basic urban public services available to all permanent residents in cities, including all rural-to-urban migrants.

Today, 750 million Chinese citizens live in cities, accounting for 55 percent of the total population. By 2050, the urban population is expected to reach 1.1 billion, or 75 percent of the total population.

LL: What are the implications of *hukou* reform on municipal finance?

ZL: The government is phasing out China's longstanding *hukou* system, and the implications for municipal finance will be significant. *Hukou* was designed to identify a citizen as a resident of a certain locality, but for several decades the government used the system to control rural-to-urban migration. A rural *hukou* holder could not become an urban *hukou* holder without the government's approval. Without urban *hukou*, a rural migrant worker is not eligible for public services provided by the urban governments.

Since the economic reform, the expanding urban economy has absorbed a large number of rural-to-urban migrant workers. Earlier, I mentioned China's urbanization rate of 55 percent and urban population of 750 million. These numbers include the 232 million rural migrants who stay in cities for more than half a year. If they were excluded from the calculation, the level of urbanization would be just 38

percent. Due to their rural *hukou* status, however, migrant workers don't have access to many services enjoyed by urban *hukou* holders, despite the fact that many have labored and lived in cities for years. Municipal governments determine the extent of many urban public services—such as public schools and affordable housing—according to the number of urban *hukou* holders inside the municipal jurisdiction. Phasing out *hukou* would significantly increase the fiscal burden to the municipal governments for public service provision. Some scholars in China estimate that the cost of providing full urban public services to each rural migrant would be at least RMB 100,000 (roughly $16,000 U.S.). The total outlays for all current rural migrants would be at least RMB 23 trillion (about $3.8 trillion U.S.).

LL: **China is introducing the residential property tax. What is the status of that initiative?**
ZL: The government is drafting the first national property tax law as part of the ongoing reform of public finance. China is one of only a handful of countries without a local property tax. The current taxation system relies heavily upon taxes on businesses and transactions, and very little upon taxes on household income and wealth. In a more urbanized China with a wealthier population who own residential properties, the property tax would be a more viable source of municipal revenues. Today, 89 percent of urban households own one or more residential units, and the value of those properties has much to do with urban public services. Property tax will allow cities to tax urban residential properties whose value would benefit from the improved public services made possible by property tax revenues. It should also fill part of the fiscal gap left by the expected reduction of revenues from land concessions. However, property tax will not be a major source of municipal revenues any time soon. It may take one or two more years for the National People's Congress to pass the new law. It would also take perhaps two to three years for cities to establish the property database and assessment and administration system.

LL: **It must be tough for cities to deal with declining revenues from land concessions without an immediate alternative—especially as they are coping with growing local debt, which has been widely reported. How will Chinese cities get out of this situation?**
ZL: The situation is indeed tough. China's economy is slowing down. The real estate sector is no longer as hot as it was in the last 10 years, resulting in lower demand for land and thus lower revenues from land concessions for municipal governments. Cities are now facing a fiscal gap. One possible way to fill the gap would be local government borrowing. However, as I mentioned earlier, many cities are indebted and have little capacity to borrow further. In fact, most cities in China do not have adequate capacity for debt management. The newly amended budget law permits provincial-level governments to issue bonds within the limit set by the State Council, but also closes the door on other forms of local government borrowing. Currently, the central government actively promotes infrastructure financing through public-private partnerships (PPP). While this is a good move, it won't be sufficient to fill the infrastructure financing gap, as PPP is suitable mainly for infrastructure projects with a strong revenue flow. There are many other urban infrastructure projects that generate little or no revenues. In the long term, I believe that China should actively establish a municipal government bond market to channel funds from institutional investors to municipal infrastructure investment and enable local governments to access commercial loans based on creditworthiness. To do so, municipal governments need to develop institutional capacity on several fronts, such as local debt management, capital improvement planning, multiyear financial planning, and municipal infrastructure asset management.

LL: **Is PLC's work relevant to the current reform?**
ZL: The PLC was jointly established by the Lincoln Institute and Peking University in 2007. By the time I arrived, in 2013, the center had developed its reputation as one of China's premier research and training institutions on urban development and land policy issues. The center supports a number of activities, including research, training, academic exchange, policy dialogue, research fellowship, demonstration projects, and publication. We focus on five core themes—property taxation and municipal finance, land policy, urban housing, urban development and planning, and urban environment and conservation. Over the last few years, our research projects have touched upon land-based finance, local debts, housing prices, infrastructure capital investment and finance, and other topics relevant to municipal fiscal health. We have also provided training to Chinese government agencies on the international experiences of property tax assessment and administration. I would say that our work is highly relevant to the current reform.

Implementation of the new comprehensive policy reforms is generating considerable demand for international knowledge and policy advice in the China Program's focus areas, especially property taxation and municipal finance. We plan to initiate a pilot demonstration project with one or two selected cities in China, to support the institutional capacity required for the development of long-term municipal fiscal health. Our team has started a study to develop a set of indicators to measure municipal fiscal health for Chinese cities. It is the right time for us to initiate this agenda in China.

The Super Ditch
CONTINUED FROM P. 17

Following Oamek's principle of collaboration, cities have been working together to acquire agricultural water supplies at low prices. City skepticism is heightened by inflationary concerns. If water cost is only going to increase, why not purchase supplies now, while prices are low, in order to keep utility rates down?

To address this matter, Nichols looked at different mechanisms for establishing price escalators that would protect buyers and sellers, including:

1. a market-based escalator, based upon other water conveyances;
2. an escalator based upon average municipal water impact fee increases over time;
3. an escalator based upon average municipal water rate increases over time; and
4. a cost-based escalator, as measured by the Consumer Price Index (CPI) and the Producer Price Index (PPI).

The pilot project with Fountain, Security, and Fowler guarantees pricing stability by adjusting the lease price every five years according to the percent change in the Colorado Municipal League's Index of Colorado Utility Costs.

At $500 an acre-foot, the current Super Ditch lease will earn the five participating farmers a quarter of a million dollars this year in addition to the revenues they will earn from crop production on non-fallowed lands. Some of these crops, such as forage, are low-value crops, and the water lease provides good income in lieu of growing them. Others, like melons and chiles, are high-value crops. Bartolo is excited about the retention of these agricultural revenues, which he thinks will create a ripple effect across the valley's many communities: "Two acre-feet of water grows an acre of chile—that's 1,000 bushels," he says, "which brings in $10,000 to $15,000 in revenue at the farm gate level."

Although municipal water prices are increasing, considering the shortages the West faces, they're still low by most counts. Cities have sought to keep prices low by acquiring as much water as they can, as early as they can, while keeping within the bounds of Colorado's anti-speculation doctrine.

By blurring the lines around the "types" of water that drive prices—both at the tap (utilities prices) and at the head gate (commodities prices)—the Super Ditch may launch a disruptive innovation that could alter the price of water in ways that better reflect Western realities. If farmers retain control of water and lease to cities, prices will adjust according to increasing demand in a field of diversified ownership. That's a new type of competition in the market, and that's not a bad thing. Urban growth won't have to correspond with rural decline. And a glass of water will still be the cheapest beverage to wash down a plate of locally grown chile rellenos.

Scott Campbell is an award-winning conservation planner and consultant whose assembles diverse teams to solve complex environmental, social, and economic problems. Scott was the 2015 Lincoln Loeb Fellow at Harvard University's Graduate School of Design and a joint fellow at the Lincoln Institute of Land Policy. Prior to his fellowship, Scott directed one of the country's largest land trusts, the William J. Palmer Parks Foundation.

Charting Progress

CONTINUED FROM P. 23

that showed how real estate values rose 17 percent on average around the cleaned-up lots, and another that showed how gun crime dropped significantly in the areas around them. A third co-benefit is the several hundred summer jobs that are tied to keeping the rehabilitated lots in good shape. "You cannot just look at housing alone," Long says. One has to consider "all the other things going on in a neighborhood."

One of PolicyMap's most popular analytic tools is the Market Value Analysis (MVA), which TRF developed for Philadelphia and has replicated in about 18 other cities. MVAs evaluate the strength of different areas of a city by looking at color-coded sections of a map that denote assigned values, which range from "Distressed" to "Regional Choice," which is the highest rating. The rankings are established using a technique called Cluster Analysis, which evaluates census blocks based on groups of indicators, such as home sale activity, vacancy rates, and foreclosures. When you click on any section of the map, a table pops up to reveal the data that was used to determine the ranking for that specific area. The Regional Choice Neighborhoods, McCullough says, are generally defined by strong sales values, low vacancy rates, and a mixture of home owners and renters.

Those MVAs provide government agencies and nonprofits the information they need to address an area's specific problems, says the Lincoln Institute's McCarthy. "You want to get the best bang for your buck from public money," he says. "In the really terrible neighborhoods, that might mean investing in large-scale demolition to accelerate the reuse of properties. In a transitional neighborhood, you might want to acquire abandoned homes and fix them up."

The Road Ahead

The PolicyMap team often releases new indices and new tools right on the heels of court decisions and agency rulings This past July, for instance, McCullough and her team released the Racially and Ethnically Concentrated Areas of Poverty (RCAP/ECAP) index, which is used to identify U.S. Census tracts that have both a high proportion of nonwhite individuals and people living below the poverty line. McCullough says that her team anticipated the Supreme Court's ruling in June on "disparate impacts" in housing practices and, several months earlier, had started developing the index to help individuals and organizations understand the issues related to the court's decision. "The timing was great," she says. "When [the Supreme Court decision] happened, we were ready to go."

PolicyMap is still missing major data sets that McCullough would like to upload, to help researchers get a better picture on critical issues facing the country. For example, McCullough says that she has long wanted to incorporate national foreclosure data as part of PolicyMap's efforts to track factors influencing home sale prices, but it's difficult to find comprehensive and authoritative foreclosure data sets. Plus, it's still prohibitively expensive to purchase licenses for the foreclosure data from private vendors. PolicyMap clients have also expressed interest in accessing credit scores—some of the most difficult data to obtain. "We couldn't even get permission from the credit-score agencies to license the data," McCullough says. "And if we were going to get it from them, it would be aggregated at a high geography, [like] at a statewide level."

Meanwhile, PolicyMap will get one of its biggest-ever data resources this coming October, with the first segment of a project tentatively titled "State of the Nation's Land," subsidized by the Lincoln Institute. "State of the Nation's Land" will include a collection of 18 huge databases from 150 different government agencies, covering criteria such as heavily polluted sites, public investments in land, flood zones, and zoning information.

The Lincoln Institute project is intended to help government agencies do their jobs better and provide average citizens with tools they can use to hold their elected officials more accountable. It should also shed more light on some our country's most vexing problems, like the persistence of poverty in certain areas or reverse redlining, when minority consumers are targeted for loans on unfavorable terms. Ultimately, however—as with the discovery that the San Fernando Valley is in fact the most unaffordable place to live in the country relative to local residents' income—we cannot even anticipate some of the most interesting facts and trends that will be unearthed in the future, as more researchers get savvy about navigating PolicyMap.

"Every time I get into PolicyMap, I start looking at new things," says McCarthy. "There is a whole process of discovery that I go through, and it's very illuminating."

Alex Ulam is a journalist who focuses on architecture, landscape architecture, urban planning issues, and housing.

Back to the Future

CONTINUED FROM P. 29

Another goal is to tie members of the downtown Holyoke community into the Innovation District the city created around the supercomputing center. "The city has a big data center," Kotelchuck says. "But that alone won't necessarily help Holyoke's low-income people. The question that SPARK addresses is how do you build upon the assets of Holyoke's immigrant population and make sure people benefit from the development that's going on around the innovation district."

City officials agree. "This award is more great news for the future of the city's Innovation District," Mayor Alex Morse said when the grant was announced. "We've been working hard to position Holyoke to compete in the modern economy, which requires us to stimulate innovative projects and business ventures. With the collaboration of some of Holyoke's finest organizations and community leaders, this funding will allow us to assist local residents in bringing their innovative ideas to fruition."

Kotelchuck says that many cities try to attract young professionals and focus on tech jobs. They see other cities succeed using that model and copy it, but not always successfully. "If we don't help low-income residents," she says, "all we're doing is moving poverty from place to place, and that helps no one. The Working Cities initiative helps people where they live. It helps people who wouldn't otherwise have jobs."

"Many cities chase the newest, flashiest strategy to revitalize themselves, but ultimately it's not the newest trend that revitalizes a city," she says. "It's the effects of many ideas over time, and it only happens in cities with community engagement and collaboration. Our advice is to look at what you have and build systematically on it."

She says that in monitoring the Challenge, she has noted differences in how cities think about their futures. "Some cities say: We have so many problems; give us some money," she says. "But others say: We have these resources. We have some energy. We need help realizing our potential." She says that revitalization efforts will require a decade of effort or more. The Fed's goal is to provide a three-year leg up on the effort.

It can also spark broader interest in the cities' revitalization. Recently, Holyoke SPARK received an additional $56,000 from the Massachusetts Growth Capital Corp., a quasi-public agency that supports small businesses, to help the program offer more classes, provide mentoring for entrepreneurs, and support a micro-enterprise loan program for those who qualify. It also received additional funding from the city's Community Development Block Grant this year.

Signs of Progress

The Fed and its partners are happy with the project's results so far, Kotelchuck says. And the bank recently announced a second and third round of grants, for cities in Massachusetts and Rhode Island. Eventually, she thinks the idea could spread to other Federal Reserve districts. "It's a new model for Fed involvement in these communities. Other Feds are showing interest, and we would be delighted if it takes root in other districts." Bank President Rosengren says that the Boston Fed plans to expand the program to other New England states at the very least.

The Working Cities program shows great potential to spread farther. Small cities and towns all over the country have been batted around by changing economic fortunes in recent decades.

Holyoke City Hall rises over the banks of the Connecticut River. Credit: Rob Deza

Fitchburg, Massachusetts, also won money through the Boston Federal Reserve Bank's Working Cities Challenge. Credit: Federal Reserve Bank of Boston

They deserve a chance at becoming resurgent cities too, and it's gratifying to see an organization like the Boston Fed putting its brains and influence behind improving their future. There is no silver bullet, no guarantee of success, but the Working Cities Challenge shows that good things can happen with time, commitment, elbow grease—and a little money.

This point was underscored by the Lincoln Institute's Reschovsky: "Although all the cities currently involved in Working Cities need more economic and fiscal resources, the key to the success of the initiative will be the combination of additional resources and the development and nurturing of local nonprofit, government, business, and social institutions."

That certainly seems to be the case in Holyoke. Lately, it has even developed a little national "buzz." In the February issue of *Popular Mechanics* magazine, the editors designated the nation's 14 best startup cities, saying they wanted to identify "the next wave of cities building an ecosystem to turn innovators into entrepreneurs." The list features smaller cities from across the country. Holyoke made the list at number six (*Popular Mechanics* 2015).

Inevitably, the city's chief advantage is a familiar one. "We have cheap energy," Mayor Morse wrote in a description of innovation in Holyoke for the magazine. "On the city's eastern border, the Connecticut River drops 57 feet as it presses south. When the city was founded, in 1850, the river powered waterwheels for paper mills; today it generates inexpensive, clean energy." He also mentioned the brick paper mills, signs of the industrial past that have been repurposed as "attractive industrial work spaces."

"Holyoke has gone back to where we started," the Chamber's Anderson says. "Our ancestors dug a canal system to harness power, and now we are still harnessing it as green energy to power a new economy." LL

Billy Hamilton is executive vice chancellor and chief financial officer of the Texas A&M University System. He was for 16 years the deputy comptroller of public accounts for the State of Texas. Since 2007, he has written a weekly column for *State Tax Notes*.

REFERENCES

Desmarais, Martin. 2015. "The Holyoke Innovation District Finds Creative Solutions to Revitalizing the City." *The Bay State Banner*. September 10, 2015. *baystatebanner.com/news/2015/sep/10/holyoke-innovation-district-finds-creative-solutio/?page=3*

Forman, Benjamin, David Warren, Eric McLean-Shinaman, John Schneider, Mark Muro, and Rebecca Sohmer. 2007. *Reconnecting Massachusetts Gateway Cities: Lessons Learned and an Agenda for Renewal*. The Brookings Institution and MassINC. February 2007. *www.brookings.edu/research/reports/2007/02/regionsandstates-muro*

Kodrzycki, Yolanda and Ana Patricia Muñoz. 2009. "Lessons from Resurgent Cities." Federal Reserve Bank of Boston. *2009 Annual Report*. *www.bostonfed.org/about/ar/ar2009/lessons-from-resurgent-cities.pdf*

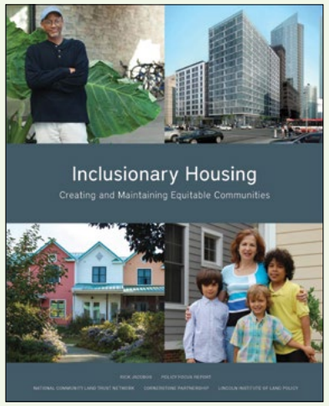
McLaughlin Green, Constance. 1939. *Holyoke, Massachusetts: A Case History of the Industrial Revolution in America*. New Haven, Connecticut: Yale University Press.

Popular Mechanics. 2015. "The 14 Best Startup Cities in America." *Popular Mechanics*. February 2015. *www.popularmechanics.com/culture/advertorial/g1859/the-14-best-startup-cities-in-america*

NEW LINCOLN INSTITUTE POLICY FOCUS REPORT

Inclusionary Housing: Creating and Maintaining Equitable Communities

By Rick Jacobus



September 2015 / 64 pages / Paper / $15
ISBN 978-1-55844-330-3
Policy Focus Report

To order, visit **www.lincolninst.edu/pubs**

From Seattle to San Francisco to Chicago to Portland, Maine, debates are raging over inclusionary housing—the requirement that developers reserve a percentage of new residential development as affordable. Some say the policy discourages development—or, in an argument that could reach the Supreme Court, that it threatens property rights. Meanwhile, New York City Mayor Bill de Blasio faces dual criticisms that his inclusionary housing proposal goes too far, or not far enough.

This new report by Rick Jacobus, *Inclusionary Housing: Creating and Maintaining Equitable Communities*, separates myth from fact, charting a path forward for policy makers and showing how inclusionary housing can be used effectively to reduce economic segregation.

"In hot-market cities, skyrocketing housing prices push middle-class and low-income residents far away from well-paying jobs, reliable transportation, good schools, and safe neighborhoods," says Lincoln Institute President and CEO George W. McCarthy. "Inclusionary housing alone will not solve our housing crisis, but it is one of the few bulwarks we have against the effects of gentrification—and only if we preserve the units that we work so hard to create."

Through a review of the literature and case studies, author Rick Jacobus of Street Level Urban Impact Advisors offers solutions for overcoming the major political, technical, legal, and practical barriers to successful inclusionary housing programs.

"More than 500 communities have used inclusionary housing policies to help maintain the vibrancy and diversity of neighborhoods in transition, and we've learned much along the way," Jacobus says. "Research shows that if programs are thoughtfully designed and implemented, they can be a valuable tool at a time when affordable housing is desperately needed."

In particular, the report addresses the concern that inclusionary housing can impede new construction by making development less profitable. According to the report, many cities have avoided such impacts by allowing flexibility in how developers comply and offering incentives, such as the ability to build at greater densities.

Other key findings and recommendations in the report include:

- Rapid construction of market-rate housing actually fuels the need for more affordable housing by changing the character of neighborhoods.
- Inclusionary housing programs have been challenged in court, but programs can be thoughtfully designed to minimize legal risks.
- Follow-up in the form of enforcement and stewardship is critical. Some communities have created thousands of affordable homes, only to see them disappear after subsequent sales.

The Lincoln Institute has for many years developed strategies to support permanently affordable housing, including the establishment of community land trusts and other shared-equity arrangements. The effort is in recognition of the ongoing housing affordability crisis in many cities. Stratospheric rents and home prices in hot real estate markets are displacing longtime residents and changing the character of cities and neighborhoods. LL

Rick Jacobus, a national expert in inclusionary housing and affordable home ownership, is the principal of Street Level Urban Impact Advisors (StreetLevelAdvisors.com). He was the founder of Cornerstone Partnership, and he currently serves as a strategic advisor to Cornerstone.

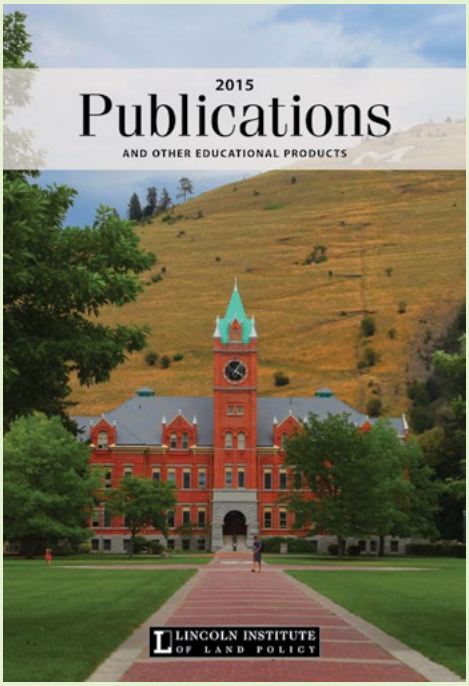
LINCOLN INSTITUTE OF LAND POLICY

Land Lines
113 Brattle Street
Cambridge, MA 02138-3400 USA

RETURN SERVICE REQUESTED

Non-Profit Org.
U.S. Postage
PAID
Boston, MA
Permit No. 57852

***Land Lines* is free. To subscribe, simply register on our website:**
www.lincolninst.edu/profile/default.aspx



2015 Publications Catalog

The Lincoln Institute's 2015 Publications catalog features more than 125 books, ebooks, Policy Focus Reports, and multimedia resources. These publications represent the work of Institute faculty, fellows, and associates who are researching and reporting on property taxation, valuation, and assessment; urban and regional planning; smart growth; land conservation; housing and urban development; and other land policy concerns in the United States, Latin America, China, Europe, Africa, and other areas around the globe.

All of the books, reports, and other items listed in the catalog are available to purchase and/or download on the Institute's website, and we encourage their adoption for academic courses and other educational meetings. Follow the instructions for requesting exam copies on the Publications homepage. The entire catalog is posted on the website for free downloading. To request a printed copy of the catalog, send your complete mailing address to **help@lincolninst.edu**.

www.lincolninst.edu/pubs