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Local government 2035: Strategic trends and implications of new technologies

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INTRODUCTION

Technological advancements increasingly disrupt and destabilize markets, institutions, and organizations around the globe. A mere 20 years ago, Katie Couric asked “What is Internet?” on NBC’s Today Show.¹ Today, the Internet is integrated into every aspect of our daily lives. And tomorrow, emergent technologies will drastically alter the landscape in which we live.

It is extremely difficult for regular people to predict the rate, scale, or impact of technological innovation. Henry Ford, who understood this principle, is famously quoted as saying, “If I had asked people what they wanted, they would have said faster horses.” The ever-increasing rate of technological innovation begs the question: how will government manage or adapt to the explosion of new technologies?

In the future, autonomous vehicles will be the prevailing mode of transportation. As a result, there will be widespread unemployment within the taxi and trucking industries, legal issues regarding accidents and liability, regulatory issues relating to GPS and telemetric data generated by vehicles, and a fundamental shift in the concept of “public transit.”² Additionally, the explosion of the consumer-to-consumer economy—e.g., Uber, TaskRabbit, and Airbnb—will continue to create legal and ethical challenges. In order to be a relevant and critical player in the future, local governments will need to rethink their design, strategy, operations, and processes in fundamental ways. We assert that changes on the not-too-distant horizon will require local governments to be agile, nimble, and dynamic. Governments must contend with an increase in the diversity of stakeholders, limited capacity to predict the future, and an erosion of governing authority. A 20th century approach to

¹ Mikey Glazer (2014). Katie Couric, Bryant Gumbel ‘What Is the Internet?’ Clip Altered in BMW’s Super Bowl Ad (Exclusive). <http://www.thewrap.com/katie-couric-bryant-gumbel-what-is-the-internet-clip-altered-in-bmws-super-bowl-ad-exclusive/>

² Scott Santens (2015). Self-driving trucks are going to hit us like a human-driven truck. Basic Income. <https://medium.com/basic-income/self-driving-trucks-are-going-to-hit-us-like-a-human-driven-truck-b8507d9c5961>

governance will not cut it anymore; the outlook for current governance models is exceedingly bleak. Adaptability and recovery from shocks will be increasingly critical. Lean, nimble, proactive government systems must be designed.

The evolution of governments must itself vary. Different parts of the developed and developing world face different types of changes and possess different resources with which to address these changes. Indian and Chinese cities are trying to keep up with the continued growth in their populations, while specifically adjusting to the increased concentrations of those populations in more dense metropolitan regions. Providing basic infrastructure and human services while attempting to adapt to a range of fundamental technological shifts poses a particularly severe demand on the human and intellectual resources in those areas. The challenges in the less developed urban areas of Africa are even more daunting as they wrestle with extraordinary in-migration to cities. Internet and social media communication help fuel tensions as awareness of the extent of local, regional, and global inequalities increases. And this awareness brings government change, both through coordinated civil disobedience, as well as through terror tactics; all facilitated by these changes in technology.

At Arizona State University's [Decision Theater Network](#) (DTN), we visualize and design solutions to complex public policy and social problems. The ASU [Center for Urban Innovation](#) (CUI) works with local leaders on implementing new ways to address seemingly intractable problems and developing resilient systems to help adapt to new challenges and opportunities as they arise. This report is an outcome of several research projects that are underway at the DTN and CUI that examine the role of emerging technologies in societal change, governance, engagement, and the public sphere. Here, we present several examples of technological innovations and societal transformations that we believe will: 1) cause fundamental shifts in how local governments are designed and operated, and 2) require radical innovation on the part of local governments to be relevant going into the future. Our intention is not to be exhaustive but rather illustrative of key issues that local governments must increasingly consider as the result of technological progress. Each of these issues were carefully chosen to unearth the various ways in which the current structure, organization, and operations of local governments and communities will be transformed—even if the most conservative predictions of the future will hold true.

DRONES AND ISSUES OF AIR SPACE

Drones, or “unmanned aerial vehicles” (UAVs), have sparked heated debate in recent years. While much of the controversy has centered on military applications, civilian use poses a serious issue for local governments that are unsure how to regulate drones. In the United States, despite a Federal Aviation Administration (FAA) report stating that there were 25 near collisions between drones and larger aircraft in the second half of 2014, the agency has only fined five people for their illegal use.³ More recently, the FAA continues to try and find a proper balance between legitimate and inappropriate uses of drone technology. In May 2015, the agency issued rules for journalist indicating that while news outlets can use drone-captured video from others, they are not allowed to use drones to capture video themselves as that would constitute a business use, which they currently argue violates US law.⁴ The FAA is trying to keep up with its regulatory responsibilities but is operating in an institutional setting that operates

³ Craig Whitlock (2014). Near-collisions between drones, airliners surge, new FAA reports show. The Washington Post: National Security. http://www.washingtonpost.com/world/national-security/near-collisions-between-drones-airliners-surge-new-faa-reports-show/2014/11/26/9a8c1716-758c-11e4-bd1b-03009bd3e984_story.html; Craig Whitlock (2014). Drones for Christmas worry the FAA. The Washington Post: National Security. http://www.washingtonpost.com/world/national-security/drones-for-christmas-worries-the-faa/2014/12/22/b4f0bd2a-8a02-11e4-a085-34e9b9f09a58_story.html

⁴ Jason Koebler (2015). The FAA tells the media it can't use drones for journalism without permission. Motherboard. <http://motherboard.vice.com/read/the-faa-tells-the-media-it-cant-use-drones-for-journalism-without-permission>

at a fundamentally different speed than the speed with which this new technology is emerging and spreading in the realm of non-military applications.

Additionally, the policies and regulations currently governing non-commercial drone use in the U.S. are woefully inadequate—as of this writing, only 21 states have laws regulating drone usage.⁵ For example, last year a Seattle woman notified police that a drone had been hovering outside her apartment window. The police stated that the activity was only illegal if she could prove that the camera had been pointed in her direction. The shocked woman told the Los Angeles Times that, “You don’t expect to be walking around indecent in your apartment and have this thing out there potentially recording you.”⁶

This issue also confronts other nations and communities around the world. For instance, despite strict regulations that prohibit air traffic 100 meters above nuclear power plants, drones have been spotted flying over 13 of France’s 18 nuclear power plants over the past year. Since radar equipment is generally incapable of detecting drones, the air force has been unable to respond effectively and mitigate the threat. In response, the French National Research Agency recently launched an initiative designed to detect, intercept, and neutralize offensive drones.⁷

This issue is further exacerbated by the increasing affordability and accessibility of UAVs. Drone sales have skyrocketed in recent years; \$13 million worth of UAVs were sold on Ebay in 2014 alone, and are projected to have an economic impact of \$82 million over the course of the next decade.⁸ Some local governments are even taking advantage of drones. In Lucknow, the capital state of Uttar Pradesh, India, police have begun to use drones to control large crowds and mobs.⁹ The drones can monitor crime hot spots, track the movements of criminals, and can even release pepper spray on unruly crowds. Furthermore, drone technology is improving. In the coming years, UAVs will have extended battery life, higher quality cameras, and be smaller and stealthier. For instance, the AeriCam company recently released a miniaturized drone that is only slightly larger than an iPhone.¹⁰ These alarming trends have prompted 28 states to consider legislation to restrict or prohibit the use of unmanned drones.¹¹

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5 Rich Williams (2014). Current unmanned aircraft state law landscape. National Conference of State Legislatures (NCSL). <http://www.ncsl.org/research/civil-and-criminal-justice/current-uas-state-law-landscape.aspx>

6 James Queally (2014). Seattle woman says drone seemed to be spying on her. L.A. Times: Nation/Nation Now. <http://www.latimes.com/nation/nationnow/la-na-nn-seattle-peeping-tom-20140624-story.html>

7 RT NEWS (2015). Catch me if you can: More drones break into France’s nuclear air space. RT Network <http://rt.com/news/219775-france-drones-nuclear-plant/>

8 Frank Bi (2015). Drone sales soar past \$16 million on eBay. Forbes: Tech. <http://www.forbes.com/sites/frankbi/2015/01/28/drone-sales-soar-past-16-million-on-ebay/>

9 <http://timesofindia.indiatimes.com/city/lucknow/Now-drones-to-be-used-to-disperse-mobs-in-Lucknow/articleshow/46794530.cms>

10 Samantha Raphelson (2014). Weekly innovation: This drone fits in your pocket. NPR: Innovation. <http://www.npr.org/blogs/alltechconsidered/2014/10/09/354820397/weekly-innovation-this-drone-fits-in-your-pocket>

11 Zach Garcia (2013). What flies when it comes to drone laws across the globe. The Missouri School of Journalism Program. <http://www.missouridronejournalism.com/2013/04/what-flies-when-it-comes-to-drone-laws-across-the-globe/>

When Amazon and the United States Postal Service (USPS) announced a partnership in mid-2014, many heralded the move as a much-needed boost for the faltering government agency—increasing package volume by 12 percent.¹² However, Amazon’s drone delivery systems, for which the FAA gave permission for experimental testing in April 2015, present a significant threat to the USPS.¹³ If ultimately approved for commercial use, these UAVs would effectively eliminate the need for conventional package delivery services. In their recently release patent application materials, Amazon highlights that their new system aims to deliver packages within 30 minutes to wherever you are based on GPS coordinates of your mobile device or coordinates that you provide to which you want a package delivered.¹⁴ This represents another atomization of delivery systems that continues to allow nearly immediate and individually tailored consumption patterns. This individualization is a key element of the challenges facing local governments both in terms of regulating these enterprises for purposes of public safety, as well as for purposes of building mechanisms capable of raising the revenues necessary to cover the costs of these protections.

Moreover, government agencies have historically struggled to embrace inevitable privatization trends within certain industries. Consider space travel, which was seen as the exclusive domain of the public sector until recently. Then, the XPRIZE Foundation championed a competition to design a three-passenger vehicle that could travel 100 kilometers into space twice within 14 days. The Ansari XPRIZE

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has revolutionized how we think about space and the rights to travel there, and has opened up a new industry focused on private space flights. Starting with the U.S. Communications Satellite Act of 1962, the government has slowly eased regulations, enabling private enterprise to explore the boundaries of space.¹⁵ As a result, companies have streamlined operations and increased the economic viability of space travel, e.g., SpaceX has successfully completed cargo restocking missions to the International Space Station on five occasions.¹⁶ And the same may be true for airspace issues closer to the ground as well. While predictions of people flying to work on their jetpacks failed to materialize to date, that

date may be approaching except that it likely won’t be for the purpose of getting to work (which has already seen a significant increase in telecommuting capabilities that make jetting to work superfluous). Rather, these technologies may be more recreational¹⁷ but will raise issues regarding airspace over cities that represent a common resource of the community.

¹² Josh Sanburn (2014). How Amazon could save the post office’s holidays. TIME: U.S. TECHNOLOGY. <http://time.com/3590662/usps-amazon-holiday-delivery-sunday-christmas/>

¹³ Christopher Pangolos (2015). FAA gives approval for Amazon to test drones. The SpaceCoastDaily.com <http://spacecoastdaily.com/2015/04/faa-gives-approval-for-amazon-to-test-drones-with-restrictions/>

¹⁴ Rene Marsh (2015). Amazon drone patent application imagines delivery that comes to you with one click. CNN Politics. <http://www.cnn.com/2015/05/12/politics/amazon-patent-drone-delivery/index.html>

¹⁵ U.S. Congress (1962). Communication Satellite Act of 1962. U.S. [47 U.S.C. 701] Congressional declaration of policy and purpose. <http://www.presageinc.com/contents/experience/satellitereform/contents/briefingbook/technology/1962act.pdf>

¹⁶ 10 News Staff, WTSP (2015). SpaceX sets April 13 launch from Cape. WTSP 10 NEWS. <http://www.wtsp.com/story/news/2015/04/02/spacex-sets-april-13-launch-of-falcon-9-from-cape/70861072/>

¹⁷ Sean O’Kane (2015). Watch two crazy people fly jetpacks over Dubai in 4K. The Verge. <http://www.theverge.com/tldr/2015/5/11/8587941/jetpacks-yves-rossy-dubai-balloon-boy>

Most local governments have also been cautious about engaging in public-private partnerships due to transparency and business protection limitations. This proclivity has added to their hesitancy to engage on the drone issue. Little debate has taken place about how this technology might be leveraged for social good. The only place where drones have gotten any, albeit modest, attention in the context of local government is in their use of law enforcement and policing. And to be clear, we are not advocating a position of drones as being good or evil. Rather, our goal is to highlight the lack of government engagement on this issue that is fundamentally affecting society in very local ways.

AUTOMATED VEHICLES

Consider the following. This past year, the City of Los Angeles generated \$161 million from parking violations.¹⁸ Red light violations have a fee of \$490.¹⁹ Californians caught driving under the influence are fined up to \$15,649 for a first-offense misdemeanor DUI conviction and up to \$22,492 for an under-21 equivalent.²⁰ Cities in California collect, on average, \$40 million annually in towing fees that they divide with towing firms. Simply put, the hundreds of millions of dollars generated from poor driving-related behaviors provide significant funding for transportation infrastructure and maintenance, public schools, judicial salaries, domestic violence advocacy, conservation, and many other public services.

Since California legalized driverless vehicles, Google has logged more than 1.7 million miles during the testing phase and been involved in 11 accidents, none of which were the fault of the driverless vehicle.²¹ Tesla, Mercedes, and others are not far behind. It turns out that automated vehicle technology—unlike humans—abides by the law. And that's bad news for local government revenues. In other words, once driverless cars become mainstream, deep revenue sources acquired from driving-related violations such as speeding tickets and DUIs will decrease greatly. In fact, Tesla's CEO, Elon Musk, predicts the tremendous safety record of driverless vehicles will ultimately demand the banning of non-driverless vehicles on public roadways. Such a law would only accelerate an already fast-paced evolution of the way we use local transportation. As the transition to driverless cars becomes the norm in the years to come, this safety record will mean that vehicles can travel faster and closer together on the roadways, which, when combined with alternative fuel technologies, can contribute to efforts to lower emissions and may help lessen the amount of physical space dedicated to roadways.

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¹⁸ Emily Alpert Reyes (2014). Group wants to revamp how L.A. collects parking ticket revenue. L.A. Times: Local/City Hall. <http://www.latimes.com/local/cityhall/la-me-parking-fine-cap-20140613-story.html>

¹⁹ L.A. Times (2013). Fees, penalties nearly quadruple traffic ticket costs for California drivers. L.A. Times: Local. <http://losangeles.cbslocal.com/2013/09/26/fees-penalties-nearly-quadruple-traffic-ticket-costs-for-calif-drivers/>

²⁰ Jerry Hirsch (2013). First drunk-driving conviction can cost nearly \$16,000 in California. L.A. Times: Business/Autos <http://www.latimes.com/business/autos/la-fi-hy-drunk-driving-conviction-cost-20130314-story.html>

²¹ Eric Jaffe (2015). Google's self-driving car is about to hit the streets. The Atlantic: Citylab. http://www.citylab.com/tech/2015/05/googles-new-self-driving-car-is-about-to-hit-the-streets/393323/?utm_source=nl_daily_link1_051515

Currently, vehicles sit unused an average 95 percent of the time.²² Given the early success of the transportation sharing economy led by companies like Uber and Lyft, it may become possible for urban citizens to “share” their cars. If vehicles are busy almost every hour of the day dropping off one traveler to pick up another based on highly predictive algorithms that harness user data to maximize efficient use of resources, then parking, towing, traffic violations, and speeding tickets revenue will significantly decrease. Even changes to the functionality of cars themselves may allow them to move laterally and to adjust their length such that when they are parked they take less space.²³

We know that insurance agencies net \$180 billion annually across the USA insuring against vehicular accidents and their associated medical costs.²⁴ Once driverless vehicles have a proven track record, local governments will lose a major source of revenue while citizen health and safety increases. In fact, you could say government is essentially left out of the game entirely, aside from still being on the hook for maintaining a transportation infrastructure without revenue sources and regulating an industry that it has virtually no data on (because the private sector will have cut government out of the overwhelming majority of their successful business operations). The challenge will be identifying opportunities within the context of these changes and emerging technologies to insert tax collection mechanisms that generate a revenue offset for the losses created in other areas in order to cover the costs associated with meeting these basic responsibilities.

Even more worrisome from a financial standpoint is what happens when these vehicles become truly eco-friendly. Gas and petrol taxes and fees for emissions are contingent on there being adverse ecological impacts or unrenewable energy use. Pedestrian-friendly cities like Vienna and other European cities have removed their car lanes and made cycling often more practical than driving.²⁵ If sustainable urban planning succeeds, then what are the impacts on local government operations? Efforts being made to advance urban transportation problems using new innovations as simple as phone apps in places like Washington D.C. have already accidentally reduced revenue, with a drop from \$90,610,266 in 2012 to \$84,458,255 in 2013.²⁶ For instance, users can use their smartphones to remotely feed their meters before they expire or submit parking ticket photos and enter violation codes to an app that provides helpful information on getting the ticket dismissed.

They can also gain real-time GPS traffic navigation through social traffic apps like Waze that reroute drivers through the least congested traffic routes while keeping their friends informed of their destination time down to the minute (meaning users don’t need to speed to be efficient, and they have less incentive to text while driving because others already know when they’ll arrive).²⁷ Such apps can also utilize crowdsourced input on the location of traffic enforcement officers, helping would be speeders evade detection with an early warning system (though this will be less of a revenue issue once driverless cars end the practice of speeding).²⁸ With citizens needing less transportation

22 RAC Foundation (2012). Spaced out: Perspectives on parking policy. Royal Automobile Club Foundation. <http://www.racfoundation.org/research/mobility/spaced-out-perspectives-on-parking>

23 Desiree (2015). A new car that can shrink and drive sideways. ScienceDump. <http://www.sciencedump.com/content/new-car-can-shrink-and-drive-sideways>

24 Alex Davies (2015). Self-driving cars will make us want fewer cars. WIRED. <http://www.wired.com/2015/03/the-economic-impact-of-autonomous-vehicles/>

25 Mike Macias (2015). Why car-free cities aren’t right around the corner. GOVERNING: URBAN <http://www.governing.com/topics/urban/gov-car-free-cities.html>

26 Ashley Halsey III (2014). District’s parking ticket revenue drops. The Washington Post. <http://www.washingtonpost.com/blogs/dr-gridlock/wp/2014/04/10/districts-parking-ticket-revenue-drops>

27 Alan Reiter (2014). Smart parking: Beware of the unintended consequences. UBM’s Future Cities: The Global Community for 21st Century City Decisions Makers. http://www.ubmfuturecities.com/author.asp?section_id=378&doc_id=526702

28 Dave Smith (2015). Police officers in Miami are intentionally trying to ruin Google’s traffic crowdsourcing app—here’s why. Business Insider. <http://www.businessinsider.com/police-officers-vs-waze-google-traffic-crowdsourcing-app-2015-2>

infrastructure and support services such as parking lots, police enforcement, and gas in the future, local governments will have to identify alternative mechanisms to supplement lost revenues.

Currently, many conversations in local government focus on sustainability. While sustainability is a serious issue today, it will become increasingly irrelevant in the future. Technological innovation will increase sustainability and address many of the challenges we face today. From reducing dependence on fossil fuels to pedestrian friendly cities, communities will be transformed to meet our current aspirations. The real question for local governments is how to ensure their relevance when a significant percentage of their revenue sources dry up due to technological automation. In addition, how do governments help the existing workforce innovate to stay relevant? And further, are local governments prepared to have their role dictated to them when it comes to driverless cars, or are they going to take a proactive role and think through these scenarios and work collaboratively through public-private partnerships?

So, local governments are poised to lose out in many ways in terms of these changes. There are alternatives that can be utilized to raise new revenues to offset the loss of old revenues, as has been the case throughout the 20th century with the emergence of then-new practices (e.g., special districts to raise revenues to pay for public subsidies for sports facilities). However, government institutions have typically been slow to react to new technological developments. Recall the protection Congress provided to Internet-based purchases of books in the early days of Amazon. While this was ostensibly to help nurture this new industry of online sales, Congress has been slow to realize that the online sales industry caught up very fast and that while they dawdled, traditional brick-and-mortar bookstores have become rare. But this does not mean governments cannot develop new solutions within existing legal constraints. Such alternatives might include a user fee system for operating a vehicle on the public roadways paid through an app that allows the engine to start or “unlocks” the vehicle and bills on a per mile basis in order to cover costs associated maintenance and operations of the transportation system generally. Regardless, the current political climate is likely to be another barrier to adapting to these changes.

Even though taxes are at historically low levels in the U.S., the political climate among state and local leaders is such that additional debt or new taxes for services are not perceived as an option. This includes any new taxes. In Arizona, for instance, efforts were mounted by the state legislature to preempt local governments from collecting taxes from Internet taxes should Congress allow such taxation but requiring local governments to offset such revenues with reductions to income tax revenues.²⁹ The legislature did not want to allow local governments to try tapping this alternative revenue source even though it would represent a means of recapturing lost revenues from sales taxes on transactions in brick-and-mortar businesses. Trapped by the forces of slow institutional rules, rapid technological changes, and recalcitrant legislators motivated by a no-tax doctrine instead of fiscal prudence, local governments are going to have to engage and be creatively innovative in finding the resources needed to fulfill their public purposes.

ARTIFICIAL INTELLIGENCE

Imagine a future where machines have replaced the vast majority of human jobs. Factories produce durable goods without human intervention, transportation networks operate autonomously, and food production occurs without the need for employees. This may initially appear to be a utopian society, but the resulting job losses and high unemployment could destabilize economic systems, further concentrating wealth in the hands of elites. The resulting riots, citizen outcry, and crime would surge as displaced workers struggle to meet their basic needs.

²⁹ Arizona House Bill 2061. January 26, 2015.

Consider a recent report released by the Oxford Martin School's Programme on the Impacts of Future Technology, which concluded that approximately 47 percent of jobs in the U.S. are susceptible to computerization within 20 years.³⁰ Further, research by Deloitte in London indicates that 2-3 percent of low skill jobs—primarily secretarial, clerical and sales related—are lost each year. The researchers conclude by estimating that 35 percent of current British jobs will be eliminated in 20 years.³¹

Workers in transportation occupations will likely be the first to lose their jobs as autonomous vehicle technologies are perfected. For example, a driverless taxi fleet would drastically cut costs for consumers. A recent study by the University of Texas shows that autonomously driven taxis could be profitable by charging just \$1.00 per mile; less

than 1/3 of current industry averages.³² Further, self-driving technologies will eliminate all 5.7 million trucking jobs in the United States as businesses move to streamline their supply chain operations.³³

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Employees in manufacturing occupations will be quickly replaced by machines as well. The car industry has long served as the model for automation: an average of 1,520 robots per 10,000 employees is used in this industry compared with 214 units per 10,000 employees in all other industries.³⁴ However, advancements in computerized tactile and motor control will soon threaten lighter

manufacturing industries. According to research by PricewaterhouseCoopers, the food and beverage, consumer goods, pharmaceutical, and biomedical industries are eroding the automotive industry's dominance over the robotics market.³⁵ Further, tabletop robots will soon replace workers in electronics manufacturing. The CEO of Foxconn, which manufactures products for Apple, Microsoft, and others, stated in an interview that an entirely automated assembly line may soon be a reality.³⁶

Advancements in robotics are likely to occur at an accelerated pace in the coming years, due in part to increased government funding. In mid-2014, the British government announced that it was making £150 million (approximately \$223.8 million) available to the Technology Strategy Board for investment in robotics and autonomous systems.³⁷

30 Carl Benedikt Frey & Michael A. Osborne (2013). The future of employment: How susceptible are jobs to computerisation? Department of Engineering Science, University of Oxford. http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf.

31 <http://www.telegraph.co.uk/finance/newsbysector/industry/11219688/Ten-million-jobs-at-risk-from-advancing-technology.html>

32 Daniel J. Fagnant & Kara M. Kockelman (2015). Dynamic ride-sharing and optimal fleet sizing for a system of shared autonomous vehicles. Proceedings of the 94th Annual Meeting of the Transportation Research Board, Washington, D.C. http://www.ce.utexas.edu/prof/kockelman/public_html/TRB15SAVwithDRSinAustin.pdf

33 Brian Fung (2013). What will happen to truck drivers when self-driving vehicles take over? The Washington Post. <http://www.washingtonpost.com/blogs/the-switch/wp/2013/11/20/what-will-happen-to-truck-drivers-when-self-driving-vehicles-take-over/>

34 Gudrun Litzenberger (2014). Industrial robots moving to sectors beyond the automotive industry. PHYS ORG. <http://phys.org/news/2014-12-industrial-robots-sectors-automotive-industry.html>

35 PWC (2015). Robots are landing new jobs...in new industries. PricewaterhouseCoopers, LLC. <http://www.pwc.com/us/en/industrial-products/next-manufacturing/robotics-landing-new-jobs.jhtml>

36 Jason Mick (2014). Foxconn billionaire hints at robotics Apple Factory, criticizes dead employees. DAILY TECH: Gadgets. <http://www.dailytech.com/Foxconn+Billionaire+Hints+at+Robotic+Apple+Factory+Criticizes+Dead+Employees/article36144.htm>

37 Alex Hamilton (2014). Government invests £150m to kickstart UK robotics industry. IT Pro: IT Analysis, Business Insight. <http://www.itpro.co.uk/strategy/22610/government-invests-150m-to-kickstart-uk-robotics-industry>

Further, a number of other governments, including France, Korea, and China, have made strategic investments into robotics in the past year.³⁸

Computerization will likely displace workers in retail, office, administrative, and logistics industries as well. Big Data will enable computers to engage in non-routine cognitive tasks involving human interaction. In the future, it will likely be possible to computerize many positions including cashiers, counter and rental clerks, and telemarketers. Future advancements will enable computers to engage in complex social tasks. Even journalists will not be spared additional cuts in their already-dwindling profession³⁹ as computers are now capable of producing basic write ups of sports events.⁴⁰

The implications of such a shift for local government are enormous. Job losses and high unemployment will present acute challenges to governance systems. Governments will lose tax revenue from citizens who are unable to work (combined with increased costs for human services to help meet their basic needs), resulting in large budget deficits.

On the other hand, if effectively harnessed, advancements in artificial intelligence and big data processing could have an enormously beneficial impact on local government operations. For example, technology could be used to automate infrastructure maintenance, efficiently allocate personnel to areas of need, and to create intelligent interfaces that interact directly with citizens. Today, robots are being created to help kids forge bonds with others. Robots can play team sports with each other (e.g. see CHARLI-2 at Virginia Tech). Many cities are already experimenting with automated garbage collection. Further automation combined with improvements in “smart” trash bins that communicate their location and current load can lead to more efficient and adaptive collection routes without the need for human participation.⁴¹ Robots can be deployed in war zones and into disaster areas to assist emergency management and response, lowering the risk to human life. Work is already underway to move from the use of big data for descriptive analytics into the sphere of predictive analytics, developing models of short to medium term estimates of human behavior. Criminal justice units are trying to adapt these techniques to predict the likelihood of criminal activities within a particular geography that can inform allocation of police resources preemptively.⁴² Given the expected advances in biometrics, big data analysis of interconnected data streams, and predictive policing strategies already in development, it may one day be possible to calculate probabilities of an individual to engage in a criminal activity and provide advanced warning in order to have law enforcement intercede before the commission of a crime. But that is still some ways off and raises extensive ethical and privacy issues that would need to be resolved before implementing such public policies.

PEER-2-PEER PLATFORMS

Some readers may recall one of the earliest successful peer-2-peer (P2P) file sharing services: Napster. This service allowed people to easily share files (largely music, and largely illegally) with others, servicing over 80 million users

³⁸ Adriana Hamacher (2014). World's governments step up investment in robots. Innovate UK Network: Robotics and Autonomous Systems. <https://connect.innovateuk.org/web/ras-sig/article-view/-/blogs/world-s-governments-step-up-investment-in-robots>

³⁹ Elaine Kamarck (2015). Improving media capacity: A series on the future of news coverage. The Brookings Institution: FixGov. <http://www.brookings.edu/blogs/fixgov/posts/2015/05/12-improving-media-capacity-series-intro-kamarck>

⁴⁰ Ed Sherman (2015). Resistance is futile: AP to use computers to cover college baseball games. Poynter: MediaWire. <http://www.poynter.org/news/mediawire/344335/resistance-is-futile-ap-to-use-computers-to-cover-baseball-games/>

⁴¹ Gajitz (2015). Smart trash bin sensors ask to be emptied when full. <http://gajitz.com/smart-trash-bin-sensors-ask-to-be-emptied-when-full/>

⁴² Hilton Collins (2013). Predicting crime using analytics and Big Data. GovTech: Justice and Public Safety. <http://www.govtech.com/public-safety/Predicting-Crime-Using-Analytics-and-Big-Data.html>

between 1999 and 2001. As Napster's popularity grew, traditional actors in the music industry acted predictably and sued. But they failed to understand the real innovation that had taken place. Napster changed the modality through which people acquired music (i.e. sharing music instead of purchasing CDs or singles from a record store) and connected to one another using the internet.

Soon after Napster ended, the same creators of Napster developed Friendster. Then Myspace came. And then, of course, the mega-success Facebook was born. All of this happened because Napster offered individuals an opportunity to have a social life online.

The on-demand streaming services Netflix and Amazon Prime recently began offering original programming, including the hit show *House of Cards*. As a result, the notion of a television show being strictly available on a streaming service was born, modifying the way we watch television. Additionally, Netflix utilizes data analytics to devise its programming strategy to ensure success, thus creating a new science to television development. Technologies such as these democratize the market and spark a sharing economy.

Today, a mere 15 years later, we cannot imagine life without such conveniences as being able to download a song, book, television show, or movie the moment it is released, or to tweet about what we had for breakfast (with an accompanying photo!). In other areas of media such as television, we see similar disruptions. The on-demand streaming services Netflix and Amazon Prime recently began offering original programming, including the hit show *House of Cards*. As a result, the notion of a television show being strictly available on a streaming service was born, modifying the way we watch television. Additionally, Netflix utilizes data analytics to devise its programming strategy to ensure success, thus creating a new science to television development. Technologies such as these democratize the market and spark a sharing economy.

Even today, established industries are reacting negatively to the emergence of P2P networks. For example, Aktarer Zaman founded *Skiplagged.com* in 2013 to help travelers find cheap flights using a strategy called "hidden city" ticketing.⁴³ Through *Skiplagged*, travelers can purchase

a ticket with a layover in their actual destination. For instance, if you are looking to travel to Atlanta, you could book travel from Dallas to Miami with a layover in Atlanta and just disembark in Atlanta, forgetting the last leg of the trip. The site uses publicly available data and doesn't even book travel for users. However, United Airlines and Orbitz sued Zaman for representing unfair competition. By the end of 2014, Zaman raised over \$79,000 for his legal defense through P2P crowdfunding site *GoFundMe*.⁴⁴

The sharing economy isn't without its troubles. There are regular stories about P2P consumerism that has gone wrong. However, innovators are not waiting on the government to regulate the sharing economy. They are taking steps themselves to mitigate P2P abuses. *TrustCloud PeerProtect* is a new service that analyzes billions of dollars

⁴³ Patrick Gillespie (2014). Why is United Airlines suing a 22-year old? CNN Money. <http://money.cnn.com/2014/12/29/news/united-orbitz-sue-skiplagged-22/>

⁴⁴ <http://www.gofundme.com/skiplagged>

of transaction data from different sharing platforms to certify providers.⁴⁵ PeerProtect provides a service guarantee to ensure that if a buyer undertakes a service by a provider who has been verified by TrustCloud and they are dissatisfied, TrustCloud will handle the claim by either fixing the work that was performed, refunding the cost of the job, or a combination of those methods.

Today, there is much talk in local government about the effects of the sharing economy that, in essence, is a large, facilitated P2P platform where the resources of peers are known and disseminated and individual transactions are negotiated. Local governments have tended to act like the music industry or airlines and have tried to step in by regulating these P2P networks. For instance, cities such as San Francisco and Seattle have sued Uber and worked to limit their ridesharing services for various named reasons such as safety and operating an unlicensed taxi service. However, these actions are another form of regulation to control innovation and protect their tax revenue.

Uber has not been the only P2P network where individuals engage in these types of transactions and negotiations. Home-sharing has become one of the biggest and most innovative lodging developments.⁴⁶ With the click of a button, this sharing economy trend has boomed since it was introduced seven years ago and the hospitality industry will never be the same.⁴⁷ In 2014, the company Airbnb had 10 million “strangers” share their home with other “strangers” and it was Inc.’s 2014 Company of the Year.⁴⁸ They are serious competitors for major hotel companies such as Hilton, Marriott, Starwood Hotels, and Hyatt. A report by Barclays estimates that Airbnb’s growth could triple by the end of 2016 to 129 million room-nights per year. In large cities such as New York, Paris, and London, they estimate that Airbnb will provide over 10% of previous hotel needs.^{49, 50}

P2P startups are proving beneficial to consumers. P2P platforms offer consumers the opportunity to save time, money, and make new acquaintances in a new and safe way. For instance, NeighborGoods is a platform that allows individuals within the same vicinity to share items such as ladders and bicycles with one another.⁵¹ NeighborGoods has the potential to cut down on storage fees, increase the use of infrequently used items, increase sustainability, and help spark a sense of community. RelayRides enables people to borrow cars from neighbors or airports by the hour or by the day. RelayRides operates in 49 states and has had transactions in 2,500 U.S. cities with a presence at over 300 airports nationally.⁵²

The sharing economy is even changing the way we lend and borrow. Lending Club is a P2P network that helps individuals lend and borrow with much better interest rates. This earned the Lending Club a designation by Forbes as one of America’s Most Promising Companies.⁵³ Lending Club takes bank and credit card lending processes and chops them down by evaluating credit rating, risk, and qualifying interest rates within minutes. They also let ordinary

⁴⁵ <https://trustcloud.com/for-platforms>

⁴⁶ Burt Helm (2014). Airbnb is Inc.’s 2014 Company of the Year. INC: ENTREPRENEUR OF THE YEAR. <http://www.inc.com/magazine/201412/burt-helm/airbnb-company-of-the-year-2014.html>

⁴⁷ Burt Helm (2014). Airbnb is Inc.’s 2014 Company of the Year. INC: ENTREPRENEUR OF THE YEAR. <http://www.inc.com/magazine/201412/burt-helm/airbnb-company-of-the-year-2014.html>

⁴⁸ Burt Helm (2014). Airbnb is Inc.’s 2014 Company of the Year. INC: ENTREPRENEUR OF THE YEAR. <http://www.inc.com/magazine/201412/burt-helm/airbnb-company-of-the-year-2014.html>

⁴⁹ Zainab Mudallal (2015). Airbnb will soon be booking more rooms than the world’s largest hotel chains. QUARTZ: Obsessions. <http://qz.com/329735/airbnb-will-soon-be-booking-more-rooms-than-the-worlds-largest-hotel-chains/>

⁵⁰ Patrick Clarke (2015). Barclays report projects Airbnb bookings to surpass hotel companies. TRAVEL PULSE: Business Travel. <http://www.travelpulse.com/news/business-travel/barclays-report-projects-airbnb-bookings-to-surpass-hotel-companies.html>

⁵¹ <http://neighborgoods.net/about>

⁵² Karsten Strauss (2014). RelayRides wants you to rent out your car in 2015. Forbes: Entrepreneurs. <http://www.forbes.com/sites/karstenstrauss/2014/12/17/relayrides-wants-you-to-rent-out-your-car-in-2015/>

⁵³ <https://www.lendingclub.com/>

investors earn a monthly return on funds that they lend.⁵⁴ Since the fourth quarter of 2014, the Lending Club has issued 117,806 loans for over \$1.4 billion.⁵⁵ The Federal Trade Commission is starting to take an interest in P2P platforms to understand their technology, use, and future implications.⁵⁶ It has been estimated that the sharing economy had a global value of \$26 billion in 2013 and is predicted to generate \$110 billion annually in the near future.⁵⁷ Now imagine the year 2035. Given all the interest in the sharing economy facilitated by P2P networks as well as the current efforts that are emerging—plus those in research and development—here are some predictions of what might happen.

The Federal Trade Commission is starting to take an interest in P2P platforms to understand their technology, use, and future implications. It has been estimated that the sharing economy had a global value of \$26 billion in 2013 and is predicted to generate \$110 billion annually in the near future.

First, the now-emerging P2P currency markets such as Bitcoin and Dogecoin will mature, and we expect that these will likely continue to operate in the largely unregulated spaces. Bitcoin is a P2P form of digital currency that can be traded across the globe and some believe it will change the future of money^{58, 59} (while others believe it to be an Internet-based Ponzi scheme⁶⁰). Bitcoin offers massive information transfer capabilities that are purposefully unidentifiable. Their value rises and falls like stocks, there are numerous modes of transfer, Bitcoin is faster, and they record digital files such as wills, contracts, and marriages.⁶¹ Neither cities, states, nor countries can regulate Bitcoin transactions.

Second, the difficulty in regulating these markets will trouble local, state, and national governments and cause them to lose out on the benefits of this new market because the sharing economy is seeing unprecedented growth. Uber's funding has grown more than 16,000 percent in six years with a valuation at \$50 billion⁶² while Airbnb has grown rapidly in seven years with a valuation currently at \$20 billion.⁶³ Growth this big undoubtedly will reach and affect local governments. The chief way local and state governments are responding is through regulation. Sarah Cannon and Lawrence H. Summers noted in the *Harvard Business Review* that governments' unfavorable response to the sharing economy is unfortunate because the incentives, particularly for city governments, are often aligned.⁶⁴

⁵⁴ <https://www.lendingclub.com/public/how-peer-lending-works.action>

⁵⁵ <https://www.lendingclub.com/info/statistics.action>

⁵⁶ Federal Trade Commission (2015). FTC to examine competition, consumer protection, and economic issues raised by the sharing economy at June workshop. FTC: News and Events. <https://www.ftc.gov/news-events/press-releases/2015/04/ftc-examine-competition-consumer-protection-economic-issues>

⁵⁷ Sarah Cannon & Lawrence H. Summers (2014). How Uber and the sharing economy can win over regulators. *Harvard Business Review* Blog Network. <https://hbr.org/2014/10/how-uber-and-the-sharing-economy-can-win-over-regulators/>

⁵⁸ David Wolman (2012). *The End of Money: Counterfeiters, Preachers, Techies, Dreamers—and the Coming Cashless Society*. Boston: Da Capo Press.

⁵⁹ Paul Vigna and Michael Casey (2015). *The Age of cryptocurrency: How bitcoin and digital money are changing the global economic order*. New York: St. Martin's Press.

⁶⁰ Eric Posner (2013). Fool's gold: Bitcoin is a Ponzi scheme—the Internet's favorite currency will collapse. Slate: View from Chicago. http://www.slate.com/articles/news_and_politics/view_from_chicago/2013/04/bitcoin_is_a_ponzi_scheme_the_internet_currency_will_collapse.html

⁶¹ Evander Smart (2015). 30 ways Bitcoin changes the future of money forever. Cryptocoins News: the True Independent News Source. <https://www.cryptocoinsnews.com/30-ways-bitcoin-changes-future-money-forever/>

⁶² Paul LaMonica (2015). Uber may now be worth \$50 billion. Really? CNN Money. <http://money.cnn.com/2015/05/11/investing/uber-50-billion-valuation/index.html>

⁶³ Ingrid Lunden (2015). Airbnb is raising a monster round at a \$20 B valuation. TechCrunch. <http://techcrunch.com/2015/02/27/airbnb-2/>

⁶⁴ Sarah Cannon & Lawrence H. Summers (2014). How Uber and the sharing economy can win over regulators. *Harvard Business Review: Technology*. <https://hbr.org/2014/10/how-uber-and-the-sharing-economy-can-win-over-regulators/>

One alignment that the sharing economy has fueled is the “gig economy,” where microjobs are offered to individuals via online marketplaces. For instance, TaskRabbit is an app that allows individuals to post errands that they would like assistance with for an hourly wage.⁶⁵ Exec is an app that outsources house cleaning duties.⁶⁶ Amazon hosts Mechanical Turk as a marketplace of individuals to find or be found to perform human intelligence tasks such as writing product descriptions.⁶⁷

A reason for local governments’ unfavorable reaction to the sharing economy is the inability to tax most of these technologies. This is important because there is a lot of money to be made. The U.S. Travel Association reported that business and leisure travelers spent \$887.9 billion in 2013, generating \$134 billion in taxes. Innovative methods of managing this could potentially be found but a failing of local government is that they are traditionally a step behind in these situations. Norton Francis, a senior research associate at the Tax Policy Center, noted that government is left on the defensive when new innovations hit the market because something as simple as the delivery being different makes things difficult and they don’t know how, or choose not, to handle the change.⁶⁸

Third, not long from now, local governments will have to manage the unmanageability of digital currencies in multiple ways. They will have to raise the financial intelligence of their employees by looking at innovative financing models. In the past, local governments have been innovative in meeting their needs and the needs of citizens by offering new financial instruments to protect citizens such as catastrophe bonds and social bonds. However, P2P networks are different from traditional markets whose funding is predicated on creditworthiness. In P2P markets, creditworthiness is assigned through distributed ratings and rankings based on aggregation of a large number of data points. Consider the trustworthiness given to sellers on eBay: past customers rate sellers and those ratings are deemed good enough for potential buyers. Government will no longer be the accreditor or regulator in these markets.

U.S. states are already considering allowing the use of Bitcoin by citizens to pay bills. However, similar to other government processes, they will require long legislative processes, regulations, and implementation plans. In 2015, state legislators in New Hampshire introduced a bill to officially accept Bitcoin as a payment for taxes and fees. In the bill, they propose a timeline for Bitcoin usage with an implementation date of July 1, 2017.⁶⁹ While states are working to manage P2P networks, companies like Overstock.com are already creating new technologies to advance the future of Bitcoin. For instance, Overstock.com is developing an independent stock exchange operating in Bitcoin and powered by Bitcoin called Medici. Medici could potentially bypass traditional stock exchanges such as the New York Stock Exchange and NASDAQ and issue corporate stock directly over the Internet.⁷⁰

Overall, local governments will be challenged to understand and adequately manage the local and global implications of P2P networks. As they understand more and see the strides other local governments are making globally, they will seek ways to join the market. However, local governments will be at a significant disadvantage if they wait too long as newer technologies and markets will have already been developed. Consider the following: Facebook is the world’s largest social media content provider and does not create any of its own data. Uber is the world’s

⁶⁵ TaskRabbit (2015). <https://www.taskrabbit.com/how-it-works>

⁶⁶ Exec Inc. (2015). <https://iamexec.com/>

⁶⁷ Amazon Mechanical Turk (2015). Amazon Artificial Intelligence. <https://www.mturk.com/mturk/welcome>

⁶⁸ Elaine S. Povich (2014). How governments are trying to tax the sharing economy. GOVERNING, THE STATES AND LOCALITIES: Finance <http://www.governing.com/news/headlines/governments-are-trying-to-tax-new-things.html>

⁶⁹ Giulio Prisco (2015). Bitcoin-friendly Bills unveiled in Utah, New Hampshire, New York City. BITCOIN MAGAZINE. <https://bitcoinmagazine.com/19418/bitcoin-friendly-bills-unveiled-utah-new-hampshire-new-york-city/>

⁷⁰ Michael J. Casey (2014). BitBeat: The promise (and limits) of Overstock’s Crypto Stock Exchange. The Wall Street Journal: Markets & Finance. <http://blogs.wsj.com/moneybeat/2014/10/24/bitbeat-the-promise-and-limits-of-overstocks-crypto-stock-exchange/>

largest taxi service and owns no cars. Alibaba is a highly valued retailer and owns no merchandise. Airbnb provides lodging yet does not own real estate. And WhatsApp does not own servers. Future organizations are built on platforms that provide connectivity between resources, personnel, and activities. Ownership is not central to the core of the organization or value-provision. How will local governments adapt to this new reality? All we know is that local governments are a long way from even contemplating much less accepting this reality.

DATA PRIVATIZATION AND DEPENDENCY

Deloitte's Gov2020 program predicts that by the year 2020, an average of 5,200 gigabytes of data will exist for every individual.⁷¹ While public sector entities have traditionally housed the most citizen data, the rise of social media and P2P platforms (e.g., Uber, TaskRabbit, Airbnb) and stateless currencies (e.g., Bitcoin) facilitate greater private data ownership. This trend will place government in a difficult regulatory position because it's hard to govern citizens when you don't have much data on them.

Extensive citizen data will continue to be used by corporations as valuable information for exchange on the free market, with over \$300 billion in Internet of Things (IoT) goods and services expected to be exchanged by the year 2020.⁷² Citizens will actively enable some of this data exchange, but if it's anything like what we have seen from the data monetization of social media activity, it's likely that many citizens will not be aware of how much of their personal data is owned and exchanged. Private sector technology companies collect an increasing amount of data. Consider Facebook, which collects an astonishing 500 terabytes of data on its users each day.⁷³ These data are then manipulated and monetized, generally by allowing advertisers to target potential customers based on various demographic variables. The monetary worth of the data varies based on numerous factors. AVG's PrivacyFix tool estimates the value of an individual's data to a variety of companies (e.g., Google and Facebook) ranges from pennies to hundreds of dollars per year.⁷⁴ Such data afford politicians, lobbyists, and others with deep pockets the ability to purchase more information on citizens compared to their financially limited peers, increasing their odds of access to civic power through financial rather than democratic means.

Many citizens have already begun designing private IoT home networks, enabling their personal devices like smartphones, "wearables," implanted RFID chips, home audio, video, lighting, household appliances, and computer hardware to communicate with each other. But when citizens wear their (intended to be) private devices into public or corporate spaces, who owns that data when their personal devices communicate with other local networks? Does data ownership change if the communication is purposefully exchanged? What about passive consent (and does passive consent include the use of wearables in public)? Where is the line between insufficient consent and non-consent/violation?

Questions of constitutional rights and individual liberties will grow in relationship to government's (in)abilities to keep private data sealed, unhacked, and well regulated. For example, it is not a stretch to imagine how poor corporate data security could ruin people's livelihoods if, for instance, those who are genetically marked as high risk for young

⁷¹ Deloitte. Data as Currency and Asset. <http://government-2020.dupress.com/driver/data-currency-asset/>

⁷² Conn Stamford (2013). Gartner Says the Internet of Things Installed Base Will Grow to 26 Billion Units By 2020. Gartner. <http://www.gartner.com/newsroom/id/2636073>

⁷³ Eliza Kern (2012). Facebook is collecting your data – 500 terabytes a day. GIGAOM <https://gigaom.com/2012/08/22/facebook-is-collecting-your-data-500-terabytes-a-day/>

⁷⁴ AVG PrivacyFix (2015). Privacy simplified. AVG PrivacyFix Dashboard. <http://privacyfix.com/start/install>

and aggressive cancer are 1) identifiable by potential employers who consequently don't hire them, and/or 2) are unable to access medical insurance in countries with privatized healthcare systems like the United States.

Local government agencies will increasingly need access to data in order to effectively deliver services and enforce laws. For example, data collected from banking institutions, credit card companies, and credit reporting agencies can be harnessed to determine likely tax evaders (unless the violators are operating only in bitcoins!). Furthermore, new data collection mechanisms are coming into vogue already, in addition to the ones we have had for years. The new Apple smartwatch has various tools available that expand on existing data collection beyond cell phones including immediate electronic payment system which means transactional data could be maintained by Apple. Locational information can be useful for local government for criminal justice reasons, but can also be useful for emergency response needs, medical events, or search and rescue. New developments are also in the near future based on research of sociometrics. Developers are building sociometers designed to statistically map interactions between people in terms of power dynamics and both social and communication networks.⁷⁵ Information from these devices could be helpful for local governments in terms of designing new and adaptive systems of communication and interaction between and among citizens. However, the information devices such as these can collect and transmit also raises security and privacy issues that must be resolved too.

While data purchasing contracts are common among private sector organizations, government agencies will need to partner with companies and pay for access to data. Given that public agencies are tight with resources, finding those funds will be challenging. This is similar to the pressures facing the field of journalism. Disruptive technologies have taken an enormous toll on this industry. And the ground continues to shift rapidly. Just recently, Facebook inked a deal with the New York Times, NBC News, and seven other news outlets the test a new feature that provides news stories directly into individuals' Facebook news feeds.⁷⁶ While this raises obvious questions about the business models of those news organizations, it also raises two other interesting questions. First, not all news stories will be fed to everyone's news feeds. Facebook will tailor the stories it thinks will be of most interest. This has a certain "cool factor," but could also be questioned in terms of exactly how a private company like Facebook decides what news their customers need to read. This ties to the second interesting question: how does the press maintain its public role as the Fourth Estate once it is beholden to a 3rd party like Facebook for the distribution of its news stories?

Similarly, local governments are increasingly beholden to 3rd parties for data maintenance and acquisition. Who exactly owns those data? These issues require governments to take a proactive approach to prepare for impending changes. Currently, local governments are concerned with issues of transparency and open data—these are yesterday's issues. Open data initiatives have yet to be proven to increase transparency or citizen engagement beyond the rhetoric. The more fundamental issues with which local governments should be wrestling is how can they take more ownership over their data, how they can better control their online presence, and how they can use both to bolster their legitimacy while continuing to delineate a clearly articulated role for themselves in these rapidly evolving circumstances?

In the future, the issue that local governments will have to contend with is not how to keep data open, but what data are citizens making open and how do local governments secure the necessary data to conduct their operations when they do not own the systems and processes that generate the data. Imagine a future where local governments

⁷⁵ Alex Pentland (2014). *Social Physics: How Good Ideas Spread—The Lessons from a New Science*. New York: Penguin Press.

⁷⁶ Vindu Goel and Ravi Somaiya (2015). Facebook begins testing instant articles from news publishers. New York Times. http://www.nytimes.com/2015/05/13/technology/facebook-media-venture-to-include-nbc-buzzfeed-and-new-york-times.html?_r=1

have to purchase data from private organizations without much assurance as to the veracity of the data. Over the last several decades, local governments have continued to increase the amount of IT services that they outsource to the private sector. This trend has made them vulnerable when it comes to their knowledge dependencies to keep their systems up-to-date and to innovate. Unless things change drastically, we believe that in the near future, most local governments will have limited capacity to manage their most critical asset: 'data' on their citizens, organizations, and communities.

FRAGILE AND CONFLICT STATES

We know little about how to govern fragile and conflict states. Despite our lack of knowledge, these states and regions are increasing in the world. Today, 1.4 billion people live in fragile states.⁷⁷ One-third of the world's poor live in fragile states; it has been estimated that by 2030, this will rise to two-thirds. Fragile states are characteristically made up of twice the amount of young people than in non-fragile states. Additionally, young people are primed to spark conflict due to limited employment opportunities and their needs not being met. These young people are turning to criminal underground technology to spark these conflicts.

Open data initiatives have yet to be proven to increase transparency or citizen engagement beyond the rhetoric.

The criminal undergrounds of the world are highly innovative, early adopters of emerging technologies.⁷⁸ In the past, criminals would hit their targets with assault weapons and explosives. But today, they have more advanced techniques. In 2008, terrorists in Mumbai used a variety of what was then considered sophisticated technologies to coordinate twelve shooting and bombing attacks across four days in Mumbai. The terrorists used Global

Positioning System (GPS) equipment, BlackBerrys, CDs carrying high-resolution satellite images, and multiple cellphones using switchable SIM cards to reduce opportunities for tracking. In 2015, just seven years later, none of these technologies are considered anywhere near sophisticated.

In the future, criminals and terrorists will harness even more advanced technologies from the life sciences to, for instance, attack cities. The ability to reprogram DNA or create synthetic biologics offers terrorists a great opportunity to hurt people en masse as well as decrease state stability, thus making it fragile. The ease of plunging a city into fragility and maintaining that condition shouldn't be taken for granted by any city. Even today we have glimpses of what the future might bring. For instance, in April of 2013, unknown assailants attacked a California power station. These assailants got into an underground vault and cut telephone cables. Then snipers began shooting a nearby electrical substation for 19 minutes and knocking out 17 transformers that power Silicon Valley. To avoid a total blackout, officials asked power plants in Silicon Valley to produce more electricity.⁷⁹ It took 27 days for repairs to be made to get the substation up and working. The chairman of the U.S. Federal Energy Regulatory Commission stated

⁷⁷ Organisation for Economic Co-operation and Development. *Fragile States 2014: Domestic Revenue Mobilisation in Fragile States*. Paris, France: OECD Publishing, 2014. Print.<http://www.gfintegrity.org/wp-content/uploads/2014/05/OECD-Fragile-States-Report-2014.pdf>

⁷⁸ Marc Goodman (2012). How technology makes us vulnerable. CNN. <http://www.cnn.com/2012/07/29/opinion/goodman-ted-crime/>

⁷⁹ Richard A. Serrano & Evan Halper (2014). Sophisticated but low-tech power grid attack baffles authorities. L.A. Times.<http://www.latimes.com/nation/la-na-grid-attack-20140211-story.html#page=1>

that this attack was “the most significant incident of domestic terrorism involving the grid that has ever occurred” and if replicated across the country could take down the U.S. electric grid and blackout most of the country.⁸⁰

What is even more troubling is how these geographies are changing as a result of globalization. Conflict used to remain self-contained within geographic regions; now these same places are breeding grounds for movements that spread across the globe. Transnational actors emerge from fragile states into other regions to spark conflict and vice versa. For instance, the terrorist group Islamic State of Iraq and Syria (ISIS), which started as a splinter from al Qaeda, now terrorizes large sections of Syria and Iraq and has targeted other places such as the United States.⁸¹

Global connectivity will also spark profound spillover impacts on cities. Extreme mobility by nomadic populations and refugees brought on by conflict, natural disasters, and climate change all trigger new dynamics within cities. We have seen this with ISIS. For instance, ISIS’ activities in Syria and Iraq have triggered massive migrations of refugees to Turkey, and ISIS has spread to Southeast Asia in Malaysia, Thailand, the Philippines, and Brunei.⁸² Terrorist group Boko Haram has expanded to various areas in Nigeria as well as Cameroon and Chad. The terrorist organization known as al-Shabaab started and continues operating in Somalia (a highly fragile state)⁸³ but has expanded by launching major terror attacks into Kenya; home to the world’s largest refugee camp of 600,000 Somali nationals.⁸⁴ The lowering of borders by new technologies will only extend the spillover effects of conflict.

Displaced refugees are growing in number around the world, and, in many cases, relocating to places that are just as volatile as the place they are escaping. To make matters even worse, most of our existing policy tools have had limited utility when dealing with them. Refugees being displaced are working with limited capacities to make decisions so they create mini-cities that can be bigger than the local governments they are near. As a result, this conundrum leaves regional, state, and local governments to deal with the issues of radicalization, denationalization, and cyber threats.

Local governments are already showing signs of weakness in dealing with this challenge. Consider the Boko Haram movement, which has levied numerous assaults on the people of Nigeria. In 2014, they kidnapped 276 schoolgirls, who have only recently been rescued after 11 months in captivity.⁸⁵ Although the world was outraged by the act, nothing happened due in large part to the lack of control the national government has in some of the areas of its own country. Over the past year, Boko Haram has continued to gain in strength and has increased its sphere of influence.⁸⁶ Groups like Boko Haram are shifting the balance of power. As a result of Boko Haram’s aggression, Nigeria postponed national elections by six weeks to improve security.⁸⁷ Necessary actions such as these reflect the true power of such groups and how countries can sink further into fragility.

80 Rebecca Smith (2014). Assault on California power stations raises alarm on potential for terrorism. *The Wall Street Journal*. <http://www.wsj.com/articles/SB10001424052702304851104579359141941621778>

81 Lee Ferran & Rym Momtaz (2015). ISIS trail of terror. *ABC News*. <http://abcnews.go.com/WN/fullpage/isis-trail-terror-isis-threat-us-25053190>

82 *The Wall Street Journal* (2014). ISIS in Southeast Asia. *The Wall Street Journal: Opinion*. <http://www.wsj.com/articles/isis-in-southeast-asia-1409590016>

83 Jane Onyanga-Omara (2015). Al-Shabab attack on Somali government office kills 10. *USA Today*. <http://www.usatoday.com/story/news/world/2015/04/14/al-shabab-attack/25753831/>

84 Greg Botelho and Lillian Leposo (2015). Kenyan official to U.N.: Relocate world’s largest refugee camp, or we’ll do it. *CNN*. <http://www.cnn.com/2015/04/11/africa/kenya-dadaab-refugee-camp/index.html>

85 Ratidzai Ndhlovu (2015). ‘I was flogged daily.’ Rescued Boko Haram survivors share tales of horror. *CNN*. <http://www.cnn.com/2015/05/14/opinions/boko-haram-survivors-share-tales-of-horror/index.html>

86 Global Conflict Tracker (2015). <http://www.cfr.org/global/global-conflict-tracker/p32137#/?marker=17>

87 BBC News (2015). Boko Haram conflict: Nigerian allies ‘retake Damasak’. <http://www.bbc.com/news/world-africa-31799172>

The most fragile states are already past the stage of figuring out how to deal with fragility—they are living in it. Foreign aid programs are largely regarded as ineffective because the funds rarely reach the poor or vulnerable. In fact, foreign aid is often given to irresponsible, corrupt, or oppressive nation-states that re-route the funds to other purposes. Most governments receiving large sums of aid are already corrupt, and are in fact contributing to the poverty and oppression within their states.⁸⁸ According to Christopher Coyne and Matt Ryan, the world's worst dictators have received \$105 billion in foreign aid for development assistance.⁸⁹ The two most corrupt countries, according to the Corruption Index in 2013, are Somalia and Afghanistan who together receive \$2.3 billion from the U.S.⁹⁰ Aid providers such as the World Bank, OECD, and USAID have given Haiti assistance amid poor governance and poverty in the country for nearly 30 years. Separately, each has concluded that, without improved governance, their aid will continue to be ineffective.⁹¹

This is particularly troubling for cities because not only are fragile states growing to encompass large shares of the world's most poor and vulnerable people, they are also susceptible to instability, which has large implications for local governments. And, it is not just fragile states that are susceptible to instability. For instance, Tunisia had a Failed State Index score equal to Brazil's in 2010; their governance and policies were praised, and their citizens maintained a middle-class, high standard of living and access to higher education. Despite this, the interconnected world of technology made it easier for young adults to connect and effectively bring about the Arab Spring. The Arab spring eventually affected Egypt, Libya, Syria, and Yemen.

Now, imagine that a surge of technology plunges your city into a dystopian environment where vitality and stability are either nonexistent or grossly inconsistent. Then imagine a criminal group diminishing your city's vitality through the use of technologies that you have never seen before, e.g., a synthetic biologic that releases a deadly virus and starts a pandemic, a nano-ecology attack that could disrupt standard biological ecologies such as food production, or a hack attack on an electrical grid or water filtration system. Making decisions within these conditions about threats are incredibly difficult on governments and will have long-lasting effects. How will governments take steps to ensure viability in the face of threats and the unknown? What is even more troubling is the fact that most local governments are unaware of how to deal with issues of globalization when it comes to the impact of fragile states and conflicts within their own communities.

Consider the following: in just the last few weeks before this writing, several arrests have been made within the U.S. of individuals who were allegedly attempting to join ISIS.⁹² Many of the individuals arrested do not meet our traditional 'profile' of a terrorist yet have been influenced by global conflict and connecting online through P2P platforms. Radicalization is even more pronounced in Britain. Several hundred citizens are known to have traveled to the region to join ISIS, and over 250 are known to have returned to Britain, raising fears that a portion of those

88 Claudia R. Williamson (2009). Exploring the failure of foreign aid: The role of incentives and information. Springer Science + Business Media, LLC. <http://dri.fas.nyu.edu/docs/IO/12361/WilliamsonRAEAid.pdf>

89 Christopher Coyne & Matt Ryan (2009). With friends like these, who needs enemies? Aiding the world's worst dictators. *The Independent Review*, 14(1), 26–44.

90 Mike Patton, Contributor (2013). Foreign aid: Money down a rat hole? *Forbes: Advisor Network*. <http://www.forbes.com/sites/mikepatton/2013/01/28/foreign-aid-money-down-a-rat-hole/>

91 Operations Evaluation Department (OED). (2002). Haiti: Country Assistance Evaluation. Washington: OED, World Bank, February 12; US Agency for International Development (USAID). (1998). Haiti: Results Review and Resource Request. Washington: USAID Mission in Haiti, June; World Bank. (2005). Project Appraisal Document: Economic Governance TA. Washington: World Bank, May 13, #32147-HT

92 Scott Shane (2015). 6 Minnesotans held in plot to join ISIS. *New York Times*. http://www.nytimes.com/2015/04/21/us/6-somali-americans-arrested-in-isis-recruiting-case.html?_r=0

returning might be plotting domestic acts of terrorism.⁹³ In May 2015, two ISIS sympathizers living in Phoenix traveled to Garland, Texas (a suburb of Dallas) and opened fire at a cartoon drawing contest of the Prophet Muhammed. Both were killed by police, but the incident raises concerns about what steps, if any, local governments and community groups are taking to insure a counter message is being provided to unite citizens against the ideologies motivating violent attacks on innocent people.

On the one hand, you have an increase in online radicalization and global connectivity used to transport ideologies and local organization of homegrown terrorists. On the other hand, you have school systems that fail to teach students anything significant about matters occurring across the globe. Local governments have not yet championed the use of their public spaces as vital platforms for difficult conversations in a proactive manner to shape the social fabric of the community. Unfortunately, citizen engagement as a concept has been bastardized over the last few years as a catch-all for any interaction with citizens. What is needed is a focus on how local governments can use their authority and convening powers to design the future of their communities and tackle difficult issues proactively rather than wait for boiling points to materialize (e.g. Ferguson, Missouri, Baltimore, Maryland, etc.).

INCOME INEQUALITY

The middle-class is disappearing from the United States. Economic policies that have favored the rich have fueled this inequality, resulting in a smaller middle class with access to a smaller portion of the national income. Over the past 15 years, this trend has exacerbated previous conditions and stresses commonly felt in cities and that often fall along racial lines. While these problems have existed for decades, recent events in places like Ferguson and Baltimore highlight that many communities are near a tipping point that, when reached, will manifest itself in violence, civil disobedience, extensive property damage, and long-term damage to the civic fabric of the community.

And this is not simply an American phenomenon. In 2014, Forbes reported that there were 1,645 billionaires in the world (more than twice as many as in 2009). At the same time, 3.3 billion people in the world each had less than \$10,000 in wealth.⁹⁴ Most of this half of the world's population cluster in very specific kinds of areas: fragile states and infrastructure-stressed urban areas.

After the Great Recession of 2007/2008, job growth has occurred, but there are still many occupations that are shrinking such as jobs that require less than an Associates degree, e.g., postal carriers, data entry clerks, and switchboard operators. Further, these jobs are increasingly at-risk of being replaced as artificial intelligence and automation technologies develop.⁹⁵ It is easy to understand why these jobs are being eliminated.

The loss of the middle class has dire effects on the economy. It is the middle class that drives the economy through the purchase of goods and services. Without them, basic fundamentals of American society do not work as they have historically. For instance, innovations and entrepreneurship would not happen and there would be a credit bust. A strong middle class creates a strong consumer base. Without the middle class' need to borrow when their

⁹³ Shiv Malik and Sandra Laville (2014). ISIS recruitment moves from online recruitment to British mosques. The Guardian. <http://www.theguardian.com/world/2014/sep/05/isis-recruitment-moves-to-radical-network-and-mosques>

⁹⁴ Luisa Kroll (2014). Inside the 2014 Forbes's billionaires list: Facts and figures. Forbes. <http://www.forbes.com/sites/luisakroll/2014/03/03/inside-the-2014-forbes-billionaires-list-facts-and-figures/>

⁹⁵ Mark Lieberman (2015). Disappearing middle class jobs. USA TODAY: Money. <http://www.usatoday.com/story/money/personalfinance/2015/03/08/247-wall-st-disappearing-middle-class-jobs/24512843/>

level of consumption outweighs their earnings, the economy loses out.⁹⁶ The wealthy save more than the middle class and consume less.

Despite this, the Pew Research Center reported that the gap between America's upper-income and middle-income reached its highest level on record in 30 years. In 2013, the median wealth of U.S. upper-income families was \$639,400; seven times higher than middle-income families' \$96,500 annual income.⁹⁷ This gap is widening and there are no signs of it slowing down. Less income means less ability to pay for the public services to which citizens have grown accustomed in their local and state governments.

The disappearance of the middle class is compounded by another global threat: technological changes. Harvard professor Larry Summers regards automation as "the biggest single contributing factor" to jobless growth and income inequality.⁹⁸ He notes that this is a long-term trend that is likely to happen across the globe. Countries that rely heavily on manufacturing (e.g., China) have demonstrated the growth that comes from export competitiveness. However, an invariable decline in employment in the manufacturing sector will occur as a result of advances in robotics and automation technologies. Additionally, Dr. Summers asserts that disruptive technologies (e.g., 3-D printing) will

accelerate this trend due to the low entry cost and the ability to make them accessible to developing economies.

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Given the likelihood that the middle-class may soon be wiped out by new technologies, there will be a gap in government services. This gap will occur because the rich will continue to pay in less to the economy while the poor will pay lower amounts (based on the proportion of their wages). When this is the case, government will have little revenue with which to operate. As a result, we

will see the rise of market-focused institutions that will come in to deliver public goods. In essence, governments will become even more privatized than they already are.

The City of Chicago has been a leader in aggressively privatizing their infrastructure. The city regularly receives criticism for their privatization because it has resulted in rate hikes, equipment malfunctions, and reasonable questions about their fair market value. For instance, the city privatized 36,000 parking meters to a private Morgan Stanley-led consortium in exchange for \$1.2 billion in up-front revenue on a 75-year lease. The inspector general found that the city took \$974 million less than the meters were worth.⁹⁹ In addition to the bad deal that was made, it became too expensive for most citizens to park. Mass privatization of local government can also give way to political action committees, or PACs, that dominate services. PACs are groups that pool campaign contributions for or against candidates, ballot initiatives, or legislation. In essence, they offer contributions to drive a particular agenda, meaning

⁹⁶ Michael Kumhof & Romain Rancière (2010). Inequality, leverage and crises. IMF Working Paper: Research Department. <http://www.imf.org/external/pubs/ft/wp/2010/wp10268.pdf>

⁹⁷ Richard Fry & Rakesh Kochhar (2014). America's wealth gap between middle-income and upper-income families is widest on record. PewResearchCenter: FACTANK: NEWS IN THE NUMBERS. <http://www.pewresearch.org/fact-tank/2014/12/17/wealth-gap-upper-middle-income/>

⁹⁸ Larry Summer (2015). Persistent jobless growth. WORLD ECONOMIC FORUM: Outlook on the Global Agenda. <http://reports.weforum.org/outlook-global-agenda-2015/top-10-trends-of-2015/2-persistent-jobless-growth/>

⁹⁹ Molly Ball (2014). The privatization backlash. The Atlantic: Politics. <http://www.theatlantic.com/politics/archive/2014/04/city-state-governments-privatization-contracting-backlash/361016/>

the more money a candidate has at their disposal, the more they can promote their cause. PACs could win contracts from the government and drive a partisan agenda in how and to whom it delivers services.

In the past, we have seen income inequality hurt the world's most vulnerable while governments provide services such as Medicare and Medicaid to soften the effects. Today, we know that a combination of income inequalities and structural dysfunctions in government spark greater challenges for all involved. However, something is different. Before, the voice of the middle or lower class would go unheard. Now, these groups are able to rally and more easily challenge the status quo, which can be a challenge to a local government.

Recall that the Occupy Wall Street movement whose slogan, "We are the 99 percent," was aimed at challenging U.S. economic inequality. Protestors utilized occupation, civil disobedience, picketing, and Internet activism to emphasize their issue. The movement resulted in scrutiny of local government's (particularly law enforcement's) abuse of peaceful protestors and several propositions for economic development that largely did not include government. The impact of Occupy Wall Street was felt nationally and replicated at college campuses and in other cities. Over the last couple of years, intense riots have broken out in major cities across Europe from Madrid to Paris and Athens to Lisbon on the issue of income inequality. Most local governments in the U.S. have not engaged with the reality of these kinds of disruptions breaking out in their own communities even when the conditions of economic decline are nearly similar.

Local and state governments have not found a sustainable or consistently successful means of addressing the income gap problem, beyond law enforcement responses when disturbances arise in response to the inequalities. The most promising option that many have turned to in recent decades has been to encourage higher education for more citizens in order to spur the creative class and provide people the means for climbing higher on the income ladder. However, when examining the effects of college education on those coming from the lower quartile of income groups, the evidence is not encouraging.¹⁰⁰ They face the lowest likelihood of escaping and remaining outside the lowest income quartile compared to college graduates from other income groups.¹⁰¹ Local governments are in a difficult position in this regard given the fragmented nature of metropolitan areas and the general inability of local governments to be preventative of this inequality. They are commonly simply reacting to the effects of the gap. But many of our most innovative solutions to intractable public problems come from local governments, and this is another challenge that needs their attention as the increase in that gap and the decline of the middle class continues.

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TRENDS IN IMMIGRATION AND THE CREATIVE CLASS

The growth of technology has certainly made the ability to immigrate and migrate much easier. While immigration is a divisive issue in many countries, very little attention is given to the push and pull factors behind widespread

¹⁰⁰ Steven Greenhouse (2014). Low-wage workers are finding poverty harder to escape. New York Times. <http://www.nytimes.com/2014/03/17/business/economy/low-wage-workers-finding-its-easier-to-fall-into-poverty-and-harder-to-get-out.html>

¹⁰¹ Guo, Jeff (2014). Why Poor Kids Don't Stay in College. The Washington Post. <http://www.washingtonpost.com/news/storyline/wp/2014/10/20/why-poor-kids-dont-stay-in-college/>

immigration. An important factor of immigration is national demographics, which offer clues about a country's future prospects and directions. Nations with evolving or declining populations must choose immigration policies that carefully fit their needs.

In Japan, population decline is a serious concern. Children from the age 0 to 15 years old only make up 12.8% of Japan's population. Individuals over 65 make up more than 25% of the population. Writer Joseph Sternberg for the *Wall Street Journal* recommends the only way to viably solve this problem is by letting 650,000 immigrants enter the country per year.¹⁰² He notes that in doing so, this offers Japan an opportunity for more productivity gains in services that are currently less efficient. One of the systemic challenges, however, is the trend that immigrants are younger and “different” from the established population. These differences can increase friction over basic public policy issues or even normal governmental operations due to disparate expectations. All levels of Japanese society must wrestle through and adapt to these changes if preserving the economic health of the nation remains a priority.

Similar to Japan, the population in Korea is aging rapidly, resulting in a deficiency of working-age citizens. Currently, 12% of Seoul's population is over 65 years and older. It is expected that by 2030, that number will double. The government is seeking to manage this by creating more jobs and inviting the retired back into the workforce. However, workforce challenges exist such as seniors that find basic service jobs menial and who also face ageism in the work place. In addition to workforce challenges, seniors consume less and do not spend their retirement money, which has negative effects on the economy. Since August 2014, the Bank of Korea cut its benchmark interest rate three times—most recently to an unprecedented 1.75%. Still, there are few signs of increasing consumption.¹⁰³

Russia has a significant depopulation issue; however, they are different from Japan and Korea because their depopulation is characterized by low life expectancy rates and low birth rates—not ageing populations. In 2006, Russian President Vladimir Putin said in his state of the nation address that the “most urgent problem facing Russia is a demographic crisis.”¹⁰⁴ In Russia, male life expectancy is 60 years, 15 years less than many other industrialized nations. Unlike other countries whose life expectancy is attributed to more women going to work, Russia's low male life expectancy rate and low birth rate is due to hard living conditions. Poor diets, high smoking rates, heavy drinking rates, violence, and suicide are high causes for death in Russia. The U.N. Population Division estimates that by 2025, the Russia population will decline dramatically settling between 121 million to 136 million; in 2000, the population was 146 million and today it is somewhere between 139 and 146 million.

Conversely, countries like the Philippines are experiencing a population boom. As with too few people, too many people can wreak havoc on a system as well. Population growth is largely happening in urban areas where there are greater risks of natural disasters and more pressure is placed on the environment. As a result, countries such as Japan and Russia tap into the globalized world and will seek out immigrant workers to grow their economy and manage the things that they cannot.

Before globalization took off in the eighties, the primary way of identifying oneself as part of a larger community was through one's nationality. Globalization started a shift in this kind of identification when more transnational work

102 Joseph Sternberg (2014). Trade in a Land Without Children. *The Wall Street Journal*. <http://www.wsj.com/news/articles/SB10001424052702304431104579547160044491576>

103 Jiyuen Lee (2015). South Korea Can't Get Old Folks to Spend Their Savings. *Bloomberg Business*. http://finance.yahoo.com/news/south-korea-cant-old-folks-031503127.html;_ylt=AwrT6Vz5CSNVaE0AJQEPxQt.

104 Ben W. Heineman, Jr. (2011). In Russia, a Demographic Crisis and Worries for Nation's Future. *The Atlantic*. <http://www.theatlantic.com/international/archive/2011/10/in-russia-a-demographic-crisis-and-worries-for-nations-future/246277/>

relationships were required to keep companies competitive, resulting in a higher number of mobile workers leaving their home countries to pursue career goals. For instance, as of 2012, 40.7 million people in America are foreign-born.¹⁰⁵ Technological advances like the Internet emerged concurrently. While real-life transnational relationships were forming for economic reasons, technological developments like video calling, social networks in digital form, and other means of fostering community free these relationships from geographic boundaries. As a consequence, peer groups and the breadth of their diverse idea exchange became transnational, supplementing people's sense of national identity with a different kind of belongingness. This was particularly true for a group of people known as the "creative class," or the core group of leaders in the arts, sciences, and technology sectors who develop new ideas and who are responsible for as much as half of all economic advancement.¹⁰⁶

Local government leaders who value their economies must court the creative class, as cities with a high creative class concentration tend to be more economically successful. The creative class is mobile, transient, and attracted by cultural amenities more than a sense of geography. For example, MacArthur award winners recognized for their creative impact on culture have a high degree of mobility and wind up in places like San Francisco, Los Angeles, and New York. These cities are known for their openness and diversity, though when adjusted for population, there are also a high number of award winners who reside in places like New Mexico, Alaska, and Vermont, which suggests that cost of living interacts with cultural amenities.¹⁰⁷ Such data should make local governments hopeful that they have the realistic ability to court these people who drive economic growth if they consciously make it a priority. One challenge with this approach is balancing it with other pressures they also face in addition to the goals of addressing diversity issues. The "creative class" tends to be younger and disproportionately white. Designing cultural amenities and economic incentive programs to attract this target group has the potential to aggravate already existing racial and/or ethnic tensions confronting local governments.

Local places that are not known for their cultural offerings or creative cultures already, should remain hopeful that they have ways to create such environments from the ground up. For instance, Utah is in the process of passing legislation to accept Bitcoin as a legitimate form of currency for paying government fees and services.¹⁰⁸ The incentive here is that technological innovators from the mobile creative class will be attracted by this legislation and see Utah as a welcoming place where they can make meaningful changes. This is likely to have a circular effect where more creative class members are drawn by the early migrators to Utah. Conversely, their local places of origin will likely lose economic resources as these individuals leave. As technology creates more ways to find a sense of identity that is not organized by geography, allegiance to geographic origins sink further. Cities with a low density of the creative class that fails to court those people will sink downward economically.¹⁰⁹ The very people who drive local economies move at a higher rate and accelerate the spiraling of cities into a "rich get richer, poor get poorer" situation.

105 Center for American Progress (2014). The facts on immigration today. Center for American Progress Immigration Team. <https://cdn.americanprogress.org/wp-content/uploads/2013/04/ImmigrationFacts-brief-10.23.pdf>

106 Juncheng Dai, Shangyi Zhou, Michael Keane, & Qian Huang (2013). Mobility of the creative class and city attractiveness: A case study of Chinese animation workers, (pp. 649-670). *Eurasian Geography and Economics*. <http://www.tandfonline.com/doi/abs/10.2747/1539-7216.53.5.649?journalCode=rege20#.VR4hBvnF-So>

107 Cecilia A. Conrad (2014). Mobility among highly creative people: What data about MacArthur Fellows reveal. MacArthur Foundation. <http://www.macfound.org/press/from-field/mobility-among-highly-creative-people-what-new-data-about-macarthur-fellows-reveals/>

108 Marc K. Roberts, Chief Sponsor & Todd Weiler, Senate Sponsor (2015). H.C.R. 6 Substitute Concurrent Resolution on Payment Options for State Services, 2015 General Session. Utah State Legislature. <http://le.utah.gov/~2015/bills/static/HCR006.html>

109 Richard Florida (2014). The fall and (partial) rise of the rural creative class. *The Atlantic: CityLab*. <http://www.citylab.com/work/2014/11/the-fall-and-partial-rise-of-the-rural-creative-class/382575/%206.%20http://www.macfound.org/press/from-field/mobility-among-highly-creative-people-what-new-data-about-macarthur-fellows-reveals/>

Especially concerning is the impact this will have on aging populations. Consider the aging problems already coming to head in Japan. The International Monetary Fund (IMF) uses crisis discourse to talk about the situation because too few of its citizens are of working age to properly care for the elderly through public pensions and public health systems.¹¹⁰ Most public systems are designed with the assumption that—because everyone goes through the birth to death lifecycle—there will be new generations to carry the torch, so to speak. However, that simply isn't going to be the case everywhere. In particular, if the creative class drives half of the economy, lives transiently, and lacks identification with their place of origin, it is likely that many places that fail to court the creative class will end up in Japan's position in the future.

Of course, downsides do come with cities that manage to court the creative class. For instance, a billionaire in California has drafted a plan to formally talk about splitting the state into six separate states, stating that he wants his taxes “well invested.”¹¹¹ Silicon Valley, the world's mecca for technological innovation and California's leading economic driver, can only go to one of them, and given the reality of much of California, many citizens from the other split states would face increased financial struggles. Such pressures are not limited to the U.S. Barcelona has long been an attractor city in the competition for the creative class. The economy of the Catalonia region of Spain is the healthiest in that country. But there is a significant push for Catalonia to separate from Spain as an independent nation. While the implications of this for Spain and the European Union would be significant in and of themselves, the change in roles for Barcelona and other Catalonian cities under this new governance regime would be extensive. Challenges of immigration would be nearly immediate due to others in Spain seeking better job opportunities in Catalonia.

Another potential downside of the creative class comes from systems expert Charles Perrow, who contends that with design complexity comes an increased risk of catastrophic failure. Citing the implementation of a new online system feature that contributed to the nuclear reactor meltdown in Chernobyl, an accident that continues to affect its community decades later, it remains true that complex projects do not always go as hoped.¹¹² Having a high concentration of intellectual innovators may be synonymous with having a high concentration of destabilizers and disruptors.

Looking also at the business of government itself, if there is a significant amount of turnover in local government with minimal personnel who possess institutional memory, it is possible that the high rate of mobility may reach a tipping point with drastic effects on local governance. This could have a range of effects, including difficulty with long-term projects, decreased abilities in understanding the unique features of the local community being governed, and systemic reinvention of what are currently understood as the fundamentals of practicing local government—a positive for those ready for dramatic change and a negative for those who see more value in the fundamentals of current practices. The lowering of borders and the change in what it means to be a part of a community creates significant challenges for local government. Since local government is, by design, developed to serve a local community, the expansion of the local community into uncertain boundaries will, indeed, challenge leaders.

110 Martin Mühleisen & Hamid Faruqee (2001). Japan: Population aging and the fiscal challenge. *Finance & Development: A quarterly magazine of the IMF*. <http://www.imf.org/external/pubs/ft/fandd/2001/03/muhleise.htm>

111 CBS News (2014). California to split into six states? Plan may get on ballot. *CBS This Morning*. <http://www.cbsnews.com/news/california-to-split-into-six-states-plan-may-get-on-ballot/>

112 Charles Perrow (1999). *Normal accidents: Living with high risk technologies*. Princeton University Press. <http://press.princeton.edu/titles/6596.html>

CONCLUSION

As speculative novelist William Gibson famously noted, “The future is already here – it’s just not very evenly distributed.” Technological change is rapid, disruptive, and destabilizing. In order to govern effectively, public sector entities must increasingly take a proactive stance and act in anticipation of impending technological innovations. This necessitates the creation of lean, nimble, responsive, and adaptable government entities. In order to create a local government that can respond and adapt to these challenges, leaders must first take stock of their internal and external realities.

Internally, the current state of government is bloated, dysfunctional, and slow to respond to change for a host of institutional reasons that tend to punish risk-taking and innovation. The two-party system of government has calcified into extreme partisanship that has made government ineffective at some basic tasks. Partisan polarization is a defining feature of politics today. This form of partisanship has contributed to a growing discontent and mistrust of government among citizens. Globally, many citizens do not believe in the value of their governments.

The 2015 Edelman Trust Barometer surveyed 27,000 people in an international survey of trust in government, business, and NGOs. Their finding stated that government is largely distrusted in 19 out of 27 countries. Internationally, only 40% of individuals trust elected officials.¹¹³ This is easy to understand: the United States and European countries had resounding debt crises caused by poorly managed and poorly regulated industries.¹¹⁴ In the wake of those crises, little has been done to prevent this from happening again. Faced with this type of reality, citizens are bound to lose trust in government and potentially look for better stewards of their resources outside of government.

The World Economic Forum’s report *The Future of Government: Lessons Learned from Around the World* states that, “To be efficient and effective in today’s complex, interlinked and fast-changing environment, governments need to redesign their structures and processes to capitalize on a new set of actors and tools.”¹¹⁵ If this is not done, efforts to manage the inevitable uprising of people and new technologies are likely fail. We are seeing warning signs of clear and present danger. The case has been made that government should prepare for a significant change to enter the future. Recent events such as the “youthquakes” and “keystroke revolutions” in the Middle East and North Africa illustrate how young people have coordinated across regions and countries on technologies such as Facebook and Twitter to literally fight for change. They have proven the power of technology to shift government behavior. For the first time in 50 years, the interests of the people within these affected countries are being addressed. These megatrends are already reshaping government.

The reshaping of government is not just a Middle East “thing.” Growing unrest in several U.S. cities often triggered by police actions and fueled by racial justice and income inequality concerns, have highlighted the role of youth and technology that is bringing pressure to bear on local governments that have not responded well to these developments.

The challenge is significant at the community level. Local governments are busy providing the services demanded by their citizens while state legislatures and a vocal minority strangle public funding for these same services. Local leaders are trying to grow their economies to provide more jobs to more citizens and attract the creative class while

¹¹³ 2015 Edelman Trust Barometer. <http://www.edelman.com/insights/intellectual-property/2015-edelman-trust-barometer/trust-around-world/>

¹¹⁴ Pan Pylas (2014). Distrust in government growing, survey finds. USA TODAY. <http://www.usatoday.com/story/news/world/2014/01/20/distrust-in-government-growing/4655111/>

¹¹⁵ World Economic Forum (2011). *The Future of Government: Lessons Learned from around the World*. World Economic Forum. http://www3.weforum.org/docs/EU11/WEF_EU11_FutureofGovernment_Report.pdf

wrestling with aging populations that often resist the very diversity desired by the creative class and fostered by healthy and balanced immigration. These fears are magnified by concerns with growing technological prowess of international terrorist organizations that can reach into cities to create mayhem combined with a lack of faith in government to stop it. Local governments are further hamstrung by the reality that they have no control over the flow of capital in their jurisdictions. This means that those who are able will join with other like-minded and resource-rich individuals to press for establishing new municipalities separate from others, which will exacerbate the coordination problems of highly fragmented metropolitan regions. This allows groups to retrench and isolate themselves (and their resources) through defensive municipal incorporations, much as we have seen for decades that helped create the very tensions over inequality that are motivating so much unrest.

Combining these dynamics with the rapid evolution of technology will lead to continued calls for greater innovation from governments because citizens and the private sector will confront the challenges of tomorrow faster than government will. Reassessing the core services of local government in a manner that recognizes how some are “public goods” and some are not, will help discern a path towards tomorrow’s version of local government that adapts to this new reality, identifies alternative revenue mechanisms that incorporate new technologies, and works as a partner with numerous private sector partners for the delivery of those services that are not purely public goods.

Instead of retreating to 20th century thinking and trying to hinder this evolution, local leaders should figure out methods for embracing and integrating new technologies into their standard operating procedures. For instance, cities could take the logic of the NeighborGoods app, but instead of neighbors owning the items to be shared, perhaps the ownership is a city function. The local government could take the responsibility for owning certain “public” assets and distribute them across various communities within their jurisdiction. Residents in these neighborhoods could use a P2P app to check out these assets so no one needs to own them individually. Local governments already do this for certain public assets, such as when citizens go to city hall to fill out a form to reserve a picnic area or ball field at a public park. Local governments can maintain their role to provide public assets (on an even wider scale) but adapt emerging technologies to facilitate the usage of such assets with user fees to help offset some of the operational costs of the asset and information infrastructure.

Smart leaders are realizing this “inconvenient truth” about the changing roles of government in the society of tomorrow and are beginning to look for solutions. Finding solutions won’t be easy, but it is a step in the right direction for local governments to take control of their destiny instead of allowing their role to be usurped by technology, citizens, or private entities. Failing to claim this ground actively will likely lead to the end of local government in the form we know it today (and states and maybe nations may follow suit over time). The public sector may fade away into different shades of corporatism. The nation-state concept will continue its evolution (not revolution) towards a corporate state structure. Calls by some politicians on both sides of the political aisle for government to run more like a business were just some of the first steps. Public-private partnerships are another early interim stage of that evolutionary process. Several communities already contract many of their responsibilities to private and nonprofit sector organizations. Concurrently, people will continue to atomize due to technological innovations that further facilitate our withdrawal from a “civic” body politic and reduce us further to nothing more than disassociated consumers. This evolution may last over a couple of generations and would likely seem perfectly normal as it unfolds in slow motion...as long as local government leaders ignore the forest while dealing with the trees.

As we mentioned before, we do not have a crystal ball and are certainly are not in the business of predicting the future. However, we do know how to chart out trends based on data, model the interactions within complex systems,

and study the pathways towards outcomes to unearth intended and unintended consequences of strategic choices. We know how to engage key stakeholders in the process of visualizing scenarios to complex public policy and social dilemmas. Designing a path forward for local governments will require deliberate collaboration among diverse stakeholders, an immersive engagement with the data and scenarios that will shape local communities, and employment of decision-tools to model and simulate alternatives.

GOVERNANCE STUDIES

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