Modern Cities as Spontaneous Orders

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Abstract: People and firms move to cities in search of two things, accessibility to a variety of destinations and space. They evaluate possible sites, trading off these objectives—even as they engage in many other trade-offs. Cities are formed as large numbers of entities do the same—often having to account for each other's choices. Firms and people are involved in many complex supply chains—as buyers and as sellers. Smithian exchange prompts the formation of supply chains for things; Schumpeterian innovation prompts the formation of supply chains for ideas. Both are formed in light of Coasean transactions costs. Transaction cost economies are available in cities. People and firms choose propitious locations that accommodate the various networking choices which support their roles in various supply chains; this often involves the trading off of physical and virtual networking options. The evolution of transactions costs is reflected in the concurrent evolution of cities and networking opportunities. Cities survive and prosper as long as they are attractive to capital and labor, notably entrepreneurial talent, as everyone seeks favorable locations from which to operate. Relatively flexible land markets are essential; it is unlikely that top-down planning can accommodate all of the complexity involved. We cite evidence that U.S. cities are mostly developed in the bottom-up fashion we are describing—in spite of the widespread view that, left alone, cities will "sprawl" and, therefore, require top-down guidance.

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> The man of the system …. seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon a chess-board. He does not consider that the pieces upon the chess-board have no other principle of motion besides that which the hand impresses upon them; but that, in the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might chuse to impress upon it.
>
> — Adam Smith

> The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design.
>
> — Friedrich von Hayek

> Their intricate order—a manifestation of the freedom of countless numbers of people to make and carry out countless plans—is in many ways a wonder.
>
> — Jane Jacobs

UNDERSTANDING MODERN CITIES

There are three prominent approaches to the study of cities. First, the widely cited model developed by urban economists suggests that the various land uses arrange themselves in terms of how they value (various) accessibilities. Accessibility to the urban core or urban center is usually the focus of these models. Competitive bidding causes equilibrium land rents to emerge so that no one has an incentive to change locations. The model predicts that cheaper access prompts more spread out cities (see, for example, Brueckner 1987). The prediction is sustained insofar as increasing spread is apparent almost everywhere, over the evolution from "pedestrian city" to "streetcar city" to "automobile city" (Mueller 2004). But these models are for the most part static and they deal in aggregates. Their focus is on just one kind of supply chain, households' supply of labor as they evaluate journey-to-work options. It is unclear that this approach can capture the rich set of interactions that characterize cities. The interactions that we want to highlight are the ones that inform and prompt more complex location choices.

Another important approach to the study of cities is associated with visionary city planning. This thinking is in the tradition of architecture-high modernism-urban design. High modernism presumes substantial knowledge and wisdom at the top, ignoring the reality of widely dispersed knowledge (see, for example, Scott 1998). It is the approach championed by Le Corbusier, Robert Moses and many others. "Garden city" and urban containment designs are examples. These are popular among city planners and policy makers. They champion "contained" cities and higher densities (and associated lifestyles) and suggest that top-down planners know the locations where compact development ought to be encouraged—via regulatory means or direct subsidies. But it is not clear whether these plans have made a perceivable difference as metropolitan areas continue to disperse. Are these plans too static and end-state focused to be useful? Can human design capability scale up to the level of cities?

A third approach is associated with Jane Jacobs and her followers (see, for example, Ikeda 2012). It recognizes *complex self-ordering arrangements*. We argue that this is the most useful way to think about cities. We owe unprecedented prosperity[1] to the workings of Smithian exchange and Schumpeterian innovation. Both of these phenomena are realized via the many supply chains in our lives—for things as well as for ideas. Networks and chains involve transactions costs. Firms' choices regarding what to make and what to buy have a spatial dimension: how remote are various possible suppliers? Discussions of transactions costs suggest a discussion of clustering, cities, and networks. Recognizing all this, we note that people choose locations and make their networking choices simultaneously. Building on the insight of Coase (1937), we note that the evolution of cities together with the evolution of networking opportunities reflect the *evolution of transactions costs*.

Prosperity requires growth and growth requires the effective coordination of large numbers of private plans via markets and prices. Smithian growth (comparative advantage) hinges on the development of supply chains for goods. Schumpeterian growth (entrepreneurial discovery) hinges on the development of supply chains for ideas. Both require effective decentralized coordination. Both have a spatial dimension. All supply chain participants seek to overcome transactions costs and, therefore, seek propitious locations. This requires well-functioning cities and effective land markets.[2] In the modern context, then, discussions of growth require discussions of cities—and how they help participants deal with transactions costs.

The argument suggests that cities provide opportunities *that cater to effective participation in the various supply chains that people and firms want to participate in*. This highlights the importance of flexible land markets and market-compatible land use arrangements, including the complexities of occasional and varied clustering. Locators must be able to find propitious locations that enable them to stay in business and even prosper. It is unlikely that competitive cluster composition can be achieved via top-down planning (Desrocher and Sautet 2004).[3]

CITIES, CLUSTERS, COMPLEXITY AND GROWTH

Consider Figure 1 and its map of the locations of software firms in the San Francisco Bay area in 2013. Readers will recognize the area as Silicon Valley and beyond, covering approximately 1,500 square miles of land. Is this a city? A cluster? An agglomeration? Are there many subcenters? Networks? Are people networking face-to-face? On the telephone? Electronically? Do we see proximities? Arrangements to facilitate spillovers? To facilitate serendipitous connections?

We believe that the conventional descriptors of settlement patterns are inadequate. The same goes for the stan-

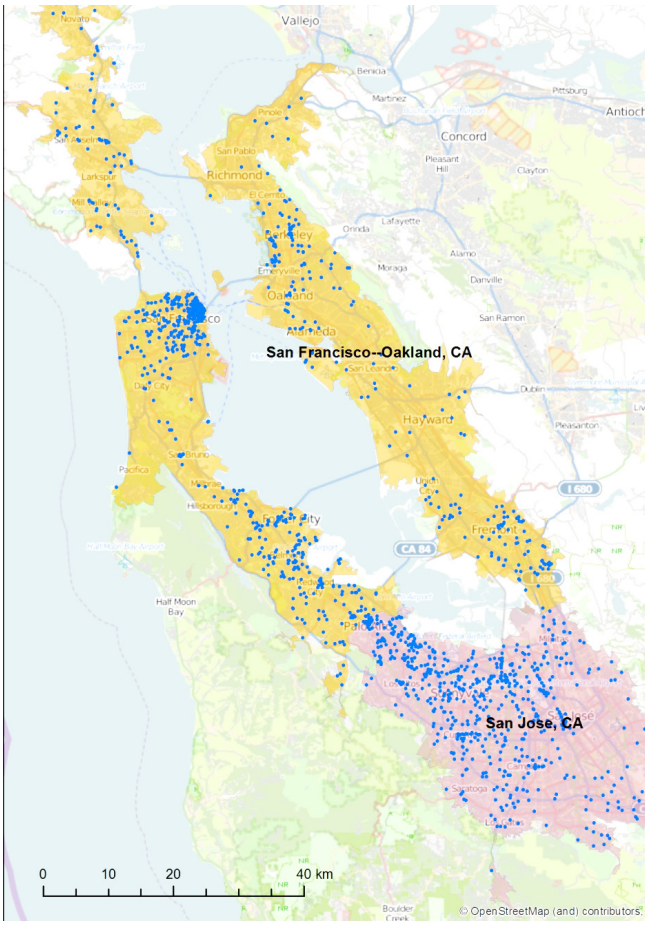

Figure 1: The location of all software establishments in the San Francisco Bay Area, 2013 (Geographic Research, Inc., 2014). From Angel and Blei (p. 27, 2015).

dard theories and discussions of cities. Distances between firms are seemingly greater than what we think of as "proximate." Interaction choices and the resulting spatial patterns are part of the same discussion; people arrange and benefit from a complex blend of networking activities; they thereby cultivate and maintain various strong as well as weak ties.

As in Figure 1 and many similar places, the land involved is expensive but people and firms are nevertheless choosing to bear the expense in order to be proximate *in some sense*. The standard definitions of "density" are not useful because of the geographic scale and distances involved; simple large-area density averages ignore most of the interesting details. In the modern world, agents manage and trade off the costs and benefits of many networks in their lives. These involve all manner of access, including electronic, air travel, face-to-face meetings that are in their immediate neighborhood or not. Face-to-face meetings are still the way that trust is established and widely diffused tacit information is exchanged. People choose favorable locations from which they can best manage all of their networks. As networking opportunities change, these choices can change; that would, in turn, change the urban environment. Economists point out that institutions evolve to facilitate economic growth (Greif 2015). We add that transactions costs also evolve—and urban environments evolve accordingly.

The city's many locators (existing and potential) continuously seek to discover, evaluate and engage in a large number of complex trade-offs—in production and in exchange. This includes the careful evaluation of locations and interaction opportunities. Everyone seeks propitious locations. This includes their efforts to be productive by learning and exchanging ideas. These locators develop and manage supply chains for various products as well as for ideas. Cities offer the opportunity to form convenient supply chain links for both. New ideas typically come first. Jane Jacobs emphasized the detailed complexion of cities, as the many people who manage and participate in large numbers of supply chains (as buyers and as sellers) seek and find favorable locations.

It appears, then, that only the third (Jacobsean) approach to the study of cities mentioned in the introduction recognizes the fact that cities facilitate open-endedness, dynamics, and the essential role of discovery. If cities are to be reliable "engines of growth" the bottom-up process described by Jacobs is essential. Top-down planning cannot "solve" the complex assignment of activities to sites that is involved. Each activity that ends up in the city ends up at some location—from which it attracts and repels many others. Significant complexity is involved in light of many locations and many locators. The success of complex assignments and how responsive the many locator-location pairings are to ever-changing conditions over time is what renders the city competitive or not.

Cities compete for labor and capital. To be competitive, they must be congenial to the extent that those who choose to function in any city can do so with realistic prospects of success. Bertaud (2014) suggests that labor's ability to access jobs explains metropolitan area success. Well and good; most city dwellers supply labor to local firms but there are an uncountable number of other supply chains to consider. Everyone (all persons, all firms) who locates in a city supplies and demands a variety of goods and/or services; everyone participates in many supply chains and evaluates many potential locations in terms of their propitiousness

for all of this participation. Cities that succeed and grow are evidence that this complex problem is somehow being solved—or at least satisfactorily addressed. In the next section, we consider evidence that the development of U.S. cities continues along these lines.

People settle in cities expecting two things: accessibility to a variety of others and living space. As already mentioned, urban economists have built various equilibrium models that reflect this trade off. Suburbanizing cities with significant auto use are the real-world realization of how large numbers of people in modern cities meet these dual demands. Policy makers have reacted in two ways. The first emphasizes that, left alone, the development of cities involves significant uncompensated externalities and is "unsustainable." The other is that people's revealed expressions of lifestyle demands are not plausible or credible. Given the chance, most people will accommodate or even demand compact cities served by expanded public transit—if they are somehow given the option.

We have already suggested that the "urban containment" dreams have come up short in light of events. Rather, left on their own, people manage to get the job done; those who do manage to stay in business signal that they have been able to find a workable location.

SPONTANEOUS SPATIAL ORDER

Two lines of research corroborate our view. The first of these investigates the suburbanization of jobs in concert with the suburbanization of people. The "Edge Cities" idea recognizes that it is not simply residences that disperse.[4] We have already noted that the simplest monocentric models developed by urban economists predict that as (dollar and/or time) transport costs (per unit of distance) fall, the city will spread out. But the monocentric model is not plausible because so many employers have relocated away from the center. We have already cited evidence that suggests they had relocated in ways that contain their employees' commuting costs.

- Glaeser, Kahn and Chu (2001) examined the locations of places of work for the 100 largest U.S. metropolitan areas using 1996 data. They found that, on average, only 22 percent of the people worked within three miles of the city center; more than 35 percent worked more than ten miles from the city center. The oldest cities had the largest shares working near the center.

- Kneebone (2009) updated the Glaeser et al. study with 2006 data. She reported that for 98 metropolitan areas, only 21 percent worked within three miles of the center; 45 percent worked more than ten miles from the center.

- Levinson (2013) developed job accessibility data for the largest U.S. metropolitan areas for 2010. The methodology involves measuring morning-peak automobile job access from an average point in each area. For the ten largest areas, 40 percent of the jobs were accessible in 30 minutes; 69 percent were accessible in 40 minutes.

- Carlino (2000) examined changes in the distribution of jobs between 1951 and 1996. He reported that the distribution had become more equal within as well as between metropolitan areas. The denser counties attracted fewer jobs than the less dense counties.

Planners have embraced ideas of "spatial mismatch" and "jobs-housing balance" (at some indeterminate geographic scale) along with the presumption that improved matches can somehow be planned and achieved by higher authority. Journey to work distance reductions are the goal. Yet an examination of actual settlement pattern reveals that much "balancing" goes on quite spontaneously. The larger point is that the discussion is naïve about what is meant by "matching." The marriage market (and the job market) are complex: they reveal that one has to want and simultaneously be wanted by the same party.

Critics of how U.S. cities develop have cited peculiar policies that they say are to blame but this claim is undermined by the fact that suburbanization occurs in places with very different policies (Gordon and Cox 2011). This is illustrated by the population growth trends in the world's high-income metropolitan areas. Among the approximately 70 core municipalities that reached a post-World War II peak population exceeding 400,000, all but two had peaked and experienced population declines by the early 2000s. This excludes municipalities that grew spatially by annexation or consolidation or which had significant areas of greenfield land development available immediately following the War (Cox 2014). Suburbanization, lower density, largely automobile-oriented development, has been the dominant mode for decades, both in the United States and in most other developed nations. This does not mean that suburbs look the same in the United States as in Europe, but they are still lower density and rely on automobiles, while a small minority of employment is in the urban core. For example, Angel,

Parent, Civco, and Blei (2010) use a global sample that indicates a 56 percent decline in urban densities between 1950 and 2000 in Europe and Japan. Five built-up urban areas were 85 percent less dense than in 1800.[5] Moreover, later data indicate that among built-up urban areas of more than 500,000 population, European built-up urban area average densities that are substantially lower (Cox 2016).

Job suburbanization can mean many things. It is interesting if it reflects the co-location of employers and employees. The following studies make use of the most widely available data on location choice, those that describe trip making within cities. Commuting is usually of greatest interest as it is typically the most significant regular destination. Various studies by various authors using various approaches reach the same conclusion, that job (and other) access in large U.S. cities is remarkably good. Consider these findings:

- Alex Anas concluded that "The data on the largest U.S. MSAs show that commute times increase only slightly with city size: the elasticity of the average commute time with respect to the number of workers was about 0.1 in 1990 and 2000" (2012, p. 146).

- Angel and Blei (2015, p. 1) report that "… metropolitan labor markets in the U.S. are held together by nimble and self-adjusting commuting patterns between self-adjusting residence and workplace locations that ensure that larger cities do not lose their productive advantage because of the added costs of long commuting trips along congested transport networks."

- Evidence developed by An, Gordon, and Moore (2014) considers work as well as non-work trips. Most people are not commuting cost minimizers because they trade-off their interest in access to a variety of sites. The travel times they analyzed are for various sub-metropolitan areas (for the sample of large U.S. MSAs); from the data on individual households, the authors were able to compute travel time means as well as variances. Several interesting findings are found. The metropolitan sub-areas' means and variances do not differ in any systematic way. This is the case for all three area types. There is no evidence of "costs of sprawl". There is evidence of co-location: vast numbers of origins and destinations have been chosen in a manner that limits separations.

- Bumsoo Lee (2011) was able to locate and categorize U.S. metropolitan area workers by place of work, whether in the central business district, in a sub-center, or anywhere else ("dispersed"). And, no matter in which metropolitan area, the "dispersed" workers reported the shortest average commute times. "Sprawl" (if we are to use that word) looks sensible.

- Cox (2014a) reports results from the Tom Tom international traffic index.[6] He notes that "All but one of the 10 least congested large cities in the Tom Tom report are in the United States. The least congested is Kansas City,[7] with a peak period index of 19.5, indicating that a 30 minute trip in free flow is likely to take 36 minutes due to congestion. Kansas City has one of the most comprehensive freeway systems in the United States and has a highly dispersed employment base. US cities also occupy the second through the sixth least congested positions (Cleveland, Indianapolis, Memphis, Louisville, and St. Louis). Spain's Valencia is the seventh least congested city, while the eighth through 10th positions are taken by Salt Lake City, Las Vegas, and Detroit."

- Crane and Chatman (2004) also examined the decentralization of jobs and housing in major U.S. metropolitan areas, specifically, they ask: "Does the average commute increase or decrease when employment decentralizes?" They find that "the more suburbanized is employment—that is the more sprawl—the shorter the average commute" (p. 312). They refer to physical distance (miles). Their source is panel data from the American Housing Survey.

- Cox (2014b) reports that job growth has been strongly associated with population growth in the urban sectors of metropolitan areas. This analysis relied on a classification of Zip Codes within metropolitan areas by "functional urban core," "early suburban," "later suburban," and "exurban" sectors—based on population density, mode of travel to work, and housing age.

Findings like these suggest that either an amazingly omniscient super-planner of U.S. cities is having great success or that the decentralized and spontaneous choices of large numbers individuals (employers and employees in this case) reveal that each recognizes their interests in co-locating—as much as possible and in light of all the trade-offs facing each of them. This is not "sprawl" or "traffic "doomsday." These are not simply "unplanned" cities. The plans of large

numbers of individuals are seemingly coordinated—with benign results.

It is also likely that the reason for these findings is that the conventional wisdom in urban planning has had little effect, especially in commercial and business locations. In much of the nation, zoning decisions are the responsibility of local levels of government, which are well below the metropolitan area level. This may have permitted the proliferation of "edge cities" and even shopping malls to a greater degree than would have occurred in a more centrally planned environment; they were probably developed in response to local conditions

Municipalities like Southland, Michigan (Detroit); Irving, Texas (Dallas-Fort Worth); Bellevue, Washington (Seattle); Clayton, Missouri (St. Louis); Overland Park, Kansas (Kansas City); Schaumburg, Illinois (Chicago); or Walnut Creek (San Francisco) can establish themselves as a competitive alternative to the principal downtown area. Even more important, as the nation has moved from polycentricity to even more dispersed employment patterns, other municipalities have allowed businesses to locate where it makes the most sense, given their requirements. All of this decentralized decision making may help explain how it is that U.S. major metropolitan areas have the shortest commute durations in the world.

Even in metropolitan regions with some of the strongest land use planning regimes, for example the San Francisco Bay Area and Portland, the legacy of decentralization has created a fabric that may have precluded strict control over employment dispersion. In the Bay area, Silicon Valley, stretching from the southern San Francisco metropolitan area to the northern San Jose metropolitan area, was already firmly established long before urban planning regulations became strong. In Portland, the growing information technology sectors of suburban Washington County were also in place before the land use regulations strengthening in the 1990s. This legacy may have helped to moderate commuting times and could negate some of the worst consequences of an overly planned environment for years to come. If U.S. cities are not planned in the conventional sense of how the term is used, perhaps the multiplicity of plans that emerge bottom-up have trumped the top-down plans.

Top-down plans will always be with us. To what extent do they matter? Do they simply impose costs? McCloskey's "great fact," the amazing rise in the economic fortunes of so many people around the world, was realized often in spite of the considerable efforts by top-down planners everywhere. In most cases they are overwhelmed by bottom-up forces. This does not mean that top-down impulses are benign or to be ignored. But it does attest to the great power of bottom-up forces.

CONVENTIONAL URBAN PLANNING VS SPONTANEOUS SPATIAL ORDERS

Whereas the idea of centrally planned economies has fallen on hard times, the idea of top-down planning of cities and regions remains respectable almost everywhere. In the modern version, the threat of environmental crisis is invoked and city planning is seen as an important antidote. Across the U.S., a large number of urban and regional planning measures are now in place. What have they accomplished? Researchers at the Brookings Institution (Pendall, et. al. 2006) made an effort to find ways to categorize and describe local government policies that regulate land uses and development between entire metropolitan areas (the relevant economic dimension of cities).[8] When we consider recent evidence on the evolution of U.S. metropolitan areas we have to recognize the concurrent effects of the efforts of many planning agencies and local governments to control land uses and development. The Brookings researchers sought to classify the bewildering set of approaches implemented in the largest U.S. metropolitan areas. Moving from a survey of state, regional, and local planning practices to a factor analysis, the authors classified metropolitan and local practices via an eight-part ranking, the toughest labeled "Reform," which included "Containment," "Containment-lite," "Growth management," and "Growth control."

The "Reform" category included a number of metropolitan areas with urban containment policies, with urban growth boundaries intended to produce more compact cities and to shorten travel distances. Such land use strategies have been identified in virtually all of the largest US metropolitan that have developed "seriously unaffordable" house prices in recent decades. Urban containment boundaries, and their equivalents, may be the strongest form of land use regulation that has been applied to U.S. metropolitan areas (Cox and He 2016).

For the 51 U.S. largest urbanized areas in the 51 metropolitan areas with more than 1 million population in 2010, only 12 showed increased average population density for the years 2000-2010, but three of these were not in the Brookings study.[9] Further, none of these increases were significant—in no urban area was the higher of the average density of 1950 achieved or the overall average of

1950 for the same urban areas.[10] The various planning policies and approaches were categorized and identified by the Brookings authors but seemingly these policies have little effect re-shaping U.S. cities. There may be multiple reasons for this, such as the radical revisions necessary to make the previously existing built environment more compact are expensive and difficult to implement, that households continue to seek more spacious suburban housing and the automotive mobility on which a vibrant metropolitan area economy depends cannot be easily replaced by strategies that are slower and offer so much less in terms of geographical job access, such as mass transit, walking an cycling.[11] At the metropolitan area level, it is difficult to a see substantial link between recent metropolitan development patterns and observed planning policies. The few MSAs that experienced density increases in 2000-2010 did not share a single identifiable planning approach in the Pendall system. Bottom-up forces are strong. Land uses are durable. The forces, notably people's preferences that gave us those spatial patterns are powerful.

Consider the following familiar story. "In many economics textbooks, the presence of externalities is invoked as a justification for government intervention in the marketplace. Yet the private sector often finds its own solutions to externality problems. This is the secret of the shopping mall's success. Because a property developer owns the entire shopping complex, its profits depend on the entire mall, not on any particular shop. By choosing the right mix of tenants and charging rents that reflect each store's contribution to the mall's overall revenues—including the business it brings to other stores—the developer can 'internalize' the externality and maximize its profits."[12] The mall owner and developer, the residual claimant, has the incentive to internalize externalities, to plan infrastructure, "land use" arrangements and "public facilities" in a package that works best. Finding this "sweet spot" involves the standard but complex series of trial-and-error entrepreneurial discovery and adjustment. It is steady and on-going effort that explains how residual claimants earn a return on investment.

A number of "edge cities" (suburban office centers) have been developed adjacent to or even in connection with major retail shopping malls. Further, in some cases, edge cities have started with a model similar to that of a mall, within initial plans and development under the control of a single developer (such as Las Colinas in Dallas-Fort Worth).

Is the mall an example useful for the discussion of larger places, even whole cities? In a previous paper (Gordon and Cox 2014) we speculated on the extent to which such "islands of planning" could be scaled up. Anything that can be metered can be privatized and transacted. The growth of private communities (not just those gated) in the U.S. has been well documented (Nelson 2005). These include various configurations of private infrastructure. In exurban settings and if the development is of a large enough scale, the infrastructure (potable water, sewage, electricity) could be free-standing and independent. If an urban infill project is involved, its own infrastructure will have to link to non-private systems at some point. Certainly far enough up the food chain, there will be "mega-projects" which private developers are unlikely to provide. The latter are also the ones that have encountered the biggest difficulties (Flyvbjerg, et. al. 2002). The private pieces are also less likely to be subject to pork politics.

Some authors are optimistic about the possibilities.

> … [O]ne way to generate more infrastructure and planning is to lower transactions costs by extending the property line. Walt Disney World and Jamshedpur [India] demonstrate that private developers will internalize externalities and plan and build infrastructure projects capable of exploiting economies of scale if the property line extends to the size of the city" (Rajagopalan and Tabarrok 2014, p. 226).

Public goods would become club goods; excludability would be feasible and the incentives to supply would bring forth entrepreneurial effort.

There is also the suggestion that there could be competition between higher-level governments for the contracts to supply these hook-ups. Arnold Kling (2008) has suggested "competitive government"; "In democratic government, people take jurisdictions as given, and they elect leaders. In competitive government, people take leaders as given, and they select jurisdictions."

By world standards, the U.S. economy has remained dynamic and innovative for many years in spite of ever more intrusions by politicians and regulators. We have documented land use arrangements in U.S. cities that are successful in terms of the available data on location, commuting and interacting that we were able to find. Likewise, the growth of private communities in the U.S. continues despite various roadblocks that are put up by traditional providers and their allies and constituents.

CONCLUSIONS

What does it all mean? What do we know? Plans are everywhere. Every person, every business, every household has some kind of informal plan by which they hope to survive and perhaps thrive. We know that markets are good at coordinating large numbers of decentralized plans. We also know that even the market economies are governed by politicians heavily invested in a variety of top-down plans. In the case of cities, such plans are often implemented with the goal of prompting "compact" development that is supposed to achieve closeness and travel economies. Our reading of the available U.S. evidence is that (i) most of the visions of the top-down planners have not been realized; (ii) the decentralized plans of an uncountable number of individuals have dominated the top-down plans; and (iii) travel costs have largely been contained in spite of the fact that top-down plans seemingly designed to achieve this result have been superseded.

The consequences of the top-down plans, however, have not been entirely benign; they have made housing expensive. Restrictions limit housing supply elasticities—with the expected consequences in terms of declining housing affordability. Failed policies usually give rise to more policies designed to undo their effects. The connection between high land costs and land use regulations has been established in a number of studies (Quigley and Rosenthal 2005; Glaeser and Gyourko 2008). This outcome does not appear to have been intended (Nelson, et al. 2002)[13] but it did provide an opening for a set of policies to support a politically influential "affordable housing" industry. The "great recession" that began in 2008 is likely to have been prompted by a politically motivated concocted housing boom and its inevitable aftermath.

NOTES

1 McCloskey (2010) refers to it as "The Great Fact" (p. 48); Phelps (2013) titles his book Mass Flourishing.

2 The possible public goods nature of ideas is not relevant because bidding for sites near information sources brings prices and market exchange into play.

3 Even the idea of a successful "cluster," often citing Silicon Valley, is unclear; the example straddles a large area which includes both sides of San Francisco Bay.

4 "Almost nobody saw it coming. The people we pay to be urban planners never imagined a future in which ordinary people pick up and move their city functions as close as possible to their suburban homes" (Garreau 1995).

5 Author's calculations.

6 http://www.tomtom.com/en_gb/trafficindex/

7 http://www.rentalcartours.net/rac-kc.pdf

8 This research is focused only at the labor market or housing market level (the metropolitan area) and does not differentiate between regulatory structures within metropolitan areas.

9 Average metropolitan population densities are widely used by analysts because the data are easily available. But there are two obvious problems: first any average defined over large areas with considerable variances ignores significant amounts of information; second, metropolitan areas are defined by political boundaries which are weak approximations of the actually developed (built-up) areas. One of us (Cox) has computed the correlation between metropolitan area average densities and the corresponding urbanized area average density; the correlation was just 0.55.

10 For densification to have any serious public policy implications with respect to the goals of urban containment policy, much higher densities would be required. The comparison to 1950 densities understates the comparative density averages because the building blocks of urban areas in 1950 were municipalities, while the building blocks in 2010 are the much smaller census blocks. Thus, 1950 urban area populations often have large rural components (such as in Los Angeles and New Orleans). Application of 2010 criteria would produce lower average densities.

11 The most recent research at the University of Minnesota Accessibility Observatory illustrates the differences between modes of travel in their ability to

provide access to metropolitan employment across the United States. Estimates are developed of the percentage of labor market (metropolitan area) jobs that can be reached in a particular time by the average labor market resident worker. (Owen, Murphy and Levinson, 2016, Owen and Levinson 2014, Owen, Levinson and Murphy 2016). Data, from the author's calculations are provided for 30 minute access, which is slightly higher than the average one way work trip travel time in the United States of 26 minutes (Polzin 2016). The resulting figures are, for automobiles, a maximum of 100 percent of jobs are accessible within 30 minutes during peak periods, a minimum of 30 percent and a median about the approximately 50 largest metropolitan areas of 63 percent. For transit, the numbers ae a maximum of 8 percent, a minimum of 0.6 percent and a median of 1.5 percent. For walking, the maximum job accessibility for the average worker is 1.2 percent, with a minimum of 0.1 percent and a median of 0.5 percent.

12 *The Economist* March 1, 1997

13 The cited work is drafted from a perspective that housing affordability is an important goal. At least some of the authors have been identified with advocacy for urban containment policies. Similar sentiments are found in other publications by urban containment advocates.

REFERENCES

Angel, Shlomo & Blei, Alejandro M. 2015. Commuting and the Productivity of American Cities: How self-adjusting commuting patterns sustain the productive advantage of larger metropolitan labor markets" NYU Marron Institute of Urban Management WP #19.

Angel, Shlomo, Parent, Jason, Civco, Daniel L., & Blei, Alejandro M. 2010. The Persistent Decline in Urban Densities: Global and Historical Evidence of Sprawl. Lincoln Institute of Land Policy. http://urb.iiedlist.org/sites/default/files/Angel%20 2010-declineinurbandensities.pdf.

Bertaud, Alain 2014. Cities as Labor Markets. New York: Marron Insitute, New York University Working Paper #2.

Brueckner, Jan K. 1987. The Structure of Urban Equilibria: A Unified Treatment of the Muth-Mills Model. In: E.S. Mills (ed.) *Handbook or Regional and Urban Economics*. Amsterdam.

Carlino, Gerald A. 2000. From Centralization to Deconcentration: People and Jobs Spread Out. *Federal Reserve Bank of Philadelphia Business Review* (November/December).

Coase, Ronald 1937. The Nature of the Firm. *Economica* 4:16, 386-405.

Cox, Wendell 2014a. Traffic Congestion in the World: 10 Worst and Best Cities. newgeography.com, http//www.newgeography.com/content/004504-traffic-congestion-world-10-worst-and-best-cities.

Cox, Wendell 2014b. Beyond Polycentricty: 2000s Job Growth (Continues to) Follow Population. http//www.newgeogrpahy.com/content/004486-beyond-polycentricity-2000s-jobs-growth-continues-to-follow-population.

Cox, Wendell 2014c. International Shrinking Cities: Analysis, Classification and Prospects. In: Harry W. Richardson and Chong Woon Nam (eds.), *Shrinking Cities: A Global Perspective*. Oxford: Routledge.

Cox, Wendell 2016. *Demographia World Urban Areas (Built-Up Urban Areas or World Agglomerations: 12th Annual Edition*. http://demographia.com/db-worldua.pdf

Cox, Wendell and He, Ailin 2016. Canada's Middle-Income Housing Affordability Crisis. Frontier Centre for Public Policy. https://fcpp.org/sites/default/files/documents/Cox%20%26%20He%20-%20 Middle-Income%20Housing%20Crisis.pdf

Crane, Randall and Chatman, Daniel C. 2004. Traffic and Sprawl: Evidence from U.S. Commuting, 1985 to 1997. In: Harry W. Richardson and Chang-Hee Christine Bae (eds.) *Urban Sprawl in Western Europe and the United States*. Burlington: Ashgate.

Flyvbjerg, Bent, Holm, MetteSkamris & Buhl, Soren 2002. Underestimating Costs in Public Works Projects: Error or Lie? *Journal of the American Planning Association* 68:3.

Frey, Bruno S. and Eichenberger, Reiner 1999. *The New Democratic Federalism for Europe: Functional, Overlapping, and Competing Jurisdictions*. Cheltenham: Edward Elgar.

Descrocher, Pierre and Sautet, Frederic 2004. Cluster-Based Economic Strategy, Facilitation Policy and the Market Process. *The Review of Austrian Economics* 17:2:3, 233-245.

Garreau, Joel 1995. Edgier Cities. *Wired* 3.12 (December).

Glaeser, Edward L. and Gyourko, Joseph 2008. *Rethinking Federal Housing Policy: How to Make Housing Plentiful and Affordable*. Washington, DC: AEI Press.

Glaeser, Edward L., Kahn, Matthew and Chu, Chenghuan 2001. *Job Sprawl: Employment and Location in U.S. Metropolitan Areas*. Washington, DC: The Brookings Institute.

Gordon, Peter and Cox, Wendell 2011. Cities in Western Europe and the United Stats: Do Policy Differences Matter? *The Annals of Regional Scienc,* 48:2, 565-594.

Gordon, Peter and Cox, Wendell 2014. Modern cities: their role and their private planning roots. In: D. E. Andersson and S. Moroni (eds.) *Cities and Private Planning: Property Rights, Entrepreneurship and Transactions Costs.* Cheltenham: Edward Elgar.

Greif, Avner 2015. Coercion and Exchange: How Did Markets Evolve? In: A. Greif et al (eds.) *Institutions, Innovation and Industrialization*. Princeton: Princeton University Press.

Ikeda, Sanford 2012. Economic Development from a Jacobsian Perspective. In: S. Hirt (ed.) *The Urban Wisdom of Jane Jacobs*. New York: Routledge.

Kling, Arnold 2008. Competitive Government vs. Democratic Government. http://patrifriedman.com/saved_papers/kling_ competitive_government.2008.pdf

Kneebone, Elizabeth 2009. *Job Sprawl Revisited: The Changing Geography of Metropolitan Employment*. Washington, DC: The Brookings Institution.

Bumsoo, Lee and Gordon, Peter 2011. Urban structure: Its role in urban growth, net new business formation and industrial churn. *Régionet Développement* 33, 137-159.

Levinson, David 2013. *Access Across America*. Minneapolis: Center for Transportation Studies, University of Minnesota.
McCloskey, Deirdre 2010. *Bourgeois Dignity*. Chicago: University of Chicago Press.
Muller, Peter O. 2004. Transportation and Urban Form: Stages in the Spatial Evolution of the American Metropolis. In: S. Hanson (ed.) *The geography of Urban Transportation* (3rd ed.) Guilford Press.
Nelson, Arthur C., Pendall, Rolf, Dawkins, Casey J. and Knaap, Gerrit J. 2002. The Link Between Growth Management and Housing Affordability: The Academic Evidence. Washington, DC: The Brookings Institution. http://www.brookings.edu/research/reports/2002/02/housingaffordability
Nelson, Robert H. 2005. *Private Neighborhoods and the Transformation of Local Government*. Washington, DC: Urban Institute Press.
Owen, Andrew and Levinson, David 2014. Access Across America: Transit 2014. Accessibility Laboratory, Center for Transportation Studies, University of Minnesota.
Owen, Andrew, Levinson, David and Murphy, Brendan 2015. Access Across America: Walking 2014. Accessibility Laboratory, Center for Transportation Studies, University of Minnesota.
Owen, Andrew, Levinson, David and Murphy, Brendan 2016. Access Across America: Auto 2015. Accessibility Laboratory, Center for Transportation Studies, University of Minnesota.
Pendall, Rolf, Puentes, Robert and Martin, Jonathan 2006. *From Traditional to Reformed: A Review of the Land Use Regulations in the Nation's 50 largest Metropolitan Areas* Washington, DC: The Brookings Institution.
Phelps, Edmund 2013. *Mass Flourishing*. Princeton: Princeton University Press.
Polzin, Steven 2015. Commuting in America 2015. *Planetizen*. http://www.planetizen.com/node/88847/commuting-america-2015
Quigley, John M. and Rosenthal, Larry 2005. The effects of land use regulation on the price of housing: What do we know? What can we learn?" *Cityscape* 8, pp. 69-138.
Rajagopalan, Shruti and Tabarrok, Alexander 2014. Lessons from Gurgaon, India's private city. In: D.E. Andersson and S. Moroni (ed.) *Cities and Private Planning: Property Rights, Entrepreneurship and Transactions Costs*. Cheltenham: Edward Elgar.
Scott, James. C. 1998. *Seeing Like a State*. New Haven: Yale University Press.