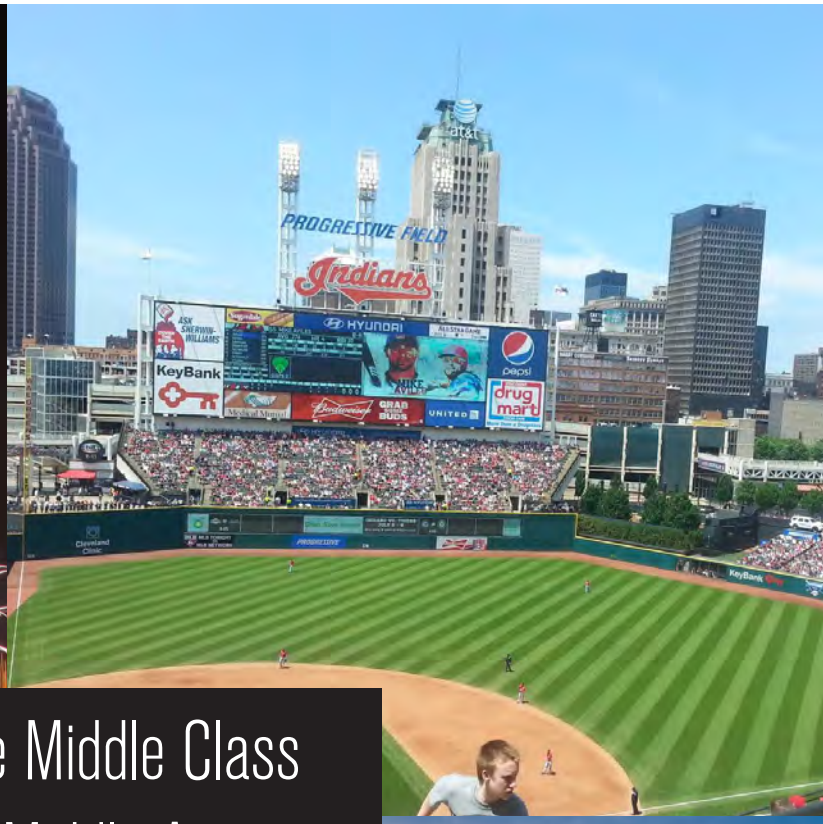
THE NEW AMERICAN HEARTLAND



Renewing the Middle Class by Revitalizing Middle America

MICHAEL LIND AND JOEL KOTKIN

center for
opportunity urbanism

The Center for Opportunity Urbanism (COU) is a 501(c)(3) national think tank. COU focuses on the study of cities as generators of upward mobility.

COU's mission is to change the urban policy discussion, both locally and globally. We are seeking to give voice to a 'people oriented' urbanism that focuses on economic opportunity, upward mobility, local governance and broad based growth that reduces poverty and enhances quality of life for all.

For a comprehensive collection of COU publications and commentary, go to **www.opportunityurbanism.org.**

CONTENTS

ACKNOWLEDGMENTS AND BIOS

This project grew out of a growing recognition about the importance of the productive economy that is anchored in the middle of the country. We want to acknowledge critical help we received from the Bradley Foundation in Milwaukee, Greater New Orleans, Inc., Cleveland State University's Center for Population Dynamics at the Maxine Goodman Levin College of Urban Affairs, and Heath-Newark-Licking County Port Authority, a development authority in Ohio.
The authors would like to express our gratitude to COU's Board for their strong support and guidance: Tom Lile-Chairman, Leo Linbeck III-Vice Chairman and Directors Alan Hassenflu, Larry Johnson, Walter Mischer, and Richard Weekley.

AUTHOR AND EDITOR BIOS

Wendell Cox (demographic consultant) is a senior fellow at the Center for Opportunity Urbanism in Houston and the Frontier Centre for Public Policy in Canada. He was appointed to three terms on the Los Angeles County Transportation Commission, served on the Amtrak Reform Council and served as a visiting professor at the Conservatoire National des Arts et Metiers, a Paris university. He has a degree in government from California State University, Los Angeles and an MBA from Pepperdine University in Los Angeles.

Michael Hecht is President & CEO of Greater New Orleans, Inc., the economic development agency for southeast Louisiana. Under Michael's leadership, GNO, Inc. was recently named a "Top Economic Development Organization in the United States" (one of 11 of 2,300) by *Site Selection* magazine. Before coming to GNO, Inc. Michael led the quarter-billion dollar Katrina Small Business Recovery Program for the State. Prior to coming home to Louisiana, Michael, whose roots in Louisiana go back to the 1830s, worked for Mayor Michael Bloomberg in New York City, running the post-9/11 small business program.

Zina Klapper (editor) is a writer/editor/journalist with many years of national credits. Most recently, she edited and helped develop a signature 1,200-page volume of 52 essays for MIT's Center for Advanced Urbanism, scheduled for publication by Princeton Architectural Press in 2017. During the past decade, her international media outreach and writing for the Levy Economics Institute of Bard College has included numerous commentaries on major news outlets worldwide.

Alicia Kurimska (researcher and copyeditor) has worked both for the Center for Opportunity Urbanism and Chapman University's Center for Demographics and Policy. She is also an editor for *NewGeography.com*, a website focusing on economics, demographics, and policy. She graduated from Chapman University with a degree in history.

Joel Kotkin is executive director of the Center for Opportunity Urbanism in Houston, Texas. He also serves as the RC Hobbs Presidential Fellow in urban futures at Chapman University and director of the Chapman Center for Demographics and Policy. He is executive editor of the widely read website *NewGeography.com* and a regular contributor to *Forbes.com, Real Clear Politics, The Daily Beast* and *The Orange County Register.* He is also author of eight books, his most recent is *The Human City: Urbanism for the Rest of Us.*

Michael Lind is co-founder and senior fellow of New America. A former editor or staff writer for *The New Yorker, Harper's, The New Republic* and *The National Interest*, Lind is the author of a number of books on American history and politics, including *Land of Promise: An Economic History of the United States* (2012) and *The Next American Nation* (1995).

Richey Piiparinen is the Director of the Center for Population Dynamics at the Maxine Goodman Levin College of Urban Affairs at Cleveland State University. His focus is on the cultural, psychosocial, and demographic changes in Rust Belt cities, particularly as they relate to economic and community development. Richey is a contributing editor to *NewGeography.com*, and he is co-editor of the book *Rust Belt Chic: A Cleveland Anthology.*

Rick Platt is President and CEO of the Heath-Newark-Licking County Port Authority . During his tenure, the Port Authority has developed a reputation as a tech-savvy, government innovator. He is a speaker on manufacturing and economic development, including serving as a Visiting Fellow in Public Leadership at Miami University in 2015. His social media profiles will show, as they have for some time, that he is a proud native of America's Heartland and one who detests the term "Rust Belt."

Aaron M. Renn is a Senior Fellow at the Manhattan Institute for Policy Research and a Contributing Editor at its quarterly magazine *City Journal*. He is also an economic development columnist for *Governing Magazine* and contributor to many other publications.

Mark Schill is Vice President of Research at the Praxis Strategy Group in Grand Folks, North Dakota. Since 2010, Mark has been the lead analyst, co-author, and primary media spokesperson of Enterprising States, a U.S. Chamber of Commerce Foundation study which analyzes and profiles economic development efforts in all fifty states. He has worked on economic development strategies and policy reports for cities in 13 states, and he has planned and implemented more than two dozen economic development action summit events. Mark's economic and population analysis work has appeared in *Politico, Forbes, Money Magazine,* the *LA Times,* and *The Wall Street Journal* and he is managing editor and co-founder of the population and economic analysis site *NewGeography.com*.

THE NEW AMERICAN HEARTLAND

RENEWING THE MIDDLE CLASS BY REVITALIZING MIDDLE AMERICA

MICHAEL LIND AND JOEL KOTKIN

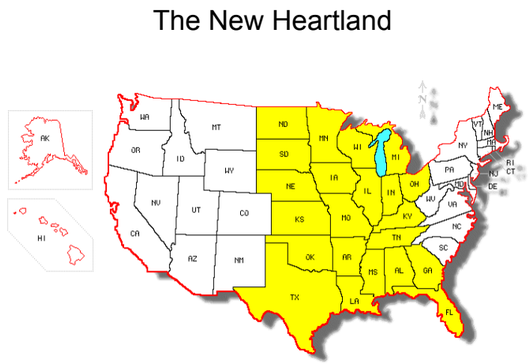
EXECUTIVE SUMMARY

The greatest test America faces is whether it can foster the kind of growth that benefits and expands the middle class. To do so, the United States will need to meet three challenges: recover from the Great Recession, rebalance the American and international economies, and gain access to the global middle class for the future of American goods and services.

The fulcrum for meeting these challenges is the combination of industries and resources concentrated in the New American Heartland, the center of the country's productive economy. Traditionally, the Heartland has been defined as the agriculturally and industrially strong Midwest, alone or perhaps together with the Upper Plains. However, the geographic distribution of US manufacturing and energy extraction has expanded through the growth of new manufacturing zones, largely in Texas, the South and the Gulf Coast.

Our map of the New American Heartland includes not only the Midwest and Upper Plains, but portions of all the Gulf States — Texas, Louisiana, Mississippi, Alabama, Florida — and the non-coastal southern states of Georgia, Tennessee, and Arkansas.

Figure 1



It comprises most of the US between the Rocky Mountains and the Appalachians.

The New Heartland incorporates the old Midwest and much of the South. Alongside it, the new continental periphery consists of the mountain and desert spine of North America from Mexico through to Canada, a region that is likely to remain thinly populated and devoted to resource extraction, tourism and wilderness preservation.

While every region contributes to American prosperity, the New American Heartland has the potential to play an outsized role in powering economic growth in the twenty-first century.

SECTION ONE: THE GEOGRAPHY OF THE NEW AMERICAN HEARTLAND

The boundaries of economic regions are subjective and imprecise. Still, an image of the Gulf of Mexico watershed suggests the rough shape and dimensions of the North American economic core we are calling the New Heartland.

This redefinition of the Heartland recognizes a shift in the changing nature of America's 'core' and its periphery. Initially, America's productive core was located in a strip along the north Atlantic

seaboard, while the rest of the country, both south and west, provided raw materials. With the onset of the industrial revolution and linkage of the Northeast with the Great Lakes region by the Erie Canal, the locus of American production shifted.

Over the course of the nineteenth century, what we now think of as the Midwest emerged as the nation's agricultural and industrial core. This area was linked to a poor, resource-producing periphery — the South, the Southwest, and the Mountain West — that sent the prosperous and diversified Midwest cotton, lumber, cattle, and minerals.

The second industrial revolution, based on the internal combustion engine and emergence of electricity helped integrate the core and peripheral economies. Between the 1930s and 1960s, federal and state public investment in rural electrification, hydropower dams and the interstate highway system modernized the periphery.

The late twentieth century ushered in the information age — the third industrial revolution. The Internet and computers, along with the evolution of container ships, enabled successful national companies to produce and locate facilities throughout North America and the world.

The automobile industry, America's most important manufacturing field, was reshaped as Japanese, German and South Korean automobile companies opened up plants in the US. Some of these 'transplants' were in the Midwest; others, in a new automotive belt stretching across the southeastern US, Texas and Mexico. In shipping, the Gulf Coast became one of the fastest growing US ports. The stage was set for a new phase in America's economic history: the emergence of a New American Heartland.

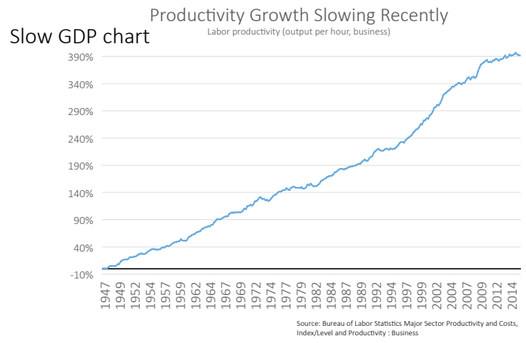
SECTION TWO: THE THREE PRIMARY CHALLENGES FOR REVIVING ECONOMIC GROWTH

The New American Heartland is more than just an emerging region. It has the power to revive and fuel sustained economic growth across the United States. This may be helped by the presence of a new administration whose rhetoric has focused on a broad - based industrial revival and, perhaps equally important, owes its existence largely to the voters of this region.

The First Challenge: Boosting American Growth After the Great Recession

In the aftermath of the Great Recession, the greatest global economic crisis since the Great Depression, US economic growth has been far below the long-term postwar average, and worse than during the previous prolonged low growth period from 1974-1995. Overall, GDP growth from 2008 to 2015 was 1.2 percent a year on average, 2 points lower than the annual average growth rate from 1948 to 2015.[1]

Figure 2



Demographic factors that include an aging population and a falling fertility rate mean that even with plausible levels of immigration, slower workforce growth is likely to result in slower overall GDP growth in the decades ahead.[2]

The Second Challenge: Rebalancing the Economies of America and the Globe

During the three-decade expansion from the 1980s until 2008, the US ran chronic trade deficits and consumed more than it produced. Rebalancing the global economy will require China, Germany and Japan to consume more, and the US to invest more in productivity-enhancing infrastructure in order to increase its manufacturing sector.

The Third Challenge — Access to the Global Middle Class for US Goods and Services

In the twenty-first century, foreign consumers will become increasingly important for the US and other developed countries with aging populations and slow population growth. For the US, this means exporting either finished products or components of a trans-national supply chain.

Most of the upcoming growth in the global middle class will take place in the middle-income countries in Asia, particularly China. US trade policy needs to focus on fairness between the world's two most important economies.

Between now and 2030, middle-class consumer spending in Asia could rise by 9 percent a year, compared to projections of only 0.6 percent a year in the US and Europe.[3] At the same time, population growth will be concentrated in Africa and, to a lesser degree, South Asia.[4] According to one estimate, middle class consumers outside of the West will grow from 350 million in 2015 to 679 million in 2030.[5]

A US economic growth strategy that focuses on the trade sector — and in particular, manufacturing — would address all three challenges.

SECTION THREE: THE IMPORTANCE OF THE TRADABLE GOODS ECONOMY

Manufacturing and energy — automobiles, jet engines, electricity — have historically been prolific drivers of upward mobility and prosperity. In recent decades, according to economist Robert Gordon, the pace of transformational innovation has slowed substantially. The newer innovations have been related to services and information, and they have not sustained previous economic growth rates.

The relative decline of manufacturing is a global phenomenon. As a share of global GDP, manufacturing has declined from 25 percent in 1970 to 15 percent in 2015. Its share of GDP has declined in Germany (to 23 percent) and Japan (to 19 percent), as well as in the US (to 12 percent). In employment, the manufacturing sector lost more than 5 million jobs over that time period, while 29 percent of job gains were in health care, and 15 percent in accommodation and food service.

Of the 32 million US jobs that were created between 1990 and 2015, only 779,000 were created in the 'tradable' sector, according to economist Michael Spence, while more than 31 million were created in the non-tradable sector of goods and services like government, health care, retail, accommodation and food service, and construction.

But manufacturing never employed most American workers.[6] Service and manufacturing employment rose in parallel as agricultural employment declined, until manufacturing employment peaked in the 1950s at 30 percent of the workforce and began its gradual decline. By 2010 nearly 80 percent of Americans worked in the service sector.

Over time, the on-shoring of manufacturing

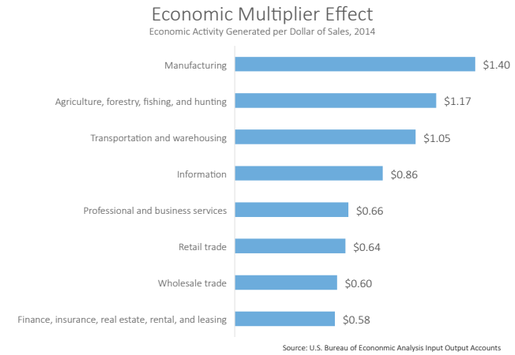
jobs might boost US manufacturing employment somewhat, but in the long run, automation will continue to reduce it. The same phenomenon has already affected agriculture, as a result of technology-driven productivity growth.

Despite this, the tradable sector, dominated by manufacturing and related services, creates much more in terms of value added in a given period than it provides in employment. And in value added per employee, the tradable sector far surpasses the non-tradable sector.[7] From 1990-2008, value added in the non-tradable sector grew only by 12 percent, while in the tradable sector it expanded by nearly 52 percent.[8]

In other ways, too, manufacturing contributes to the economy far out of proportion to its shrinking share of employment. In 2013, the manufacturing sector employed 12 million workers, but generated an additional 17.1 million indirect jobs.[9]

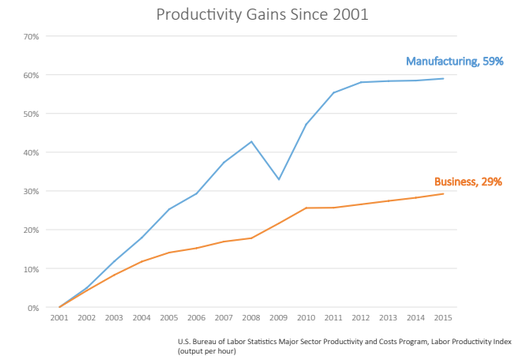
The multiplier effect measures how much a dollar of final demand for each industry generates in terms of additional output. The multipliers in the retail sector (64 cents), wholesale trade (60 cents), and FIRE (finance, insurance, and real estate, 58 cents) are low. The professional and business services sector, while it contains many high-paying jobs, delivers just 66 cents of impact per dollar of output. In contrast, manufacturing has the largest multiplier of any economic sector. A dollar's worth of manufactured goods sales generates $1.40 in output from other sectors of the economy.[10]

Figure 3



The contribution of manufacturing to US productivity growth is also disproportionate. From 1997-2012, labor productivity growth in manufacturing — 3.3 percent per year — was a third higher than productivity growth in the private economy as a whole.[11] The charts below demonstrate that although overall US productivity growth has been weakening, manufacturing has remained consistently ahead. [12]

Figure 4



Perhaps most important may be manufacturing's contribution to higher wages, particularly for blue-collar workers. Tradable services and the 'knowledge economy' are often pitched as saviors

of American workers who face declining manufacturing job prospects, and those jobs do average nearly $90,000 per year. But the distribution of occupations in these sectors is polarized: on one end, highly paid professionals; on the other, support staff making less than $18 per hour. Overall, the goods producing sector pays higher wages than personal services, health care, education and hospitality.

Figure 5

U.S. Tradable Service Industries

Tradable Service Industry Sector	2016 Jobs	2010 - 2016 Jobs % Change	Wages, Salaries, & Proprietor Earnings Per Worker
Computer Systems Design & Related Services	2,126,219	35%	$101,329
Management, Scientific, & Technical Consulting Services	1,615,890	27%	$79,892
Architectural, Engineering, & Related Services	1,524,743	11%	$82,394
Legal Services	1,341,907	0%	$85,726
Accounting, Tax Preparation, Bookkeeping, & Payroll Services	1,202,582	15%	$63,392
Business Support Services	977,637	10%	$37,817
Other Professional, Scientific, & Technical Services	801,395	17%	$45,079
Scientific Research & Development Services	681,657	7%	$128,345
Advertising, Public Relations, & Related Services	552,331	19%	$73,529
Other Financial Investment Activities	534,060	29%	$187,412
Securities & Commodity Contracts Intermediation & Brokerage	461,272	(1%)	$223,596
Motion Picture & Video Industries	454,822	13%	$62,193
Software Publishers	345,219	33%	$142,115
Other Support Services	322,443	15%	$43,457
Data Processing, Hosting, & Related Services	307,957	25%	$96,517
Specialized Design Services	283,022	17%	$43,809
Medical & Diagnostic Laboratories	278,341	15%	$60,017
Other Information Services, Including Internet Publishing	259,442	76%	$164,624
Travel Arrangement & Reservation Services	223,277	7%	$52,676
Sound Recording Industries	25,746	(5%)	$61,202
Securities & Commodity Exchanges	5,646	(31%)	$181,277
Total Tradable Services	**14,325,609**	**17%**	**$88,871**

Source: EMSI Employment Data, 2016.2

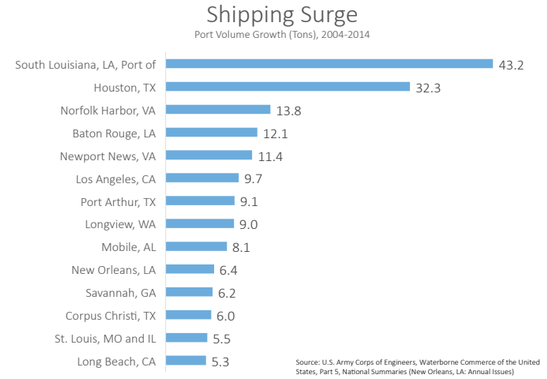
Many blue-collar sectors remain key sources of employment for middle-skill workers. The industries in the "U.S. Tradable Service Industries" chart above all pay above the national average in earnings per worker for some 19 million employees.

For those with less than a four-year education, it is the blue-collar work in fields such as installation and repair, construction and extraction, manufacturing production, and transportation that offer prospects of pay upwards of $15 per hour nationally.

Figure 6

These sectors are also critical to our international competitiveness. In 2015, the US exported $2.23 trillion worth of goods and services combined. Of the total, only $716.4 billion, or about a third, consisted of services.[13] In contrast, exports of goods totaled more than $1.5 trillion.[14] Manufactured goods accounted for 50 percent of all exports.[15]

Figure 7



It is notable that intellectual property payments, like royalties to Silicon Valley tech companies and entrepreneurs, amounted to only $126.5 billion — 18 percent of service exports and less than 6 percent of total exports of goods and

services combined.[16]

SECTION FOUR: THE NEW HEARTLAND AND THE GEOGRAPHY OF THE TRADABLE ECONOMY

Sectors like professional and business services depend largely on goods-producing industries, like manufacturing, energy, and agriculture to generate a market. Their lower multiplier effects relative to manufacturing are indicators of this relationship. These productive sectors generate business for custom software programming shops, accounting firms, advertising agencies, and engineering consultants. Though these service sectors are concentrated on the coasts, their ties to the goods-producing economy present an opportunity to grow within the Heartland region.[17] Many of the fastest growing metropolitan areas for tradable services are located in the Heartland. The largest growth has been in blue-collar towns, largely in the mid-south, the Great Lakes and the Great Plains.

Notwithstanding trade deficits in some sectors like consumer electronics, the US remains an export powerhouse; its major exports are capital goods (39 percent of total exports), industrial supplies (28 percent), consumer goods (12 percent), automotive vehicles, parts and engines (10.5 percent) and foods, feeds, and beverages (7 percent).[18]

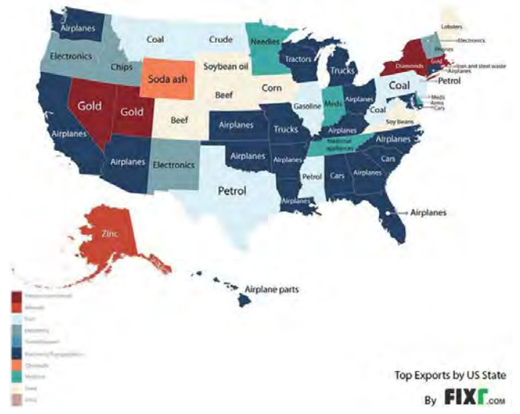
The benefits to the economy of a flourishing manufacturing sector, along with the energy and agriculture industries, justify making the promotion of manufacturing and manufacturing-enabling infrastructure central to a strategy for American economic growth. Any such strategy must focus on mobilizing the existing assets and future potential of the region where America's manufacturing, infrastructure, natural resources and population are concentrated: the New American Heartland.

The Industrial Core of North America

The New Heartland has the potential to emerge as the core of a single manufacturing super-region that includes newly industrialized zones of Mexico and parts of Canada.

Between 2010 and 2016, most of the top states for manufacturing job creation were in the New Heartland.[19] The top four – Michigan, Indiana, Ohio, and Tennessee – accounted for nearly 40 percent of the nation's new manufacturing jobs since 2010. The nation's largest state, California, still holds the largest number of manufacturing jobs, yet it grew that sector by just 3.5 percent, barely half the rate of national manufacturing gains of 6.9 percent.

Figure 8

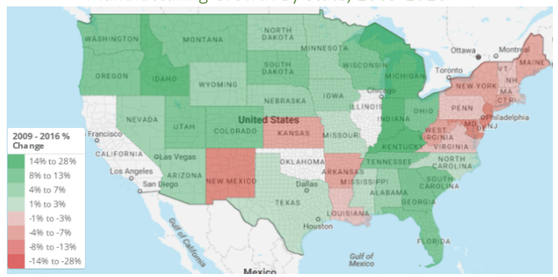


This map of the top exports of mainland states, based on census data for 2014, shows the extent to which the older Great Lakes industrial area and the newer southeastern industrial belt have merged into a single Gulf-to-Great Lakes industrial region. Energy, food and industrial products dominate the major exports of the New Heartland

states. The fastest growing industrial regions are led by Grand Rapids, Louisville, Nashville, Detroit, Austin, Oklahoma City, Cincinnati, Columbus, and Minneapolis, all firmly located in the Heartland belt.[20]

Figure 9

Manufacturing Growth By State, 2009-2016

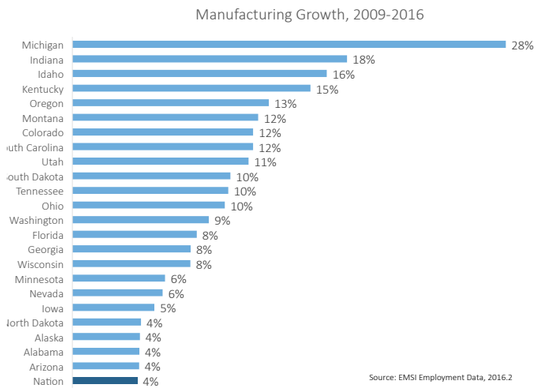


Source: EMSI Employment Data, 2016.2

The future trajectory of industry is likely to continue its focus in the New Heartland, as the Northeast and California continue to deindustrialize. This pattern began to develop in 2010, which marked the end of the Great Recession and the emergence of a limited but sustained economic recovery.

Figure 10

Manufacturing Growth, 2009-2016



Source: EMSI Employment Data, 2016.2

The story of post-Katrina New Orleans is one of Schumpeteresque dimensions. Pre-Katrina, New Orleans was a two-trick pony, economically stuck between the vicissitudes of the energy industry and the low economic mobility associated with the hospitality industry. The metro economy was stagnant over time, growing at only about half the rate of the national average, and far below ascendant cities like Austin, Tampa and Raleigh. The best people and companies left, the energy industry migrated to Houston, the title of "Gateway to the Americas" ceded to Miami, and the population of the city dropped from over 650,000 in the 1960's down to about 480,000 before the hurricane.

When Hurricane Katrina – the worst man-made (engineering) disaster in modern American history – inundated New Orleans, many thought it was a sad but inevitable end to a once-great city. Some headlines suggested "Don't Refloat" New Orleans and that the architectural and cultural treasure be "bulldozed".

But then something amazing happened: out of the destruction, a new creative energy emerged. Public and private leaders banded together, and vowed to not only rebuild New Orleans, but to build it back better than before. This meant strategically levering New Orleans' intrinsic strengths - the river, energy infrastructure, and world-famous culture - in order to diversify the economy and rebuild the middle class.

The result of this focused effort, along with massive ($140B) investment, and some good fortune (see: Super Bowl XLIV), is that the "new" New Orleans is the most economically strong it has been in decades. Spurred by low natural gas prices, industrial companies have invested over $70B in the region, in projects like a recently announced $8.5B LNG facility. The Port of New Orleans is not only seeing record exports, but has diversified into the cruise business, and is now #6 in the nation for leisure.

Advanced manufacturing is undergoing a renaissance, with the former NASA Space Shuttle factory now a public/private facility, building not only the new "Mission to Mars," but also composite windmill blades and commercial drones. Leveraging the "high culture/low cost" arbitrage of New Orleans, software companies are flocking to the city, helping to make New Orleans #2 in the nation for growth of "Knowledge Industries." Out of the rubble of the flood, a new $2B medical center has been built, and New Orleans has even taken the indelible images of hurricane Katrina, and pivoted them into a new industry – Water Management – with local companies now working and advising from New York to Japan.

The net result is that the New Orleans region is first in the south for economic development wins over the past decade. Most importantly, New Orleans leads the nation in "traditional city" population growth since 2010 and for in-migration of college graduates.

Post-Katrina people are voting with their feet, and they are voting for New Orleans.

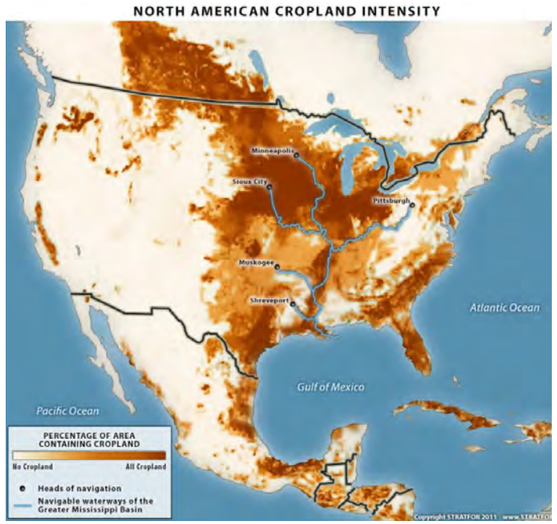
- Michael Hecht

Natural Resource Industries

Even before the onset of manufacturing as the key driver of Heartland development, the region benefited from its great natural bounty in food and energy.

Almost four out of ten of all ears of corn (maize) grown on earth originate in the watershed of the Mississippi River, which is also the source of most US grain, cotton, sorghum, soy, livestock and poultry.[21] Ninety-two percent of US agricultural exports, and 78 percent of global feed, grain, and soybean exports are from the Mississippi Basin. Sixty percent of all US grain exports travel via the Mississippi through the Heartland Port of New Orleans and the Port of South Louisiana to foreign markets.[22]

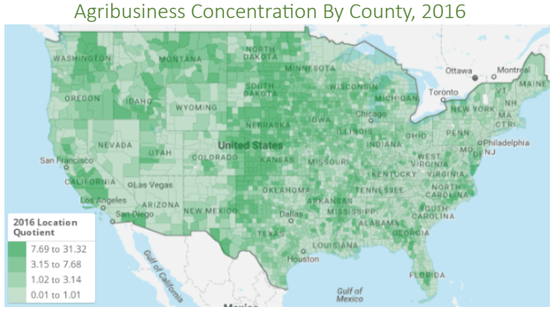
Figure 11



Consequently, the New Heartland is well-positioned to take advantage of the growth in population and prosperity abroad. In a world with an urbanized majority, most people will buy food from regional and global commercial food supply chains, rather than grow it.

Figure 12

Agribusiness Concentration By County, 2016



Source: EMSI Employment Data, 2016.2

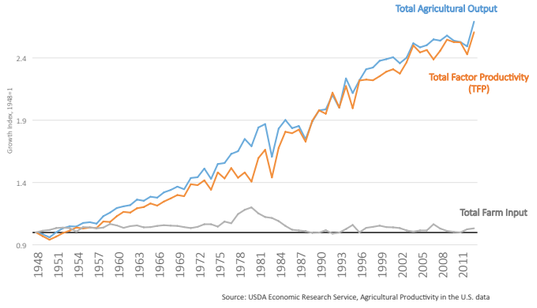
As national incomes increase with development, growing middle classes prefer more meat in their diets. Between 2006 and 2050, consumption of cereals worldwide is expected to grow only slightly, from just under 350 pounds per capita to

just above it. But per capita meat consumption is expected to grow from about 85 to 109 pounds per capita in 2050, and 122 pounds in 2080. Changing global diets will increase the demand not only for livestock, but also for livestock and poultry feed, and for aquaculture.[23]

In the race to feed the larger, more affluent, urban populations of the future, the US has a head start. Today, its share of global exports of sorghum is nearly 80 percent. It provides more than 50 percent of global corn exports, more than 40 percent of soy, and around 20 percent of global wheat exports.[24] America's agriculture, the most productive in the world, will become even more productive and competitive in the years ahead as the industry is transformed by new technologies including drones, genetically-modified foods, and big data.[25]

Figure 13

U.S. Agricultural Inputs, Output, and Total Factor Productivity, 1948-2013
Agriculture productivity gains

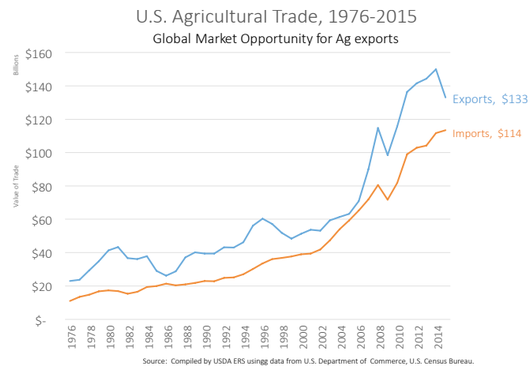


Source: USDA Economic Research Service, Agricultural Productivity in the U.S. data

Simply put, the Heartland is likely to remain 'the nation's breadbasket.' With future demand likely to increase along with global population, this could further enhance its position in the world economy.

Figure 14

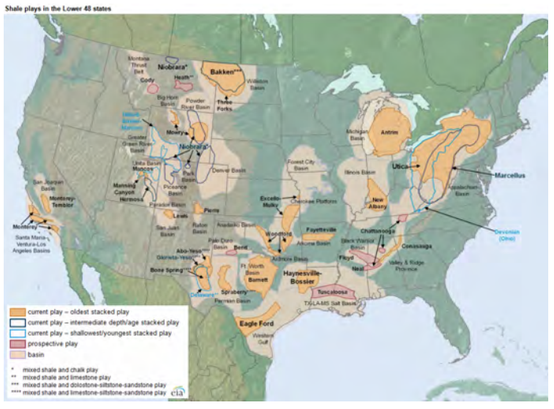
U.S. Agricultural Trade, 1976-2015
Global Market Opportunity for Ag exports



Source: Compiled by USDA ERS usingg data from U.S. Department of Commerce, U.S. Census Bureau.

Perhaps even more important than agriculture has been energy development. The New American Heartland contains the greatest concentration of shale gas and tight oil reserves in the continental United States, and, unlike coastal states such as California and New York, the Heartland has embraced the opportunities for American-produced energy. Despite the recent decline in energy prices, demand is likely to rise as China and other developing countries increase automobile use and seek to replace coal with cleaner natural gas.[26]

Figure 15

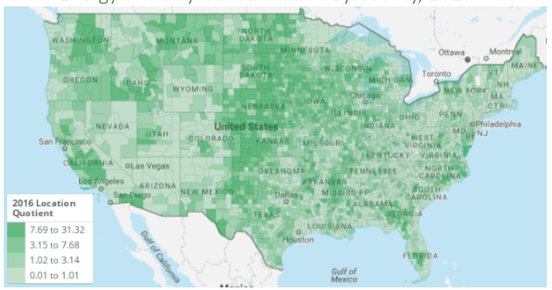


The Heartland has long been a center of energy production, but may produce even more as

California and New York, and perhaps some other coastal states, ban fracking and fossil fuel energy development. There have been attempts by some West Coast ports to ban all shipments of oil, gas and coal, which will likely force producers to export their products through Heartland ports, such as Houston.[27]

Figure 16

Energy Industry Concentration By County, 2016



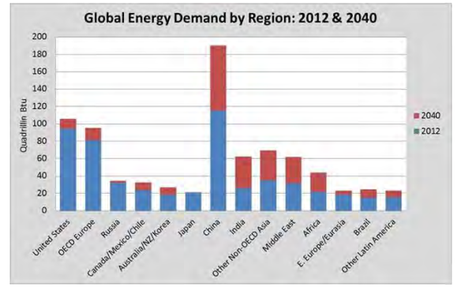
Source: EMSI Employment Data, 2016.2

The technology-driven shale gas and tight oil revolutions promise to usher in an era of low energy prices that will revolutionize the world economy and geopolitics.[28] In the words of energy expert Mark P. Mills, "Until recently, the future of global energy trade resembled an oligopoly of two: Russia and the Middle East stood aloft as the dominant suppliers of oil and gas, particularly for Europe.[29] Now, the US, especially as part of a triumvirate with Mexico and Canada in a North American Energy Common Market, can become not just a stabilizing third player in global markets, but the new dominant one."[30]

Against opposition from environmentalists, the federal government has authorized the export of national gas to Europe and Asia. Global demand for natural gas is predicted to be 50 percent higher in 2035, and the US is well positioned to take market share away from such sometimes less-than-friendly countries such as Iran and Russia.[31]

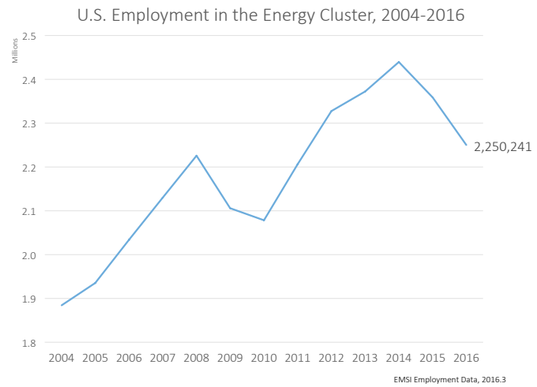
Figure 17

Global Energy Demand Chart



This new energy production has had many positive effects on Heartland economies. For one thing, it has created, even after the current downturn, hundreds of thousands of high-paying jobs, not just for geologists and engineers, but also for blue-collar workers. Overall, energy jobs pay as well, and often better than, those in the heralded occupations, such as finance, business services and information.

Figure 18

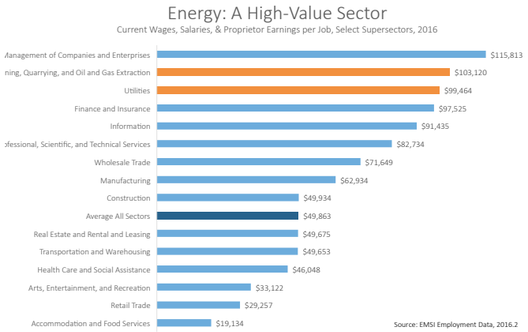


EMSI Employment Data, 2016.3

Although now facing some tough times, the energy boom provided good opportunities to

blue-collar workers directly, and helped increase the wages of service workers in communities where the energy industry thrived. In some parts of the energy belt, wages for service workers nearly doubled during the boom.[32]

Figure 19



Energy development, and in particular, lower prices for natural gas, have tremendously positive implications for the Heartland's industrial sector, with significant employment spinoffs for local service businesses. Low energy prices and stable sources of supply are among the reasons that industrial firms, including those from abroad, have flocked to large parts of the Heartland, notably Texas and Ohio, where energy is a primary generator of high paying manufacturing employment, as well as energy jobs.[33]

Figure 20

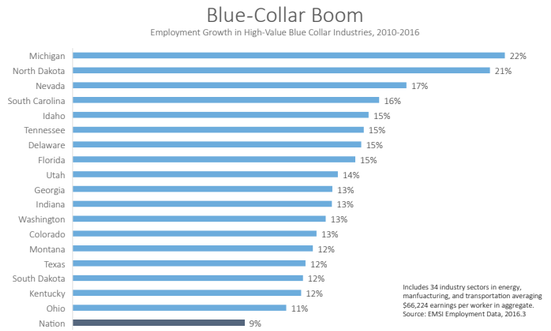
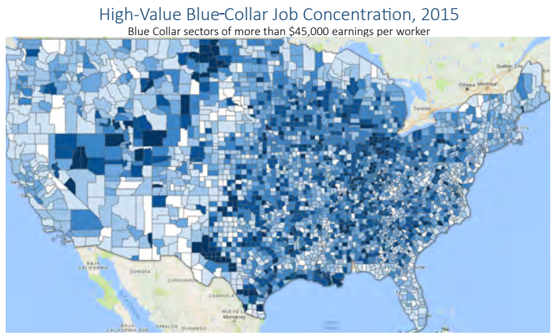


Figure 21



SECTION FIVE: THE REVIVAL OF HEARTLAND URBANISM

Since its emergence, the Heartland developed a flourishing foundation of wealth based on industry, energy and agriculture. From this, the great Midwestern cities arose — Chicago, Detroit, St. Louis, Kansas City, Milwaukee, Cleveland, Columbus, Cincinnati, and Minneapolis — as well as a host of smaller, dynamic places like Des Moines, Omaha, Grand Rapids, Kalamazoo, Fargo and Louisville.

In the latter half of the twentieth century, as the American economy became increasingly centered on services, information, and technology, these cities tended to lag behind. The massive

de-industrialization process — Michigan lost one third of its plant jobs between 1999 and 2006 — that characterized the era left many of these cities, especially the urban cores, bereft of employers.[34] Many urban cores, and in some cases, whole metropolitan areas, lost population.[35] In places where employment has not recovered or continues to fall, the social consequences have been catastrophic.[36]

Historian John Teaford has noted that attempts at redevelopment have usually failed to produce "the miracles" that were expected from new stadia, pedestrian plazas and luxury housing projects.[37] Whereas New York retained its centrality in media, art, and finance, most Midwestern cities, even Chicago, notes Teaford, lacked "cultural allure," and suffered a "sense of cultural inferiority" that accompanied the economic decline.[38]

Figure 22

The southern Heartland cities were slow to industrialize, and were plagued with a heritage of racial discrimination, economic under-development, and low education levels. Unlike their Midwestern counterparts, these southern cities generally continued to grow, particularly as industry relocated to lower-tax, non-union cities both in the south and the west.

The media and academics have largely viewed Midwestern and southern Heartland cities as failing to become "informational cities," in comparison with New York, San Francisco, Los Angeles and other global cities.[39] The information hubs, it is widely held, are destined to become even richer and more influential, based primarily on their predominance of "producer services."[40]

This notion certainly had merit in the past, but fails to recognize forces that are bolstering the urban appeal of New Heartland cities based largely on economic opportunity and lower costs, especially housing. Migration flows are transforming once declining or underdeveloped cities into vibrant and attractive ones.

Shifts in Migration Flows

The metropolitan areas of cities like Des Moines, Indianapolis, Louisville, and Columbus have experienced net domestic migration gains in both the 2000s and 2010s. In most cases, they are dominated by migration from more rural parts of the region, as opposed to from the rest of the country.[41]

The most spectacular growth has been in the southern parts of the Heartland, particularly Texas and the Mountain West, which have appealed to people from the Northeast and California. Altogether, the New Heartland has experienced a strong net inflow from the rest of the country, including California, which once received many people from the Heartland. Particularly revealing is the latest IRS data, which shows that many of those leaving key Northeastern and California states are people in their childbearing years between 25 and 54.

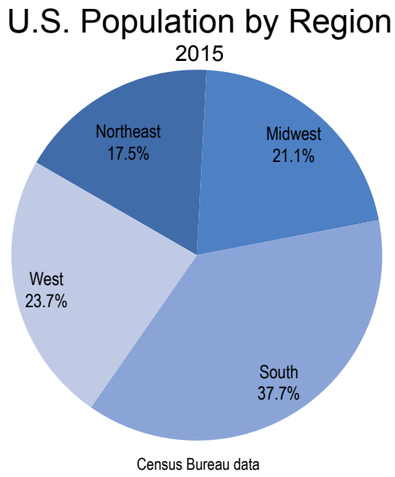
The net domestic migration loss in 2014 from

California and the Northeast – from the District of Columbia to Maine – among households of 25 to 54 year olds was approximately 180,000. By comparison, in the New Heartland there was a net migration gain of 72,000 among households in the same age range. Put another way, this northeastern stretch lost 15 percent more domestic migrants than it gained. The New Heartland gained 3 percent more in-migrants than it lost out-migrants. There was also net in-migration in the states outside the New Heartland and the Northeast Corridor (Figure 23).[42] The balance of the nation gained 7 per cent.

Not all areas of the New Heartland enjoy strong net in-migration. Some Deep South states have experienced net domestic out-migration, as has Illinois. At the same time, some Great Lakes states that traditionally were large losers of domestic migrants, such as Michigan and Ohio, have seen their out-migration rates drop since 2000. Overall, the trends suggest that the New Heartland areas will dominate the nation's population growth in the years ahead by widening margins. According to a 2015 Urban Institute Report, growth between now and 2030 will be led by four areas, all of them within the New American Heartland: the Texas-Oklahoma region, the southeastern Piedmont, Florida, and the Front Range area including Denver, Colorado.[43]

The combination of a slowing of migration losses in some New Heartland states and rapid migration gains in others, led by Texas, suggest that the region is likely to remain demographically dominant in the future. In 2015, the South (37.7 percent) and Midwest (21.1 percent) as defined by the Census held 58.8 percent of the US population, compared to 23.7 percent for the West and 17.5 percent for the Northeast (Figure 23).[44]

Figure 23



These trends will greatly affect the locus of population in the country. Both the northeastern region and coastal California are projected to grow slower than the national average between 2010 and 2030.[45] The demographic momentum belongs to the New Heartland, particularly its southern and western reaches.

Quality and Standard of Living Factors

Quality of life considerations increasingly favor Heartland cities, particularly as crowded coastal cities become more congested and expensive. For example, the difference in traffic. In general, the cities of the New Heartland have less congestion than those along the coast, with the exception of Chicago. This is important not only for commuters, but also for those shipping goods.

According to the Tom Tom Traffic Index, cities in the New Heartland rate the best, with five of the six least congested cities in the world out of the 295 rated.[46] They include Knoxville, with a 7 percent average traffic delay, and Dayton,

COLUMBUS, INDIANA

Columbus, Indiana is a small city in a metropolitan area with 80,000 people that hardly reflects the typical script of a dying, small Heartland industrial region.

In fact, Columbus is thriving and doing it with an economy that has nearly 38% of its jobs in manufacturing. The city benefits from being home to the corporate headquarters of diesel giant Cummins Engine, yet still lacks a major university, a large technology startup sector, or any notable natural amenities.

Columbus' success shows what corporate leadership can do. The late J. Irwin Miller, the Yale-educated CEO of Cummins Engine, recognized as far back as the 1950s that attracting engineering talent to his small city would be a challenge. He decided that first he needed to show prospective employees that his town had great schools. So, he launched a program in which Cummins would pay the architectural fees for new school buildings, provided that they picked an architect off his list. His program expanded to other public buildings over time.

Miller's list was a who's who of modern architects, including Eliel and Eero Saarinen, Harry Weese, I.M. Pei, and César Pelli. The American Institute of Architecture now ranks Columbus as the sixth most architecturally significant community in the United States.

With its public and private buildings, Columbus has focused on the quality of life game long before other Heartland cities, allowing Cummins to thrive there. Other manufacturers have caught on as well. Columbus is home to 20 Japanese firms, including Toyota, NTN, and Enkei as well as plants from firms based in Germany, China, France, and elsewhere. It is by far the top destination for foreign direct investment in the southern Indiana region.

Although a quintessentially Hoosier city, Columbus has become more globally diverse, with a foreign-born population of around 9%. It has established an international welcome center to help new foreign arrivals, often high skilled engineers and executives, to acclimate themselves to the community.

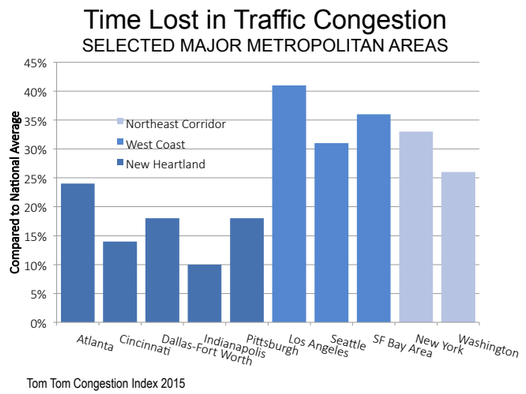
Columbus has been gaining residents – population is up over 13% since 2000 – and strongly performed by better than two to one when compared to the national level of job growth. Its per capita income is 96% of the US average, which is a solid showing given the area's very low cost of living.

Columbus shows how Heartland communities can compete and thrive in a globally competitive world through a mixture of pro-business policies and attitudes, and forward-looking quality of life investments – with an economy still centered on industry.

- Aaron Renn

Omaha, Kansas City and Indianapolis. Among the 153 urban areas with populations of more than 1,000,000, Kansas City and Indianapolis ranked the best, with an average travel time loss of 10 per cent.

Figure 24



Tom Tom Congestion Index 2015

Housing Cost

By far the greatest allure of the New Heartland for potential migrants lays with the cost of living, which is consistently lower, base d on income, than in the Northeast or on the West Coast, particularly California.

The major metropolitan areas of the New Heartland have an average cost of living that is 4 percent below that of the nation. By contrast, northeastern cities have a cost of living nearly 10 percent higher than average, and cities of the West Coast nearly 12 percent higher (selected city examples are shown below).

Costs of living are strongly associated with disparities in housing prices. In the Heartland, housing prices are considerably lower, relative to incomes, than their elite city rivals. To use a price-to-income ratio called the "median multiple," the median house in New Heartland major metropolitan areas costs 3.4 times the median household income.[47] Compare this to 7.5 times in California, 4.4 times in the balance of the West outside California, 4.3 times in the Washington to Boston Northeast Corridor, and 3.7 times in the balance of the non-Heartland South.[48] For the last 33 years, the New Heartland's median multiple has been below that of the four other regions noted above.[49] There is a growing body of literature that suggests a strong association between higher house prices and net domestic outmigration.[50]

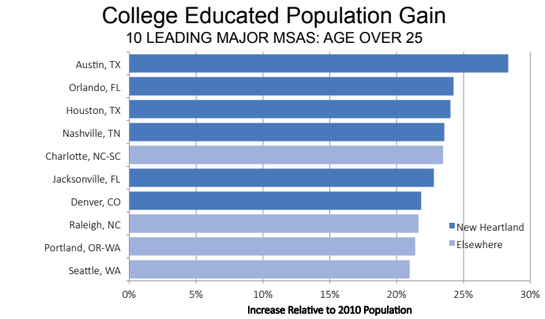
Figure 25

Calculated from BEA 2014 Data (Regional Price Parities)

Millennial Migration

Perhaps most paramount have been changes in youth migration. Research conducted by Cleveland State University suggests a sea change since 2010 in the migration patterns of educated millennials towards Heartland cities. In earlier periods the strongest growth did indeed go to 'hip and cool' cities like San Francisco, San Jose, Washington DC, Los Angeles and New York. More recently, the big growth has been in such 'rustbelt' cities as Pittsburgh and Cleveland, as well as Sunbelt standouts such as San Antonio, Houston, and Austin, all of which increased more than the Bay Area, Washington, or New York.[51]

Figure 26



Derived from Census Bureau data

Millennials represent the nation's largest living generation. These trends foreshadow likely migration patterns, and may become more pronounced when the younger cohort begins to start families and seek out homes.[52]

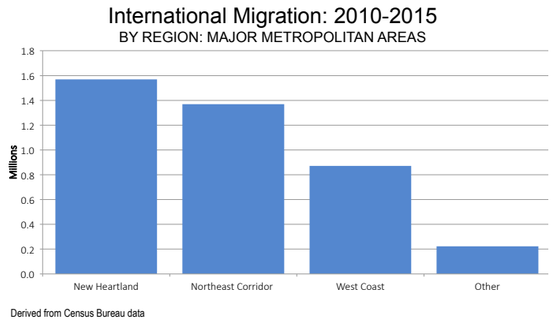
International Migration

Some coastal metropolitan areas have depended on international migration to replace exiting native-born Americans during the past decade. Foreign immigration has long been critical to the growth of cities, and may be of even greater importance in the globalized era. Immigrants often bring skills and entrepreneurial tendencies that are in short supply; they also boost the cultural life of cities.

New York, Los Angeles, Washington, Baltimore, Boston, and Philadelphia would be shrinking without international immigrants.[53] But today, much of the fastest rise in foreign-born populations is not taking place in coastal areas, but instead in the Southeast and mid-South, in Texas, and even in parts of the Midwest. Indeed, since 2000, the growth of foreign born in absolute numbers was greater in Dallas-Ft. Worth, Houston and Atlanta than in Los Angeles or San Francisco, longtime major centers for immigrants. Even the suburbs of Detroit have attracted large pop-

ulations of Asians — a nearly 70 percent increase from 2000 to 2014 —as companies such as Toyota, Nissan and Hyundai have established a major presence around the auto capital. [54]

Figure 27



CLEVELAND OR NOWHERE

Figure 28

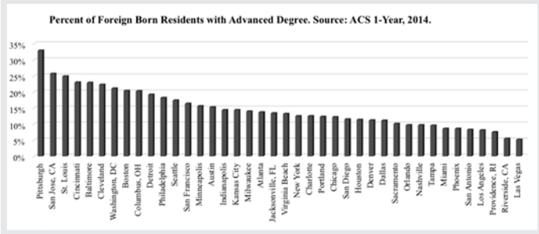
During Game 7 of the World Series in Cleveland, LeBron James—the second most famous athlete in the world—was in the stands wearing a shirt that read: "Cleveland or nowhere". [55] The image provided a powerful counter narrative to the belief that Cleveland, like other Midwestern cities, was simply a place to leave. It is a far cry from the sentiments of early 20th century playwright Tennessee Williams who wrote: "America has only three cities: New York, San Francisco, and New Orleans. Everywhere else is Cleveland." [56]

Long ignored, Middle America's metropolitan areas are back onto the nation's mental map. This reflects larger structural changes reasserting Middle American relevance. In a recent report entitled "Brain Gain in America's Shrinking Cities", Manhattan Institute's Aaron M. Renn found that numerous Rust Belt cities, including Pittsburgh, Buffalo, and Cleveland, "are holding their own with—and, in many cases, outperforming—the rest of the country in overall education-attainment rates". [57]

This Rust Belt revival reflects more than cities transforming themselves into consumption centers. It is jobs related. Over twenty percent (20.3%) of employed Clevelanders aged 25 to 44 have an advanced degree. [58] For Pittsburgh, the number is 19.9%. This ranks the regions 5th and 6th out of the top 40 metros in the concentration of young workers with an advanced degree, just ahead of Seattle and New York.

Where do these young adults work? Nearly 75% of the advanced degree workforces in both Cleveland and Pittsburgh are employed in four leading sectors: education, health care, professional services (including research and engineering), and manufacturing. [59]

Figure 29



The evidence of talent clustering is just as stark when we analyze the region's immigration patterns. Pittsburgh leads the top 40 metros with 33% of its foreign-born holding an advanced degree, ahead of second place Silicon Valley (25.7%). Other Middle American metros in the top 10 include St. Louis (24.9%), Cincinnati (23%), Cleveland (22.3%), and Columbus (20.3%). Overall, Ohio is the most educated state in the nation in terms of concentration of foreign born with a graduate or professional degree (21.7%).

"History is a relentless master," said John F. Kennedy, intimating the cyclical nature of events. The Industrial Revolution enabled regional industrialists to "early-seed" some of the best anchor institutions in the world, like Carnegie Mellon University in Pittsburgh, Washington University in St. Louis, and the Cleveland Clinic. That investment—initially motivated to keep those same industrialists healthy and their sons and daughters educated—are now proving critical to regional economic development.

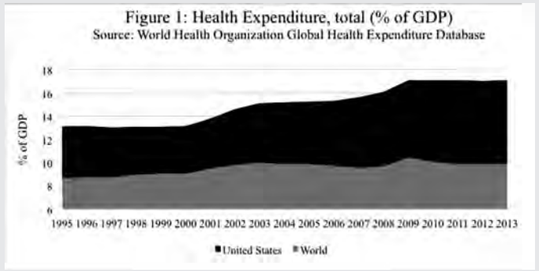
These institutions are of ever more strategic importance as Wall Street continues its prioritization of short-term profit at the expense of the ability of private industry to perform "blue sky" research. [60] Now roughly 75% of applied and basic research in America takes

place on university campuses.[61] This shift suggests a competitive advantage for the region economically.

Increasingly, this knowledge production is reversing the postwar pattern which concentrated innovation on the coasts. For instance, Uber's recent location of its Advanced Technologies Center into Pittsburgh—to be near the artificial intelligence and robotics expertise housed in Carnegie Mellon and away from California regulators—has turned the city into a center for the national autonomous vehicle movement.[62] In Cleveland, IBM announced the construction of a new healthcare analytics division beside the Cleveland Clinic.[63] There, hundreds of programmers, alongside some of the world's best practitioners, will work to make health care better and less costly.

A case can be made that the nascent health analytics scene in Cleveland is not unlike what occurred in Silicon Valley during the Cold War. The federally-funded advancement of innovation in Northern California was key in President's Kennedy's "moonshot" bet in the race to space with the Soviets. Today, the race in America is largely the product of demographic change, as the aging Boomer cohort exposes inefficiencies in the nation's healthcare system. Over 17% of the national GDP is comprised of health expenditures in the U.S., compared to 10% globally. The fiscal constraints have become an issue of national security.

Figure 30



Of course, such tech efforts do not make Cleveland or Pittsburgh cool, at least in the classic case. Medtech and autotech, after all, do not have the sheen of consumer tech firms like Twitter or Facebook. But then again, cool is in the eyes of the coder. "You can work for a cool tech company with a texting app," said a Cleveland software engineer recently. "Or you can work for a company that improves health for millions of people."[64]

In that respect, Tennessee Williams' dig that "everywhere else is Cleveland" doesn't have a bad ring to it. It is better to be everywhere than nowhere. Just like LeBron said.

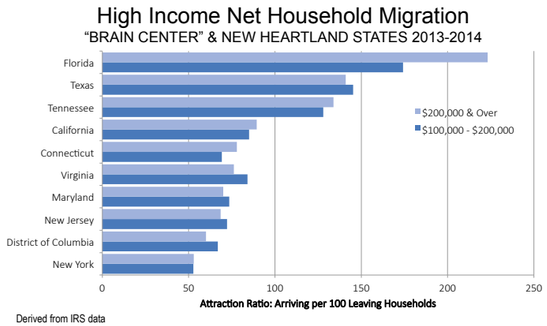
- Richey Piiparinen

The New Heartland Brain Belt

One common assumption by coastal pundits has been that growth will cluster in areas often considered 'brain centers,' while the Heartland states will attract those, native born or immigrant, without degrees or preferred skills.[65] This suggests that while some people may move to less expensive areas, elite industries and their employees will remain concentrated in the coastal cities.

Yet, a recent analysis of 2014 IRS data shows that more households with incomes over $100,000 annually are leaving states with strong information technology and financial industries than are arriving. These places include California, New York and its New Jersey and Connecticut suburbs, Massachusetts, and the Washington, DC area (District of Columbia, Maryland and Virginia). At the same time, more are arriving than leaving the New Heartland states of Texas, Florida, and Tennessee.[66]

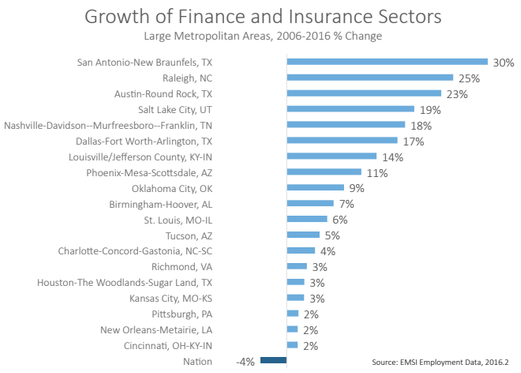
Figure 31



Over the past decade, and particularly the past five years, both the southern tier and Heartland areas have been growing in attractiveness to high wage industries. In financial services, for example, fourteen of the fastest growing places, led by Nashville, are in the Heartland. Texas alone accounts for three of the top seven fastest growing areas out of 70 large metros, and Dallas-Ft. Worth

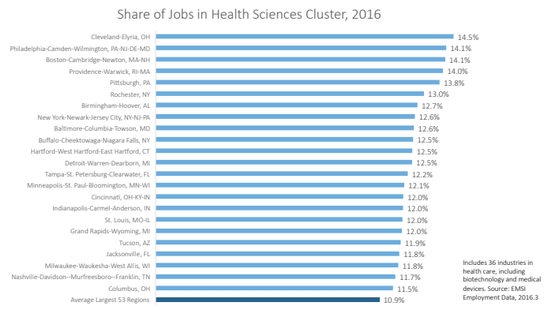
now has more financial jobs than any metropolitan area besides New York.[67] The shift to more affordable areas in the middle part of the country has taken place as more conventional financial areas, such as Bridgeport-Stamford in Connecticut, with its high costs, have declined markedly.[68]

Figure 32



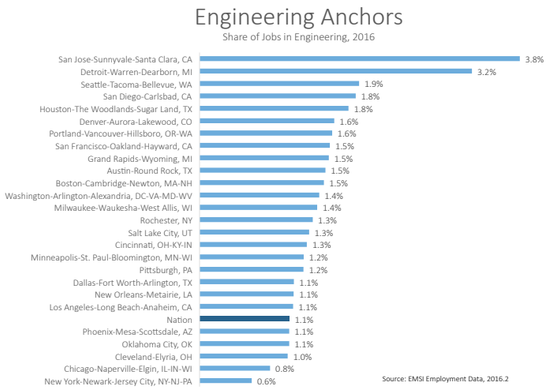
At the same time, Heartland cities are making major progress in terms of medical care and research, one of the fastest growing industries in the country. Much of this is built on a foundation of legacy institutions such as Rochester, Minnesota's Mayo Clinic, Washington University in St. Louis, the Cleveland Clinic, and the Texas Medical Center in Houston.

Figure 33



Many of these achievements reflect the region's human endowment. The northern Heartland and the Midwest possess many of the largest concentrations of engineers in the nation. Areas such as Detroit, Houston and Dayton lag only much celebrated 'brain centers' like the San Francisco Bay Area and Seattle in terms of engineers per capita. And, significantly, these 'rust belt' regions have far greater concentrations of engineering talent than the country's two largest megaregions, New York and Los Angeles.[69]

Figure 34



The New Heartland is becoming more attractive to educated workers overall. The number of educated workers in many Heartland cities — Nashville, Orlando, Austin, Houston, Jacksonville and Denver — has been growing faster in recent years than in places like Los Angeles, San Francisco, Boston and Washington DC. These new knowledge workers can increasingly find both opportunities and lower living costs in the New Heartland.

All these trends suggest that the Heartland, long considered an urban backwater, is increasingly on the cutting edge of city development. One-time provincial cities, such as Nashville, have suddenly emerged as what the *New York Times* calls an "it" city.[70] Charlotte, Austin, and Atlanta

are among the few that have had this kind of reputation for some time.[71]

What is often missed is the nature of the correlation. A generation of pundits has claimed that the way for a region to revive is to attract the cultural 'creatives' and become 'cool.' Yet, Nashville, Columbus, Houston, Dallas-Ft. Worth and even Cleveland gained a 'vibe' not because they have suddenly become hip, but because of fundamental new economic opportunity.

Because they attract companies with well-compensated employees, these areas now boast a growing array of amenities, both urban and suburban. Kansas City, for example, has seen its downtown residential populations surge, and even Detroit's long desolate downtown shows sign of life.[72]

SECTION VI: POLICIES FOR THE NEW AMERICAN HEARTLAND

The New American Heartland is rich in assets: population, resources, agriculture, manufacturing and infrastructure. But if the Heartland is to achieve its full potential as an engine of American and global economic growth in the twenty-first century, these assets must be entirely put in play.

The first step toward a comprehensive strategy is to begin thinking of the New American Heartland as a semi-continental 'super-region', including a number of conventional multi-city 'megaregions', like the Texas Triangle.

The federal government has a limited but legitimate role in supporting regional economic development. Instead of promoting top-down plans or competing with state and local economic development initiatives, the federal government should complement them by leveraging its strengths, including basic R&D in science and technology, direct federal aid for infrastructure like highway spending, and indirect support through the federal tax code for state and local infrastructure finance and appropriate public-private partnerships.

While supplementing the efforts of the private sector and state and local governments in useful ways, the federal government should not thwart economic development by means of misguided regulations. For example, policies that seek to mitigate possible harmful climate change by raising the cost of fossil fuels, rather than by increased efficiency or technological innovation, pose the danger that energy industries (and others sensitive to energy costs) would simply shift to other countries. This comes at the cost of American employment and productivity growth, and with no beneficial effect on global emissions.[73]

Economic development should be as 'bottom up' as possible, and preferably driven by the state and local governments with appropriate federal support. To succeed, bottom-up economic development needs to be based on a sound understanding of the fundamental strengths of a particular area.

Agglomeration succeeds because of specialization. Every city or county cannot be Silicon Valley, just as it cannot be Hollywood or Wall Street. State and local governments may waste effort and resources on doomed attempts to occupy niches that are already occupied. Research universities that have been in the New Heartland since the establishment of land grant colleges in the nineteenth century can serve as powerful drivers of regional specialization and expertise.

From a broad historical perspective, neither

industry-chasing at the municipal level nor top-down government industrial or procurement policies have played the major role in US industrial development. The most important part has been played by infrastructure investment, which precedes and enables new development in the productive economy. This is best driven by the region's local economies, and by ad hoc arrangements to meet specific goals.

The Case for Infrastructure-Led Industrial Development

State-of-the-art, modern infrastructure is essential for national economic growth to be maximized. It reduces costs for national producers and consumers in the home market, and in foreign markets. It is predictably more important for a region whose primary exports remain based in the material world of energy, manufactured goods and agriculture. For the most part, the same infrastructure serves both producers for the national home market and producers that are part of regional or global supply chains.

Even if the improvements are incremental, rather than radical, they compound over time to the benefit of producers and consumers alike. And truly radical gains are associated with the replacement of one kind of infrastructure with a wholly new one — canals by railroads, telegraphs by telephones.

The case for infrastructure-led industrial development is obvious, on a moment's reflection. Factories, farms and mines almost never spring up in advance of the infrastructure that connects them to markets. Instead, the infrastructure is built first, and productive enterprises and communities rise around it.

CASE STUDY: A MICROCOSM OF THE NEW HEARTLAND IN THE COLUMBUS, OHIO REGION

NO RUST HERE

There is a mass media-fueled idea, revived every presidential election, that Ohio is a "Rust Belt" place with only a past but no future. However, that is certainly not the case in the Columbus region, the fastest growing metro area in the Midwest.

Despite some common perceptions, technology is nothing new here. For over 50 years, precision gyroscopes have been manufactured at Heath, Ohio in Licking County—population 10,000. Boeing Company technicians take a reference shot of the North Star to ensure the test equipment and calibration devices they manufacture have the precision accuracy equivalent to a pencil point on a football field. Missile components, aircraft and navy navigation devices, and RF antennae are assembled here for the defense of our nation.

Just 17 miles west, also in Licking County, the reshoring of manufacturing jobs is already becoming a reality. Big machines fill sparkling soaps into a container manufactured down the street with an aluminum cap that was produced next door. Retailer L Brands has created a manufacturing village, surrounded by cornfields and cow pastures, to house previously off-shored manufacturing.

Eight miles south, Amazon's robots position small products for fulfillment of a customer's order. Four thousand people report to work at the Etna, Ohio distribution center that opened in 2016. It is not a dream to imagine drone deliveries from here in the not-too-distant future.

Logistics matter in the New Heartland. The Panama Canal's opening brings competition to the middle of the country. The emergence of the Third Coast, along with the east and west coasts, provides the Industrial Midwest with more logistical options. Columbus is second only to Pittsburgh in reaching the highest percentage of the U.S. population in a day's drive. Options and reach mean pricing advantages.

Energy is part of the story - an industry whose prospects, despite the decline in prices, seem certain to be enhanced in the new administration. Horizontal drilling technology improvements have made natural gas and oil supplies more plentiful, and inexpensive, than long assumed.

Central Ohio and the rest of the New Heartland has a bigger role than many have imagined. The Heartland – long defined by pejoratives like the "Rust Belt" and "Fly-Over Country" – is back; and the story is just unfolding.

- Rick Platt

The Erie Canal, for example, stimulated the growth of the Great Lake ports of Buffalo, Cleveland, Detroit as well as Chicago, which later became, and remains, the most important hub in the continental railroad system. It connected the Northeast to the Great Lakes first, and the massive growth of Midwestern farming to supply northeastern markets followed.[74] After World War II, communities sprang up at the intersection of new highways.[75] The writer John D. Kasarda coined the term "aerotropolis" to describe urban development driven by airport infrastructure.[76]

In the first industrial era, factories with steam engines fueled by coal often sprang up near the waterways on which coal was shipped. Electricity liberated manufacturing from its bondage to water-borne coal supplies, but greenfield factories on cheap land still needed to be connected to electrical grids and roadways. Following World War II, the interstate highway system allowed companies to disperse factories to lower-cost regions of the country.

In some cases, logistics companies themselves have pioneered economic development. For example, Atlanta-based UPS, a multimodal logistics company, is experimenting with on-demand manufacturing (3-D printing) in its stores, in order to shorten supply chains for its customers.[77]

Infrastructure for a New American Heartland

The centers of global consumption outside of North America in the next half century will be Europe and Asia. Over time, India may not only surpass China in population, but also catch up in GDP. Over an even longer period, the billion-plus people who are predicted to live in Africa by 2100 may contribute a growing share to the global consumer class.

It follows that a strategy for infrastructure-enabled, manufacturing-led economic growth in the New American Heartland should begin with these present and prospective foreign markets, and work backwards to determine the appropriate connections with American producers.

The key link between the New American Heartland and foreign markets will be seaports and inland waterways. Roughly 90 percent of global trade is carried by ship.[78] Producers in the American heartland will be connected to foreign markets through the Gulf of Mexico and the Great Lakes via the Saint Lawrence Seaway.

The Heartland's largest container port, Houston, ranks 15th largest in tonnage in the world. However, this ranking could materially improve as the expanded Panama Canal makes Houston more accessible from East Asia, where nine of the 10 largest container ports in the world reside. The Port of Houston has invested about $1 billion in expanded Panama Canal related improvements to handle the expected 7 per cent increase in Gulf port share of Canal traffic in 2017, and 3-4 percent increases every year through 2028.[79]

Along with Atlantic ports such as Savannah and New York, Gulf ports in Mississippi and Alabama are expected to receive more container traffic business to and from Asia via the expanded Panama Canal. West Coast port traffic is growing slower than that on the East Coast and Gulf Coast ports that serve the Heartland, like the ports of Houston, New Orleans, Mobile, and Savannah.[80]

Increased shipping will put strains on America's inland waterway system, which is made up of more than 12,000 miles of inland waterways, in addition to Gulf and Atlantic Coast intra-coastal waterways.[81] Upgrading ports that link the New

American Heartland with global commerce must be one of the priorities of a region-wide economic development strategy. Unfortunately, when it comes to funding port infrastructure, the US ranks 23rd in the world.[82]

Figure 35

Inland Waterways

Rail, Road, Air… and Robots

Ports and inland waterways in the New American Heartland must be connected with factories, farms, mines, oil wells, warehouses and offices with minimum congestion and friction. A key part of any region-wide development effort should be to study how to best link ports and waterways with state-of-the-art rail, road and air transportation infrastructure, as well as pipelines and power grids.

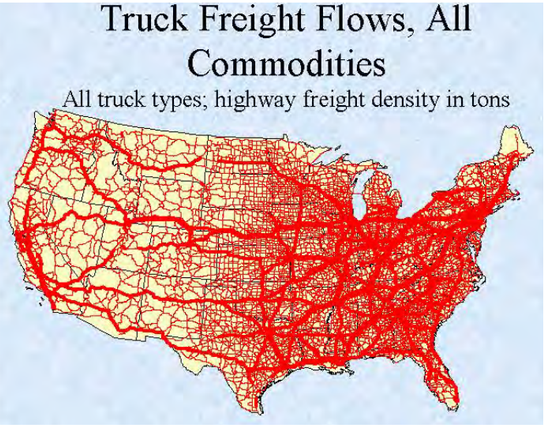
Rail congestion is a major bottleneck to US economic growth. A quarter of freight rail traffic passes through Chicago, North America's most significant railroad hub. In 2012, it took 33 hours for the average freight train to move through Chicago.[83] Another problem is the heavy use of freight rail to transport shale gas and tight oil cross-country. One solution is the build-out of new oil and gas pipelines.

A major, long recognized flaw of the existing Heartland transportation system — both rail and surface — is the lack of adequate north-south freight corridors. Most major rail networks and highways run east-west, yet the future of economic and demographic growth runs on a more north-south axis. This is an area where private industry and investment, in cooperation with regional authorities, can play a critical role.

Some national transportation initiatives have failed because members of Congress could not resist the temptation to appease supporters by multiplying the number of "high priority" corridors.[84] This means that state and regional efforts are necessary to create an efficient twenty-first century highway infrastructure in the New Heartland and other parts of the country.

Figure 36

Trucking for the future



One proposed economic development corridor, the Ports-to-Plains corridor, would be a 4,950

mile infrastructure network from northern Alberta to the port of Mazatlan in Sinaloa, Mexico, linking a North American region including Alberta and Saskatchewan and nine U.S. states—Texas, New Mexico, Oklahoma, Colorado, Nebraska, South Dakota, North Dakota, Montana and Wyoming.[85] The Ports-to-Plains region generates more than 25 percent of total U.S. trade with Canada and Mexico, contains four of the top eight U.S. farm states, includes shale gas and tight oil plays from the Bakken in the northern Plains to the Permian and Eagle Ford in Texas, and also includes eight of the ten states that contribute almost 78 percent of America's wind-power generation capacity.[86]

In 2014, a highway along US Route 83 for self-driving freight trucks from Canada through North Dakota and other Plains states to Texas and Mexico was proposed.[87] One of the states on the proposed robot route, Nevada, licensed the first self-driving truck.[88] The economic benefits of widespread adoption of autonomous vehicles are potentially enormous.[89] Cost savings include reductions in crashes and congestion, and higher fuel economies. Like self-driving trucks, civilian drones may also transform logistics.

Advanced technological infrastructure, including cloud computing, voice over Internet protocol (VoiP), and telecommuting software may reshape patterns of work and residence.[90] In 2015, 37 percent of Americans said they had telecommuted, defined as using a computer to work from home.[91]

This changing employment picture does not mean the Heartland should abandon industrial pursuits. Quite the opposite. Skilled workers, particularly those who can operate automated equipment, are already hard to find, and there remains a pressing need to educate the next generation of machinists, welders and tool operators — many of them well paid — necessary for a revived, more technologically advanced industrial infrastructure.[92]

Robotization may reduce many lower-skilled jobs, but could also bring more manufacturing to the US with excellent opportunities for properly skilled workers. Indeed, in many key Heartland areas, such as Iowa, there appears to be a long-term shortage of employees across the spectrum, something very different than the image of a declining region driven by "dying" basic industries.[93] The current shortage of welders, now 240,000, could grow to 340,000 by 2024.[94]

The rapid pace of technological innovation means that any long-range master plan for infrastructure in the New American Heartland might be obsolete within a few years. What is needed is not a top-down strategy, but an environment that facilitates innovation and entrepreneurship, and leaves most initiatives to private companies, local authorities and ad hoc associations.

CONCLUSION

The American people today have a choice of futures. One influential narrative holds that America has become a post-industrial 'knowledge economy,' in which the lead industries will be services like software and finance. In this view, the US can delegate the manufacturing of material goods to low-wage, low-tech nations, and subsist from the licensing of patents, royalties and other forms of intellectual property.

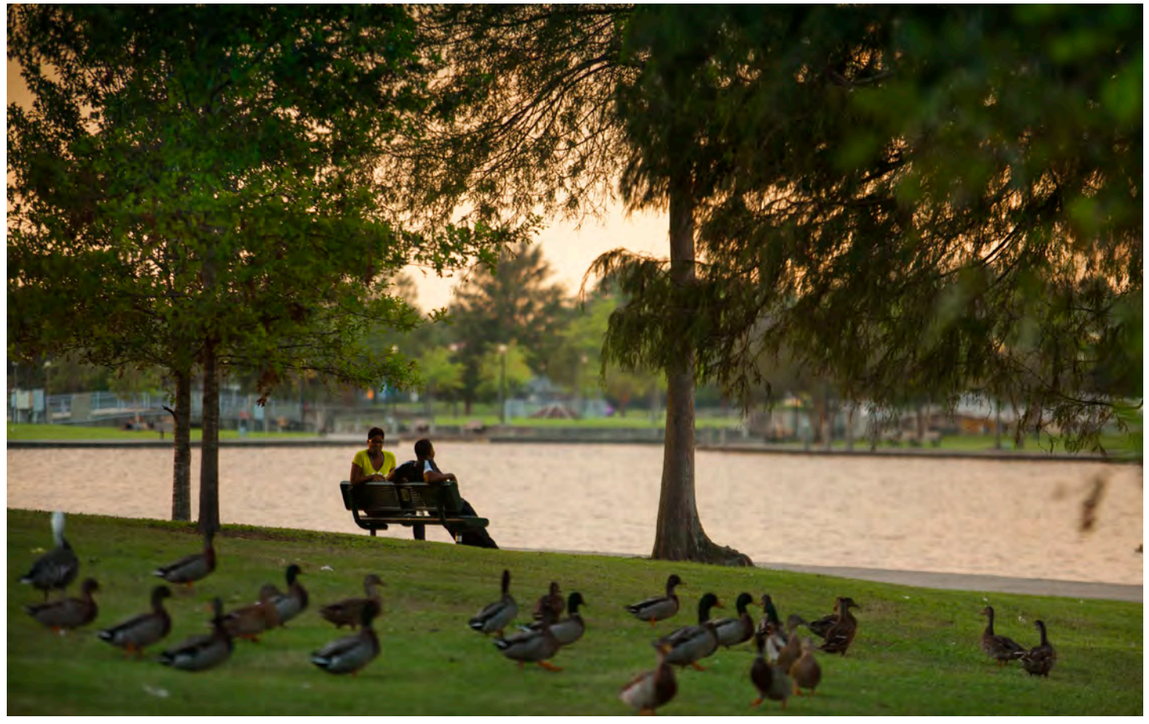
Unfortunately, while a few fortunate individuals can live on incomes from capital gains, continental nations with hundreds of millions of people cannot. As we have seen, service exports are only about a third of total US exports of goods and services.

And while most jobs in the future will not be in manufacturing and other traditional industries, the industrial era itself has not ended. The information technology revolution is merely the latest phase of the evolving industrial economy, not the beginning of a post-industrial knowledge economy that does not rely on tangible industries.

Tradable sector industries with enormous markets at home and abroad will contribute disproportionately to national productivity growth, and to economic opportunities for a broad swath of working and middle class Americans, even though they will not employ a majority of workers in the twenty-first century. The Heartland is this sector's logical epicenter.

A flourishing and dynamic tradable sector based in the Heartland can continue to support a higher standard of living for the majority of American workers and consumers in every region, even those in less-productive, more labor-intensive jobs in health care, retail, education and other growing occupations. At the same time, comparatively low costs of living will continue to make the center of the country attractive for young workers and parents raising families. It is in the Heartland that America's new generation can be gainfully employed and enjoy a middle class standard of living.

The road to America's future runs through middle America. The renewal of American growth and prosperity can succeed only with the renewal of the New American Heartland.



ENDNOTES

1. Mark P. Keightly, Marc Labonte, Jeffery M. Stupak, “Slow Growth in the Current US Economic Expansion,” Congressional Research Service, June 24, 2016, p. 6.
2. Fernando M. Martin, “Projecting GDP Growth Using Trends in Labor Force Participation,” Economic Synopses No. 26, Federal Reserve Bank of St. Louis, November 24, 2014.
3. “Asia 2050: Realizing the Asian Century,” Asian Development Bank, August 2011.
4. Steef Bergakker and Richard Speetjens, “The ascent of the emerging middle class: Still all about China,” Robeco White Paper, July 2015, p. 5.
5. Mathew Burrows, “The Emerging Global Middle Class—So What?” The Washington Quarterly, Spring 2015, p. 10.
6. Bob Tita, “How to Revitalize U.S. Manufacturing,” The Wall Street Journal, June 7, 2016, http://www.wsj.com/articles/how-to-revitalize-u-s-manufacturing-1465351501.
7. Michael Spence, “Growth in the Post-Crisis World,”, p. 54 www.imf.org/external/np/seminars/eng/2011/res/pdf/MSpresentation.pdf.
8. Michael Spence, “Globalization and Unemployment: The Downside of Integrating Markets,” Foreign Affairs, June 2, 2011.
9. Robert E. Scott, “The Manufacturing Footprint and the Importance of US Manufacturing Jobs,” Economic Policy Institute, Briefing Paper #338, January 22, 2015.
10. Authors’ analysis of US Bureau of Economic Analysis Input/Output Accounts, adapted from Manufacturing Institute, MAPI and National Association of Manufacturers, Facts About Manufacturing (9th Edition, November 2012), p. 3.
11. Bureau of Labor Statistics, “Multi-factor Productivity Statistics, Output Per Hour, Manufacturing Sector,” NAICS 311-339, http://data.bls.gov/cgi-bin/surveymost?mp.
12. National Association of Manufacturers, Manufactures Alliance for Productivity and Innovation, and The Manufacturing Institute, “Facts About Manufacturing,” November 2012.
13. International Trade Administration, “US Export Fact Sheet,” December 2015 Export Statistics Released February 5, 2016.
14. US Census Bureau Foreign Trade Statistics.
15. Authors’ analysis of US Census Bureau Foreign Trade Statistics, adapted from “Facts About Manufacturing,” p. 33.
16. US Export Fact Sheet.
17. Stephen Gold, “Manufacturing’s Economic Impact: So Much Bigger Than We Think,” MAPI, February 16, 2016, https://www.mapi.net/blog/2016/02/manufacturings-economic-impact-so-much-bigger-we-think; “Number of Jobs Supported by Manufacturing in Other Industries,” Manufacturing Institue, http://www.themanufacturinginstitute.org/Research/Facts-About-Manufacturing/Economy-and-Jobs/Jobs-Supported/Jobs-Supported.aspx; Stephen Gold, “The Competitive Edge: Manufacturing’s Multiplier Effect – It’s Bigger Than You Think,” Industry Week, September 2, 2014, http://www.industryweek.com/global-economy/competitive-edge-manufacturings-multiplier-effect-its-bigger-you-think.
18. Trading Economics, September 2016, www.tradingeconomics.com.
19. Mark Koba, “Top US States for New Manufacturing Jobs,” CNBC, June 25, 2013, http://www.cnbc.com/id/100832195.
20. “Large Cities Manufacturing Jobs – 2016 Best Cities Rankings,” New Geography, http://www.newgeography.com/content/005294-large-cities-manufacturing-jobs-2016-best-cities-rankings.
21. Sally Deneen, “Raiding the Bread Basket: Use and Abuse of the Upper Mississippi River Basin,” National Geographic, January 24, 2012.
22. National Park Service, “Mississippi River Facts,” https://www.nps.gov/miss/riverfacts.htm.
23. Table 1.1. “Key variables beyond 2050,” in Nikos Alexandratos and Jelle Bruinsma, World Agriculture Towards 2030/2050: The 2012 Revision, ESA Working Paper No. 12-03, Food and Agriculture Organization of the United Nations (FAO), Agricultural Development Economics Division (June 2012), p. 20.
24. Figure 1, “US Role in Global Production and Trade,” in “The Challenge of Meeting Future Demand for Food,” AGree, http://foodandagpolicy.org/sites/default/files/The_Challenge_of_Meeting_Future_Demand%20_for_Food.pdf.
25. Scheherazade Danehskhu, “Future Farming relies on new technology,” Financial Times, January 14, 2016.
26. Mark P. Mills, “After the Carnage, Shale Will Rise Again,” The Wall Street Journal, January 18, 2016, http://www.wsj.com/articles/after-the-carnage-shale-will-rise-again- 1453162664.
27. Amy Harder and Erin Ailworth, “Fossil Fuels’ Unpopularity Leaves a Mark,” The Wall Street Journal, June 1, 2016, http://www.wsj.com/articles/fossil-fuels-unpopularity-leaves-a-mark-1464827381; Alejandro Lazo, “Oakland Coal Terminal Becomes a Political Flash Point,” The Wall Street Journal, October 18, 2015, http://www.wsj.com/articles/oakland-coal-terminal-becomes-a-political-flash-point-1445212486; Timothy Cama, “New York makes fracking ban official,” The Hill, June 29, 2015, http://thehill.com/policy/energy-environ-

ment/246479-new-york-makes-fracking-ban-official; Zahra Hirji, "California Democrats Approve Sweeping Fossil Fuel Divestment Resolution," Inside Climate News, May 22, 2015, https://insideclimatenews.org/news/22052015/california-democrats-approve-sweeping-fossil-fuel-divestment-resolution.

28. Marian Radetzki and Roberto F. Aguilera, "The Age of Cheap Oil and Natural Gas is Just Beginning," Scientific American, May 3, 2016, http://blogs.scientificamerican.com/guest-blog/the-age-of-cheap-oil-and-natural-gas-is-just-beginning/.

29. Georgi Kantchev, "With U.S. Gas, Europe Seeks Escape From Russia's Energy Grip," The Wall Street Journal, February 25, 2016, http://www.wsj.com/articles/europes-escape-from-russian-energy-grip-u-s-gas-1456456892.

30. Mark P. Mills, "Five numbers reveal our energy future," USAT Today, November 24, 2014.

31. International Energy Agency, "World Energy Outlook 2012"; Daniel Yergin, "The Global Battle for Oil Market Share," The Wall Street Journal, December 15, 2015, http://www.wsj.com/articles/the-global-battle-for-oil-market-share-1450220940.

32. Paul Polzin and Bill Whitsitt, "The U.S. Energy Boom Lifts Low-Income Workers Too," The Wall Street Journal, April 4, 2014, http://www.wsj.com/articles/SB10001424052702303978304579471391927466968.

33. David E. Dismukes, "Unconventional Resources and Louisiana's Manufacturing Development Renaissance", LSY Center for Energy Studies, January 11, 2013; Stanley Reed, "3 Foreign Companies Invest in U.S. Project to Export Liquid Gas," May 7, 2013, http://dealbook.nytimes.com/2013/05/17/3-foreign-companies-invest-in-u-s-project-to-export-liquid-gas/; Nelson D. Schwartz, "Boom in Energy Spurs Industry in the Rust Belt," The New York Times, September 8, 2014, http://www.nytimes.com/2014/09/09/business/an-energy-boom-lifts-the-heartland.html.

34. "A third of plant jobs evaporate in Michigan," Walleye Central, April 20, 2006, http://www.walleyecentral.com/forums/showthread.php?t=40912.

35. Since 1980, the Buffalo, Cleveland, Detroit and Pittsburgh metropolitan areas have lost population.

36. Shibani Mahtani and Scott Calvert, "Milwaukee Neighborhoods Slid After Factory Jobs Vanished," The Wall Street Journal, August 15, 2016, http://www.wsj.com/articles/milwaukee-neighborhoods-slid-after-factory-jobs-vanished-1471304446.

37. John Teaford, *Cities of the Heartland: The Rise and Fall of the Industrial Midwest* (Indiana University Press, Bloomington: 1993), p. 218-219.

38. Teaford, 250-251.

39. The term "information city" derives from the work of Manuel Castells. Castells, *The Informational City: Information, Technology, Economic Restructuring and the Urban Regional Process* (London: Blackwell, 1982).

40. Derek Thompson, "The Feedback Loop That Will Makes America's Richest Cities Even Richer," The Atlantic, March 26, 2015, http://www.theatlantic.com/business/archive/2015/03/the-feedback-loop-that-will-make-americas-richest-cities-even-richer/388712/: Saskia Sassen, *Cities in a World Economy* (Thousands Oaks, CA: Pine Forge Press, 2000), p. 2-4, 15, 61.

41. Aaron M. Renn, "In-state vs. Out-of-State Migration," Urbanophile, February 9, 2014, http://www.urbanophile.com/2014/02/09/in-state-vs-out-of-state-migration/.

42. Complete states in the New Heartland. States only partially in the New Heartland are included in other regions.

43. Derek Thompson, "It's 2006 All Over Again: Expensive coastal cities are emptying out. Americans are moving to sunbelt suburbs," The Atlantic, March 24, 2016, http://www.theatlantic.com/business/archive/2016/03/2006-all-over-again-suburbs/475290/.

44. United States Census Bureau, "United States Population Growth by Region," 2015.

45. Rolf Pendall, Steven Martin, Nan Marie Astone, Austin Nichols, Kaitlin Franks Hildner, Allison Stolte, and H. Elizabeth Peters, "Scenarios for Regional Growth from 2010 to 2030," Mapping America's Futures, Brief 1, Urban Institute, January 2015, p. 9; analysis based on population projections from the State Department of Finance, http://www.dof.ca.gov/Forecasting/Demographics/projections/.

46. Wendell Cox, "Best World Cities for Traffic: Dallas-Forth Worth, Kansas City, Indianapolis, and Richmond," New Geography, June 3, 2016, http://www.newgeography.com/content/005271-best-world-cities-traffic-dallas-fort-worth-kansas-city-indianapolis-and-richmond.

47. If Denver and the four Florida major metropolitan areas (Jacksonville, Miami, Orlando and Tampa-St. Petersburg) are excluded, the New Heartland's median multiple is 3.1. These five markets have the least affordable housing in the New Heartland and have (Denver) or recently had (Florida) urban containment land use policy, which has been associated with higher house prices (a median multiple of 4.4). See, for example: Paul C. Cheshire, Max Nathan, Henry G. Overman, Urban economics and urban policy: Challenging conventional policy wisdom (Northampton, MA: Edward Elgar Publishing, 2014).

48. The balance of the west excludes California and Denver, which is in the New Heartland. The balance of the South is North Carolina, South Carolina, Virginia and West Virginia, which are outside the New Heartland.

49. See, for example: Peter Ganong and Daniel Shoag, "Why Has Regional Income Convergence in the US Declined?", 2013, HKS Working Paper No. RWP12-028.

50. Richey Piiparinen, Jim Russell, and Charlie Post, "The Fifth Migration: A Study of Cleveland Millennials," The Cleveland Foundation, 2016, http://engagedscholarship.csuohio.edu/cgi/viewcontent.cgi?article=2339&context=urban_facpub.

51. Richard Fry, "Millennials overtake Baby Boomers as America's largest generation," Pew Research Center, April 25, 2016, http://www.pewresearch.org/fact-tank/2016/04/25/millennials-overtake-baby-boomers/.

52. Thompson, "It's 2006 All Over Again."

53. Calculated from 2000 census and 2014 American Community Survey data; Micheline Maynard, "Detroit Grapples With a New Era: The Not-So-Big 3," The New York Times, May 11, 2006, http://www.nytimes.com/2006/05/11/business/11detroit.html.

54. Derek Thompson, "America's Bipolar Population Shift," The Atlantic, December 30, 2010, http://www.theatlantic.com/business/archive/2010/12/americas-bipolar-population-shift/68709/.

55. "ESPN World Fame 100," ESPN, May 31, 2016, http://www.espn.com/espn/feature/story/_/id/15685581/espn-world-fame-100.

56. Rebecca Solnit, "Centers and Edges," in *Nonstop Metropolis: A New York City Atlas* (Oakland: University of California Press, 2016).

57. Aaron M. Renn, "Brain Gain in America's Shrinking Cities," Manhattan Institute, August 2015, http://www.manhattan-institute.org/pdf/cr_102.pdf.

58. CPS.

59. IPUMS 5-Year 2012.

60. Ashish Arora, Sharon Belenzon, Andrea Patacconi, "Killing the Golden Goose? The changing nature of corporate research, 1980-2007," Duke University, January 9, 2015, https://faculty.fuqua.duke.edu/~sb135/bio/Science%201%2091%2015.pdf.

61. Thomas W. Ross, "The Real Value of Higher Education," The News & Observer, March 15, 2015, http://www.newsobserver.com/opinion/op-ed/article14056646.html.

62. Joseph Vranich, "Uber! Regulations Mean San Francisco Loses While Phoenix and Pittsburgh Win," The Business Relocation Coach, December 22, 2016, http://thebusinessrelocationcoach.blogspot.com/2016/12/regulations-mean-san-francisco-loses.html.

63. Michelle Jarboe, "IBM eyes new office building on Cleveland Clinic land, to house Explorys subsidiary," Cleveland.com, August 5, 2016, http://www.cleveland.com/business/index.ssf/2016/08/ibm_eyes_new_office_building_o.html.

64. Robert L. Smith, "Big Data pioneer Explorys plans to expand in University Circle," Cleveland.com, January 26, 2015, http://www.cleveland.com/business/index.ssf/2015/01/big_data_pioneer_explorys_plan.html

65. Joel Kotkin, "America's New Brainpower Cities," Forbes, April 3, 2014, https://www.forbes.com/sites/joelkotkin/2014/04/03/americas-new-brainpower-cities/#5e8a420613b0.

66. Wendell Cox, "Back to the Future: Moving Interstate Again, to the South and West," New Geography, December 24, 2016, http://www.newgeography.com/content/005486-back-future-moving-interstate-again-south-and-west.

67. Joel Kotkin and Michael Shires, "Welcome to Y'all Street: The Cities Challenging New York for Financial Supremacy," New Geography, August 17, 2016, http://www.newgeography.com/content/005363-welcome-to-yall-street-the-cities-challenging-new-york-for-financial-supremacy.

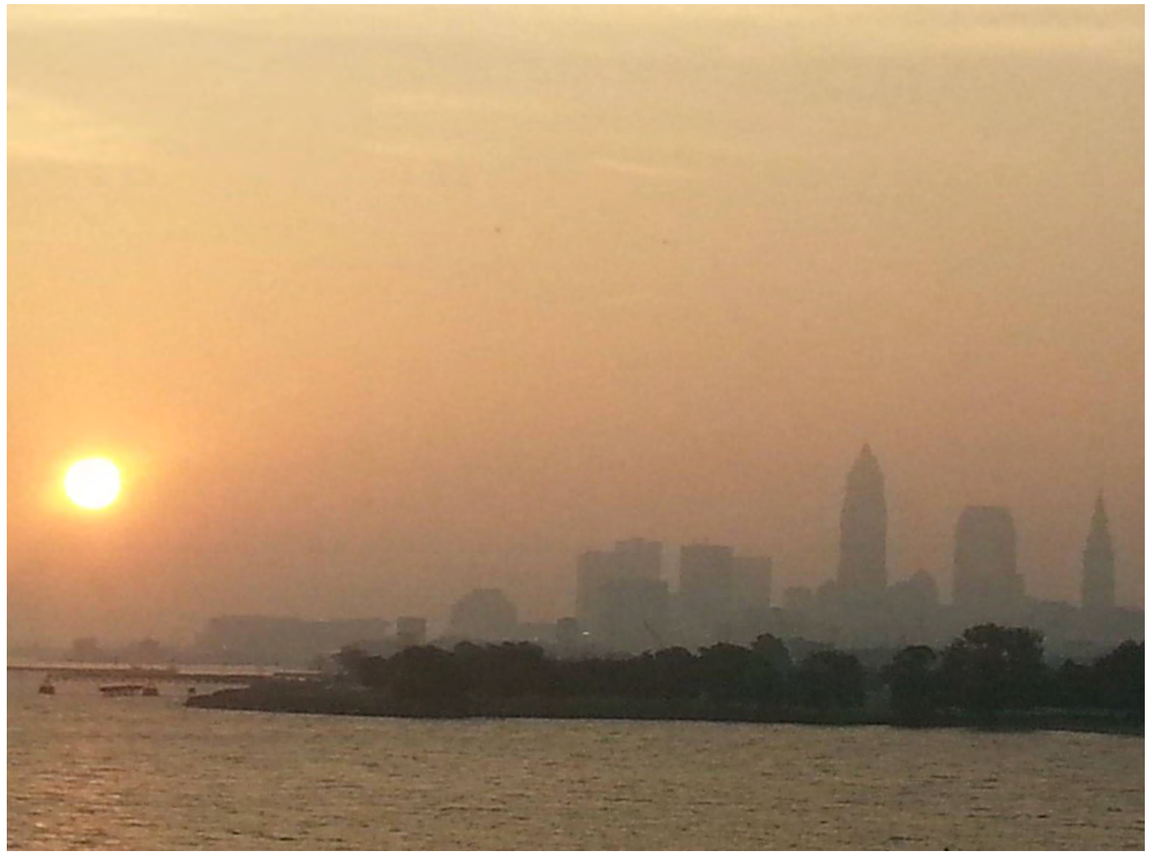
68. Nathaniel Popper, "In Connecticut, the Twilight of a Trading Hub," The New York Times, July 23, 2015, https://www.nytimes.com/2015/07/26/business/dealbook/wall-street-pulls-in-its-horns-in-connecticut.html.

69. "Concentration of Engineering Occupations," Greater Houston Partnership, August 11, 2016,http://www.houston.org/newgen/16_Industry_NEC/16T%20W002%20Highest%20Concentration%20of%20Engineering%20Occupations.pdf.

70. Kim Severson, "Nashville's Latest Big Hit Could Be the City Itself," The New York Times, January 8, 2013, http://www.nytimes.com/2013/01/09/us/nashville-takes-its-turn-in-the-spotlight.html?_r=0.

71. Greg Lacour, "The 'young and restless' flocking to the Queen City," The Charlotte Observer, December 7, 2006.

72. Joe Gose, "Millennials Going to Kansas City, to Live and Work," The New York Times, August 19, 2014, http://www.nytimes.com/2014/08/20/realestate/commercial/millennials-going-to-kansas-city-to-live-and-work.html; Stan Humphries, "Detroit's revival template for struggling U.S. cities," USA Today, July 6, 2015, http://www.usatoday.com/story/opinion/2015/07/06/fixing-detroit-mismanagement-housing-transit-revitalization-strategy-struggling-us-cities-column/29577383/.



73. Bjorn Lomborg, “Obama’s Climate Policy Is a Hot Mess,” The Wall Street Journal, June 30, 2016, http://www.wsj.com/articles/obamas-climate-policy-is-a-hot-mess-1467327996; Rupert Duwall, “Obama’s Renewable-Energy Fantasy,” The Wall Street Journal, July 5, 2016, http://www.wsj.com/articles/obamas-renewable-energy-fantasy-1436104555.

74. David Edwin Harrell, Jr., Edwin S. Gaustad, John B. Boles, Sally Foreman Griffith, Randall M. Miller, Randall B. Woods, Unto a Good Land: A History of the American People, Volume 1: To 1900 (Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 2005), p. 308.

75. Joel Garreau, Edge City: Life on the New Frontier (New York: Doubleday, 1991).

76. John D. Kasarda, Greg Lindsay, Aerotropolis: The Way We’ll Live Next (New York: Farrar, Straus and Giroux, 2011).

77. Lindsay Ellis and Laura Stevens, “UPS Tests a 3-D Printing Service,” The Wall Street Journal, September 18, 2015.

78. “Shipping and World Trade,” International Chamber of Shipping, http://www.ics-shipping.org/shipping-facts/shipingand-world-trade.

79. Gail Delaughter, “Port of Houston Says It’s Ready for Business From an Expanded Panama Canal,” Houston Public Media, June 22, 2016,http://www.houstonpublicmedia.org/articles/news/2016/06/22/157865/port-of-houston-says-its-ready-for-business-from-an-expanded-panama-canal/; Peter T. Leach, “US Gulf ports investing for growth from new Panama locks,” joc.com, February 15, 2016, http://www.joc.com/port-news/us-ports/port-houston/us-gulf-ports-investing-growth-new-panama-locks_20160215.html.

80. Erica E. Phillips, “South Carolina Will Get Boost From Expanded Panama Canal,” The Wall Street Journal, June 23, 2016, http://www.wsj.com/articles/south-car-olinawill-get-boost-from-expanded-panama-canal-1466674203.

81. Chris Clark, Kevin E. Henrickson, and Paul Thoma, “An Overview of the U.S. Inland Waterway System,” Institute for Water Resources, November 1, 2005, http://www.corpsnets.us/docs/other/05-nets-r-12.pdf.

82. Joan M. Bondareff and Stephen C. Peranich, “US Fails Its Ports,” joc.com, February 27, 2012, http://www.joc.com/us-fails-its-ports_20120227.html.

83. Kristine Owram, “Rail Chaos Reigns in Chicago,” National Post, http://business.financialpost.com/welcome-to-choke-point-usa.

84. Kyle Ruscingo, “America’s Infrastructure Needs Better Life Support,” Daily Utah Chronicle, March 3, 2016, http://dailyutahchronicle.com/2017/03/03/americas-infrastructure-life-support/

85. Ports-to-Plains Alliance, portstoplains.com.

86. “Ports-to-Plains Corridor: A Pipeline for Progress,” Inbound Logistics, August 2013, http://www.inboundlogistics.com/cms/article/ports-to-plains-corridor-a-pipeline-for-progress/.

87. Claire Clancy, “Driverless truck corridor from Mexico to Manitoba proposed,” CBC, May 26, 2015, http://www.cbc.ca/news/technology/driverless-truck-corridor-from-mexico-to-manitoba-proposed-1.3086215.

88. Alex Davies, “The World’s First Self-Driving Truck Hits the Road,” Wired, May 15, 2015, https://www.wired.com/2015/05/worlds-first-self-driving-semi-truck-hits-road/#slide-2.

89. “Morgan Stanley - the Economic Benefits of Driverless Cars,” Robotenomics, https://robotenomics.com/2014/02/26/morgan-stanley-the-economic-benefits-of-driverless-cars/.

90. Hunter D. Robot, “How Telecommuting Will Change Workplaces?” Future of Work, November 11, 2014, http://www.futureofwork.com/article/details/how-telecommuting-will-change-workplaces.

91. Jeffrey M. Jones, “In U.S., Telecommuting for Work Climbs to 37%,” Gallup, August 19, 2015, http://www.gallup.com/poll/184649/telecommuting-work-climbs.aspx.

92. Thomas H. Davenport, “The Future of the Manufacturing Workforce,” Manpower 2016, http://www.manpower.us/Website-File-Pile/Whitepapers/Manpower/Man_Future-of-Manufacturing-Workforce_021113.pdf.

93. Patricia Cohen, “In Iowa, Jobs Are Plentiful but Workers Are Not,” The New York Times, January 28, 2016, https://www.nytimes.com/2016/01/29/business/economy/in-iowa-jobs-are-plentiful-but-workers-are-not.html.

94. Rich Karlgaard, “This Tragic Economic Mismatch Costs Trillions and Orphans Millions,” Forbes, July 6, 2016, https://www.forbes.com/sites/richkarlgaard/2016/07/06/economys-tragic-mismatch/#144b26c111b1.

center for
opportunity urbanism

www.opportunityurbanism.org