

2008

## Mountain megas: America's newest metropolitan places and a federal leadership to help them prosper

Robert E. Lang

*Brookings Mountain West*, [robert.lang@unlv.edu](mailto:robert.lang@unlv.edu)

Andrea Sarzynski

*Brookings Institution*

Mark Muro

*Brookings Institution*, [mmuro@brookings.edu](mailto:mmuro@brookings.edu)

Follow this and additional works at: [https://digitalscholarship.unlv.edu/brookings\\_pubs](https://digitalscholarship.unlv.edu/brookings_pubs)



Part of the [Urban, Community and Regional Planning Commons](#), and the [Urban Studies and Planning Commons](#)

---

### Repository Citation

Lang, R. E., Sarzynski, A., Muro, M. (2008). Mountain megas: America's newest metropolitan places and a federal leadership to help them prosper.

Available at: [https://digitalscholarship.unlv.edu/brookings\\_pubs/3](https://digitalscholarship.unlv.edu/brookings_pubs/3)

This Report is protected by copyright and/or related rights. It has been brought to you by Digital Scholarship@UNLV with permission from the rights-holder(s). You are free to use this Report in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself.

This Report has been accepted for inclusion in Brookings Mountain West Publications by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact [digitalscholarship@unlv.edu](mailto:digitalscholarship@unlv.edu).

Blueprint for American Prosperity  
Unleashing the Potential of a Metropolitan Nation



# Mountain *Megas*

America's Newest Metropolitan Places and a Federal Partnership to Help Them Prosper



Metropolitan Policy Program  
at BROOKINGS

## About the Metropolitan Policy Program at Brookings

Created in 1996, the Metropolitan Policy Program provides decisionmakers with cutting-edge research and policy ideas for improving the health and prosperity of metropolitan areas including their component cities, suburbs, and rural areas. To learn more visit [\*\*www.brookings.edu/metro\*\*](http://www.brookings.edu/metro)

### The Blueprint for American Prosperity

*The Blueprint for American Prosperity* is a multi-year initiative to promote an economic agenda for the nation that builds on the assets and centrality of America's metropolitan areas. Grounded in empirical research and analysis, the Blueprint offers an integrated policy agenda and specific federal reforms designed to give metropolitan areas the tools they need to generate economically productive growth, to build a strong and diverse middle class, and to grow in environmentally sustainable ways. Learn more at [\*\*www.blueprintprosperity.org\*\*](http://www.blueprintprosperity.org)

### The Metropolitan Policy Program Leadership Council

The *Blueprint* initiative is supported and informed by a network of leaders who strive every day to create the kind of healthy and vibrant communities that form the foundation of the U.S. economy. The Metropolitan Policy Program Leadership Council—a bipartisan network of individual, corporate, and philanthropic investors—comes from a broad array of metropolitan areas around the nation. Council members provide us financial support but, more importantly, are true intellectual and strategic partners in the *Blueprint*. While many of these leaders act globally, they retain a commitment to the vitality of their local and regional communities, a rare blend that makes their engagement even more valuable. To learn more about the members of our Leadership Council, please visit [\*\*www.blueprintprosperity.org\*\*](http://www.blueprintprosperity.org)



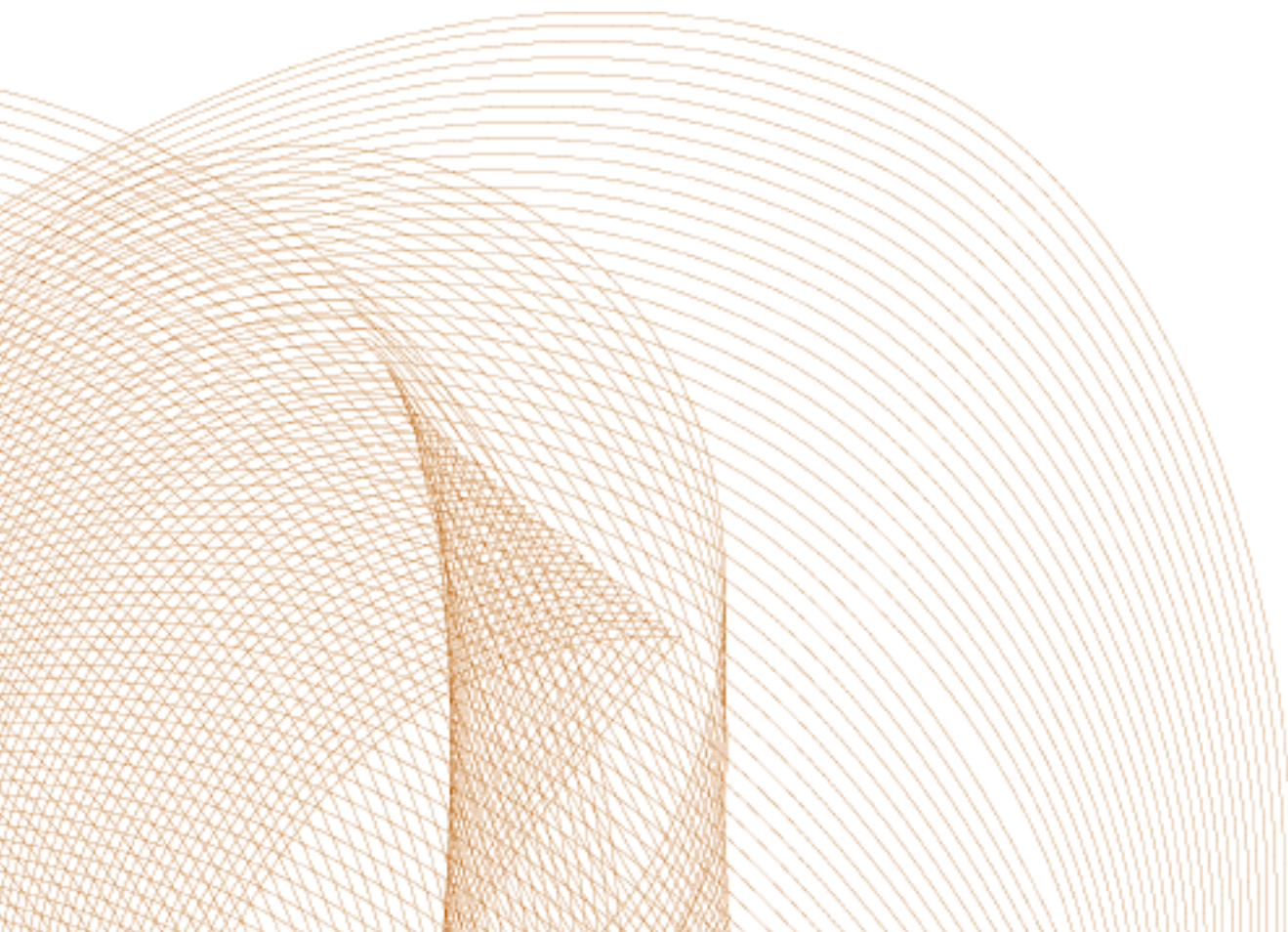
# Mountain *Megas*

**America's Newest Metropolitan Places and a Federal Partnership to Help Them Prosper**



# CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>	<b>IV. EMERGING CHALLENGES AND OPPORTUNITIES .....</b>	<b>26</b>
<b>I. INTRODUCTION .....</b>	<b>8</b>	1. Infrastructure.....	27
<b>II. MEGAPOLITAN DEVELOPMENT IN THE INTER-MOUNTAIN WEST .....</b>	<b>12</b>	2. Innovation.....	36
1. New megapolitan areas are emerging in the Intermountain West .....	13	3. Human Capital .....	39
2. The western megapolitan areas have a unique urban character .....	17	4. Quality Places .....	41
<b>III. TRENDS IN AMERICA'S FASTEST GROWING, MOST URBAN REGION .....</b>	<b>18</b>	<b>V. FORGING A NEW FEDERAL-MEGA AGENDA FOR THE INTERMOUNTAIN WEST .....</b>	<b>48</b>
1. The region is in the midst of a major population explosion.....	18	1. Infrastructure .....	49
2. The region's economy is rapidly changing .....	19	2. Innovation.....	51
3. Rapid growth is changing the face of the region ...	23	3. Human Capital .....	53
4. The booming megapolitan West will likely keep on booming .....	25	4. Quality Places .....	55
		<b>VI. CONCLUSION .....</b>	<b>58</b>
		<b>ENDNOTES .....</b>	<b>60</b>
		<b>SELECTED REFERENCES .....</b>	<b>64</b>



# EXECUTIVE SUMMARY

## Rapid change is enveloping the American West.

States in the southern Intermountain West—Arizona, Colorado, Nevada, New Mexico, and Utah—are experiencing some of the fastest population growth and economic and demographic transition anywhere in the country.

The region is growing up, flexing its muscles, and distancing itself from California, which historically has had an outsized impact on the West's development.

In fact, thanks to such maturation, the southern Intermountain West is well on its way to earning itself the title moniker of the *New American Heartland* as its economy, people, and politics become more central to the nation. Politically, the Intermountain West could be home to several swing states in the 2008 election and in time play the storied “kingmaking” role the Midwest does now.

With its growth, the southern Intermountain West is also rapidly pioneering new urban forms. Most notably, the region is home to five emerging “megapolitan” areas—vast, newly recognized “super regions” that often combine two or more metropolitan areas into a single economic, social, and urban system. In the 1960s, Dallas and Fort Worth were clearly colliding, as were Washington and Baltimore by the 1980s. Now regions with more far-flung urban cores such as Phoenix and Tucson are exhibiting the same pattern, as are the urban spaces extending around Denver, Salt Lake City, Las Vegas, and Albuquerque.

In short, an extraordinary new settlement pattern has come to characterize growth in the nation's fastest-growing region.

Which is where this document begins: Prepared as part of the Brookings Institution's *Blueprint for American Prosperity* initiative, **“Mountain Megs: America's Newest Metropolitan Places and a Federal Partnership to Help Them Prosper”** describes and assesses the new super-sized reality of the Intermountain West and proposes a more helpful role for the federal government in empowering regional leaders' efforts to build a uniquely Western brand of prosperity that is at once more sustainable, pro-

ductive, and inclusive than the past eras dynamic of boom and bust.

Along these lines, “Mountain Megs” assumes that true prosperity is based on achieving three interrelated dimensions of prosperity—sustainable, productive, and inclusive growth—all at once. Such balanced growth depends, in turn, on the region assembling in its megapolitan areas sufficient stocks of the crucial assets that contribute to such prosperity: top-notch infrastructure, world-class innovation

**“Mountain Megs” assumes that true prosperity is actually based on achieving three interrelated dimensions of prosperity—sustainable, productive, and inclusive growth—all at once.**



inputs, vital human capital, strong quality-of-place, and as well as the necessary effective regional governance to put it all together.

From that standpoint, “Mountain Megs” surveys trends and federal policy challenges in the Intermountain West and draws a number of conclusions:

**1. The Intermountain West—dominated by its five vast “megapolitan” areas—has emerged as America’s fastest-changing, most surprisingly urban region.** In this respect, the Mountain West’s current development, economic, and social trends describe a region in the midst of massive transformation. The region is neither the Old West, nor the New West. It is the New New West, continuously unfolding:

■ ***A surprisingly urban population explosion continues.***

Together, the “mountain megas” are home to more than 80 percent of their five states’ population, employment, and economic and cultural activity, and have captured almost all of the region’s recent growth. They include some of the fastest growing places anywhere in the country (Las Vegas) and have captured 13 percent of the nation’s growth so far this decade. What is more, the Intermountain States and their megas have grown surprisingly urban, with urban Denver and Salt Lake achieving densities as high as urban Chicago and higher than urban Boston

■ ***The Intermountain West’s economy is rapidly changing.***

Job creation far above the national average in industries serving local markets (such as health services, real estate, and construction) has ensured that few workers remain in resource-extraction industries or in agriculture despite their historical importance to the region. At the same time, a new, high-value Intermountain economy has come into focus that is anchored by clusters of firms in critical, often well-paying “traded,” or export, industries such as hospitality and tourism, information technology, aerospace, or knowledge creation. The nature, size, and competitiveness of these strategic export clusters vary across the megas but they represent the shape of the future. However, while the region’s megas have been moving up the value chain, they still have a ways to go to achieve truly top-flight productive growth. Average labor productivity—a critical measure of economic potency—rose in the megapolitan West from about \$79,500 per year in 2001 to \$85,400 per year in 2005. But the 2005 figure in the region remained slightly beneath the national average of \$87,800, and only the Front Range among the megas exhibited above-average productivity. What is more, productivity growth across the megapolitan West also lagged national rates, with output per job rising by just 1.8 per-

cent on average each year from 2001 to 2005 compared to 2.3 percent nationwide. Not surprisingly, living standards—as measured by per capita income—have also been rising though they remain below the national average in all Mountain megas except the Front Range

■ ***Rapid growth is changing the face of the region.***

On this front, the region’s demographic vitality reflects its robust dynamics on all components of population change. Strong natural increases of population continue to be complemented by rapid in-migration from other parts of the country (especially from the “old Sun Belt” states of CA, TX, and FL) and immigration from abroad (especially from Mexico and Latin America). Although the region remains 80 percent white, it has experienced steady and sizable increases in its Hispanic population. The region’s labor force, meanwhile, is quite well educated, but educational gaps have opened especially between the foreign-born and native populations and between non-Hispanic whites and Hispanics, blacks, and Native Americans. Finally, a once-egalitarian, middle-class region has seen its prominent middle class dwindle as stark income disparities have appeared

■ ***The long boom of the Intermountain State megas will likely continue.***

Nationwide, projections completed for this report anticipate America may add its next 100 million residents by 2040, and by all indications the Intermountain West will gain a disproportionate share of the coming growth. Along these lines, the five Intermountain West megas are together projected to add nearly 12.7 million residents and more than 8 million jobs by 2040. This means the Mountain megas’ population and job bases could each roughly *double* by 2040 from 2005 levels. Such projected expansion will also have tremendous implications for the built environment and regional construction activity. Such growth, for example, would require the megapolitan West to nearly double the number of housing units that were on the ground in 2005 (5.6 million units) while replacing or upgrading another two million. Equally staggering, a total of 9.4 billion square feet of new or replacement non-residential space may need to be built to accommodate the coming new jobs. The estimated construction cost attached to this massive growth and replacement of structures in the megapolitan West could approach \$2.25 trillion for housing and \$916 billion for non-residential space

In short, the massive, ongoing change that has been convulsing the Intermountain West shows no sign of slowing.



**2. These changes have brought many benefits to the Intermountain West but they also are posing a series of complex, mega-scaled challenges.** To date, growth has brought demographic vitality, rising incomes, and vibrant workforce growth. But it is also bringing stress. In this respect, the achievement by any region of truly productive, inclusive, and sustainable growth depends on its assembling in its megapolitan areas sufficient stocks of the crucial assets that contribute to prosperity: infrastructure, innovation inputs, high levels of human capital, and a strong quality-of-place (plus effective regional governance). However, the region faces hard work in achieving such critical mass, and will likely not be able to master events solely by itself:

■ **Infrastructure:** Infrastructure networks provide essential linkages that knit together urban systems. However, the newness of the megapolitan West combined with hyper-growth leave the region facing major infrastructure challenges. Currently, the region lacks a robust and supportive surface and air transportation network. A critical interstate linkage is missing between Phoenix and Las Vegas. Intercity passenger rail is underdeveloped throughout the region. And transportation choices (such as parallel highways, commuter rail, and transit) are still uncommon in this New American Heartland. Likewise, the region's air network is underdeveloped, and serves mainly to support regional flights and few direct, international connections. In addition, the threat of global climate change raises vexing questions about water and energy systems and grids. Consumption patterns, planning, capture and reuse systems, and delivery are critical water issues regionwide; on energy, transmission grid capacity and expansion and the move to renewables loom large as huge issues. Alternatively, the threat of global climate change may help to speed development of new water conservation approaches and widespread renewable energy resources and technology to meet future demand for low-carbon energy

■ **Innovation:** Not-yet-top-echelon productivity and productivity growth in the megapolitan West highlight the importance of assembling world-class innovation inputs in the megas. Innovation matters because innovation—the process of inventing and exploiting new products, processes, and business models—drives productivity growth which in turn enhances living standards. Unfortunately, while the Intermountain West is home to world-class research institutions and a number of strong industry clusters in export markets, the region must overcome two hurdles to unleashing the next stage of high-value economic growth. First, the region makes do now with the rather variable quality of the

Mountain West research complex as indicated by measures of R+D expenditures, the translation of inventions to job-creation, and the presence of highly educated workers. Second, the region currently contends with a somewhat underperforming portfolio of critical industry clusters in export “traded” sectors. These highly strategic clusters represent a potent source of quality jobs and productivity growth, but as yet only Colorado's Front Range ranks as a national superstar in assembling top-flight strong clusters and using them to drive regional wage growth. The challenge of the Intermountain West megas, then, is to enhance and leverage their research capacities and high-value industry clusters to move up the innovation and productivity curves so as to increase their overall economic competitiveness and so the local standard of living

■ **Human capital:** The status of the megas' human capital stores—their greatest resource—also bears attention if the Intermountain West is going to produce balanced, broadly-shared prosperity. Plentiful and increasingly skilled people remain the key to economic growth. Likewise, how well all groups are integrated into society and can participate in its economy defines whether a place truly delivers on the American dream of upward mobility and middle-class stability. Unfortunately, on this front also, the megapolitan West is struggling with serious stresses. Rapid legal and illegal immigration in the context of the nation's unsettled immigration policies, has generated uncertainty and controversy among employers and communities alike, and is creating dislocations for firms, families, and local governments. At the same time, this new reality finds the training and education needs of an increasingly diverse population largely unmet. More and better English language classes, new ideas for educating the children of new Americans, and new strategies for securing the educational pipeline from pre-K through high school and beyond are needed. Similarly, widening income disparities and growing poverty rates give rise to concerns that the Mountain West—once a middle-class society—is developing into a society of haves and have-nots

■ **Quality places:** Finally, the crafting of attractive, high-quality, and well-designed urban places also matters in the search for true prosperity. On this front, all of the Mountain megas have embarked on the important drive to craft a built environment to match the region's alluring scenery. What is more, their efforts have been aided by the existence of physical growth constraints such as mountains and Indian reservations that have facilitated the emergence of relatively compact, high density urban spaces in the West. And yet, the fact





remains that all of the region's megas face significant placemaking challenges largely tied up with mitigating or even undoing the legacies of auto-oriented development. Today, all of the Mountain megas experience most of the downsides of higher density development (e.g., congestion) with very little of the benefit (e.g., vibrant urban environments). Too often, the West's auto-dependent, segregated-use development mode provides few transportation or housing choices for workers and residents, fails to link residential or commercial building to public transportation, and fails to inspire much in the way of neighborhood cohesion. Crafting distinctive neighborhoods and workable urban systems will require retrofitting or transcending the autoscape of past decades

\* \* \*

And there is one other critical challenge the mountain megas face as they continue to grow and change is governance. In this regard, while leaders may want to promote mega-scale responses to mega-scale problems, they are frequently hobbled because they lack the super-scaled governance institutions and networks needed to shape their futures.

Nonetheless, region-minded leaders throughout the Mountain megapolitan West have begun to craft impressive, wider-reaching governance solutions in response to the emerging megapolitan reality.

And yet, the fact remains that the broad sweep of

megapolitan development in the West is in several of the region's megas outstripping the region's local governance structures and raising serious questions about the megas' ability to steer events. The upshot is clear: Designing innovative, smart, and effective new wide-area governance mechanisms for the new megapolitan reality will surely rank among the Intermountain West's most important challenges in the next decade.

**3. Given these challenges, then, the time is right for leaders around the Intermountain West and their partners in Washington to fashion a new federal-state-mega partnership that will allow the region's pivotal megapolitan areas to surmount their common challenges and assert their leadership in the nation and the world.** To be sure, self-help will

always remain the primary source of

progress in the Intermountain West. After all, American's most vibrant new urban region has long relied on its own do-it-yourself spirit to begin the work of building a "civilization to match the scenery," to paraphrase Utah-born writer Wallace Stegner. And yet, the fact remains that while the West's megapolitan leaders and institutions can achieve a lot by themselves, they "cannot go it alone." Instead, at least at times, and on certain crucial, mega-scaled issues, Western leaders require a steady, supportive partner in the federal government to offer leadership on certain uniquely federal, border-transcending issues like inter-mega transportation, basic science research, immigration, and climate change responses even as it works more frequently to empower the rising megas of the West. Of top priority should be work aimed at bolstering the West's standing on the four fundamental drivers of prosperity and catalyzing continued regional governance innovation:

■ **Infrastructure:** Given the region's extraordinary coming growth, the time is now for the Mountain West's leaders to ask that the federal government become a more constructive partner with state and local governments and the private sector in helping the region make crucial investments in its stressed infrastructure and water and energy supply systems. For example, strategic, targeted, and reliable help from Washington will be critical if the Mountain West is going to effectively **build out its passenger and freight networks** both between and within the Mountain megas, using highways, high-speed and light rail, and air connec-

tions to improve connectivity and shape development. The region also needs Washington to lead where it must in investing in **better data and modeling on climate change, water, and energy issues; setting a national framework for reducing greenhouse gas emissions; and facilitating creative, collaborative regional water and energy agreements as well as progress on expanding the region's overtaxed energy transmission grid.** On all of this, help with direct investment will be critical, but so will related policy and attitudinal adjustments aimed at setting up a more supportive federal policy framework within which all parties can work together to provide America's fastest-growing region with the world-class infrastructure it needs to help America the nation prosper

■ **Innovation:** A new partnership is also needed on assembling world-class innovation inputs in the Mountain megas. To be sure, Western entrepreneurs, companies, workers, industry associations, universities, and investors will clearly play the largest role in building the high-performance economy of tomorrow in the Intermountain region. However, they will succeed best if they have a strong, supportive, and focused steward of innovation in Washington. To ensure that they do, Washington should bring greater purpose and rigor to the nation's currently diffuse innovation activities while respecting, enhancing, and empowering the distinctive and promising specializations of the Intermountain West's megapolitan economies. To that end, the federal government should **step up and better leverage its investments in science research and commercialization; establish a nimble, bottoms-up program to support and enhance the power of local industry clusters; and experiment with new paradigms for augmenting and commercializing alternative-energy innovation**

■ **Human capital:** Creating an inclusive, middle-class society where educational opportunity allows upward mobility also remains significantly the province of state and local leaders, in the West and elsewhere. But the Intermountain megas' acute human capital challenges are of a sort that call for federal engagement. Most notably, only Washington—as the ultimate authority on who can cross the nation's borders on what terms—can provide the nation the **balanced, comprehensive, and effective immigration reform** it must have. On this front, enhanced enforcement and expanded legal channels of entry should be complemented by an earned legalization pathway that encourages illegal immigrants to register for temporary legal status, after security checks and substantial

fees, and allows them to wait in line after legal immigrants to obtain permanent status. In addition, Washington should **compensate state and local governments** for the impact their immigrant populations have had on the costs of public service provision and **provide seed funding for regionally-scaled and regionally-tailored public-private partnerships to better integrate immigrants** through English language instruction, civics education, welcome centers, referral services, or other activities that regional leaders identify as necessary. Yet that is just part of a true partnership to ensure that the region continues to build the human capital necessary to generate true prosperity. In addition, Washington should serve once more as a “game-changer” on education as it has in the past, even if states and localities will retain the lead role. On this front, Washington should make catalytic **research and development on immigrant education** a core national education goal and help **secure the nation's now-leaky pipeline to post-secondary education** with a real-time data system that tracks individual outcomes from high school to college to help others monitor performance, pinpoint problems, devise interventions, and allocate resources. Finally, the federal government should complement efforts to increase educational attainment by working also to **boost the wages of the lower income workers and their families by expanding and modernizing the EITC.** This federal engagement would not only help bridge gaps between wages and living costs but may also promote greater labor market attachment and participation and skills growth—all important assets for the economic and social well-being of the nation and its regions





■ **Quality places:** Carving higher-quality, more walkable and accessible places out of the mass-produced and car-dominated suburbs of the Intermountain West will also require a long-time partnership of all relevant actors—public, private, and non-profit, and federal, state, tribal, and local. In this regard, while some may reject the notion of a federal role in placemaking, the fact is that the federal government is already heavily engaged in local and regional land use development in the Intermountain West because of its primary landowner status throughout much of the west, and because its water, energy, and transportation investments have widespread effects. But now it is time to imagine a new sort of involvement. And so, if the federal government is to become a more a constructive partner in the development of the Intermountain West, it needs to engage in three ways while respecting local autonomy and decision-making. First, it must **invest in and encourage public transportation in the megas**, and so help provide both outstanding inter-city and inter-mega rail links as well as top-flight intra-mega public transit networks. To support this goal, Washington must remove current federal policy and process biases that substantially favor highway construction over transit and in many ways intrude on metropolitan and megapolitan discretion in transportation programming. In addition, the government should also bolster public transportation by working to **refine existing performance standards** to ensure pedestrian-oriented design and a finer-grain mix of land uses at transit station stops and applying to road projects a new **performance standard for multi-modal connectivity**, to ensure the projects properly integrate with existing transit systems and into the local fabric. Second, Washington should undertake to incentivize energy- and resource-efficient land use and building design wherever possible by conditioning federal transportation dollars, land transfers, or other actions on partners meeting appropriate standards to encour-

age sustainable development and greenbuilding. And finally, the federal government should **issue a “sustainability challenge”** to catalyze bold Western problem-solving among state, mega-regional, metropolitan, local, and tribal actors. This challenge, delivered in the form of a competitive grant offer, would challenge all regions to figure out the boldest, most creative, and effective new ways to better **link up disparate housing, transportation, environmental, energy, and land use policies** to achieve sustainability goals, such as a reduced carbon footprint. The grant would be performance-based, and effectively award the most ingenious and creative solutions to widespread sustainability challenges with a substantial financial carrot and flexibility in implementing federal program requirements. In that way, Washington would appropriately reward Mountain State West innovation without pre-judging the possible solutions or micro-managing the details

\* \* \*

Finally, there remains the matter of supporting the emergence of new, wider-reaching and more interconnected governance networks to match the geographic scale and dynamism of the new reality.

Quite simply, the prosperous build-out of the Intermountain West—a matter strongly in the national interest—depends heavily on getting governance right within the megas, which argues in turn that Washington should support megapolitan leaders’ efforts to work out effective super-regional governance systems.

To that end, the federal government should provide a tactful mix of information and encouragement to help catalyze the emergence of more cross-boundary and mega-scaled problem-solving within and across U.S. megas. On the information and learning front, for example, federal agencies should move to **understand the new geography, provide relevant information, and support broadened understanding** of it—but not prescribe particular governance solutions. To further support the learning process, moreover, Washington could help Western leadership organizations like the Western Governors Association or the Council of State Governments West **create a West-wide learning network** tasked specifically with facilitating cross-mega understanding, dialogue, and best-practice exchange. Such a focused learning network could speed the spread of innovative new governance solutions, both those already underway and ones not yet envisioned.

To more directly encourage mega-scaled governance innovation, meanwhile, the federal government should materially reward initiatives that join-up local and metro institutions into super-regional webs. A start in this direction would be to **tweak federal metropolitan planning**



**Organization (MPO) rules** to provide new incentives and assistance to MPOs to support greater consideration of transportation patterns and development patterns beyond their specific territory. But Washington could go farther in fostering connections. First, it could establish a broad sort of **regionalism “steer”** to key categorical, block, and other grant programs that would give preferential treatment or funding to recipient states, municipalities, or other entities that embrace cross jurisdictional and regional or super-regional planning and problem-solving. Alternatively, and more creatively, the federal government could lay down—in partnership with state governments—a **“governance challenge”** aimed at boldly challenging megapolitan-area leaders to attempt deep-going experiments in organizing themselves. A governance challenge, like its sibling the sustainability challenge, would stipulate no particular policy goal. Instead, it would simply reward the most path-breaking proposals available for connecting regional and super-regional governance in such key domains as transportation planning or land use or housing with substantial grant money. In addition, the governance challenge would require the participation of state government in proposals, given that localities and even MPOs remain legally “creatures of the state.” Significant grant money would be awarded in a competitive process to the partnerships of states, localities, MPOs, regional business alliances, and other entities that devised the boldest, most multi-jurisdictional proposals for improving cross-boundary coordination, service and program integration, or regional decisionmaking.

**To more directly encourage mega-scaled governance innovation, meanwhile, the federal government should materially reward initiatives that join-up local and metro institutions into super-regional webs.**

\* \* \*

In sum, the time has come to make America’s emerging New Heartland in the West a prime test-bed for the nation’s next generation of pragmatic, far-sighted metropolitan policies.

With the Intermountain States West increasingly central to national affairs, Washington should look West and seek to craft with Mountain mega leaders a supportive new partnership that matches the size and promise of the nation’s newest urban places.



# I. INTRODUCTION

## Rapid change is enveloping the American West.

The southern Intermountain West—consisting of Arizona, Colorado, Nevada, New Mexico, and Utah—is experiencing some of the highest population growth rates and economic and demographic transition of any place in the country. The region is growing up, flexing its muscles, and distancing itself from California, which historically has had an outsized impact on the West’s development.

**Together, the five southern Intermountain West states are projected to add more than three times as many new residents—and potential voters—as the five Midwestern states by 2030.**



As it does so, the southern Intermountain West may soon earn itself the title of *New American Heartland* as its economy, people, and politics become more central to the nation. Consider the old expression “will it play in Peoria,” which was a reference to whether or not a product would satisfy a mainstream Midwestern taste. The idea was that if something played well in the Midwest, it would appeal to most Americans. In this decade, Peoria, AZ passed its namesake Peoria, IL in population size. This little noticed switch may signal a broader change that the West is now the nation’s center. Politically, the Intermountain West could be home to several swing states and serve in the same role that the Midwest now plays.<sup>1</sup> Where the road to the White House in 2008 leads through Ohio, it could easily switch to Arizona, which by mid-century should also outweigh Ohio in electoral votes.<sup>2</sup> Together, the five southern Intermountain West states are projected to add more than three times as many new residents—and potential voters—as the five Midwestern states (Illinois, Indiana, Michigan, Ohio, and Wisconsin) by 2030.<sup>3</sup>

The region’s new political importance may be evident as early as this coming election.<sup>4</sup> Indeed, the Democratic party is returning to Denver in August 2008—exactly 100 years after its last and only convention held in the Intermountain West.<sup>5</sup>



A lot has changed since 1908.

For instance, the southern Intermountain West has grown nearly three times faster than the United States as a whole over the past two decades, led by triple-digit population growth in Nevada. The area's economy is expanding rapidly and diversifying as it moves from a resource-based extraction economy to a service- and knowledge-based one. Simultaneously, the southern Intermountain states face significant social challenges as they seek to accommodate the disparate needs of millions of immigrants and thousands of young families and retirees from all over the country.

With its growth, the southern Intermountain West is also rapidly pioneering new urban forms. Most notably, the region is home to five emerging "megapolitan" areas—vast, newly recognized "super regions" that often combine two or more metropolitan areas into a single urban system.<sup>6</sup> People intuitively sense a large-scale metropolitan convergence is underway as they see metropolitan areas that were once distinct places merge into enormous urban complexes. In the 1960s, Dallas and Fort Worth were clearly colliding, as were Washington and Baltimore by the 1980s. Now regions with more distant urban cores such as Phoenix and Tucson or Denver and Colorado Springs are exhibiting the same pattern.

These five megapolitan areas constitute the primary focus of the present analysis of the southern Intermountain

West. Together, the five megapolitan areas are home to more than 80 percent of the region's population, employment, and economic and cultural activity, and have captured almost all of the region's recent growth.

In short, an extraordinary new development pattern has come to characterize growth in the nation's fastest-growing region.

Hence this document: Prepared as part of the Brookings Institution's *Blueprint for American Prosperity* initiative, this report describes and assesses the new super-sized reality of the Intermountain West and proposes a more helpful role for the federal government in empowering leaders' efforts to build a uniquely Western brand of prosperity that is at once more sustainable, productive, and inclusive than past eras of boom and bust.

Along these lines, "Mountain Megas" assumes that true prosperity is actually based on achieving those three inter-related dimensions of prosperity—sustainable, productive, and inclusive growth—all at once and holds that such balanced growth depends on the region assembling in its megapolitan areas sufficient stocks of the crucial assets that contribute to such prosperity: top-notch infrastructure, world-class innovation inputs, vital human capital, and a strong quality-of-place, not to mention effective regional governance to put it all together.<sup>7</sup>

## Prosperity : What It Is and How to Get It

This report follows the Brookings Institution's *Blueprint for American Prosperity* in asserting that true prosperity in the Intermountain West, as in the country as a whole, requires achieving three types of growth:

**Sustainable growth** that crafts high-quality places and communities, conserves natural resources, and advances efforts to address climate change and achieve energy independence

**Productive growth** that leverages innovation, generates quality jobs and rising incomes, and supports a high standard of living

**Inclusive growth** that expands educational and employment opportunities, reduces poverty, and fosters a strong and diverse middle class

Sustainable, productive, and inclusive growth—and the prosperity to which they contribute—reflect a desired outcome for America's future, and for that of the Intermountain West. They represent a goal for public and private striving.

As to ensuring the region makes progress toward these goals from where it stands now, abundant

research suggests that cultivating certain fundamental capacities, resources, and assets can produce those outcomes.

Four sorts of assets in particular play crucial roles in driving prosperity:

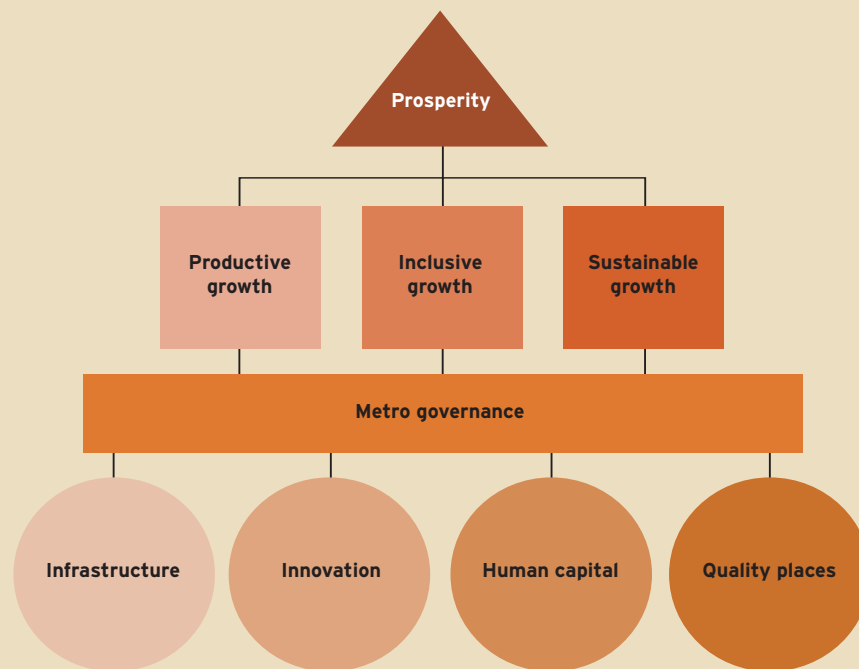
**Infrastructure**—ranging from roads, transit, and ports to telecommunications networks—can determine how efficient and rapidly goods, people, and information move within and across markets and can also help improve air quality, conserve land and natural resources, and reduce energy consumption

**Innovation**—or the ability to conceive and develop new products, new services, new technologies, new ways of organizing work, and new business models—is crucial to sustaining economic advantage, generating and retaining high-quality jobs, and responding to the challenges and opportunities presented by climate change

**Human capital**—both educated and skilled labor—drives innovation but is also a prerequisite for income growth, upward mobility, and access to opportunity

**Quality places**—dense, distinctive cities and sub-

Innovation, human capital, infrastructure, and quality places—along with strong regional governance—are crucial drivers of a multi-dimensional brand of prosperity



urbs that are rich in amenities and transportation and housing choices—are essential to attracting and retaining innovative firms and talented workers, promoting energy security, and growing in environmentally sustainable ways

Also important to the production of true and lasting prosperity are *effective regional governance* systems that work smoothly across boundaries to provide decisive, strategic decisionmaking in service of the regional good.

In short, consistent, and collaborative work to improve the Intermountain West megapolitan area's standing on all of these crucial drivers of prosperity is necessary if the region is going to elevate its future standard of living. Only with such attention to the basics will it construct a truly livable, vibrant, and fair future.

*Sources: Alan Berube, "MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity" (Washington: Brookings Institution, 2007) and Mark Muro and others, "MetroPolicy: Shaping a New Federal Partnership for a Metropolitan Nation" (Washington: Brookings Institution, 2008).*

In addition, the report assumes that while the private economy along with state and local leadership and creativity play the largest role in determining whether a region flourishes or falters, regions also need to be able to count on having a steady, supportive federal partner in Washington as they build needed infrastructure networks, nurture innovation, promote social health, and craft sustainable, high-quality places.

And so this report seeks to sketch a sensible agenda for limited federal engagement to support the problem-solving of Western megapolitan leaders while keeping a clear fix on the unique opportunities and challenges the Intermountain megas have before them.

Reflective of the experiences of numerous leaders in the West, "Mountain Megs" begins with a recognition that conventional understandings of how urban areas work and what measures count do not fully apply to the cities and urban areas of the Intermountain West and proceeds to assess ongoing trends and challenges from that standpoint.

Chapter 2 provides context for understanding the factors driving the emergence of new Western megapolitan form. This chapter makes clear that the region's differences with older and more traditional parts of the United States have to be understood on their own terms.

Chapter 3 lays out the major trends facing the region, including its booming population, its changing economic structure, and its changing demographics. The chapter closes with projections for coming development and thoughts on alternative development scenarios given such uncertain factors as environmental limitations, continued turmoil in the housing markets, impacts of global climate change, and rising energy prices.

With the context and trends in mind, Chapter 4 analyzes the region's hidden capacities and vulnerabilities. What does the region have to build on as it seeks to attain sustainable, productive, and inclusive growth? What are the potential barriers? The basic assumption guiding our analysis is that success in the West is not defined by emulating the East, but in by how it reflects and enhances the quality of life and openness of opportunity that has always defined the region.

Finally, the report concludes with a new federal policy agenda to support and enhance the prosperity of the new American Heartland by empowering it. This agenda assumes that while state, local, and mega-scaled Western self-help will always remain the primary source of progress in the Intermountain region, the federal government continues to matter in the Mountain states, and needs to offer a new brand of support to the region that is limited but substantive and strategic, helpful but not overbearing, and always catalytic.

In this fashion, these pages begin with the recognition that the federal government has long been intricately involved in the Intermountain states (if only as a huge landowner) and ends by insisting that Washington's continued importance in the region makes it a necessary partner with private and public sector actors in securing the region's future prosperity.

Now is the time to ensure that the steadiness and effectiveness of that partnership matches the size and promise of the West's newest urban areas.

**This report seeks to sketch a sensible agenda for limited federal engagement to support the problem-solving of Western megapolitan leaders while keeping a clear fix on the unique opportunities and challenges the Intermountain megas have before them.**



## II. MEGAPOLITAN DEVELOPMENT IN THE INTERMOUNTAIN WEST

Each American urban era contains a “shock city” of the day—or a place that fully captures the period’s emerging metropolitan trends and points to a new future.<sup>8</sup> In the late 19th century, Chicago was that city, with its tangle of railroads and soaring downtown skyline. By the mid 20th century, Los Angeles became the shock city, as the first metropolis fully transformed by automobiles. Recognizing the importance of these places scholars began referring to a “Chicago School” of urbanism by the 1920s and a “Los Angeles School” of “post-modern urbanism” by the 1980s.<sup>9</sup> In this first decade of the 21st century, the idea of Los Angeles being new seems old, in part because the city has taken on a more traditional character.



As Los Angeles settles into middle age, what urban area constitutes this era’s shock city? While there is no clear inheritor of the title, places such as Las Vegas and Phoenix may be the next shock city. Consider Las Vegas. The very fact that Las Vegas even exists on the scale it does is something of a shock. Southern Nevada would seem to lack many qualities requisite for large cities—including basics such as water. Yet, by the 1970s, the city had grown interesting enough that some architects sought to “learn from Las Vegas.”<sup>10</sup> The important lesson from Las Vegas may have less to do with its look than how it functions. Las Vegas today is the nation’s leading convention city and perhaps the most important setting for face-to-face interactions among people working in such diverse fields as electronics, construction, and medicine.<sup>11</sup> What started with gangsters and whimsically themed hotels has matured into a giant venue for business networking. Contrary to its current mar-



keting slogan, what happens in Las Vegas often does not stay there but instead influences global commerce.

Phoenix, which just passed Philadelphia to become the nation's fifth largest city, also has a shock quality about it.<sup>12</sup> The Phoenix region (or the Sun Corridor) is the newest mega metropolis in the United States—built mostly in the past three decades. The nearest rival in this quality is the Atlanta metropolitan area. Where Atlanta has a strong 19th century urban tradition and a large city center, Phoenix is more like a giant suburb. In fact, the unique urban quality of greater Phoenix is that it has spawned some of the most notable suburbs in America—including Mesa, a place that is more populous than Kansas City or Cleveland. In total, the Sun Corridor has eight suburbs with more than a 100,000 residents, and another half dozen places poised to cross this mark by 2030. Yet these suburbs—or “boomburbs”—are mostly not traditional bedroom communities and instead represent a new quasi-urbanized space that appears to be a new type of city.

Other regions in the Intermountain West, such as Denver, Salt Lake City, and Albuquerque, may not shock, but they can surprise. For example, Denver and Salt Lake City rank first and second among American metropolitan areas for the investment they are making in their light rail systems. Much of the track will run through larger suburbs and will help urbanize these places. As energy constraints begin to shape the metropolis, places such as Denver and Salt Lake may demonstrate how fast a car-centered region can switch to one where alternative transportation plays a significant role. By 2030, both regions could be transformed by responding quickly and at a large scale to shifting fashions in the market space. Like Phoenix, they will offer another new form of urbanism that is not like the traditional cores of Eastern cities (or even Los Angeles) but much more “city-like” than 20th century suburbs. Albuquerque too has seen significant change and will see more. The city has one of the most recently-transformed downtowns in the United States and the region is seeing innovative and sustainable projects proposed in its suburbs.

## NEW MEGAPOLITAN AREAS ARE EMERGING IN THE INTERMOUNTAIN WEST

**H**ow ought the West, as well as the rest of the nation, understand the nature and dynamics of these new urban spaces? One way is through the prism of a new geography: the megapolitan area.

Megapolitan areas link up multiple metropolitan areas into urban agglomerations connected by transportation networks and widespread economic and social activity. Megapolitan areas share a physical geography, a cultural and political history, and an economic and social reality. Many of these large-scale urban agglomerations exist throughout the United States—the most famous being the Washington to Boston contiguous urban fabric originally termed the “megapolis” by geographer Jean Gottmann.<sup>13</sup>

A similar style of megapolitan development is emerging in the Intermountain West, despite the region's small population size. In fact, by 2040, five largely contiguous urban spaces of more than one million residents each may emerge in the Intermountain West. These include:

- **Sun Corridor:** metropolitan Phoenix, Tucson, and Prescott plus smaller urban areas in Cochise and Santa Cruz counties<sup>14</sup>
- **Front Range:** Colorado's I-25 corridor linking up metropolitan Boulder, Colorado Springs, Denver, Fort Collins, and Greeley
- **Wasatch Front:** Utah's I-15 corridor linking up metropolitan Logan, Ogden, Provo, and Salt Lake City plus smaller urban areas in Box Elder and Wasatch counties
- **Greater Las Vegas:** metropolitan Las Vegas plus smaller and increasingly connected urban areas in Nye County, NV and Mohave County, AZ
- **Northern New Mexico:** metropolitan Albuquerque and Santa Fe plus smaller connected urban areas in Los Alamos and Rio Arriba counties

These five megapolitan areas constitute the primary focus of the present analysis of the southern Intermountain West. Together these five megapolitan areas are home to the vast majority of the region's population, employment, and economic and cultural activity. Indeed, the megapolitan scale captures the true impact of urban development and economic growth in the Intermountain West.

## About the analysis: The megapolitan geography

**T**his study uses a new geographic unit of analysis—the megapolitan area (or mega).<sup>15</sup>

The term “megapolitan” originated with the U.S. Census Bureau in 1999 as part of a process to remake the nation’s urban geographic definitions in anticipation of the 2000 enumeration. The label was intended for “Core-Based Statistical Areas” with 1 million or more residents in the core.<sup>16</sup> The megapolitan name would have been attached to such large regions as New York, Chicago and Los Angeles. However, the Office of Management and Budget, which oversees the U.S. Census Bureau, decided against developing a new large-scale metropolitan designation in 2000.

In 2005, Robert Lang and Dawn Dhavale revived the name “megapolitan” and attached it to the nation’s biggest metropolitan agglomerations.<sup>17</sup> Their purposeful use of the name megapolitan was part of an effort to match the Census methods and terms in identifying large regions. Virginia Tech then further developed the megapolitan concept to geographically depict where the next 100 million Americans will live.<sup>18</sup>

The most recent Virginia Tech analysis found 20 emerging megapolitan areas based on the U.S. Census Bureau’s definition of a “combined statistical area” (CSA). The main criterion for a Census Bureau-defined CSA is economic interdependence as evidenced by overlapping commuting patterns.<sup>19</sup> Virginia Tech’s megas are the CSAs of 2040 derived by extending the Census Bureau’s current method several decades forward. The CSAs of 2040 include the Chesapeake mega (Washington, Baltimore, and Richmond), the Carolina Piedmont mega (Charlotte and Raleigh), and the Puget Sound mega (Seattle and environs).

The megapolitan definitions used here differ slightly from earlier megapolitan definitions by anticipating what will eventually become the region’s large urban agglomerations. Virginia Tech’s latest megapolitan definition required the area to achieve a 15-percent employment interchange between major metropolitan areas with anchor cities of 50 to 200 miles apart by 2040.<sup>20</sup> While this definition works to identify megapolitan areas throughout the country, including the Sun Corridor and the Front Range, it misses some of the smaller but similarly emerging mega-urban forms in the Intermountain West.

For instance, an agglomeration of four major metropolitan areas is emerging along interstate 15 and the Wasatch Mountains, which we call the Wasatch Front. Northern New Mexico—including Albuquerque and

Santa Fe—has substantially fewer residents than other megapolitan areas in the region, but is exhibiting the same megapolitan form by connecting two proximate metropolitan areas 60 miles apart. And while Greater Las Vegas currently has only one major metropolitan area, it will likely grow out towards its smaller “micropolitan” neighbors over the coming decades to exhibit a truly megapolitan form. Las Vegas has grown quickly and is pulling itself away from the Southern California megapolitan, with which it was previously aligned.

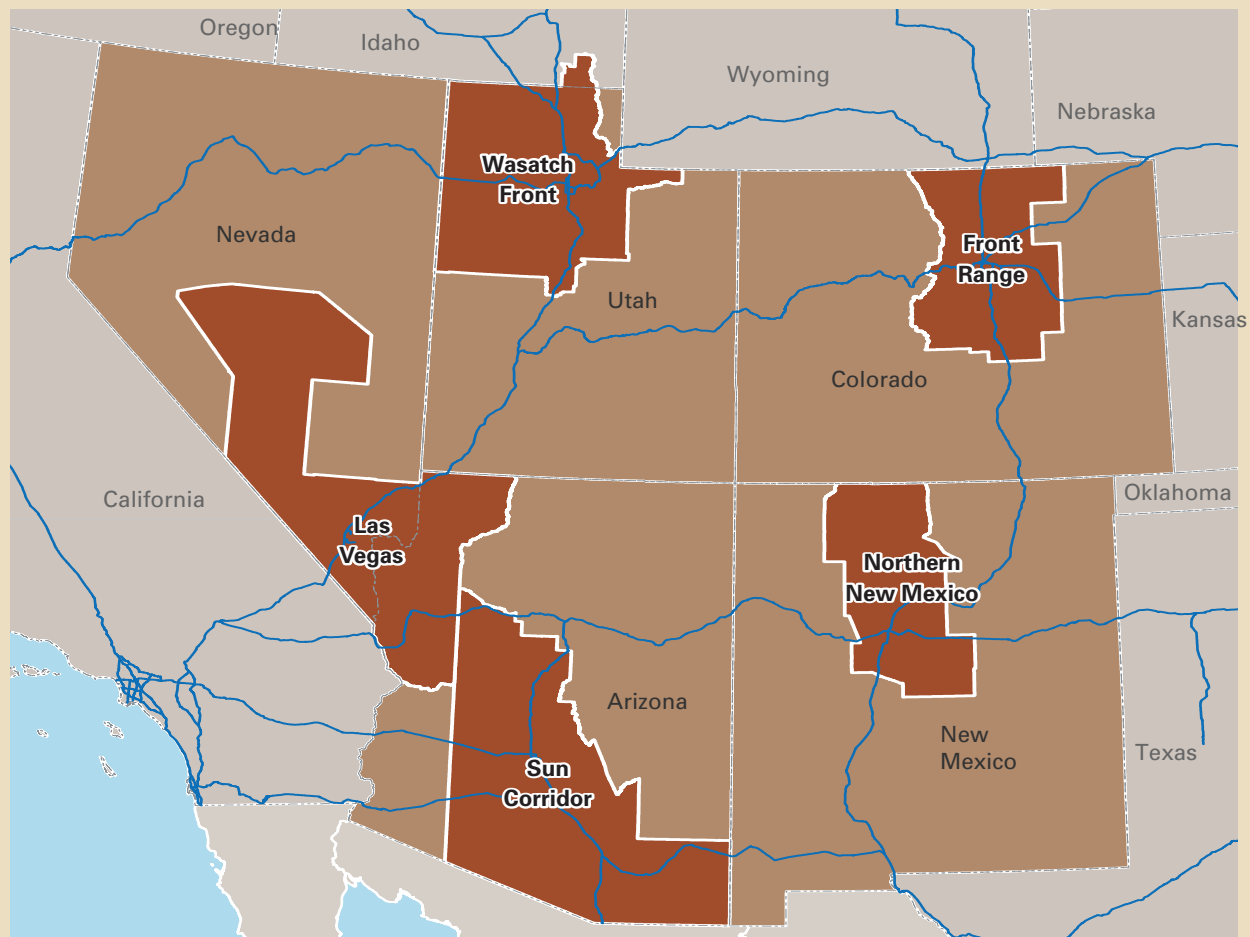
This report also relaxed the overlapping commuter shed criterion somewhat for the Intermountain West such that contiguous transportation networks, historic connectivity between metropolitan areas, and a shared cultural geography or identification were also considered.<sup>21</sup> For example, metropolitan Colorado Springs does not share a high level of employment exchange with the Denver metro area. This is due in part to a large agricultural preserve in the southern part of Douglas County, CO that breaks up commuting between the two largest Front Range metro areas. However, Denver and Colorado Springs share a common history and there are considerable business and personal linkages between the two metro areas, leading us to combine Colorado Springs into the Front Range megapolitan.

Defining a new urban geography can be controversial. The goal of this report is to begin a discussion about large-scale metropolitan development in the Intermountain West and to focus attention on the leading challenges and opportunities for this growing region. The methodology can then be further refined as the region matures and its scale of development becomes clearer.

Organizations such as the Lincoln Institute of Land Policy and the Regional Plan Association of New York (or RPA) have also developed new regional models and planning strategies to manage future metropolitan expansion. RPA and Lincoln convened the National Committee for America 2050—a coalition of planners and civic leaders to develop a national framework for America’s rapid population growth and the emergence of what they call “megaregions.”<sup>22</sup> Lincoln’s Armando Carbonell and RPA’s Robert Yaro led a University of Pennsylvania planning studio in 2005 that established a new megaregional geography. While the Penn megaregions do not maintain overlapping commuter sheds they nonetheless form networks of mostly contiguous metropolitan areas.

William Travis, a geographer at the University of

## Five megapolitan areas are emerging in the Intermountain West



*Note: Megapolitan areas are ultimately built from counties, which are giant in the West and give the impression that an enormous amount of space is urbanized. The reality is that only a fraction of this vast space is in urban use.*

Colorado, also developed a western-specific application of Virginia Tech's original megapolitan work by adding several western metropolitan areas to the list of large connected regions. Travis shows "metro zones" along the Front Range, the Wasatch Front, and the Upper Rio Grande (or what we call Northern New Mexico).<sup>23</sup>

### About the analysis:

#### The data

**T**he data for this report derives largely from U.S. Census Bureau decennial censuses conducted in 1990 and 2000, and from the American Community Survey (ACS) sample of 2006. The decennial census offers the most comprehensive information on demographics, housing, and employment for varying levels of geography.

ACS provides more recent information than the decennial census on demographics and housing, although county components of megas with fewer than

60,000 residents have not yet been sampled in the ACS. This means that the most recent demographic data are missing for Santa Cruz and Cochise counties in the Sun Corridor, Box Elder and Wasatch counties in the Wasatch Front, Rio Arriba and Los Alamos counties in Northern New Mexico, and Nye County in Greater Las Vegas.

To supplement the ACS and for the most recent population counts, this report uses data from the U.S. Census Bureau's 2007 Population Estimates, which include all counties in the country.

Employment data derives primarily from the Bureau of Economic Analysis and the Bureau of Labor Statistics.

As with the ACS, some of the data are available only for metropolitan areas within the megapolitan areas, and as such are noted in the text or references.

Other data sources are noted within the text and references.

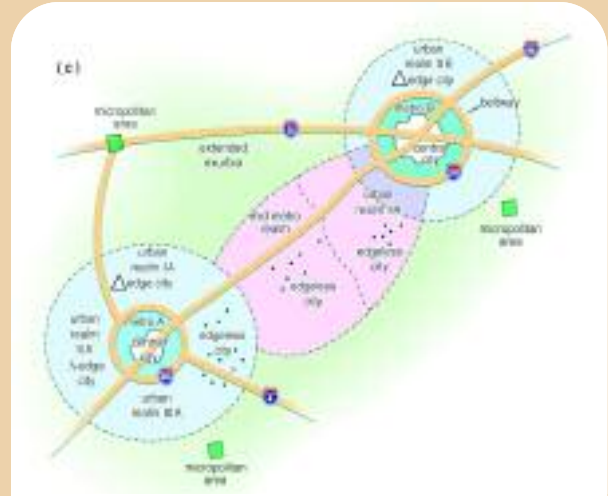
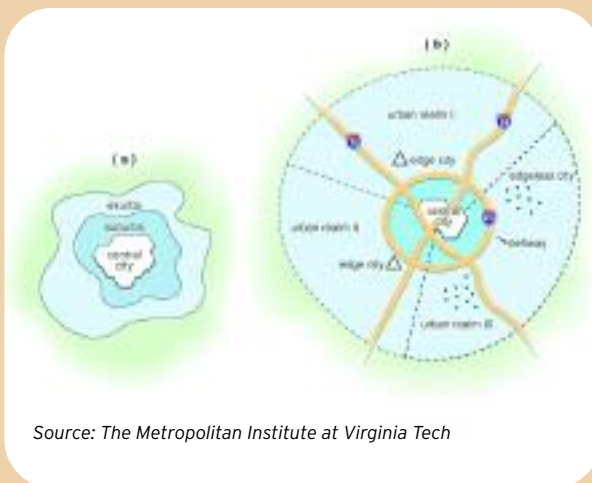


## The origin and evolution of megapolitan form

A new metropolitan form is emerging, with its most vivid expression being the megapolitan area.

In first decades of the 20th century, the large regional city emerged (see panel A).<sup>24</sup> It was an extended space yet it remained anchored to a central core. This classic regional form is the one the U.S. Census Bureau used as a model when it developed the metropolitan area statistic in 1949.<sup>25</sup> The Census Bureau only recently moved away from the “central city/suburb” scheme.<sup>26</sup> The Census Bureau now offers a poly-nuclear “principal city” category that lifts select suburbs to the status of big cities. The Census Bureau also rolled out a new “micropolitan” definition to show small urban regions.<sup>27</sup> The micropolitans fill in a large share of space in between metropolitan areas and suggest that a larger functional urban structure exists.<sup>28</sup>

The late 20th century metropolis, often served by Interstates and a beltway, splintered metropolitan areas into distinct sub regions known as “urban realms” (see panel B).<sup>29</sup> Suburban business clusters—or edge cities—also arose outside the downtown core and urban realms became tied to non-central city commerce. While this metropolitan pattern seems polycentric, the reality is that office and retail development scatters in far less predictable and more decentralized ways than can be easily depicted. Along with the clustered edge cities, each urban realm also has an often even greater share of “edgeless cities,” which fail to coalesce into distinct nodes.<sup>30</sup>



Source: The Metropolitan Institute at Virginia Tech

By 2000, a new metropolis emerged with its signature feature being the megapolitan area (see panel C). Interstate highways are the key structural elements in megapolitan development. One force driving this change is simply the massive nature of recent growth in the United States. The stylized megapolitan form includes two major metropolitan areas and several micropolitans that fall in their orbits. Urban realms now exist between metro areas and may even link two or more places. For instance, consider a place such as Fredericksburg, VA, which is halfway between Washington, DC and Richmond, VA. The area has commuters that drive both north towards Washington and south towards Richmond. Fredericksburg exists as a kind of nether-realm between the two—not really in either metropolitan area, but yet tied to both.

## THE WESTERN MEGAPOLITAN AREAS HAVE A UNIQUE URBAN CHARACTER

**R**eflecting their growing scale and importance in the American urban system, the Intermountain West's urban spaces are becoming an active area of study.<sup>31</sup> Interestingly, these places contrast with East and West Coast cities. They are mostly not the "melting pot" regions as found in California and Texas, or the "wet Sun Belt" cities of Georgia and North Carolina, and they are far removed in look and feel from the older metropolitan areas in the Northeast and Midwest.<sup>32</sup>

Most of the interior West's settlement is located in the region's megapolitan areas, making the region the most rural and the most urban in the nation. The megapolitan West sits in a vast sea of open space.

The West's contained settlement pattern appears in the U.S. Census Bureau's original analysis of the American frontier. Census Bureau scholars developed a density-based frontier definition in the late 19th century to track national settlement since the first census in 1790. They defined the frontier as lands with a population density between 2-6 people per square mile, which is much lower density than typical rural places. The frontier definition captures deep rural land.

By 1840, about half the East had settlement that exceeded six people per square mile. Interestingly, by 2000, roughly half the West (the Pacific and Intermountain States) remained frontier.<sup>33</sup> The East erased half its frontier in the early industrial era—the West did at the end of the 20th century. Although the West was settled later than the East, this delay alone does not account for why so much open space has remained in the region even into the 21st century.

Despite the relatively limited reach of settlement, the West's urban centers grew rapidly. This seeming contradiction of a large, even expanding, frontier amid rapid urbanization perplexed 19th century scholars. Over a century ago, the West was showing a pattern of growth that distinguished it from the East to such an extent that social scientists were hard-pressed to explain it.

To some degree, the confusion continues. The wide-open spaces ringing Western metropolitan areas are deceptive; their ruggedness can inhibit urban expansion.<sup>34</sup> Outward expansion often requires an expensive extension of metropolitan water supply. The surrounding rural hinterland that does not share this water supply may not be able to sustain even moderate exurban development such as large-lot subdivisions. In addition, the West is mountainous and buildable land is often limited on at least one side, as happens along the Front Range of the Rockies and along the Wasatch Mountains.

The fact that the West is so arid and rugged resulted in the federal government retaining large amounts of public lands. Under various legislation beginning with the North-



west Ordinance of 1787, most public lands were designated for transfer to private parties. In the East, this transfer occurred quickly and the federal share of land was quickly reduced to relatively minor holdings. This was largely because Eastern land could be easily farmed and quickly settled. But big stretches of the West required massive irrigation projects to be "reclaimed" as farmland. In many cases, such projects did not occur until well into the 20th century. In the process, the federal government set aside much of this land as parks, monuments, forests, military reserves, and Indian reservations. In addition, most land that that was intended to be settled under the Homestead Act of 1862 was simply never claimed and defaulted to public agencies.<sup>35</sup> In extreme cases such as Nevada, the federal government now controls the vast majority of the land.

\* \* \*

It is clear that megapolitan development in the southern Intermountain West is unique and needs to be understood on its own terms. The following chapter offers additional insights into the trends and forces at work in the Intermountain West.

# III. TRENDS IN AMERICA'S FASTEST GROWING, MOST URBAN REGION

A fundamental transformation is underway in the Intermountain West. What were once desert outposts and small cities have become massive and booming urban regions. This section describes the dominant growth, economic, and demographic trends shaping the region. Three basic trends emerge:



- The region is in the midst of a population explosion
- The region's economy is rapidly changing
- Rapid growth is changing the face of the region

Despite local variation, the trends highlight the region's distinctiveness. No other region of the country today faces as strong growth pressures as does the Intermountain West. And projections suggest the region should continue to boom well into the 21st century.

## THE REGION IS IN THE MIDST OF A MAJOR, SURPRISINGLY URBAN POPULATION EXPLOSION

**The Intermountain West is experiencing some of the fastest population growth in the country.** Nevada, Arizona, and Utah ranked first, second and third in state growth rates between 2000 and 2007. None of the nine U.S. Census Bureau-defined regional divisions grew faster than the Mountain division, including the five Intermountain West states plus Montana, Wyoming and Idaho, in the first part of this decade. The Mountain division is also projected to continue growing the fastest of all the country's divisions

**The megapolitan West has far outpaced the nation's rate of population growth in this decade, led by booming Las Vegas**

	Population, 2007	Population growth, 2000-2007	Percent population growth, 2000-2007
Sun Corridor	5,529,862	1,076,582	24.2%
Front Range	3,895,548	453,410	13.2%
Wasatch Front	2,301,099	342,045	17.5%
Las Vegas	2,075,393	492,659	31.1%
Northern New Mexico	1,037,460	116,389	12.6%
Five mega total	14,839,362	2,481,085	20.1%
United States	301,621,157	19,426,849	6.9%

*Source: Brookings analysis of U.S. Census Bureau data*

through 2030.<sup>36</sup> While the region experienced periods of rapid growth and leveling off going back to the 18th century, the today's sustained rapid growth projections signal a new growth dynamic is at work in the region.

**Most of the new regional growth is occurring within the five megapolitan areas here termed the "megapolitan West."** As a group, the megapolitan West contains 80 percent of the five-state area's population, and captured 88 percent of the region's population growth since 1990. Growth in the megapolitan West has consistently outpaced national rates since 1940, with growth nearly three times the national rate in the 1990s and since 2000. Together, the five megapolitan areas in the Intermountain West picked up 11 percent of the nation's population growth between 1990 and 2007, and nearly 13 percent of the nation's growth since 2000.

**Leading the region is greater Las Vegas, which has been growing by more than 6 percent a year in the 1990s and more than 4 percent annually since 2000.** In fact, metropolitan Las Vegas added population more than twice as fast as any other large U.S. metropolitan area since 1969, including fast growing metropolitan Phoenix in the number two spot. Even the slowest growing of the anchor metropolitan areas in the Intermountain West, Albuquerque, still ranked among the top 30 fastest growing large U.S. metropolitan areas since 1969, shortly behind Denver and Salt Lake City.

**The megapolitan West is surprisingly dense.** In 2000, 93 percent of the megapolitan West's population lived in urbanized areas—areas that contain at least 1,000 persons per square mile—well above the national average of 79 percent. These rates translate to an average urbanized density of over five persons per acre in the megapolitan West,

although in Las Vegas the figure jumps to more than seven persons per acre. Urban Denver and Salt Lake each had an urban density of six persons per acre in 2000—the same as in urban Chicago and far above the 3.6 persons per acre in urban Boston.

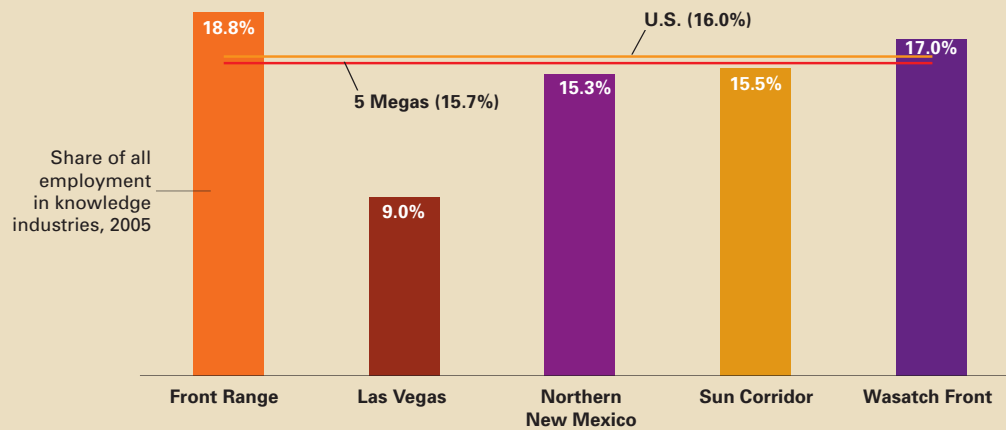
## THE REGION'S ECONOMY IS RAPIDLY CHANGING

**Job growth has proceeded even faster than population growth.** Since 1970, the megapolitan West added 6.2 million jobs for a 3.9 percent annual increase over 1970 levels, well beyond the nation's 1.9 percent annual growth in jobs and 1.2 percent growth in population.<sup>37</sup> Las Vegas' job base grew by an astounding 6.0 percent annually, while the Sun Corridor alone added 2.25 million jobs. By 2005, the megapolitan West had captured a significantly larger share of U.S. employment growth (7.6 percent) than its share of national employment (4.9 percent). This strong growth has also kept unemployment levels low in the megapolitan West. As of December 2007, all of the megapolitan areas except greater Las Vegas had unemployment levels lower than the national average of 4.8 percent, with rates at 3 percent or lower in Northern New Mexico and the Wasatch Front.<sup>38</sup>

**Despite their historical importance to the region, few workers remain in resource-extractive industries.**<sup>39</sup> Private sector, non-agricultural jobs in natural resource-based industries, such as forestry and mining, declined 28 percent from 1990 to 2004. Resource-based industries, however, contained fewer than 16,000 employees in 2004 and only 0.3 percent of the megapolitan West's private sector, non-agricultural jobs. Agricultural employment has also declined from 2.3 percent of all jobs in 1969 to just 0.6 percent in



**Critical “knowledge industry” employment is variable across the Megapolitan West**



Source: Brookings analysis of data from the Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

2005.<sup>40</sup>

**Following a larger national trend, clusters of firms and industries serving local clientele dominate the megapolitan West's economy.** These local clusters, such as health services, real estate, and construction establishments, constitute an increasing share of the metropolitan West's employment, rising from 65 percent of private-sector, non-agricultural jobs in 1990 to 69 percent in 2004, and captured 75 percent of the total private-sector, non-agricultural employment growth since 1990. Average annual wages for employment in local clusters in the megapolitan West (\$30,700) were on par with average national wages (\$30,400) in 2004.

**The remaining employment growth occurred in critical “traded” clusters, which export services and products to other regions and countries.** Traded clusters, such as business and financial services, are particularly important to a region's economy because of their generally higher wages, productivity, and innovation potential.<sup>41</sup> However, employment in traded clusters dropped from 34.5 percent of the region's private-sector employment in 1990 to 30.7 percent in 2004. Still, traded clusters maintained a slightly stronger foothold in the megapolitan West than for the whole United States. Nationally, the share of employment in traded clusters declined from 34.1 percent in 1990 to 29.3 percent in 2004. At the same time, the megapolitan West has seen greater employment growth in its traded sector. Only 13 percent of the national employment growth from 1990 to 2004 occurred in traded clusters compared to

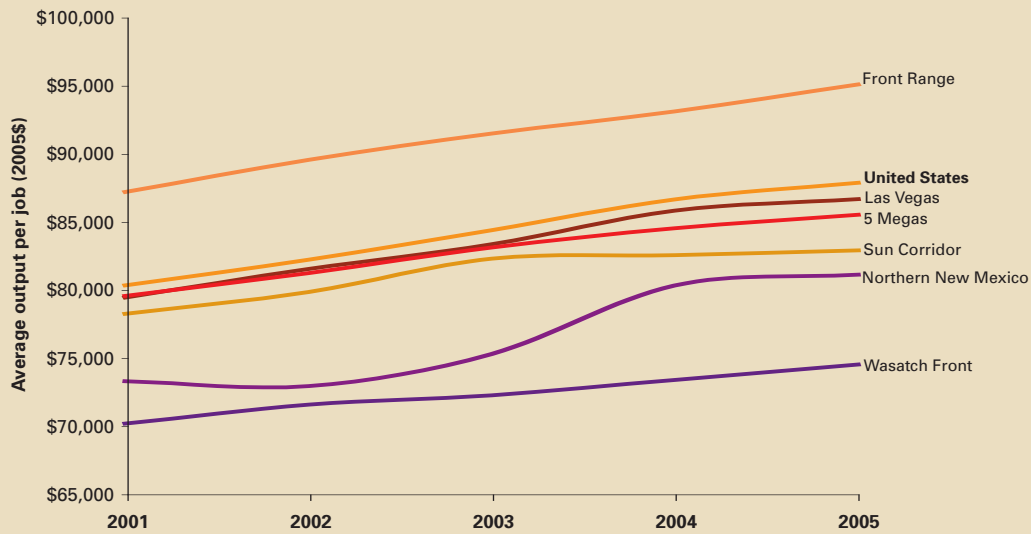
the megapolitan West's robust 25 percent.

**The hospitality and tourism cluster employed more workers than other traded clusters in the megapolitan West.** Unlike traded clusters such as information technology and financial, business, and distribution services, average annual wages in the export hospitality cluster are low, although these jobs are often tip-dependent and wages do not reflect tip earnings. This helps to explain why average annual wages in traded clusters in the megapolitan West (\$44,000) were 12 percent lower than the national average (\$49,400) in 2004.

**The region's megas vary in their specialization in especially strategic “strong clusters.”** Competitive strength and wages closely track specialization in “strong clusters”—export-oriented industries in which a metropolitan area's concentration of employment ranks it in the top fifth of all metropolitan areas nationally.<sup>42</sup> On this front, Las Vegas leads the way in the share of its export-oriented employment in strong clusters (73 percent). Phoenix, Colorado Springs, Tucson, and Denver also place more than half of their export-oriented employment in strong clusters. Salt Lake and especially Albuquerque are more diversified with 43 and 25 percent of their traded cluster employment in strong clusters.

**The megas also vary in the extent of their involvement in knowledge-driven economic activity.** In 2005, one million jobs in the megapolitan West were in high-value “knowledge” clusters—defined as financial services, information technology, health care, and knowledge creation.<sup>43</sup>

### Labor productivity trails the national average in all megas but the Front Range



Source: Brookings analysis of Bureau of Economic Analysis data

Rates of concentration across the megapolitan West varied substantially, from 9.0 percent of employment in Greater Las Vegas to 18.8 percent of employment in the Front Range. Denver and Phoenix made the top 40 U.S. metropolitan areas for total employment in each of the four knowledge clusters in 2004.<sup>44</sup> Salt Lake City and Provo, in the Wasatch Front, placed high nationally in the knowledge creation and information technology clusters, and Albuquerque ranked high nationally for information technology, alongside Colorado Springs. Relatively speaking, however, the megapolitan West's share of employment in these knowledge clusters (15.7 percent) slightly lagged behind the national average (16 percent).

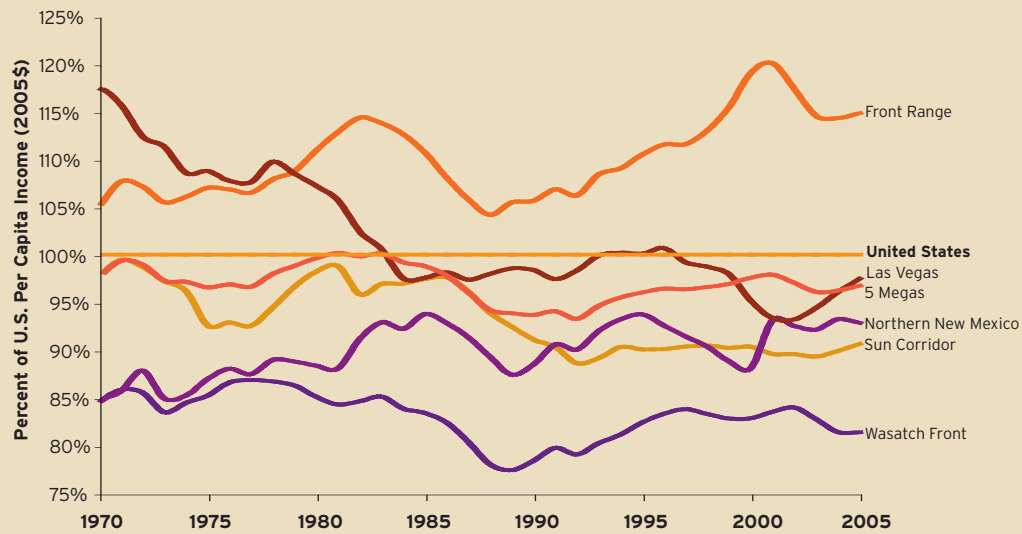
**Economic change has helped drive up productivity across the megapolitan West—but not as fast as it could.** "Productivity isn't everything, but in the long run it is almost everything," declares economist Paul Krugman.<sup>45</sup> And so it is: Economists generally agree that few indicators matter more than productivity, which points to the efficiency by which an economy generates value from resources and so income. By this measure, the Intermountain West's megas—while they are moving up the value chain as their economies grow and change—have a ways to go to secure true prosperity. To be sure, average labor productivity—the value of goods and services produced per worker—rose in the megapolitan West from about \$79,500 per year in 2001, to \$85,400 per year in 2005. However, the 2005 figure in the region remained slightly beneath the national average of \$87,771. Only the Front Range among the megas exhibited

above-average productivity. What is more, productivity *growth* across the megapolitan West also lagged national rates, with output per job rising by just 1.8 percent on average each year from 2001 to 2005 compared to 2.3 percent nationwide. Had the region seen the same rate of growth as the nation, it would have nearly pulled even with national productivity levels.

The region's middling performance on productivity is troubling and something of a puzzle. Productivity is a crucial indicator of the efficiency and value of an economy that heavily determines living standards. And so its lag merits concern. At the same time, the relative youth of the region's current labor force may be constraining productivity growth temporarily in advance of potential future leaps forward. In any event, output per unit of labor expended remains a crucial metric of prosperity and bears constant monitoring.

**Living standards—as measured by per capita income—are also lower than average in the megapolitan West.** Because labor productivity largely determines living standards, it should not be surprising that the Intermountain megas continue to struggle to raise their living standards. Since 1969, per capita income has consistently trailed national levels in three of the region's megapolitan areas—Northern New Mexico, the Sun Corridor, and the Wasatch Front.<sup>46</sup> Northern New Mexico had the lowest per capita income of the five areas relative to U.S. levels in 1969, but improved notably by 2005. On the other hand, Las Vegas started with the highest per capita income of our five

**Per capita income in the megapolitan West is lower today than the national average, except again in the Front Range**



Source: Brookings analysis of Bureau of Economic Analysis data

megapolitan areas but experienced substantial erosion of its income level compared to U.S. levels from 1969 to 1995. Paralleling the productivity trends, only the Front Range has seen consistently higher per capita income relative to U.S. levels since 1969. Overall, the inferior per capita levels in the megapolitan West persist despite real income growth of 73 percent since 1969, outpacing national growth of 69 percent. Low per capita figures may be a result of the part-time workers and larger than average household sizes in the megapolitan West, and especially in the Wasatch Front.

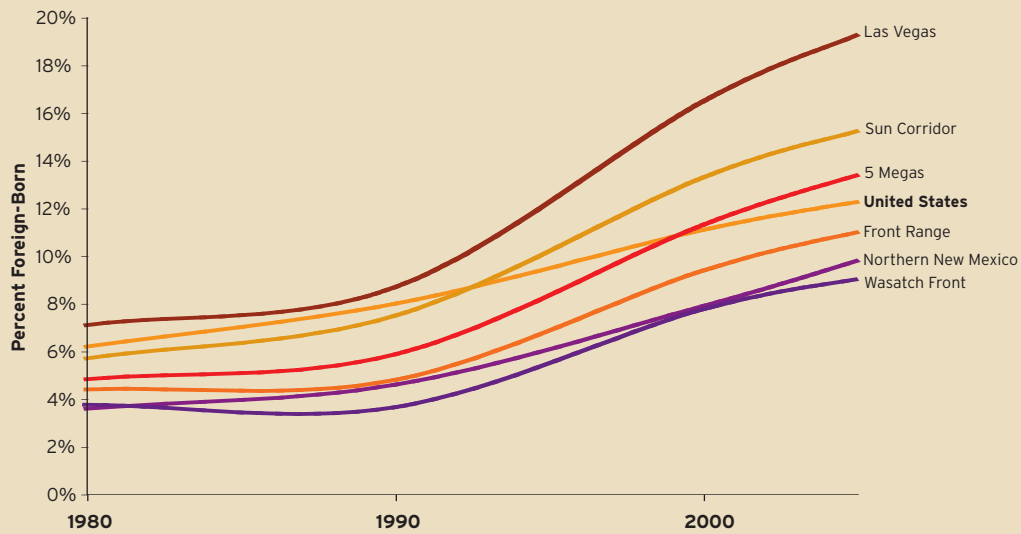
**At the same time, living costs are slightly higher in the megapolitan West than the nation as a whole.**

Averaged across multiple items, such as housing, transportation, energy, and health care, overall living costs appear only slightly higher than the national average (approximately 1.8 percent higher).<sup>47</sup> Average costs in Greater Las Vegas and the Sun Corridor range higher (at 3.1 and 2.6 percent higher).

Food and health care costs are consistently higher in the region than nationally, while median housing and utility costs tend to be lower. Still, pockets within the megapolitans, such as in Santa Fe, NM; Boulder, CO; and Park City, UT, have substantially higher housing costs, and therefore have higher overall living costs.

**Overall, the inferior per capita levels in the megapolitan West persist despite real income growth of 73 percent since 1969, outpacing national growth of 69 percent.**

### Immigration is increasing the share of foreign-born residents in these areas



Source: Brookings analysis of U.S. Census Bureau data

## RAPID GROWTH IS CHANGING THE FACE OF THE REGION

**Growth in the megapolitan West incorporates both a natural population increase and migration from elsewhere in the United States.** Native-born U.S. citizens have increased by more than 70 percent in the megapolitan West since 1990, capturing approximately 15 percent of the country's native-born growth. Recent transplants to the megapolitan West most frequently move from the "old Sun Belt"—California, Texas, and Florida—and other areas within the Intermountain West.

**Immigration has played an important role in the megapolitan West's growth.** Since 1990, the foreign-born population has almost quadrupled in the megapolitan West, growing from about a half million to just under 2 million. The megapolitan West's share of residents that are foreign-born increased from 5.9 percent in 1990 to 13.7 percent in 2006. Greater Las Vegas and the Sun Corridor now have the largest concentrations of residents that are foreign-born within the megapolitan West, at 19.8 percent and 15.6 percent, respectively. The Sun Corridor alone is home to 43 percent of the region's immigrants, with 834,000 residents that were foreign-born in 2006. A majority of the megapolitan West's foreign-born population is from Mexico and the rest of Latin America, with small contingents from Asia and Europe.

**The newness of the immigrant wave is striking.** Sixty-one percent of the megapolitan West's population that is foreign-born entered the country after 1990, and half of

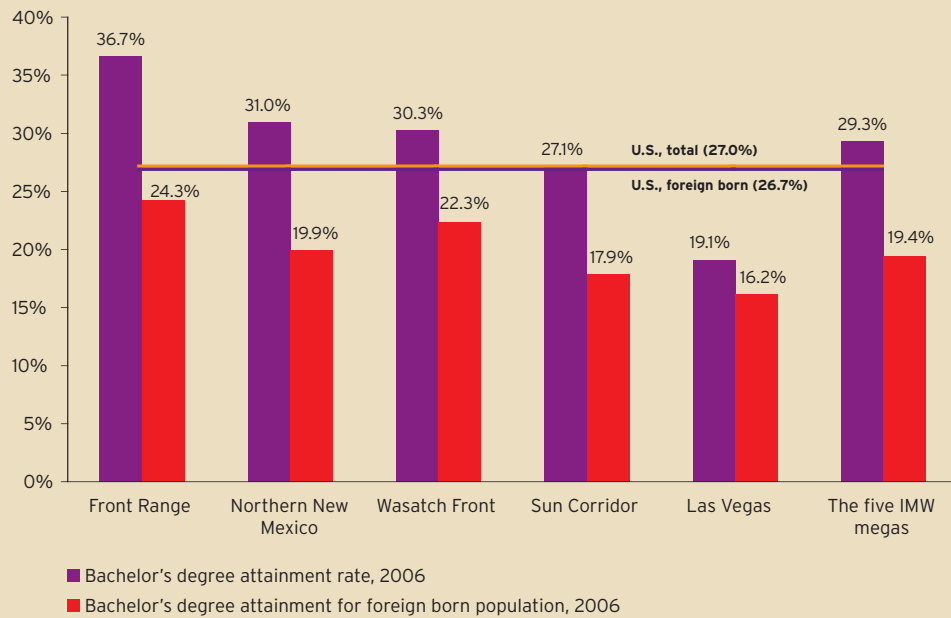
those have arrived since 2000.<sup>48</sup> These rates are slightly higher than the national average (54 percent entering since 1990 and 24 percent entering since 2000.) The Wasatch Front stands out for having the region's largest share of immigrants entering since 1990, a full 12 percentage points higher than the national average. Surprisingly, slower-growing Northern New Mexico now has proportionally more very recent immigrants (entering since 2000) than any of the other immigrant gateways in the region.<sup>49</sup>

**The racial and ethnic mix of the megapolitan West is slowly but steadily diversifying.** In 1990, 86 percent of megapolitan West residents were white (compared to 80 percent nationally). By 2005, the share of white residents had dropped to 80 percent in the region (compared to 75 percent nationally). Given its proximity and strong immigration from Mexico, the megapolitan West has a larger than average and fast-growing Hispanic population (of all races). Hispanics in the Wasatch Front grew more than 200 percent since 1990, and grew more than 400 percent in greater Las Vegas. Although growing slower than the nation, Northern New Mexico is home to the largest proportion of Hispanics in the megapolitan West at nearly 45 percent of the megapolitan area's population in 2005.

**Today's labor force is relatively well educated in the megapolitan West.** The share of adults 25 years and older with at least a bachelor's degree in the megapolitan West has consistently exceeded national shares. In 1990, 23.7 percent of megapolitan West residents had bachelor's degrees, compared with 20.3 percent nationally. By 2006,



**Educational attainment for the foreign-born population significantly lags average attainment in each of the five megapolitan areas**



Source: Brookings analysis of U.S. Census Bureau data

the share of residents in the megapolitan West with bachelor's degrees rose to 29.3 percent, compared to 27 percent nationally. More than 60 percent of recent migrants to the region—both domestic and international—reported having at least some college education.<sup>50</sup>

**However, a large share of the metropolitan West's fast-growing immigrant population is poorly educated.** Nearly 40 percent of the megapolitan West's foreign-born adult population had less than a high school education in 2005, compared to 32 percent of all U.S. adult immigrants who did not have a high school education. Similarly, only 19 percent of the adult immigrants in the megapolitan West had college degrees in 2006, compared to 27 percent nationally. Of the region's immigrants arriving this decade, more than half did not report any college education.<sup>51</sup>

**Sizable spatial and racial disparities in educational attainment crisscross the megapolitan West.** Residents in the Front Range are particularly well educated, consistently outperforming national levels regardless of race. The reverse tends to be true in Greater Las Vegas, where educational attainment lags national levels. Disparities between Hispanics and the other races were stark: only 11 percent of Hispanics had college degrees in the megapolitan West in 2006 compared to 43 percent of Asians, 35 percent of non-Hispanic whites, 21 percent of blacks, and 15 percent of American Indians.<sup>52</sup> These disparities are troubling given

the Census Bureau's projections that Hispanics will comprise almost half of the country's population growth through 2040 and will reach more than 20 percent of the region's future workforce.<sup>53</sup>

**At the same time, the megapolitan West's prominent middle class has been shrinking and income disparities have grown.** In 1970, an above-average share (42.1 percent compared to 40.6 percent nationally) of families in the megapolitan West enjoyed "middle-class" incomes, defined as ranging between 80 and 150 percent of their area's median family income.<sup>54</sup> By 2005, there were more lower-income families (earning less than 80 percent of their median area family income) than there were middle-income families in all five megapolitan areas, and the middle-class share dropped to 33.7 percent (compared to 32.2 percent nationally). Fortunately, some families in the megapolitan West were upwardly-mobile, resulting in modest gains in the upper-income bracket (families earning more than 150 of the median area family income) by 2005. Thus, areas once heavily populated by middle-class families now show deep class divides. While troubling on many fronts, the relative erosion of the middle class and gain in both lower and upper income families closely tracks a larger national trend of widening income gaps between the rich and poor.<sup>55</sup>

## THE BOOMING MEGAPOLITAN WEST WILL LIKELY KEEP ON BOOMING

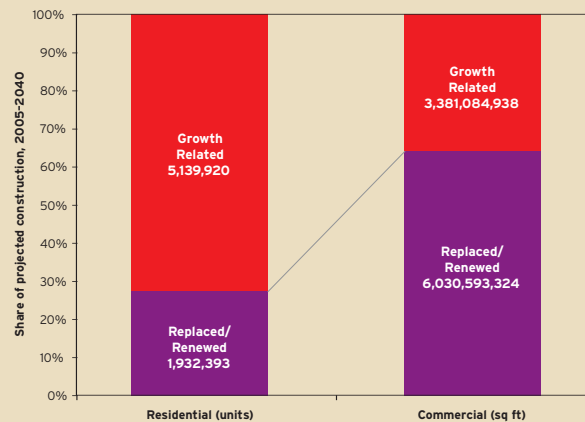
Overall, the United States is projected to grow rapidly. Consider that the nation has just past 300 million residents and seems well on its way to adding the next 100 million by 2040.<sup>56</sup> In fact, population growth this decade is approaching the U.S. Census Bureau's high trend prediction of 311 million people by 2010 (the likely number is 309 million).<sup>57</sup>

While America will keep adding people and retain aging ones, the Intermountain West is projected to gain a disproportionate share of this growth. Together, the five Intermountain West megapolitan areas are projected to grow by nearly 12.7 million residents and to add more than 8 million jobs by 2040.<sup>58</sup> This means the megapolitan West's population would nearly double (increase by 91 percent) and jobs would more than double (increase by 107 percent) their 2005 levels by 2040. This growth constitutes more than 88 percent of the five state region's projected population and employment growth between 2005 and 2040. It also constitutes more than 12 percent of the nation's projected population growth and more than 9 percent of the nation's projected job growth between 2005 and 2040.

Continued growth will likely require tremendous new construction from now to 2040.<sup>59</sup> The megapolitan West would likely have to build 5.1 million new housing units and replace or renew 1.9 million existing dwellings to accommodate 12.7 million new residents. This means that by 2040, the megapolitan West may have nearly doubled the number of housing units as were on the ground in 2005 (5.6 million units), plus replaced or upgraded another quarter as many more. It also means that nearly two-thirds of all the housing units in place by 2040 will have been constructed (new or replaced) since 2005. The estimated construction cost attached to this massive growth and replacement of homes in the megapolitan West is \$2.25 trillion.<sup>60</sup>

Equally staggering, a total of 9.4 billion square feet of new or replacement non-residential space may need to be built to accommodate an additional 8 million jobs by 2040. Nearly 6 billion square feet of this space (64 percent) is replacement inventory, which is a much larger share of the stock replaced than in housing due to the shorter life cycle of commercial real estate. This means that between now and 2040, the megapolitan West may build nearly the same amount of new commercial real estate as was on the ground in 2005, and replace nearly twice as much as it cur-

To accommodate growth, the megapolitan West may need to build or replace 7 million residential units and 9.4 billion square feet of commercial space by 2040



Source: Analysis conducted for Brookings by the Metropolitan Institute at Virginia Tech

rently has by 2040. The total value of this non-residential construction reaches an estimated \$916 billion.

New construction may also require massive new investments in infrastructure by 2040, estimated at around \$648 billion. These investments include both public and private infrastructure, such as roads and sewers, making infrastructure—and its financing—one of the major challenges facing the Intermountain West in the coming decades.

The projections presented in this section present only one growth scenario for megapolitan areas in the Intermountain West. Other possible outcomes are worth exploring. One scenario is that the Western quality of life becomes so compromised due to overdevelopment that it drives people from the region. Another is that environmental limits such as declining air quality or dwindling water supply sharply constrain the region's carrying capacity. The current downturn in the nation's economy and the drag of the housing market could also drive down the amount of new development. Rising energy prices may constrain new development and devalue buildings in far-flung, inaccessible locations.<sup>61</sup>

The momentum for growth in the West appears strong, however. While the exact year that the Intermountain West's megapolitan areas achieve the development numbers shown in the projections is hard to know, the chance that these gains eventually will be seen is highly probable.

# IV. EMERGING CHALLENGES AND OPPORTUNITIES

The Intermountain West's megapolitan areas are in many respects flourishing.

Year after year, the megas post startling population growth and job creation rates.

Year after year, these new megapolitans are attracting migration from home and abroad, and pioneering new urban forms.

**Growth continues to outstrip the construction of adequate and appropriate transportation systems.**

However, though the growth projections offered in this report suggest the Intermountain West should continue to boom well into the 21st century, that expansion would bring new challenges to the region along

with the benefits and opportunities of growth.

Growth continues to outstrip the construction of adequate and appropriate transportation systems. Economic transition has not yet yielded a fully diversified and consistently high-value economy. And meanwhile, the Intermountain states face significant social challenges as they seek to accommodate the varying needs of millions of Latino immigrants and other young in-migrants seeking a better life.

Grappling with this growth will require even greater attention in the coming decade to ensuring that the area's dominant megapolitan areas grow more truly prosperous as they grow larger—ensuring they amass and secure adequate stores of the crucial assets and inputs that contribute to true prosperity. Accordingly, this section will assess the Intermountain West's readiness to deliver a balanced brand of prosperity by assessing the five megapolitan areas' standing on the crucial prerequisites of balanced vitality: adequate infrastructure, competitive innovation inputs, an



educated workforce, and a strong quality-of-place, as well as effective regional governance.

These pages find that while the Intermountain West has made important progress in amassing the core prerequisites for prosperity it faces a series of unique challenges, as well as urgent opportunities, that it will likely not be able to surmount solely by itself.

## INFRASTRUCTURE

Infrastructure networks—the first critical driver of megapolitan and national prosperity—provide essential linkages that knit together an urban system. Infrastructure connectivity promotes economic synergy by clustering related economic activity and fostering regional specialties. Infrastructure connectivity improves access to jobs and educational opportunities, further supporting economic health and prosperity. And likewise, strategically developed infrastructure can also play a critical role in determining a region's shape and improving its ability to adapt to the climate and resource challenges of the 21st century. In the face of the region's rapid growth, four major infrastructure challenges loom large:

- Underdeveloped surface transportation network
- Limited global air connectivity
- Uncertain water supplies
- Energy in transition

### **Underdeveloped surface transportation network**

Few observers—even just several decades back—ever saw the West achieving large-scale urbanization. As recently as 1950, the Intermountain West was the least developed part of the United States. In 1980, author Joel Garreau referred to the Intermountain West as the “empty quarter” in his book *The Nine Nations of North America*.<sup>62</sup> In 1950, the region's biggest metropolitan area, Denver, contained 612,000 residents. That same year the now massive Phoenix region had just over 100,000 residents, while Las Vegas was home to less than 50,000 people.

The legacy of this unanticipated growth haunts the region. For instance, 1950s population data and projections, which were used to guide the investment and planning of the Interstate Highway System, showed the Intermountain West would have little need for direct linkages from city to city or for metropolitan beltways.<sup>63</sup> Today, no direct interstate connects Las Vegas and Phoenix. Imagine another region of nearly 2 million residents that is located near one with 5 million residents, without a direct Interstate highway between them. Several Interstates directly connect Nashville, for instance, with big neighboring cities. Simi-

larly, I-10 connects San Antonio with Houston and I-75 connects Chattanooga with Atlanta.

The lack of a robust and supportive transportation network linking megapolitan areas is troubling when considering the volume of traffic that passes through the Intermountain West en route to other destinations. For instance, CANAMEX is a critical freight corridor running from Mexico through the Sun Corridor, greater Las Vegas, and the Wasatch Front on its way to the northern Intermountain West states, Canada, and eventually Alaska. CANAMEX travels along routes I-19, I-10, U.S. 93, and I-15. U.S. 93—the two-lane highway running between Phoenix and Las Vegas—is one of the weakest links in the CANAMEX corridor, especially where it crosses the Hoover Dam.<sup>64</sup> In addition, the U.S. 93/I-15 intersection in Las Vegas is the second worst congestion choke point in the country for freight traffic, causing nearly 300,000 hours of delay for freight per year, valued at 2.3 billion dollars.<sup>65</sup>

The Intermountain West also lacks the transportation choices common between other nearby major U.S. cities. Consider the multiple linkages running between the Baltimore and Washington metropolitan areas. There are two highway connections (I-95 and the Baltimore-Washington Parkway) plus intercity rail (Amtrak, MARC trains). These options improve circulation by providing choices for travel within the Chesapeake megapolitan area as well as connecting residents to areas throughout the Washington-Boston corridor and the entire Eastern Seaboard. By comparison, the Sun Corridor has only one major highway linkage between Phoenix and Tucson and traffic congestion along this corridor is getting steadily worse.

Intercity passenger rail service is underdeveloped throughout the Intermountain West. Passenger rail lines that run through the megapolitan West connect the region to its Eastern and Western neighbors but do not serve the megapolitan areas themselves well. Service frequency and on-time departures are low on Amtrak's routes through this region, in part because the system must share tracks with an already overburdened freight rail system. Not surprisingly, usage of Amtrak lines is modest throughout the Intermountain West. Denver's Union Station is the largest Amtrak station in the region, and served only 123,000 passengers in 2007.<sup>66</sup> The seven Amtrak stations in the five Intermountain West megapolitan areas together served 252,000 passengers in 2007, approximately the same number of passengers served by just one station (San Juan Capistrano) in the Los Angeles metropolitan area.<sup>67</sup>

Linkages within metropolitan areas of the megapolitan West are also underdeveloped. For instance, beltways were almost unknown in the megapolitan West until the past decade. The beltways that now exist had to be built after the federally-financed Interstate program had ended, meaning a much larger share of local funding compared with earlier-built beltways for similar-sized regions in the East.<sup>68</sup>



**Amtrak passenger rail offerings in the Intermountain West connect the largest cities to their Eastern and Western neighbors but do not serve the megapolitan regions well**



*Source: Brookings analysis of 2007 data from Amtrak Government Affairs Division.*

The newness of the beltway infrastructure in the West means there is a lot of momentum for development near the beltways. This is especially true where the main highway out of the central city meets the beltway.<sup>69</sup> Consider Eastern cities such as Atlanta and Washington, D.C. In Atlanta, the “Perimeter” road (i.e., the beltway) in its intersection with Georgia Route 400 gave rise to the large edge city of Perimeter Center. In the Washington, D.C. area, Tysons Corner emerged where the Capital Beltway and the Dulles Toll Road intersect. The Intermountain West has the opportunity to learn from these older metros and guide development into “smart growth on the fringe.”<sup>70</sup> The key will be to develop densely and to bring rail transit to these developing centers so that the new development will be multi-modal and provide transportation options for passenger travel and freight movement within the region.

As the Intermountain West looks to its future, it is considering its needs for highways and for substantially

improved passenger and freight rail. For instance, the Wasatch Front is currently planning the Legacy Parkway from Salt Lake north to Ogden, and is working to fund the south link to Utah County. Commuter rail is currently operating within the I-15 corridor between Salt Lake and Ogden and will open from Salt Lake to Utah County with a few years.<sup>71</sup> This parallel corridor would help to alleviate projected congestion along the Wasatch Front’s portion of the CANAMEX corridor, while providing local travel choices within the region. Northern New Mexico plans to expand its 15-mile Rail Runner commuter rail service later this year to run from Albuquerque to Santa Fe, which will help to focus growth inward towards accessible locations along the new line and strengthen the emerging megapolitan form. Additional focus is being paid to development of light-rail and bus rapid transit systems throughout the region to improve connectivity within core urban areas and to anchor residential and commercial development (discussed later).

### **Limited global air connectivity**

The airports of the Intermountain West have seen substantial growth in air passenger and freight transport since the early 1990s. Nearly 39 million more passengers flew through the region's airports in 2006 than in 1991.<sup>72</sup> Air freight has been increasing even more rapidly, with the megapolitan West's airports now transporting 749 million more pounds of air freight in 2006 than they transported in 1991.

Faced with rapid growth in passenger travel and air freight, the region's major airports will be reaching capacity soon. McCarran Airport in Las Vegas and Phoenix's Sky Harbor may be closest to reaching capacity without further expansion.<sup>73</sup> Las Vegas has plans to develop the Ivanpah Valley Airport south of Las Vegas to relieve McCarran Airport.<sup>74</sup> Phoenix-Mesa Gateway Airport in Mesa will likewise relieve the Phoenix Sky Harbor.<sup>75</sup> These changes will signal development and employment opportunities, as other regions have seen a boom in business near their relief airports, such as near John Wayne Airport in Orange County, CA.<sup>76</sup> Development of relief airports could also allow McCarran and Sky Harbor to focus more on securing regular direct service to international destinations in Europe and Asia.

While frequent non-stop flights currently connect the Intermountain West to the rest of the United States, its direct links to Europe and Asia are far weaker. Each major airport in the Intermountain West served fewer than 3 percent foreign-bound passengers in 2006, compared to 36 percent in Miami and 10 percent in Atlanta.<sup>77</sup> Los Angeles International Airport—LAX—functions in reality as the region's main international gateway. LAX buffers most of

the West's international trips, especially to Asia and even Europe. If the Western megapolitan areas are to become world cities, they need direct international connections. The leading global producer service firms in fields such as finance, insurance, law, management consulting, media, advertising, and accounting, seek branch locations that have the most access to global air travel. Regions such as Atlanta and Dallas have emerged as world cities in part because of their well-connected airports, which serve as both domestic and international hubs. Salt Lake City has made strides towards establishing direct international connections, as evidenced by its new flight to Paris and the European and Asian connections that may be brought through a Delta-Northwest Airlines merger.

Fortunately, air travel trends and technology are merging to provide the West's megapolitan hubs a shot at increasing international routes. The new Boeing 787 Dreamliner, which starts service in 2009, will go long distances and make direct links possible between cities outside the now overburdened major international hubs. The plane is also smaller and more fuel-efficient than previous generations of long haul aircraft such as the Boeing 747 and the new Airbus 380. That means more airlines can experiment with new routes to places such as Salt Lake City, Sky Harbor, and Denver International. The day is not far off when a passenger could fly to places such as Sydney, Hong Kong, and Tokyo from the interior West without setting foot in Los Angeles or San Francisco. Only McCarran Airport in Las Vegas now features multiple links to Europe and Asia. This direct connectivity provides Las Vegas a significant asset in expanding its role as a world city.



## Air connectivity is a critical resource in developing the West's global integration zones

**R**egional global integration zones (GIZs) strongly connect to the world economy based on a combination of their business networks, airport activity, and the value of exported goods. For all of their recent growth, the Intermountain West's emerging megapolitan areas lag far behind the nation's major urban centers—such as New York, Los Angeles, and Chicago—in the degree to which they are connected to the global economy.<sup>78</sup> Sun Belt regions such as Atlanta, Dallas, and Miami, outpace the Sun Corridor, Front Range, and Las Vegas in global connectivity, while the Wasatch Front and Northern New Mexico fall behind comparable regions such as Charlotte and Memphis.

Five indicators are used here to illustrate the relative strengths of the region's megapolitan areas as global integration zones. The first GIZ indicator considers the extent to which the region's major metropolitan areas plug into the global business network based on their number of headquarters and branch offices of leading producer service firms.<sup>79</sup> Producer services are those sold to business as opposed to ones offered to consumers. Leading producer service firms operate in the three largest areas of the world economy—North America, Europe, and East Asia—and include sectors such as accounting, advertising, finance, insurance, management consulting, law, and media. Only three of the five megapolitans in the Intermountain West—the Front Range, Sun Corridor, and Las Vegas—had metropolitan areas with strong-enough network linkages to be ranked on this score.

The next two indicators of GIZ strength gauge airport connectivity. Airports integrate cities into the

world economy through business travel, tourism, conventions, and air freight. Major airports are now essential to global business and, in fact, have put what were once regional cities—such as Atlanta and Dallas—on the world map.<sup>80</sup> All Western megapolitan areas except Northern New Mexico have airports ranked among the world's top 30 airports as measured by traffic movements (i.e., takeoffs and landings). In fact, three of the world's top ten airports according to this metric lie in the Intermountain West.

On other measures of international airport activity, the West's megapolitan areas also score high. According to the Airport Council International, the Front Range's Denver International Airport ranked 10th in the world in total passengers in 2006, followed by Las Vegas' McCarran Airport at 11th, and the Sun Corridor's Sky Harbor Airport at 19th.<sup>81</sup> But on one measure—air freight—no Western megapolitan area scored in the top 30 airports. In this way, the West falls behind Southern U.S. airports in Atlanta, Dallas, and Miami, which all rank in the top 30. Air freight is the fastest growing segment of America's cargo economy.<sup>82</sup> It is a critical element of the high-tech economy where high value components are shifted around the world in the manufacturing process. Scoring low in this measure is another indication that the West still lags behind in global trade.

The second GIZ measure of airport connectivity shows the extent to which a region serves as an origin and destination in global travel. Witlox and Derudder analyzed world airport connectivity this way using the Marketing Information Data Transfer database.<sup>83</sup> This measure eliminates the problem of hub airports that only show the total volume of travel, much of which is actually forwarding on to other cities. Therefore, Harts-

### The Front Range leads the megapolitan West in global connectivity

U.S. GNC Rank	U.S. GNC Megapolitan Area	Top 30 Rank (1)	Top Global Airport (2)	Exports Air Link (3)	Exports Value (4)	Exports Per Capita (5)
1	Front Range	12	7	—	8.5	\$ 2,235
2	Sun Corridor	25	8	—	14.2	\$ 2,647
3	Las Vegas	36	5	9	1.1	\$497
4	Wasatch Front	—	19	—	6.7	\$ 3,003
5	Northern New Mexico	—	—	—	2.3	\$ 2,257

*Notes: (1) GNC score measures integration in the global producer service economy. London GNC score = 1.00. Source: Taylor, Peter J and Robert E Lang. 2005. "U.S. Cities in the 'World City Network'." Washington: Brookings Institution. (2) Top 30 ranked world airport based on traffic movements in 2006 (take offs and landings per year). Source: Airports Council International. 2007. "Annual Traffic Data." ([www.aci.aero/cda/aci\\_common/display/main/aci\\_content07\\_c.jsp?zn=aci&cp=1-5-54\\_666\\_2\\_](http://www.aci.aero/cda/aci_common/display/main/aci_content07_c.jsp?zn=aci&cp=1-5-54_666_2_)) [April 2, 2008]. (3) U.S. rank based on analysis of connectivity to the global airport matrix. Source: Witlox, Fred and Ben Derudder. 2007. "Airline Passenger Flows through Cities: Some New Evidence." In Taylor, Derudder and Saey, eds., *Cities in Globalization: Practices, Policies and Theories*. London: Routledge. (4) Figures are in billions of dollars in 2006 and are based on the ZIP code entered on export declarations. Source: International Trade Administration. 2006. "Metro Exports Value." ([www.ita.doc.gov/td/industry/otea/metro/Reports/2006/mv\\_value06.html](http://www.ita.doc.gov/td/industry/otea/metro/Reports/2006/mv_value06.html) [April 2, 2008]). (5) Per capita figure derived from dividing export figure (4) by 2006 megapolitan population.*



field in Atlanta—the world’s busiest airport as measured by passengers—drops to 7th place in the United States under this method. Witlox and Derudder find ten leading airports in the United States that met their criteria as being part of the origin/destination global air network.<sup>84</sup> Nine of the 10 metropolitan areas also had the highest GNC scores. Only the 9th ranked Las Vegas made the list among the Intermountain West’s megapolitan areas. Las Vegas is a unique world city in that it has achieved the status of a global destination due almost exclusively to tourism and conventions.

Finally, the value of exported goods and services that regions generate indicates the degree to which these areas are invested in world trade. According to the International Trade Association, New York had the highest export value in 2006 at \$66 billion.<sup>85</sup> New York is followed by regions noted for major exports categories, such as Houston (energy), Seattle (aircraft), Detroit (autos), and San Jose (technology). Just 25 U.S. metropolitan areas exported \$10 billion or more in goods and services in 2006.<sup>86</sup> The Sun Corridor (and even Phoenix metropolitan area on its own) is the only region in the Intermountain West to achieve this mark. Partly, this is due to scale—the Sun Corridor is one of the largest regions in the United States. But all the megapolitan areas in the West lag in exports even measured in per capita terms. The total U.S. metropolitan per capita figure for exports is \$4,191. The last column in Table 1 shows that even the West’s top exporting regions—the Sun Corridor, Front Range, and Wasatch Front—fall well below this mark. Las Vegas’ per capita export figure is a paltry \$497. Yet foreign tourist and convention dollars flood into Las Vegas, which are not factored into export value.

Overall, the Intermountain West’s megapolitan areas are not well integrated into the global economy. The West’s lack of connectivity ranges from a modest export economy for goods to a producer service economy that is mostly not plugged into the global business network. The one bright spot is the region’s airports. The West maintains three top airports. But these airports mostly handle domestic passenger traffic, with heavy connections to California’s big cities. The Intermountain West’s one real world-class global connection is McCarran Airport in Las Vegas. This airport serves as a destination for world travel on par with Dallas-Fort Worth Airport and Atlanta’s Hartsfield Airport. Building direct relationships with international destinations in Europe and Asia—as may happen for Salt Lake with the Delta-Northwest Airlines merger—will be an important step to securing the global connectivity of the region’s inland megapolitan areas.

### **Uncertain water supplies**

Nine-tenths of the United States west of the 100th meridian, or about the nation’s midpoint, is either arid or semi-arid. This includes almost all the land in the Intermountain West, except for high elevation areas. All five areas analyzed in this study face this reality. Last year, Las Vegas and Phoenix received less than 10 inches of precipitation, while Albuquerque, Denver, and Salt Lake City received between 10 and 20 inches.<sup>87</sup> The West’s saving grace has been its high mountain ranges that receive abundant snowfall.





### What is the current water situation in the Intermountain West?

**T**he Sun Corridor—especially the Phoenix area—has perhaps the most secure water supply among the five megapolitan areas. Arizona receives a large allocation of the Colorado River’s water, sent to both Phoenix and Tucson via the Central Arizona Project canals. To obtain Congressional support for the Central Arizona Project, Arizona had to agree to subordinate its priority to Colorado River water. In the event of a shortage in the lower basin (a likely prospect), Arizona will have to take the first cut. To sustain a growing population, cuts may come out of irrigated agriculture, which currently uses more than 70 percent of the Sun Corridor’s water.<sup>90</sup>

By contrast, Las Vegas may have the least secure water supply of the five Western megapolitans.<sup>91</sup> By 2035, the city may have to conserve 400,000 acre-feet of water, nearly as much as it currently uses, to meet demand.<sup>92</sup> Las Vegas receives such a small share of the Colorado River supply that it needs to develop its own proprietary water supply as Phoenix has done. Ironically, the region bumps right up against Lake Mead—one of the largest reservoirs in the country—but most of that water goes to California and Arizona. What water does go to Las Vegas from Lake Mead—nearly 90 percent of the city’s supply—may become increasingly unstable by 2013.<sup>93</sup> Fortunately, north of Las Vegas is a series of mountain ranges, many of which are high enough elevation to receive significant

snow pack. The melting water flows down these mountains and collects in a giant aquifer. This water provides irrigation to Nevada’s farms and ranches, with little flowing to cities. This could soon change as Las Vegas pressures these communities to share their bounty. Las Vegas has purchased a large share of water rights and proposes to pipe this water to its urban areas, but it is meeting with significant local resistance.<sup>94</sup> The legacy of the Owens Valley—where Los Angeles in the early 20th century bought up water rights and then drained a river for urban uses and left the area dry—serves as a cautionary tale for ranchers in central Nevada. Eventually, Las Vegas could win out because of its size and wealth, in which case its capacity for new growth could double.<sup>95</sup>

The rest of the megapolitan West has sufficient water capacity for now. Where there is snow, there is water. The front ranges of the Wasatch and the Rocky Mountains (supporting Salt Lake and Denver) lie at the foot of high mountains that receive considerable snow each year. In the case of Salt Lake City, it was the principal reason for why Brigham Young selected the location. As soon as Mormon pioneers arrived, they began to work immediately on irrigation projects. Denver enjoys this same capacity. It lies adjacent to some of the highest mountains in the West and this run off irrigates agriculture and provides water to cities.<sup>96</sup> The same is true for Albuquerque because it lies along the Rio Grande, which has historically provided sufficient water to the region by recharging groundwater supplies.<sup>97</sup>

There are threats on the horizon that may reduce the water supply to the southern Intermountain West, most notably climate shifts due to global warming.<sup>98</sup> The region has been warming over the last 30 years.<sup>99</sup> It has also experienced small net increases in precipitation over the last 30 years (and even record snow in 2007), but climatologists predict the region will become noticeably drier throughout this century.<sup>100</sup>

A warming trend could have several impacts. The first is that it will raise elevations at which snow packs occur. This will shrink the run off in Rio Grande, Salt, and Colorado River systems, which provide most water to the megapolitan West.<sup>101</sup> Warmer temperatures will cause more evaporation, further reducing available surface water. Recent sustained drought conditions forced the region to come to a new understanding last year about what to do with Colorado River water in dry years.<sup>102</sup>

Climate shift could also enhance periodic, heavy rains in the Intermountain West.<sup>103</sup> When the Intermountain West

warms in the hot summer months, rising air can help drain moisture from the nearby Gulf of California. Hotter summers due to global warming could enhance this effect and produce more intense Asian-style monsoons. Heavy monsoonal rains could cause more severe flooding, which combined with warming surface water, could affect water quality and drive up the need for costly drinking water treatment.<sup>104</sup> The water capture system within the Intermountain West is ill-prepared for the surge in streams and rivers that accompany heavy rains. Instead, the current system is built around capture of slow, steady runoff from mountain snowmelt.

Faced with a continued population boom and a potentially drying climate, the megapolitan West must carefully consider its future water uses. In 2000, irrigation used more than twice as much surface water in the megapolitan West than urban uses, and much of the water for agriculture irrigates low-value crops, such as alfalfa. As the region grows, a larger share of water will shift from irrigation (especially

low-value agriculture) to urban uses.<sup>105</sup> For instance, if 10 percent of the water used in irrigation within the five megapolitan areas was diverted to urban uses, the total water available for urban uses would increase by 73 percent. Converting water to municipal uses, however, means that the water cannot be shut off in a dry year as might happen with irrigated agriculture, reducing the flexibility of the water system to respond to future weather and water variability.

Creative conservation and water planning efforts are being developed out of necessity throughout the Intermountain West. Recent conservation efforts by the Southern Nevada Water Authority—such as paying customers to rip up lawns and use desert landscaping—reduced water demand in Las Vegas by 18 percent.<sup>106</sup> Denver saw a 20 percent decrease in water demand since 2002 in response to conservation efforts and Denver has a 10-year goal of reducing water consumption another 22 percent from 2006 levels.<sup>107</sup> Arizona has made substantial progress in water planning in or near its urban areas since passage of its 1980 Groundwater Management Act, and conservation efforts are widespread throughout five active management areas that cover most of the Sun Corridor megapolitan area.<sup>108</sup>

Together, a shift to urban uses combined with demand reduction techniques could take some of the pressure off the Intermountain West to secure additional supplies as the region adapts to global climate change.<sup>109</sup> Keys to developing effective climate adaptation strategies include better understanding past variability, better tracking of current water usage and responses, and better understanding the local and regional implications of global climate models—all areas in which stepped up federal leadership on data-collection, information sharing, modeling, and prediction could unleash improved regional and local response.<sup>110</sup>

### **Energy in transition**

As the megapolitan West continues its rapid growth, and as energy prices continue to reach record highs, the region's energy resources have again become an increasingly important national asset. Concern about the longer-term climate and sustainability implications of developing the region's fossil fuel resources, however, permeates today's energy dialogue and complicates the assessment of the region's energy needs.

Currently, the region's five states produce more electricity than they consume. In fact, four of the five states are net exporters of electricity and only Nevada currently imports what it needs to meet electricity demand. The region exports its excess electricity, in large part, to its neighbors in California. The region's current exports of 60 billion megawatt-hours (mWh) would be enough to power approximately 5.6 million additional homes, at current average usage levels.<sup>111</sup> This capacity would be more than enough to

power the 5.1 million additional homes projected to be built in the region by 2040, but not enough to cover the demand for additional commercial and industrial buildings, at current usage levels and still retain excess capacity for exports.<sup>112</sup>

Clearly, this simple analysis of electricity capacity ignores several important factors. First, it would be difficult to shift all of the region's current excess capacity to powering buildings within the region, given strong continued demand from rapidly-growing California. Second, these projections assume that the region will maintain the same production levels as it currently sustains, which may be impractical for multiple reasons.

Consider that in 2006, coal produced half of the electric power in the region, natural gas generated 38 percent, renewable energy provided eight percent, and the remainder came from nuclear and other sources.<sup>113</sup> Thus, approximately 90 percent of the region's power in 2006 was generated using fossil fuel energy, which produces greenhouse gas emissions and contributes to the nation's substantial carbon footprint. Coal, in particular, produces the most greenhouse gas emissions on a per unit energy basis of any fossil fuel source. Utilities proposing new or expanded coal-fired power plants are finding increased resistance throughout the region and the country due to its high projected greenhouse gas emissions. Coal-fired plants also release smog-forming sulfur and nitrogen dioxide and toxic pollutants such as mercury, limiting their viability near population centers.

At the same time, local, state, and regional actors in the Intermountain West are setting climate policy that will likely make it more difficult and costly to produce power from fossil fuels. For instance, the Western Climate Initiative (WCI) has set a greenhouse gas reduction goal and is currently designing a regional cap-and-trade system that would regulate greenhouse gas emissions from power plants, among other sources.<sup>114</sup> Arizona, New Mexico, and Utah currently participate in WCI (with four other Western states plus three Canadian provinces). Colorado has been observing the process and may be more likely to join now that Congress has failed to pass climate legislation this year.

Ramped up alternative energy production will be one key to meeting local, state, and regional climate goals, although as yet the needed federal engagement to move the national economy toward new energy sources has not been forthcoming. Fortunately, the Intermountain West has substantial renewable energy potential—especially for geothermal, solar, and wind power—to go with its important technical and business strengths in the fields.<sup>115</sup> As of 2006, Arizona generated the most renewable energy in the region, at 6.8 million mWh compared to 15.4 million mWh in the five-state region and 386 million mWh generated nationally.<sup>116</sup> Currently, most of the region's renewable energy flows from hydropower, followed by geothermal in Nevada and Utah,

and wind power in New Mexico.<sup>117</sup> The Department of Energy and the Western Governors' Association (WGA) are leading a new effort to identify Western Renewable Energy Zones (WREZs), which could be developed to meet the WGA's production goal of "30,000 megawatts of clean and diversified energy by 2015."<sup>118</sup>

Technological advances in photovoltaics and solar power generation, such as by researchers at Arizona State University, have meanwhile led to rapid recent expansion of solar capacity. Costs for solar power may become comparable to coal-generated power by 2012 in high solar regions like the Intermountain West.<sup>119</sup> High-carbon emitting power sources like coal may face additional costs under a regional or national cap-and-trade framework, which may further tip the scales in favor of solar power generation in the coming years.

Yet the virtual absence and instability of federal renewable energy incentives means renewable energy companies

must compete on an uneven playing field with conventional energy resource companies whose products generate unpriced environmental costs and whose production is federally subsidized. For instance, FY2007 federal subsidies for oil and gas production totaled \$2.2 billion; estimates peg FY2010 subsidies at a still-substantial \$1.7 billion.<sup>120</sup>

By contrast, consider the shaky state of production incentives for renewable energy. In less than 10 years, the Renewable Electricity Production Credit for generators has expired twice and gone for periods without being renewed. The current tax credit—between one and two cents per kilowatt hour depending upon the resource used—is set to expire at the end of 2008 and does not include solar power. The federal Clean Renewable Energy Bonds program provides interest-free financing for renewable energy production, including solar, landfill gas, wind, biomass, hydro, geothermal, and other clean energy technologies.

### Oil shale: another energy gamble in the Intermountain West?

**T**he West's natural resource bounty has figured prominently in its past and will help shape its future. One key resource is energy. Energy is once again in a global crisis. In early 2008, the price for crude oil reached its all time high even with adjustments for inflation. The problem this time is not an immediate resource disruption as it was during the 1970s when OPEC cut oil production. Instead, a longer-term problem exists of increasing demand from nations such as China and India that have bid up the price of oil as new supplies are brought on line.

Some believe the world is rapidly nearing peak oil production and will then enter a permanent decline phase.<sup>123</sup> Cambridge Energy Research Associates (CERA) offers a more optimistic assessment of global energy potential, disputing the notion of near-term peak oil. CERA sees a larger capacity for conventional oil due to improvements in discovery and extraction.<sup>124</sup> The firm also argues that unconventional oil resources such as tar sands and oil shale will play a bigger role in supplying energy.

The Intermountain West is home to an enormous resource of unconventional oil—oil shale. The Green River Basin contains the largest reserve of oil shale in the world. The biggest formations occur in eastern Utah, western Colorado, and southwest Wyoming, with the richest known deposits located in Colorado's Piceance Basin north of Grand Junction. By some estimates, the potential for oil production from shale is the equivalent of all proven reserves in Organization of

Petroleum Exporting Countries.<sup>125</sup>

The West has been down this road before—most recently in the 1970s and 1980s, when the last energy crisis sparked investment in new methods to recover oil shale. But oil shale boom soon turned to bust as the price for oil collapsed in the mid 1980s.

Today, many people believe that the potential for major environmental damage from oil shale extraction is not worth the risk. The Green River Basin is after all red rocks country and home to some of the most stunning scenery America has to offer. There is also the issue of the larger impact that the mining and burning of oil derived from shale rock would have on the world's climate. Oil shale mining and processing would likely produce a much larger carbon footprint than the recovery of conventional liquid oil. Finally, it is possible that oil shale production would consume large quantities of water in an arid region now suffering from a long-term drought.

The heightened global demand for energy and the rising cost of gasoline make the West's oil shale reserves an extraordinarily valuable commodity.<sup>126</sup> There will be substantial pressure on the West to develop its oil and gas resources. The opportunity here is not just for temporary economic development in keeping with the "boom and bust" history of the region. The region could instead divert resources it receives from oil shale development into alternative energy resources and so make the transition to a sustainable energy future.

Like the production tax credit, this bond program is set to expire at the end of 2008. Extension of these credits this year was again embroiled in delay and argument in Congress over how to pay for them.<sup>121</sup>

On the consumer side, few incentives for renewables remain. Tax credits for the installation of geothermal heating systems expired in 2007 while a maximum \$2,000 credit for the installation of solar or fuel cell energy systems is set to expire at the end of 2008.<sup>122</sup> As with the production supports, confusion has also engulfed a bill extending the consumer credits. Whether or not an extension is granted, it is clear that the year-to-year uncertainty that surrounds these provisions severely hinders the region's exploitation of its alternative energy advantages by complicating the long-term decisionmaking of renewable energy firms, investors, and consumers alike.

Large-scale renewable energy development can only help to meet future energy demand if there is sufficient transmission capacity to carry the power. Current transmission lines, however, cannot handle much additional capacity, including for planned generating capacity from conventional sources that will be coming online within the coming years.<sup>127</sup> Nationally significant weak spots have been identified in the Sun Corridor and Southern California, leading to the announcement of the Southwest Area National (Transmission) Corridor in 2007.<sup>128</sup> The federal energy and land management agencies are involved in a broader effort to identify national energy transmission corridors throughout the American West, which will help connect conventional and renewable energy sources with urban markets.<sup>129</sup> Even with corridors identified, transmission companies must still find funding and gain approvals to extend the transmission network, making transmission a long-term concern for the region.

Finally, energy efficiency can help to meet future energy demand in a carbon-constrained future. Overall, the Intermountain West uses energy relatively efficiently but much more can be done. Shortly after the energy shocks in the 1970s, average energy use per person in the Intermountain West fell below national levels and has continued that way ever since.<sup>130</sup> Still, according to the American Council on Energy Efficiency, the five-state region received an average efficiency score of only 12.4 (28 percent of the maximum score) in 2006.<sup>131</sup> Colorado scored the highest of the five states at 35 percent while Utah scored the lowest at 22 percent. The region is moving forward, with its utilities spending an estimated \$26 million on energy efficiency in 2006.<sup>132</sup> The Southwest Energy Efficiency Project estimated that if the region undertook various energy efficiency efforts, it would avoid having to add 16,000 MW of new capacity at an estimated cost savings of \$26.7 billion, while generating 55,800 new "green" jobs, and saving 59 billion gallons of water per year by 2020.<sup>133</sup>

## INNOVATION

**N**ot-yet-first-echelon productivity and productivity growth in the megapolitan West highlight another major challenge for the region: the provision and maintenance of world-class innovation inputs in the megas.

Innovation matters, because innovation—the process of inventing and exploiting new products, processes, and business models—drives productivity growth, which in turn drives job and business creation, wealth-creation, and higher wages. In short, the region's future standard of living hinges in large part on how well its megas function as incubators of new ideas and knowledge-driven businesses.

Unfortunately, while the Intermountain West is home to world-class research institutions and a number of strong industry clusters, it must with its federal partners overcome several hurdles to unleashing the next stage of high-value economic growth. At least two innovation challenges require attention, and include:

- Variable research capacity
- Underperforming industry clusters

### **Variable research capacity**

The Intermountain West has more research capacity (critical to technological and economic growth) than is typically attributed to the region. For instance, seven universities in the megapolitan West rank among the nation's top 100 state research universities, according to the Center for Measuring Research Performance.<sup>134</sup> Brigham Young University in Provo, UT—the nation's largest private undergraduate institution with more than 30,000 students—ranked 62nd among private universities in total research spending in 2005. The megapolitan West also contains six research-intensive academic institutions: two in the Front Range, two in the Wasatch Front, and one in greater Las Vegas.

In addition, the megapolitan West is home to five major federally funded research centers. The Department of Energy funds the massive Los Alamos and Sandia National Laboratories in Northern New Mexico and the small National Renewable Energy Laboratory in Golden, CO. The National Science Foundation funds the National Optical Astronomy Laboratory in Tucson and the National Center for Atmospheric Research in Boulder, CO. In FY 2006, these five centers captured more than \$4.5 billion—more than one third—of the nation's expenditures at federally funded research institutions.<sup>135</sup>

Despite the research capacity provided by these universities and national labs, however, spending on R&D in the region has lagged recently. From 1998 to 2006, colleges and universities in the megapolitan West increased their R&D expenditures by 80 percent, compared to 85 percent nationally.<sup>136</sup> The megapolitan West's share of national R&D



**Seven universities in the megapolitan West place among the top 100 state research universities according to the Center for Measuring Research Performance**

<b>Megapolitan Area University</b>	<b>Ranking in 2006 (Based on 2004-2005 data)</b>	<b>Ranking in 2002 (Based on 2000-2001 data)</b>
<b>Sun Corridor</b>		
University of Arizona	15	21
Arizona State University	59	55
<b>Front Range</b>		
University of Colorado	26	26
University of Colorado, Denver Health Sciences Center	42	41
Colorado State University	55	51
<b>Wasatch Front</b>		
University of Utah	30	30
<b>Northern New Mexico</b>		
University of New Mexico	84	79

*Note: All universities classify as "Research University/Very High" under Carnegie system. The ranking is for state universities only (with the top-ranked school being the University of California, Berkeley).*

*Source: Center for Measuring Research Performance ([http://mup.asu.edu/research\\_data.html](http://mup.asu.edu/research_data.html))*

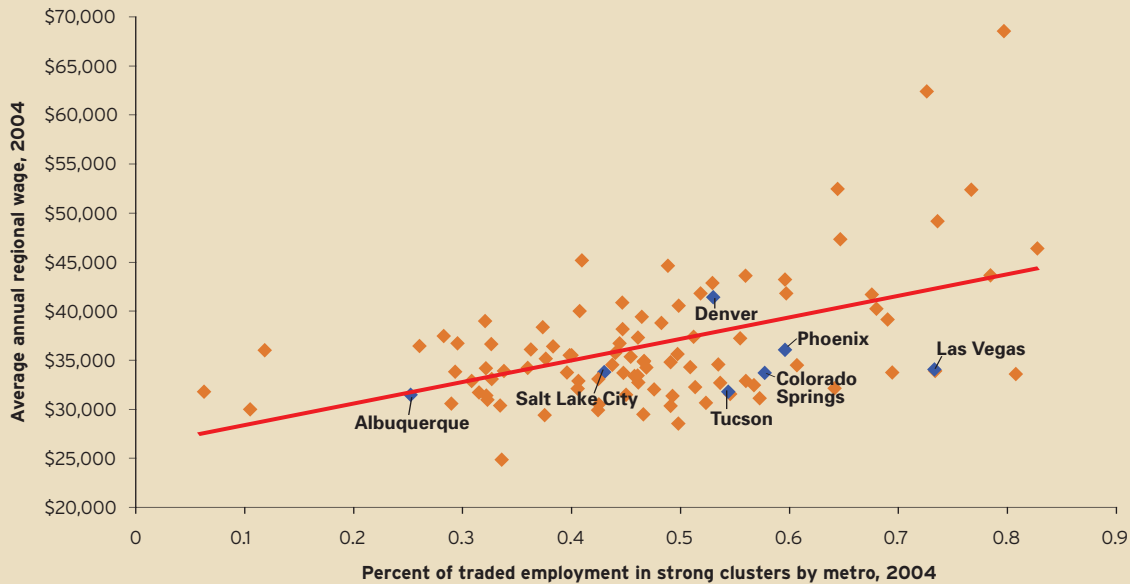
spending at academic institutions fell slightly from 4.7 percent in 1998 to 4.5 percent in 2006. This recent decline may help to explain why some of the region's universities declined slightly in ranking from 2002 to 2006 by the Center for Measuring Research Performance.<sup>137</sup> At the five major national labs, total research funding increased 6.0 percent compared to an average increase of 9.0 percent for all labs between 2003 and 2006. Federal expenditures for the Intermountain West labs increased 8.1 percent over this time compared to 9.8 percent for all labs. Los Alamos National Lab, in fact, saw its total research funding increase by only 1.9 percent. And the National Renewable Energy Laboratory experienced an 11.3 percent decrease in research funding—from \$219 million in 2003 to \$189 million in 2006.<sup>138</sup>

At the same time, the yield of invention disclosures, like patents, as a function of research spending varied widely across the megapolitan West. According to the Association of University Technology Managers, academic institutions spent an average of \$2 million for each invention disclosure in FY 2004-06.<sup>139</sup> Brigham Young University, the University of Utah, and Arizona State University all performed well, spending less than \$2 million per invention disclosure in FY 2004-2006. Utah State University, Colorado State University, the University of Arizona, and the University of Colorado averaged \$2-\$6 million per invention disclosure in FY 2004-2006. And for its part, the University of Nevada, Las Vegas saw the least return on investment by this indicator as more than \$14 million in research activity needed to occur to generate every one disclosure in FY 2004-2006. Regardless of this variable performance, the success or failure of federal government's insignificant technology

transfer and commercialization efforts play a key role in impeding the path between university research and the marketplace.<sup>140</sup>

The Intermountain West's solid corps of highly skilled labor is another important asset for driving future innovation. The region is by no means Silicon Valley, but the Intermountain megas—with Las Vegas as the sole low-performer—enjoy high school, bachelor's degree, and graduate degree attainment rates that exceed the national average.<sup>141</sup> And several megas—including the Front Range, Wasatch Front, and Sun Corridor—post levels of knowledge economy employment that meet or exceed the U.S. average.<sup>142</sup> A hidden asset for the Wasatch Front, in addition, is its large base of multilingual workers who speak more than 55 languages fluently and have lived abroad for at least two years in one of 150 or so foreign countries. However, the Intermountain megas may face a growing skills challenge due to the low educational attainment rates of their fast-growing foreign-born populations. While the share of all U.S. immigrants holding at least a bachelor's degree is not significantly different than that of all U.S. residents, every Western mega falls behind the national foreign-born average, even the highly educated Front Range. As a group, the five megas post a foreign-born college attainment rate of just 18.7 percent compared to the national foreign-born average of 26.7 percent.<sup>143</sup> Such a wide gap for a fast-growing segment of the population suggests the Intermountain megas must pay close attention to the education and skills development needs of its important immigrant workforce.

**Many of the region's metropolitan areas are underperforming as generators of high metro wages**



Source: *The Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.*

### Underperforming industry clusters

Regional industry clusters—geographic concentrations of interconnected firms and supporting organizations—represent a powerful source of quality jobs and productivity growth for any region, especially when they exist in valuable “traded,” or export, sectors.<sup>144</sup> In the Intermountain West, such clusters are present in all of the megas. So, too, are what the Harvard Business School scholar Michael Porter calls “strong” clusters—highly competitive regional agglomerations in traded sectors with very high employment concentrations relative to the nation that tend to support higher wage levels all across a region.<sup>145</sup>

Denver provides an excellent example. Some 53 percent of its important “traded” sector employment resides in eight strong clusters that contributed to a high average regional wage of over \$41,000 in 2004, figures that rival those in such powerhouse economies as metro Chicago, Houston, Minneapolis, and Los Angeles. Strong clusters in traded sectors are making Denver rich. Unfortunately, however, Denver is the lone superstar in the Intermountain West on this front. While strong clusters in numerous Intermountain metros show promise—from analytical instruments in Albuquerque, to genealogy and genetic research in Salt Lake, to aerospace in Tucson—many of the region’s clusters are underperforming as generators of high metro wages. For instance, the Phoenix and Tucson metros in the Sun Corridor, Colorado Springs in the Front Range, and the Las

Vegas metro area all maintain over half their traded-sector employment in strong clusters, but their average regional wages continue to trail other metros enjoying similar levels of strong cluster employment. For that matter, metropolitan Albuquerque’s low average annual wage of just over \$31,000 very much reflects its relatively low employment in competitive strong clusters: Only 25 percent of the area’s traded-sector employment lies in just four strong industry clusters—the fourth-lowest rate out of the country’s 100 largest metro areas.<sup>146</sup>

The challenge for the Intermountain West megas, then, is to leverage their positions in their existing strong clusters—industries such as entertainment and hospitality in Las Vegas and financial services and information technology in Phoenix—and move up the innovation and productivity curves to increase their overall economic competitiveness and standards of living.

### What Happens in Las Vegas... Impacts the National and Global Economy: The Las Vegas Convening Cluster Moves up the Value Chain

**“W**hat Happens in Las Vegas...Stays in Las Vegas”: This popular slogan comes from a recent Las Vegas promotion campaign. The slogan, and the ads based on it, signals a shift in how Las Vegas positions its tourist trade. The city is returning to its roots by emphasizing sin after having tried to lure families. Las Vegas’ new Rat Pack-inspired image of an inward-focused party town masks the major outward impact that Las Vegas has on the U.S. and world economies. Las Vegas, best known for its gambling and entertainment, also emerged as a major deal-making center. Because Las Vegas is such a “fun” place and has a large tourist capacity in terms of hotel rooms and meeting space, it attracts the nation’s largest trade shows. These shows form ad hoc market exchanges that gather whole industries to a common space to make deals. The irony is that what happens in Las Vegas, arguably reaches well beyond the city in terms of business activity. The city’s reputation for discretion in personal matters has enhanced its attractiveness as a public space.

As a place for business networking, Las Vegas is already a leading world city. The city has not reached this status by traditional means and conventional data measuring economic activity does not easily capture its form of exchange. In a world where face-to-face interaction still matters—and may be even more important than ever—Las Vegas offers world class venues for people to meet and do business. A sample of 2006

trade shows highlights the diversity for groups now gathering in the city; these include the National Association of Broadcasters (110,000 attending), World Of Concrete Exposition (85,000 attending), International CES (Consumer Electronics Show) (150,000 attending) and the International Wireless Communications Expo (15,000 attending).<sup>147</sup>

In general, shows that exceed 50,000 attendees have a difficult time finding an alternate location to Las Vegas (with the exception being Orlando, FL) and some organizations simply hold their annual meeting in the city every year. An example is the International Council of Shopping Centers, which holds its annual “deal making” conference exclusively at the Las Vegas convention center. This conference is mostly a gathering of real estate developers, retail chains, and local governments that seek to make deals on shopping centers. The contacts established in Las Vegas are an essential part of the process as the parties that cooperate on retail development establish trust via personal contact at the conference and then follow up via E-mails and phone calls. This is how what happens in Las Vegas shapes the economy elsewhere.

Las Vegas needs to leverage its dominant role as a trade show venue into an economy based on this competitive advantage. This process has already begun in some sectors. Take for example home furnishings. For years, North Carolina was home to the largest home furnishing shows in the United States largely due to its role as a leading manufacturer of furniture. As the trade shows grew, it became apparent that they would need a permanent home in a place where such shows reach their largest scale—Las Vegas. Thus, downtown Las Vegas now boasts the Pavilions at World Market Center, which will contain 4.2 million square feet of exhibit space when complete. This development will draw design experts to the region and could make Las Vegas a leading center for architecture.

Las Vegas, which is now the top U.S. venue for live entertainment, has an enormous work force with a talent at putting up temporary shows on a level unrivaled by any other city. The advantage previously limited to entertainment has now spilled into exhibition, offering the potential for further expanding the Las Vegas regional economy. This diversification is particularly important, as the current economic downturn has finally reached the region’s entertainment industry.<sup>148</sup>





Given the energy and climate challenges discussed earlier, alternative energy is likely to become one of the region's most lucrative and highest value-added high-tech sectors. One Intermountain West company capitalizing on this potential is Phoenix-based Stirling Energy Systems, a leader in new solar technology that is also investing in other alternatives, such as biogas.<sup>149</sup> The company's specialty is the development of utility-scale solar arrays. The company holds most of the key patents in converting solar power to electricity and is working with Intermountain West universities such as the University of Nevada, Las Vegas on new technology to create an even more efficient conversion.<sup>150</sup>

## HUMAN CAPITAL

**T**he status of the megas' human capital stores—it's greatest resource—also matters intensely if the Intermountain West is going to produce balanced, broadly shared prosperity. Hopeful, energetic, plentiful, and increasingly skilled people remain the key to economic growth. Likewise, how well all groups are integrated into society and can participate in its economy defines whether a place truly delivers on the American dream of upward mobility and middle-class stability.

Unfortunately, on this front also, the megapolitan West is struggling with several serious human capital problems that raise questions about the competitiveness of its future

workforce as well as the region's long-term social cohesion and fairness. These challenges include:

- Immigration pressures
- Inadequate workforce preparation
- Widening income disparities

### *Immigration pressures*

Between 1990 and 2006, the foreign-born population grew at a rate three times faster in the megapolitan West than in the nation at large.<sup>151</sup> Whereas immigrants used to come through established gateways like New York and Los Angeles, today's immigrants increasingly funnel through non-traditional areas such as the Intermountain West. Denver has re-emerged as a national immigrant gateway, Las Vegas and Phoenix are now emerging gateways, and Salt Lake City's rapid recent immigrant growth foreshadows its importance in the coming years.<sup>152</sup> These four major metros alone captured more than 20 percent of the immigrant growth since 1990 within the nation's "twenty-first-century gateways."<sup>153</sup>

Not surprisingly, today's national debate on immigration matters intensely to the megapolitan West. Central to this debate is the issue of legal status. Nationally, a third of all foreign-born residents are estimated to be unauthorized



(i.e., illegal) migrants.<sup>154</sup> This share is double what it was only ten years ago.<sup>155</sup> Nearly 80 percent of the unauthorized migrants nationally are from Mexico (56 percent alone) and Latin America, likely entering along the U.S.-Mexican border. Border state Arizona is estimated to house almost half a million unauthorized migrants, while the remaining states in the region likely house another half million.<sup>156</sup>

In the absence of comprehensive federal immigration reform to address not only border security and status issues but inclusion and integration as well, local leaders in the Intermountain West, and around the country, are grappling with how to deal with the flow and settlement of immigrants into their respective regions.

Almost every state has some laws or regulations concerning illegal immigration. In the Intermountain West, Arizona and Nevada authorize varying degrees of sanctions against employers that hire undocumented workers. Colorado refuses public benefits to people who cannot prove their legal residence. In contrast, New Mexico allows illegal immigrants driver's licenses and in-state tuition and is home to several self-declared "sanctuary cities."

But no matter what these states and localities do or how actively they do it, they cannot address all issues related to immigration; much of the process is out of their control. Border security, admission, and deportation of migrants are still exclusively federal responsibilities. A patchwork of varied state and local policies will make comprehensive federal immigration reform even more difficult to achieve. And, in the interim, some of these laws may cause local turmoil. In Arizona, for example, 11 percent of the workforce is made up of illegal immigrants, and state efforts to curb undocumented workers are leaving some employers short on labor, driving up home vacancies as fearful workers flee, and potentially depressing state economic output.<sup>160</sup>

Left alone on the front lines of immigration issues, states and localities are also bearing the rising costs of providing public services to newcomers, both legal and illegal. In fact, the arrival of unauthorized migrants only adds to what would otherwise be increasing service loads for communities growing from natural increases, domestic migration, and immigration from abroad. States provide federally mandated K-12 education, emergency health care, and incarceration to unauthorized migrants. Additional costs accrue to states and localities for providing services such as police and fire protection, worker compensation, immunizations, and nutrition benefits. In return, migrants pay state and local taxes, spend money locally, and may work at jobs other workers do not want. The benefits of immigration are often lost in this debate over service provision costs.

Finally, communities must also contend with connecting their immigrant populations to necessary social services and job opportunities. Accessing these resources is especially difficult when newcomers lack English language skills. While the process of integration—that fix defined as the

"economic mobility and social inclusion of newcomers"—remains largely absent in federal legalization debates, it is crucial for ensuring that vast numbers of immigrants and their children are adequately incorporated into the regional fabric.<sup>161</sup>

### ***Inadequate workforce preparation***

The "graying" of the baby boom generation, combined with demographic changes and immigration, means that the workforce of tomorrow will be substantially more diverse than the workforce of today. In the Intermountain West, one in four workers will be Hispanic, up from one in six in the boomers' generation.<sup>162</sup> This diversification portends a skill and knowledge gap that may be difficult to address without targeted education and workforce preparation.

The skills and knowledge gap stems, in large part, from the historically lower rates of educational attainment among minorities and especially immigrants. Over 40 percent of the region's Asians, nearly 30 percent of its non-Hispanic whites, and 20 percent of its blacks age 25 and older hold bachelor's degrees. By contrast, only about 10 percent of the region's Hispanic, Pacific Islander, and American Indian populations hold bachelor's degrees.<sup>163</sup> Similarly, less than one-fifth of the region's foreign-born over the age of 25 had a college education in 2006; most, in fact, had less than a high-school degree (40 percent).<sup>164</sup>

The responsibility for closing these gaps and ensuring that the region's present and future workforce are equipped with the necessary knowledge and skill lies with the regional education systems of the Intermountain West. To be successful, the region's educational systems must be prepared to meet the learning needs of their changing demographics with adequate capacity and sustained or enhanced educational quality.

The growth of the Hispanic population, and to a lesser extent other historically underrepresented minority groups, is changing the face of educational systems in the Intermountain West. Hispanic students made up over one-third of the total public school enrollment in Arizona, Nevada, and New Mexico in 2005, and their share is projected to continue to rise into the future. Correspondingly, Hispanic students are projected to make up a greater share of the graduating classes from the region's public high schools. In Nevada, for example, the share is expected to skyrocket from the 9 percent level it was at in 1991 to 56 percent by 2021.<sup>165</sup>

The escalating diversification of the Intermountain West's student body also comes hand in hand with projections of explosive growth in the total number of students enrolled in and graduating from public schools in the region. It is estimated that by 2010, K-12 enrollment will have grown from 1992 levels by 35 percent in Colorado, almost 90 percent in Arizona, and over 120 percent in Nevada. Similarly, the number of public high school graduates is expected to rise

dramatically in these states, by over 50 percent in Colorado, over 130 percent in Nevada, and over 150 percent in Arizona.<sup>166</sup>

For the region's education systems—from pre-K through high school and beyond—the growth and diversification of the student body is likely to impact curriculum, preparation, affordability, and demand for support services and post-secondary education.<sup>167</sup> Without a national strategic framework to deal with such circumstances, regional leaders are left on their own to tackle these and other related issues in order to safeguard the economic and social health of the megapolitan West.

### **Widening income disparities**

Across all the megapolitan regions of the Intermountain West, the share of the population with middle class incomes has been steadily declining since 1970 while the shares at the upper and lower income levels have been increasing. In fact, lower income families—those with less than 80 percent of the median area family income—now dominate as share of the regional population. Furthermore, poverty rates for the Intermountain West, while lower on average than national levels, have increased rapidly since 1990.<sup>168</sup>

Widening income disparities in the population and growing poverty rates gives rise to concerns that the Intermountain West region is developing into a society of haves and have-nots. A particular worry for certain places is the ability of families to meet the cost of living. The Sun Corridor, which saw a 50 percent increase in poverty since 1990, has living costs 2.6 percent higher than the national average. Greater Las Vegas, whose population in poverty more than doubled since 1990, has living costs that are 3.1 percent higher than the national average.<sup>169</sup> In the Las Vegas metro, specifically, over 18 percent of households in 2005 were severely housing cost-burdened (spending more than 50 percent of their incomes on housing), compared to just 14.7 percent nationally.<sup>170</sup> A gap between incomes and living costs is clearly present in metropolitan Denver, where wages at the 20th percentile (typically those for less-skilled workers) remained flat between 1999 and 2005 at the same time that fair market rents rose more than 18 percent.<sup>171</sup>

There is only so much that state and local governments can do on their own to boost the wages of lower income workers. After all, labor supply and demand trends are ultimately global. Many states and localities in the Intermountain West now depend on the federal Earned Income Tax Credit (EITC) to provide support to lower income workers and their families. The metros of Salt Lake City, Tucson, and Albuquerque all have populations in which the share that is eligible for EITC is greater than the overall national rate of 17.7 percent.<sup>172</sup>

## **QUALITY PLACES**

**T**he creation of attractive, high-quality urban places is the fourth fundamental asset that matters intensely in the search for true prosperity, given that the presence of an amenity-rich, accessible, and distinctive built environment appears increasingly important in attracting educated workers, promoting regional efficiency, and enhancing the productivity, inclusivity, and environmental sustainability of metropolitan places for all residents.

On this front, all of the Intermountain region megas have embarked on the important drive to craft a built environment to match the region's alluring scenery. What is more, the sheer volume of the growth coming to the region offers a prime opportunity to carefully design and construct sustainable, high-quality places that knit together jobs, housing, shopping, and recreation in configurations that give a better sense of place.

And yet, the fact remains that all of the region's megas face significant hurdles along with the opportunities as they seek to provide distinctive quality neighborhoods, improve the region's urban locales, and preserve the region's fragile arid environment. In this regard, moreover, the megas' placemaking challenge comes down in large part to wrestling with one critical underlying challenge, and that is:

### **■ Legacies of auto-oriented design**





### ***Legacies of auto-oriented design***

Physical growth constraints contributed to the development of relatively compact, high density urban spaces in the megapolitan West.<sup>173</sup> Still, these areas experience most of the downsides of higher density development (e.g., congestion) with very little of the benefit (e.g., vibrant urban environments).

The problem lies with the West's auto-dependent, segregated use communities that provide few transportation or housing choices for its workers and residents, are not linked-up well to accommodate future public transportation, and fail to inspire much in the way of neighborhood cohesion.

The standard subdivision typically contains no stores. Street scales discourage pedestrian use. Common design features, such as walls around subdivisions and big box retail surrounded by ribbons of parking, break up the urban fabric and force residents and workers into cars for many of their daily trips.

Yet given their often relatively high densities, Western megapolitan areas could eventually support public transit and more neighborhood-integrated retail and walkable environments.

Public transit plays only a small role in moving people throughout the Intermountain West. In 2000, more residents in the megapolitan West worked at home than used public transportation to get to work.<sup>174</sup> This low usage is, in part, because the region has only recently reached sufficient size for its population to demand—and be able to support—public transit service.

Today, however, there is a rail boom in the Intermountain West. Three of the region's megapolitan areas—the Sun Corridor, Front Range, and Wasatch Front—have light rail systems either running or under construction. Sections of all these systems should be functioning by 2010, and significant future expansion will be likely if funding can be secured.



## Transit comes to the Intermountain West

**S**alt Lake's Utah Transit Authority (UTA) TRAX light rail has been running for several years. It is a half-billion dollar 19-mile system with 28 stations. TRAX has two lines, both beginning in the downtown. A referendum last November approved another 2.5 billion in spending for 26 new miles of light rail, and 88 miles of commuter rail, and up to 40 new stations. The system carries more than 55,000 riders per day, which exceeds all original ridership projections when TRAX was proposed.

Colorado's Front Range is the only region in the United States with plans to add greater light rail capacity than the Wasatch Front. The FasTracks system is an extensive, multi-line system with 151 miles of track that will afford dozens of opportunities for transit-oriented development (TOD). Consider for example, the West Corridor line, which runs through the older northern neighborhoods in Lakewood, CO (a Denver suburb). The line will have six stops in Lakewood alone, including one at the Denver Federal Center. Lakewood hopes Denver's FasTracks triggers an urban makeover similar to what the Washington Metro did for Arlington, VA.

Thirty years ago before Metro, Arlington had been a fading older suburb that was losing jobs and people to its western neighbor Fairfax County. Arlington used the Orange Line stops along its low-rise commercial corridor—Wilson Boulevard—to anchor dense mixed-use development. Today, the Wilson Corridor offers an alternative urban environment to Washington, D.C. and an antidote to suburban Fairfax County's more sprawling growth.

Lakewood plans to redevelop its light rail stops based on the Arlington model. Most of the areas around the stations along the West Corridor line either will be designed for mixed use, or will be de facto mixed use due to existing development. The city is especially optimistic about the project at the Federal Center. Right now, the Federal Center is on one square mile of federal government land. The Center's buildings take up only a fraction of the space. Lakewood has been given permission to annex 230 acres of the Federal Center. The city will zone the land for a large-scale TOD that will include multifamily housing with a diverse income mix.

Even Phoenix in the Sun Corridor now has a light rail system under construction. The first phase of the Valley Metro will run 20 miles, with 27 stations and costs 1.4 billion dollars. The "Red Line" connects downtown Phoenix, with the Sky Harbor Airport, runs through downtown Tempe (with stops at Arizona State Univer-



sity) and ends just west of downtown Mesa. The rail is already having an impact on development at station stops. New high-rise construction is especially notable in Tempe where several towers are rising, two of which exceed 20 stories. The next phase of Valley Metro will extend another 30 miles and has been funded by a 20-year 1/2-cent sales tax that passed in 2004 as part of a larger package to support regional bus, light rail, and bike and walking improvements throughout the region.<sup>175</sup>

Finally, while Las Vegas and Albuquerque lack light rail systems, both regions have seen projects proposed. Las Vegas now has a failing private monorail system that runs to major hotels along the strip. The Las Vegas region has one of the highest concentrations of employment in the United States due to hotel development on the Strip and is ready-made for light rail. Further, like most regions in the West, Las Vegas has greater built density than much of the metropolitan East, which also helps support light rail. Instead, Las Vegas is now considering a bus rapid transit (BRT) system that could bring some of the land use changes associated with light rail.

Las Vegas could learn from Albuquerque, which opened an 11-mile BRT system in 2004 known as Rapid Ride to serve its downtown area and connect to a transit center. BRT can function as light rail without the rail at 40 percent of the cost, as long as there is a strong commitment to provide needed infrastructure, such as station stops with level boarding, dedicated lanes, light timing, and off-bus fare collection.<sup>176</sup> Since the summer 2006, Northern New Mexico has also had commuter rail—the 15-mile Rail Runner Express—that links downtown Albuquerque to the suburbs of Bernalillo county. The Rail Runner will begin service from Albuquerque to Santa Fe this December, which may help to substantially reshape and strengthen megapolitan development in Northern New Mexico.

Rail is more than an effort to relieve traffic. Rail is urban shock therapy for suburban-dominated regions. It demonstrates the market potential for denser, mixed use projects and may whet a regional appetite for traditional urban living in a region known only for horizontal sprawl.

Rail can also trigger a wave of emulation developments. Consider the case of Plano, TX. The city's original high-density, mixed-use development appeared at its light rail station. In the now redeveloping Legacy office park, a faux-style transit-type development is occurring. The new Legacy is a lifestyle center that features pedestrian-oriented retail

**The emergence of new transit-oriented or transit-ready places may help the region's megapolitan areas attract large workforces that seek urban settings and thus improve the prospects for attracting high tech firms.**

and multifamily housing. The same kind of pattern can happen in the megapolitan West as rail firmly establishes city-like growth at stations that lead to similar development away from transit. These projects comprise a new "transit-ready" built form. In time, these places will provide a good urban environment to extend rail systems.

The emergence of new transit-oriented or transit-ready places may help the region's megapolitan areas attract large workforces that seek urban settings and thus improve the prospects for attracting high tech firms. In addition, by building neighborhoods where people are less dependent on cars, the West and the nation can improve air quality, shrink its carbon footprint, and lessen its dependence on oil as a transport fuel.

Indeed, the region's investment in rail seems visionary with today's record high energy prices. High gasoline prices are pinching household budgets across the country, especially in suburbs and exurban areas far from transportation alternatives such as transit or commuter rail.<sup>177</sup>

\* \* \*

One other critical challenge facing the Intermountain megas as they continue to grow and change is their governance.

In this regard, while megapolitan-area leaders may want to promote mega-scale responses to mega-scale problems, they are frequently hobbled because they lack the super-scaled governance institutions and networks needed to shape their futures.

Certainly, Western megas have been notably successful in implementing mega-scaled, super-regional initiatives aimed at enhancing their standing on the key drivers of prosperity.

Thirty-two Front Range mayors back FasTracks through the (Denver) Metro Mayors Caucus. Regional business groups in Phoenix, Tucson, and Flagstaff are collaborating on the Sun Corridor's Science Foundation Arizona (SFAz), a unique public-private partnership moving to upgrade the corridor's innovation capacity with transformative investments in education and strategic research. And in the Wasatch and Front Range megapolitan areas, regional visionaries have worked to craft quality places by persuading individual municipalities to voluntarily adopt regional growth principles, such as adequate public infrastructure, water quality management, housing type diversity, and integrated land use and transportation strategies in their own local comprehensive planning.

For that matter, region-minded leaders throughout the megapolitan West have begun to craft wider-reaching governance solutions in response to the emerging megapolitan reality. A case in point is transportation planning on the Wasatch Front, where two major metropolitan planning organizations (MPOs) now tightly coordinate their long-range transportation plans and growth strategies through an overlapping committee structure as well as coordinated planning and modeling.

Yet, the fact remains that the broad sweep of megapolitan development in the West is more than ever outstripping the region's local governance structures and raising serious questions about the region's ability to steer events.

In this respect, the expansion and merger of multiple metropolitan areas into vast new urban agglomerations is much further along in economic and social reality than in administrative fact.

Administration, after all, remains frequently parochial, notwithstanding the new super-sized, boundary-crossing reality. While the Intermountain region remains less fragmented than other regions, some 355 general purpose governments—including 312 separate municipalities and 41 counties with key development, land-use, and service-provision powers—complicate the governance map in the megapolitan West. This fragmentation results in the familiar inter-local jockeying that can trump mega-scaled planning: in the Sun Corridor Phoenix, for example, and Scottsdale skirmish over the location of shopping malls while Glendale, Tucson, and other cities compete to lure minor league baseball teams and build stadiums. In addition, private governments in the Intermountain West, such as



special improvement districts and homeowners associations, add a new dimension to the traditional government fragmentation problem.<sup>178</sup>

Likewise, while metro-scaled economic development or planning organizations strive to apply cohesive regional planning to this localism, their metropolitan focus does not always reach wide enough to encompass the entire super-regional reality. For example, three MPOs carry out transportation planning in the Front Range, two do in Northern New Mexico, and three do in the Sun Corridor, but none has the mandate to plan or act at the new extra-huge scale of today's expanding flows of freight, commuting, and pollution. This means that each organization may work urgently and well on events affecting its own member cities and towns, but give less thought to connections to another metro 50 to 120 miles away, and still less to the "no man's land" between the two metros, for whom no one speaks.

Contributing to the disconnect is that the federal government has mostly withdrawn from its past efforts in the 1960s and 1970s to actively promote more regional and cross-jurisdictional collaboration and problem-solving. Few conditions on the award of transportation, housing, environmental, or other categorical or block grants provide incentives for the development of more effective regional or mega-regional planning and governance approaches. Federal programs themselves remain stovepiped, thereby reinforcing local fragmentation. And little effort has gone into linking regional and megapolitan leaders into a national learning network or catalyzing local testing of improved regional governance models. The result: Fundamental decisions about the future character of the West's megapolitan areas are being reached in piecemeal, often haphazard manner or, worse, are never made at all.

The upshot, moreover, is clear: Designing innovative, smart, and effective new governance mechanisms for the new megapolitan reality will surely rank among the Intermountain West's most important challenges in the next decade.

\* \* \*

These trends and challenges require a new approach. Massive new growth is coming to the Intermountain West. Pursuing a business-as-usual approach will not be good enough for the region to ensure sustainable growth, productive growth, and a prosperous middle-class. With new focus on the region and new ideas in the air, an opportunity exists to shape the region's impending growth, boost its productivity, and promote upward mobility through creative collaboration with the federal government.

# V. FORGING A NEW FEDERAL-MEGA AGENDA FOR THE INTERMOUNTAIN WEST

Overall, the Intermountain West's megapolitan areas have made impressive progress toward addressing the super-sized challenges that stand between them and true prosperity.

Year after year, the megas post startling population growth and job creation rates.

In large part, moreover, they have done this by working patiently to secure their standing on the most fundamental drivers of regional prosperity.

On infrastructure, they have thrown themselves into building new light rail systems, whether in metro Denver, Phoenix, or Salt Lake City.

On innovation, they have collaborated across local and metro lines to make serious investments in the region's scientific, engineering, and medical capabilities, as exhibited most dramatically by SFAz.

And on placemaking and governance, leaders of the megapolitan West have led the nation by immersing themselves in regional visioning processes like Envision Utah or experimenting with new regional governance networks as in greater Denver.

It is exactly this sort of home-grown leadership—supported by the do-it-yourself spirit of a region that has long been overlooked in debates about the national good—that will surely play the largest role in the region's construction (or not) of a megapolitan “civilization to match the scenery,” to paraphrase writer Wallace Stegner.

However, the fact remains while the West's megapolitan leaders and institutions can do a lot, they cannot “go it alone.” Western leaders require at least at times, and on certain crucial, mega-scaled issues, a steady, supportive partner in the federal government.



In this fashion, mega-scaled self-help will always remain the primary source of progress in the Intermountain West. However, on crucial inter-metro infrastructure, on key innovation inputs, on immigration, and water and energy issues, the federal government continues to matter in the Mountain states, and needs to offer to state, mega, metro, and local problem-solvers a new brand of simultaneous support and empowerment.

And so, as the approaching 2008 election decides upon a new administration in Washington, the time is right for leaders around the Intermountain West to propose a compact with the federal government that will allow the region's pivotal megapolitan areas to overcome their common challenges and assert their leadership in the nation and world.

What should this new compact or partnership look like? To begin with, it should revolve around securing a young region's standing on the four core drivers of future prosperity—efficient and strategic infrastructure links, potent innovation capacity, high-potential human capital, and sustainable, quality places—as well as on regional governance. But beyond that, the new partnership should be characterized by a new tone and stance—a fresh and pragmatic style that is more catalytic than commanding, more empowering and facilitating than micromanaging.

Finally, it is important to consider the historic relationship between the federal government and Western states. Many citizens in the region resent that so much of their land is owned and controlled by Washington and the heavy imprint of federal policy in the region over generations. This resentment often manifests itself in an open hostility to the federal government. Given that, federal policymakers should carefully consider how their efforts to “help” the West, or otherwise “intervene,” may be interpreted. Westerners are not seeking handouts from Washington. Rather, they are looking for constructive engagement and partnership as they face a series of vexing challenges. In this spirit, the following pages propose a series of policy adjustments that propose a new, more supportive, and empowering relationship between Washington and the Intermountain West.

## INFRASTRUCTURE

**F**ast-growing megapolitan areas in the Intermountain West have a heavy burden when it comes to keeping up with growth. They need to meet new demand for buildings and replace aging stock while building out efficient, state-of-the-art surface transportation and air links, as well as the fundamental infrastructure necessary to move and deliver water and electricity.

No other region of the country will face such acute growth pressures as the Intermountain West. Not surprisingly, Westerners tend to be more concerned about growth pressures than are residents elsewhere in the United States.<sup>180</sup>



Knowing the extent of coming development offers the region a vital opportunity to address various infrastructure challenges while it manages growth and improves on its current level of prosperity. Now is the time for the region's leaders to ask that the federal government become a more constructive partner with state and local governments and the private sector in helping the region make crucial investments in the region's infrastructure and resource systems. Help with direct investment will be critical, but so will related policy and attitudinal adjustments aimed at setting up a more supportive federal policy framework within which all parties can work together to improve surface and air transport and address pressing water and energy issues. Along these lines, the Intermountain West has a particular interest in helping work out new federal-state-mega partnerships through which Washington will more constructively help to:

- Bring the transportation network to scale, smartly
- Proactively address enormous resource needs

### ***A number of issues need to be engaged:***

Bring the transportation network to scale, smartly. Given the region's extraordinary coming growth, the Intermountain West will need to build out its passenger and freight networks both between and within megapolitan areas, using highways, high-speed and light rail, and air connections to improve connections and shape development. The megas cannot “go it alone” on this front, and so the federal government needs to provide strategic, targeted, and reliable help.

First, the federal government should give priority in the next round of transportation funding to **strengthening nationally significant passenger and freight corridors**.<sup>181</sup> One of the weak spots along the CANAMEX corridor is the two-lane U.S. 93 highway connecting Las Vegas and Phoenix. Arizona is already investing in upgrading U.S. 93,





but federal support and funding will likely be needed to complete the Hoover Dam Bypass and complete the upgrades through to Las Vegas. Similarly, several major points of congestion lie along CANAMEX, such as I-10 in and around Phoenix, U.S. 93 in Las Vegas, and through the Wasatch Front on I-15, which could all benefit from targeted federal investments to improve circulation and add multi-modal connections. The passenger and freight corridor between the Front Range and Northern New Mexico will at some point need to be strengthened, and in this case, corridor needs may be met by improving rail connections along existing railroad rights-of-way running parallel to I-25. The federal government could encourage state and local investment in designated transportation corridors across the region by relaxing federal right-of-way acquisition guidelines, which may prevent early right-of-way acquisition.

Relatedly, the region would benefit from **a long-term federal commitment to high-speed rail (HSR)**. European experience confirms HSR is immediately substitutable for passenger air travel for destinations up to 200-300 miles apart.<sup>182</sup> A full third of all flights leaving Phoenix travel to Southern California and many of these trips could be shifted to HSR. Similar potential exists for HSR between Las Vegas and Southern California, and possibly between Las Vegas and Phoenix. If the train is fast enough, the feasible range for substituting air trips with high-speed rail can extend to 400-500 miles.<sup>183</sup> All of the major cities of the Intermountain West could eventually be connected by HSR, allowing HSR to deflect regional travel demand away from airports that will be reaching capacity within the coming decades.

To make the most of global economic opportunities, the

megapolitan West and its federal partners must **plan strategically for its long-term air transportation needs**.

Airports are particularly important for the Intermountain West, as its inland cities are reliant on air transportation to link to the world. As the region grows, it will need expanded runway capacity at its major airports to alleviate bottlenecks, both in passenger travel and air freight. Some of the pressure on the major airports can be relieved by strategically developing secondary airports, such as Phoenix-Mesa Gateway proposed in the Sun Corridor and Ivanpah proposed in greater Las Vegas, and by developing HSR to absorb short-haul trips (as above). To finance expansion, the federal government should provide more flexibility for developing public-private partnerships and alternative financing arrangements. Substantial pressure can also be alleviated by upgrading the nation's antiquated air-traffic-control system to a more efficient, global positioning system (GPS) based system. This upgrade is beginning in bits and pieces but implementation has been slow due to congressional arguments about how to pay for it, and needs to be expedited. Finally, the federal government should pursue an open-skies policy that allows greater European and Asian airline access to travel opportunities within the United States in return for similar opportunities in their home countries. Such a policy would especially benefit the Intermountain West as most of the region's international connections are through Los Angeles and even Dallas.

As the region invests in air travel, the region also needs to **develop high-quality surface transportation links between airports and regional job and distribution centers**. Several of the regions are considering or constructing



their own surface linkages to airports, including a light-rail link between downtown Phoenix and Sky Harbor airport (with short bus transfer), a link between Denver's Union Station and Denver International Airport, and a light-rail extension from downtown Salt Lake City to the airport. Additional needs may include a light-rail extension from the proposed Phoenix-Mega Gateway airport to downtown Mesa and to the edge city that will likely emerge on the old GM proving grounds.

To support appropriate development, the federal government must **become mode-neutral** by putting transit and highway financing on the same footing.<sup>184</sup> Currently, proposed highways and transit projects must meet different standards to obtain federal transportation funds, substantially tilting the playing field in favor of highway development. Funding policies should be equalized across modes, such as by extending the "80-20 match" to transit projects. At the same time, the Federal Aviation Administration should reform its decades-old Airport Improvement Project regulations to encourage public-private partnerships to fund, construct, and operate these critical intermodal linkages.

**Proactively address enormous resource needs.** Similar partnership will also be necessary on other fronts. Specifically, the megapolitan West will need water and energy for an additional 11 million residents by 2040, while preserving its air quality and reducing its carbon footprint. Washington will have to help.

Historic federal investments in water infrastructure facilitated the development of the arid Intermountain West. The federal government—through the Department of the Interior—also played an important role in negotiating water rights and in facilitating regional water agreements, such as the Colorado River Compact. As the region adapts to its urbanization and to climate shifts from global warming, the federal government should **facilitate creative, collaborative regional water agreements**. While decisions must ultimately be made by states and localities within the region, the federal government can also play a constructive supporting role by **investing in better data and models for climate, water, and energy** to inform local decision-making and adaptation to the climate challenge. A related federal effort should compile best practices on incentivizing water efficiency, water conservation in both urban and agricultural settings, and appropriate approaches to minimize fire danger and promote drought relief. Such assistance to local leaders will catalyze change.

At the same time, Washington should get serious about supporting alternative energy development. Climate change, the geopolitics of oil, and recent energy price spikes all make the logic of expediting the development of clean new energy sources unassailable. How should the nation begin? One helpful federal assist would be to get energy prices right. In this respect, a national **carbon pricing sys-**

**tem**—in the form of a carbon tax or "cap-and-trade" system—would result in fossil-based energy prices that better reflected their true costs and so would open important market space for alternative-source energy development.<sup>185</sup> While this approach may seem burdensome in an era of \$4 gas, more accurate energy prices would stimulate conservation and demand for energy-efficient, low- or no-carbon energy alternatives. Pricing carbon correctly would have particular benefits in the Intermountain West. Higher fossil fuel prices would likely favor additional investment in the region's research labs and accelerate the development of the enormous solar, wind, and geothermal resources possessed by the Mountain states. Furthermore, energy-efficient development patterns stimulated by a price response are critical for a region facing significant development constraints.

Of course, fossil energy exploration and production will continue throughout the Intermountain West, especially considering the rising price of resources such as oil and the large store of fossil fuel resources found in the region. However, it makes sense to seek ways to use the West's conventional energy economy to help speed the emergence of its next, alternative, one. In this regard, the many negative externalities associated with the extraction of fossil fuels and their use—and the financial resources required to develop alternatives—alone suggest that the Intermountain West would be wise to urge the federal government to **dedicate a portion of royalty and licensing fees** from fossil fuel development to support R&D and commercialization of alternative energy technologies. In this way, traditional carbon-oriented extraction activities in the Intermountain West could be made to help support the development of the region's next-energy new economy.

The resource-rich Intermountain West would also benefit from other federal policies aimed at leveling the economic playing field between renewables and fossil fuels. One such policy would be to extend federal **tax credits and loan guarantees** for alternative energy generation by producers and investments by consumers. Many of the incentives that currently exist are set to expire at the end of 2008. Extending such credits and making their long-term availability more certain would go a long way toward bringing renewable energy technologies to scale.

Finally, the federal government must also facilitate and support the expansion of the national energy transmission grid, which will be necessary to supply growing areas with energy as well as to access new renewable energy resources. As part of this effort, the federal government could support development of distributed energy systems (where alternative power is generated locally) and smart-grid technology to reduce demand for new transmission lines and improve reliability of local energy delivery.

## INNOVATION

A new partnership is also needed on assembling world-class innovation inputs in the Mountain megas. Western entrepreneurs, companies, workers, industry associations, universities, and investors will clearly play the largest role in building the high-performance economy of tomorrow in the Intermountain region. However, they will succeed best if they have a strong, supportive, and focused steward of innovation in Washington.

To ensure that they do, Washington should bring greater purpose and rigor to the nation's currently diffuse innovation activities while respecting, enhancing, and empowering the distinctive and promising specializations of the Intermountain West's megapolitan economies. To that end, the federal government should:

- Step up and better leverage its investments in science research and commercialization
- Establish a nimble program to support and enhance the power of local industry clusters
- Experiment with new paradigms for augmenting and commercializing alternative-energy innovation

Strategic engagements along these lines would do a lot to help the Intermountain West's megapolitan areas build on their competitive advantages, seize new opportunities, and generate higher-quality jobs.

**Leverage sci-tech research capacities for economic development.** The Intermountain West is well situated to pursue cutting-edge research and development work and then spin off innovative new businesses and good jobs, whether in biotech and IT or new renewable energy technologies.

To reach its full potential, though, the Intermountain West would benefit greatly from a helpful partner in Washington. Indeed, federal leadership on innovation, R&D, and commercialization would yield dividends not just for the West, but for national economic competitiveness as well.

The Intermountain West's many high quality public universities and national labs represent a significant set of economic assets. However, stagnant—and at some institutions, declining—federal funding constrains their research and innovation potential. Likewise, a growing immigrant workforce with sub-par educational attainment levels portends future employment challenges for the Intermountain megas. A year ago, the bipartisan America COMPETES Act of 2007 began to address these and other concerns. Signed into law in August of 2007, America COMPETES significantly increases federal funding for basic science R&D and science, technology, engineering, and math (STEM) education. However, Congress has not yet fully appropriated

funding for the bill. So, to secure a substantial and steady stream of funding for critical science research and education in the Intermountain West and elsewhere, Washington should **fully fund America COMPETES**, a critical step toward building an innovation economy in the West.

But the federal government should go farther: It needs to help accelerate the commercialization of university-developed and other innovation. In this regard, while the basic research performed in the Intermountain West's universities and national laboratories is crucial, so too are activities that bridge the gap between the lab and the marketplace. Most of this work will be pursued by scientists, entrepreneurs, investors, and workers working in the Intermountain West, to be sure. But Washington can and should play a helpful supportive role in two ways. First, the federal government—as the funding source for university- and lab-based research—is in an ideal position, as the Ewing Marion Kauffman foundation has observed, to encourage experimentation with new and radical ways to **promote more rapid commercialization** of university and lab-developed ideas. In particular, Washington can play an important role in collecting and disseminating information on the various new and existing commercialization models developing throughout the country.<sup>186</sup>

More broadly, the federal government could do what some of America's toughest competitors are doing and establish a true **national innovation policy** that focuses innovation efforts rather than scattering them throughout various government agencies. Key ingredients of such a policy—which could be realized through a National Innovation Foundation—could include the grants to catalyze industry-university research partnerships, increased regional innovation promotion activities, technology adoption efforts, and cluster investment.<sup>187</sup> These activities would be particularly beneficial in the Intermountain West, where innovation assets abound yet overall commercialization performance remains relatively low.

**Build up local export clusters.** Building up and strengthening the Intermountain West's portfolio of promising yet often under-performing industry clusters is a second crucial innovation agenda as the region seeks to craft a more productive, prosperous future. Again, strategic, sustained, and intense local efforts among firms, education institutions, local and state governments, and investors will anchor the efforts.

Yet here, too, the federal government can play a supportive role in assisting the Intermountain West's entrepreneurs and economic development leaders by establishing a catalytic, bottom-up, industry-led **cluster development grant program** to further stimulate innovation. Such a program would provide funding for feasibility studies, planning, and start-up activities for new cluster initiative programs, as well as competitively awarded matching dollars for existing cluster initiative programs.

Funded activities would include combinations of training, R&D, business and workforce attraction, marketing, and technology adoption aimed at increasing innovation and productivity within existing, competitive industries. Similar programs—particularly the Employment and Training Administration’s Workforce Innovation in Regional Economic Development (WIRED) program—are already making an impact in the Intermountain megas. For instance, a three-year, \$5-million WIRED grant is helping eight New Mexico counties (including six counties from the Northern New Mexico megapolitan area) put together a regional plan for developing a green technology cluster through focused training, education, and economic development efforts in the region’s advanced manufacturing, green building, alternative energy, aerospace, microelectronics, and optics sectors.<sup>188</sup> A federal cluster grant program would build on and expand the success of WIRED—a federal pilot project that is unlikely to initiate future funding rounds.<sup>189</sup>

**Experiment with new paradigms for augmenting and commercializing alternative-energy innovation.** Finally, the nation needs to help the Intermountain West realize its extraordinary potential to grow a globally significant innovation economy centered on alternative energy. Once again, Western scientists, entrepreneurs, investors, executives will play the largest role in making good on the vast promise of the region. However, the scale and nature of the need for new research and technology transfer argues for a federal role in implementing a new research paradigm aimed at securing a transformative “step change” in the available technology and knowledge that can be brought to bear on creating a clean economy.

To that end, the federal government should at once expand its current investments in energy research and channel some of the new investment into creating an experimental network of public-private, multi-disciplinary **“discovery innovation institutes”** aimed at speeding breakthrough energy technologies to the marketplace. These institutes (which are the subject of a forthcoming Brookings paper) would frequently be sited at universities around the West.<sup>190</sup> There, they would function as nodes of intense collaboration among multiple partners—federal agencies, research universities, established industry, entrepreneurs, and the investment community—aimed at linking fundamental scientific discoveries with technological innovations so as to create the products, processes, and services that will drive the next economy. Along these lines, the creation by the federal government of a cluster of linked discovery innovation institutes in the Mountain States and elsewhere could go a long way to bringing the region’s emerging research strengths in renewable energy technologies (such as solar, wind, and geothermal) and energy distribution to commercial fruition. Western leaders should consider urging the nation to make their region—with its

enviable array of research universities, its national labs, and its burgeoning alternative energy industry clusters—a prime test bed for this new model for collaborative, translocation-oriented research.

## HUMAN CAPITAL

Creating an inclusive, middle-class society where educational opportunity allows upward mobility also remains significantly the province of state and local leaders, in the West and elsewhere. But the Intermountain megas’ acute human capital challenges are of a sort that call for federal engagement.

Most notably, Washington’s inability to provide the nation balanced, comprehensive, and effective immigration reform has left the southern Intermountain region grappling with the side effects of dysfunctional federal rules. Consequently, while the federal government holds exclusive authority of national immigration and border policy, the Intermountain-region megas are being left to wrestle largely on their own with the fiscal, civic, educational, and social burdens of absorbing major concentrations of legal and illegal migrants.

In view of that, Washington needs to better support Western communities as they strive to ensure the economic, social, and civic integration of large numbers of immigrants as well as other young and under-educated in-migrants.

Along these lines, the Intermountain region should insist that the federal government:

- Deliver balanced, workable immigration reform
- Support the creation of a capable, productive, diverse middle-class workforce

**Deliver balanced, workable immigration reform.** Long-lasting solutions to the immigration question, which is tied up with enormous global trends and remains solely the province of national policy, can only come from Washington. As the ultimate authority for deciding who can cross the nation’s borders and legally reside in this country, only the federal government can relieve the pressure that is being placed on states and localities by today’s unworkable federal rules and policies.

To fulfill its responsibilities and be a better partner to regional leaders, then, the federal government must deliver **comprehensive immigration reform**. In addition to enhanced enforcement and expanded legal channels of entry, reform strategies should include earned legalization that encourages illegal immigrants to register for temporary legal status, after security checks and substantial fees, and allows them to wait in line after legal immigrants to obtain permanent status. By taking leadership in supporting such a strategy, the federal government would end ambiguity

### Thinking Like a Mega

**T**he Wasatch Front began thinking and acting at the megapolitan level more than a decade ago when Envision Utah's famous 10-county scenarios were created, modeled, and taken to the public and community leaders in the largest outreach in Utah's history. Those scenarios clearly demonstrated the interrelationships of key issues across the Wasatch Front and Wasatch Back and that the best solutions to challenges relating to the environment, transportation, and urban growth would be found by incorporating a regional and super-regional perspective into governmental process at all levels and in all forums. The Envision Utah scenario modeling—accomplished by combining the two metropolitan planning organization (MPO) models for the first time with the assistance and leadership of the governor's office and the MPOs—tested different regional outcomes and created a new “way of thinking and doing business.”

The concept that continues to take root and bear fruit in Utah is cooperative and voluntary regional

“governance,” where local governments have and will retain their decisionmaking power but understand and help promote the best regional as well as local outcomes. The MPO boards—composed predominantly of city, county, and state leaders, plus representatives from the chambers of commerce, Envision Utah, and numerous other groups—foster and support this approach.

Envision Utah and the Wasatch Front are perhaps the best example of regional cooperation in a political environment that believes in maintaining the benefits of strong local decision making but with a strong focus on understanding how local decisions impact the entire region.

---

*Source: Envision Utah, “The History of Envision Utah,” available at [www.envisionutah.org/pdf/historyenvisionutahv5p1.pdf](http://www.envisionutah.org/pdf/historyenvisionutahv5p1.pdf) (July 13, 2008); Robert Grow, O'Melveny & Myers LLC, and founding chair emeritus of Envision Utah.*

about immigrant legal status and coax immigrants themselves out of the shadows and into the mainstream, where they may be more productive members of society.

Washington should also **compensate state and local governments** for the impact their immigrant populations have had on the costs of public service provision. Further, the federal government should **provide seed funding for regionally-scaled and regionally-tailored public-private partnerships to better integrate immigrants** through English language instruction, civics education, welcome centers, referral services, or other activities that regional leaders identify as necessary. These federal efforts at boosting immigrant inclusion and integration would be particularly important for the Megapolitan West, where several metros, including Denver, Las Vegas, and Phoenix, have emerged or re-emerged as new immigrant gateways. Their rapid demographic changes may have left their corresponding states and localities underprepared for the flux of new migrants and lacking the appropriate resources and finances to provide needed services.

**Support the creation of a capable, productive, diverse middle-class workforce.** A necessary ingredient for boosting the human capital potential of the Intermountain West—and the nation as a whole—is education. While localities may be responsible for delivering education and states for managing it, the federal government has more often

than not set the stage. Among its policies over the years, the federal government has championed desegregation, protected special education with the Americans with Disabilities Education Act, and emphasized standards and accountability through the No Child Left Behind Act.

With the regional education systems of the Intermountain West facing greater and greater diversification of their student bodies, Washington can step up again to make a real difference. The federal government should take on **research and development on immigrant education** as a core function of its education policies. More diversity in the student body introduces more diverse needs in teaching, learning, and support services as new students enter the system with varying English skills, levels of preparation, and post-graduation plans. Current education capacity, quality, and methods and materials of instruction may not adequately handle all this new diversity. To really ensure that all students, regardless of their background, achieve success, regional education systems need more and sustained innovation, particularly around early interventions all along the education pipeline, from pre-K through high school to vocational and other post-secondary schools, that can determine how successfully educators can serve a wider diversity of students much better.

The federal government could support more innovation on education by providing research and development (R&D)



into transformative new education ideas, technologies, and approaches. Of all the federal government agencies, the Department of Education currently spends the smallest share of its budget on R&D. Ramped up R&D funding there could support the development of new groundbreaking projects, fielding testing and evaluation of a small fraction of them in selected schools, and supplemental grants to those schools that serve as “innovation laboratories”.

In addition, the federal government should do more to **secure the pipeline to post-secondary education**. Given that projections indicate that much of the Intermountain West can expect explosive growth in the number of high school graduates from their regional education systems, it is imperative to ensure that they are on track to earn the post-secondary credentials that have become increasingly important for good paying jobs in the 21st century marketplace. Supporting the future workforce is a matter of regional and national economic competitiveness, and so, the federal government should partner with states to create a real-time data system that tracks individual outcomes from high school through college to pinpoint any problems, allocate resources, devise interventions, and monitor performance over time. This effort would spur more collaboration between schools and colleges to ensure that students are transitioning successfully with the level of skills and preparation they need to fully complete a post-secondary degree and graduate ready to be productive members of the workforce.

Finally, the federal government should complement efforts to increase educational attainment by working also to **boost the wages of the lower income workers and their families by expanding and modernizing the EITC**. This federal engagement would not only help bridge gaps between wages and living costs but may also promote greater labor market attachment and participation and skills growth - all important assets for the economic and social well-being of the nation and its regions.

A revamped EITC would involve improving the credit's design so that a portion of EITC proceeds could be received by taxpayers throughout the year rather than as a lump sum to better meet the pattern of their expenditures. A new, enhanced EITC would also allow for greater benefits for childless workers, dual-earner couples, and families with three or more children. These three enhancements would augment the EITC's impact in the Intermountain West to such an extent that an estimated 191,986 tax filers in metropolitan Phoenix would receive an additional \$154.3 million in benefits. An estimated 95,415 tax filers in metro Denver and 86,128 tax filers in metro Las Vegas would also benefit greatly, with each region receiving roughly \$70 million more in total EITC receipts.<sup>191</sup>

## QUALITY PLACES

**C**arving quality places out of the mass-produced and car-dominated suburbs of the Intermountain West, meanwhile, will also require a long-time partnership of all relevant actors—public, private, and non-profit, and federal, state, tribal, and local—to design the kinds of accessible and walkable neighborhoods that the market is increasingly demanding. In this regard, while some will reject the notion of a federal role in placemaking, the fact is that the federal government is already heavily engaged in local and regional land use development in the Intermountain West because of its primary landowner status throughout much of the west, and because its water, energy, and transportation investments have widespread effects. If the federal government is to become a more a constructive partner in the development of the Intermountain West, it needs to make a series of investments and policy reforms that provide needed support while respecting local autonomy and decision-making. Three actions would be helpful. Along these lines, the federal government should in partnership with Western leaders:

- Invest and encourage supportive public transportation
- Incentivize energy- and resource- efficient land use and building design
- Issue a sustainability challenge



**Invest in and encourage supportive public transportation.** Just as the region needs supportive surface transportation such as roads and rail for intercity and inter-mega transportation, it needs supportive public transit networks. Transit improves mobility by providing transportation choice to workers and residents, which is becoming increasingly critical in an era of \$4 per gallon gasoline. Transportation is also one of the most important federal levers for influencing the development of quality places.

Current federal transportation policies make it difficult for regions to develop the projects they need, by breaking up project review between the federal highway and transit agencies, and by substantially favoring financing for highway development over transit. Federal transportation policy must **remove this policy and funding bias in favor of highways** and **loosen the purse strings for transit**, such as by applying the same “80-20” federal-local match requirements common with highway projects to transit projects.<sup>192</sup> Most of the funding for developing transit systems in the megapolitan West has so far been locally generated. Help from Washington would substantially speed up and expand these systems even further.

Similarly, the federal government should **refine existing performance standards** to ensure pedestrian-oriented design and a finer-grain mix of land uses at transit station stops. These performance standards would be used when entities are applying for new funds or funds for extending existing systems. Similarly, a **performance standard for multi-modal connectivity**, including a pedestrian-oriented component, should be applied to road projects to ensure the projects properly integrate with existing transit systems and into the neighborhood fabric.

**Incentivize energy- and resource-efficient land use and building design.** Providing funding for transit will not be enough to ensure that new development is energy- and resource-efficient, and protects the fragile, arid environment of the Intermountain West. To do this, the federal government should **condition receipt of federal transportation dollars on state and local governments having appropriate standards** to encourage sustainable energy development, greenbuilding, and mitigation of the heat island effect (such as through greening and roofing improvements) in urban areas.

Another way the federal government can shape the emerging megapolitan forms in the Intermountain West is by **attaching standards to federal land transfers** to cities such as Las Vegas and Salt Lake City. The federal government could require plans that show sustainability for large-scale projects before authorizing transfers. In Las Vegas, for instance, few prescriptive land use requirements exist for transfer of Bureau of Land Management land to private developers. Standards could follow the spirit of adequate public facilities ordinances by including provisions

for appropriate local water (both surface and groundwater), open space, and wildlife protection plans as part of federal land transfers.

Caution should be noted. The federal government has a history of issuing unfunded mandates to localities, and the West is especially sensitive to edicts issued from Washington. Thus, we suggest that changes to federal requirements come out of **engagement and partnership with state, local, and tribal actors** so that there is local input in decision-making and all parties contribute to a workable plan for sustainable growth. As part of this engagement process, the federal government should also provide financial support and guidance for developing appropriate local plans and standards.

**Issue a “sustainability challenge.”** Another way a new federal partnership could catalyze bold new problem-solving would be to issue what might be called a “sustainability challenge” to state, mega-regional, metro, local, and tribal actors.<sup>193</sup> This challenge, delivered in the form of a competitive grant offer, would challenge all regions to figure out the boldest, most creative, and effective new ways to better **link up disparate housing, transportation, environmental, energy, and land use policies** to achieve sustainability goals, such as a reduced carbon footprint. The grant would be performance-based, and effectively award the most ingenious and creative solutions to widespread sustainability challenges with a substantial financial carrot and flexibility in implementing federal program requirements. Perhaps originating in ongoing congressional climate discussions or in the housing or transportation appropriations processes, such a challenge would seek new approaches to assist states, megas, and metros in one of their hardest tasks: creating holistic transportation, housing, education, energy, and environmental policies. In this way, the federal government would encourage action toward a societal goal at the same time as it stimulated high-quality experimentation and feasibility of creative, new solutions. In this fashion, a bold new sustainability challenge holds real promise for stimulating a powerful wave of creative, place-based problem-solving in the megapolitan West, trumping the program stovepiping that leads to undesirable development outcomes.

\* \* \*

Finally, there remains the matter of supporting the emergence of new, wider-reaching and more interconnected governance mechanisms and networks to match the geographic scale and dynamism of the new reality.

Quite simply, the prosperous build-out of the megapolitan West depends heavily on getting governance right within the megas. That, in turn, argues that Washington should support megapolitan leaders’ efforts to manage the evolution of their regions given the nation’s strong interest

### One Mega Is Better than Two Metros: Super-Regional Collaboration in the Sun Corridor and Elsewhere

A key element of any Sun Corridor business development effort is now the growing recognition that, in a global economy where size and concentrations of resources matter, the combination of Phoenix and Tucson adds up to much more than the sum of the two parts—to the benefit of both metros as well as the nation.

Of course, that recognition has been a while in coming. Inside Arizona, the Phoenix-Tucson rivalry is legend. Phoenix looks on Tucson as its poor country cousin and Tucson sees Phoenix as a mini-LA that has created a “Disney Desert.” And yet, in recent years the natural drift of events and the onset of the new super-regional reality has led Phoenix and Tucson (and Flagstaff) to begin competing together against Frankfurt, Singapore, and Mumbai rather than with each other.

Such a discovery of common cause has occurred elsewhere in the megapolitan era, as it did when Dallas and Fort Worth put their differences aside and rebranded their now-unified region as the “Metroplex.” To outsiders, the fact that that Dallas and Fort Worth were once bitter rivals is irrelevant, and perhaps even silly, not least because the two metros built a single new international airport (emphasis on international!) between the two.

The same is true now of the Phoenix-Tucson corridor. The two metros simply have too much at stake to be divided by petty differences, and significant cooperation between the two is well underway. Prime examples of the new spirit include the new joint University of Arizona-Arizona State University Medical School in downtown Phoenix and the nationally significant Science Foundation Arizona (SFAz) initiative. The med

school stands as a much-needed anchor to the Sun Corridor’s ambition to become a player in the biotech industry. Likewise, SFAz—initiated in the spring of 2006 by the three statewide CEO groups, the Flagstaff 40, Greater Phoenix Leadership, and Southern Arizona Leadership Council—represents a unique multi-metro public/private push to make serious investments in scientific, engineering, and medical infrastructure that will result in transforming Arizona into a state that is even more innovative and enterprising. Much has changed since 2002, when Brookings researchers found “no significant biotech research or commercialization” in the Phoenix metropolitan area.<sup>179</sup>

As to what’s next in terms of economic integration in the region, opportunities exist but will need time to unfold. The Wasatch Front and Colorado’s Front Range each share a potential for multi-metro development strategies similar to that in the Sun Corridor. However, both regions face challenges. Salt Lake City dominates the Wasatch Front and its smaller partners of Ogden, Provo, and Logan are really satellites to the core area. Denver in the Front Range has a decent-sized partner to the south in Colorado Springs, but it is somewhat disconnected economically and shares only a relatively small number of commuters with its smaller neighbor. Similarly, Albuquerque is substantially larger than Santa Fe and home to a more diverse economic base, but the two metropolitan areas are slowly knitting together with Los Alamos and Espanola to form a connected urban system throughout Northern New Mexico.

In short, interconnection is coming and will not likely stop. The bottom line for the megapolitan West: Every mega needs to locate its own competitive advantages as a regional economy, while considering what forms of cooperation between places may prove to be mutually beneficial.

in ensuring these dynamic areas reach their full potential for prosperity.

Already much valuable regional collaboration is emerging on its own. And yes, states likely have more direct influence than Washington over local and metropolitan governance arrangements and must play a lead role. However, state and local movement toward metropolitan and megapolitan cooperation remains uneven and underfunded, suggesting that the federal government can play an important role at the margin to help foster the coalescing of new, wider-angle governance systems.

And so to help megapolitan governance innovation keep pace with events, the federal government should provide a tactful mix of information and encouragement to help catalyze the emergence of more cross-boundary and mega-scaled problem-solving within and across U.S. megas. In all, Washington should lend its support without trying to micromanage.

On the information and learning front, for example, federal agencies should talk up the new geography and support broadened understanding of it—but not prescribe governance solutions. Instead, federal officials—particularly



transportation officials—should **understand the new reality** and help **stimulate and facilitate dialogue** on it, which will help federal agencies better respond to megapolitan leaders' needs. Similarly, the federal government should move to **build a top-quality information base** to support regional efforts to respond to the new megapolitan reality, and better inform its own decisionmaking. For example, much more data collection and modeling on transportation and business flows at the new scale needs to be done to allow better analysis of the growing integration of clustered metropolitan areas. To further support the learning process, moreover, Washington could help Western leadership organizations like the Western Governors Association or the Council of State Governments West create a West-wide learning network tasked specifically with facilitating cross-mega understanding, dialogue, and best-practice exchange. Such a focused learning network could speed the spread of innovative new governance solutions, both those already underway and ones not yet envisioned.

To more directly encourage mega-scaled governance innovation, meanwhile, the federal government should materially reward initiatives that join-up local and metro institutions into super-regional webs. A start in this direction would be to **tweak the federal MPO law** and related regulations to provide new incentives and assistance to MPOs to support greater consideration of transportation patterns and development patterns beyond the immediate reach of their specific territory. This would at once underscore the importance of extra- and inter-territorial planning and support it materially. But Washington could go farther

in fostering connections. First, it could establish a broad sort of **regionalism “steer”** to key categorical, block, and other grant programs that would essentially give preferential treatment or funding to recipient states, municipalities, or other entities that embrace cross jurisdictional and regional or super-regional planning and problem-solving. For example, groups of metros or municipalities that wanted to embrace inter-connected, multi-metro transit or land-use strategies could be rewarded with extra incentive funds. This would allow states and regions that wanted to fully embrace the new approach to do so and be rewarded, while others could simply proceed as they preferred.

Alternatively, and more creatively, the federal government could lay down—in partnership with state governments—a **“governance challenge”** aimed at boldly challenging megapolitan-area leaders to attempt wholesale experiments in organizing themselves.<sup>194</sup> A governance challenge, like its sibling the sustainability challenge, would stipulate no particular policy goal. Instead, it would simply reward the most path-breaking proposals available for connecting regional and super-regional governance in such key domains as transportation planning or land use or housing with substantial grant money. In addition, the governance challenge would require the participation of state government in proposals, given that localities and even MPOs remain legally “creatures of the state.” Significant grant money would be awarded in a competitive process to the partnerships of states, localities, MPOs, regional business alliances, and other entities that devised the boldest, most multi-jurisdictional proposals for improving cross-boundary coordination, service and program integration, or regional decisionmaking. Winning proposals would be rewarded with special prize resources (on top of regular block grant allocations) as well as new powers and flexibility to align disparate federal programs in support of the new vision. In this fashion, Washington could truly help Western leaders develop—and test—new variants of large-scale thinking and action.

\* \* \*

In sum, the time has come to make America's emerging New Heartland in the West a prime test-bed for the nation's next generation of pragmatic, far-sighted metropolitan policies.



# VI. CONCLUSION

This report comes at a critical time for the Intermountain West's megapolitan areas. These large-scale urban zones have seen decades of rapid growth that transformed them from sleepy small towns into major cities. The next round of growth will move the biggest of these places into the ranks of America's world cities—that includes peers such as Atlanta and Dallas. The moment presents both pitfalls and possibilities. There was little anticipation that the Intermountain West would have cities on the scale that we now see. The region was slow to develop with much of its urban growth coming as a burst in the last three decades of the 20th century. Change happened so fast that there was hardly time for basic infrastructure to keep up, or for the West's urban economy to mature past its historic pattern of boom and bust.

So far this decade, there has been no relief from the now generation-long pattern of massive expansion. Yet, the region should stop to reevaluate its planning and development practices or risk compounding past mistakes. The Intermountain West faces multiple stresses from deteriorating long-term environmental conditions (e.g., drought) to immediate economic challenges (e.g., a housing crisis). There is a growing sense that the legacy of a boomtown past may be finally catching with the West's big cities.

This report assesses current conditions in the Intermountain West's megapolitan areas. This analysis serves as a context for a policy discussion that considers how the West's next growth wave may improve upon past practices and fix some chronic problems. This report serves as a wake up call. Before the Sun Corridor becomes a Chicago-sized metropolis, which it is well on its way to achieving by 2040, now is the moment to establish a new model for growth.

For all of their national presence, the Intermountain West's megapolitan areas are still playing catch up as world cities. This report shows that the West's big urban areas

economically resemble overgrown regional cities. Their export economy and connectivity to global business remains largely underdeveloped. These places risk reaching the scale of Dallas or Atlanta, but may do so without establishing the economic status of true world cities.

While the West began as an economic colony of the East, California's influence now looms large. The region has a complex relationship with the West Coast, especially Los Angeles. The Southland has helped people the urban West in recent years and provides a critical link to the global economy. But California's sheer size overwhelms the Intermountain West's metropolitan markets. The region needs to steer an economic path that leverages California's global presence, but also creates a clear space for places such as Denver and Phoenix to emerge as world cities in full. This is no easy task, but a careful analysis of how the Intermountain West's megapolitan areas connect to the world economy is a start.



# ENDNOTES

1. Thomas F. Schaller, *Whistling Past Dixie: How Democrats Can Win Without the South* (New York: Simon & Schuster, 2006).
2. William H. Frey, "The Electoral College Moves to the Sunbelt." (Washington: Brookings Institution, 2005).
3. U.S. Census Bureau, "Interim Projections of the Population by Sex for the United States, Regions, and Divisions: April 1, 2000 to July 1, 2030," available at [www.census.gov/population/www/projections/projectionsagesex.html](http://www.census.gov/population/www/projections/projectionsagesex.html) (June 12 2008).
4. William Frey and Ruy Teixeira, "Election Demographics in the Inter-mountain West: Key Purple States for 08" (Washington: Brookings Institution, forthcoming).
5. The Republican party has not held a national convention in the Inter-mountain West.
6. Metropolitan areas are defined by the U.S. Office of Management and Budget to include an urbanized area of 50,000 residents, its home county or counties, plus any adjacent counties that maintain commuting and other economic ties to the core urbanized area. Thus, metropolitan areas are county-based. Current definitions of metropolitan areas are available at [www.census.gov/population/www/estimates/metrodef.html](http://www.census.gov/population/www/estimates/metrodef.html) (June 12 2008).
7. For extended articulations of this perspective on the desired nature of national and regional development and the key "drivers" of such prosperity, see Alan Berube, "MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity" (Washington: Brookings Institution, 2007) and Mark Muro and others, "MetroPolicy: Shaping a New Federal Partnership for a Metropolitan Nation" (Washington: Brookings Institution, 2008).
8. Robert Fishman, *Bourgeois Utopias: The Rise and Fall of Suburbia* (New York: Basic Books, 1987); Harold L. Platt, *Shock Cities: The Environmental Transformation and Reform of Manchester and Chicago* (Chicago: University of Chicago Press, 2005).
9. See especially the works of Robert Park and Edward Soja.
10. Robert Venturi, Denise Scott Brown, and Steven Izenour, "Learning from Las Vegas: The Forgotten Symbolism of Architectural Form" (Cambridge, MA: MIT Press, 1977).
11. Robert E. Lang, "Is Las Vegas a World City?" Plenary Presentation, Urban Land Institute Annual Fall Meeting, October 2007.
12. U.S. Census Bureau, "Census Bureau Announces Most Populous Cities," available at [www.census.gov/Press-Release/www/releases/archives/population/010315.html](http://www.census.gov/Press-Release/www/releases/archives/population/010315.html) (August 12 2007).
13. Jean Gottmann, *Megalopolis: The Urbanized Northeastern Seaboard of the United States* (New York: The Twentieth Century Fund, 1961).
14. The exact counties found in these metropolitan areas can be found at <http://www.census.gov/population/www/estimates/metrodef.html> (June 12 2008).
15. Robert E. Lang and Arthur C. Nelson, "Beyond the Metroplex: Examining Commuter Patterns at the 'Megapolitan' Scale" (Cambridge, MA: Lincoln Institute of Land Policy, 2007); Robert E. Lang and Arthur C. Nelson, "The Rise of the Megapolitans," *Planning* 73 (1) (2007): 7-12.
16. Office of Management and Budget, "Recommendations From the Metropolitan Area Standards Review Committee to the Office of Management and Budget Concerning Changes to the Standards for Defining Metropolitan Areas; Notice." *Federal Register* 64(202): October 20, 1999.
17. Robert E. Lang and Dawn Dhavale, "America's Megapolitan Areas." *LandLines* 17(3) (2005):1-5.
18. Robert E. Lang and Dawn Dhavale, "Beyond Megalopolis: Exploring America's New 'Megapolitan' Geography" (Alexandria, VA: Metropolitan Institute at Virginia Tech, 2005); Lang and Nelson, "Beyond the Metroplex: Examining Commuter Patterns at the 'Megapolitan' Scale"; Lang and Nelson, "The Rise of the Megapolitans."
19. William H. Frey and others, "Tracking American Trends into the Twenty-First Century: A Field Guide to the New Metropolitan and Micropolitan Definitions." In Alan Berube, Bruce Katz, and Robert E. Lang, eds., *Redefining Urban and Suburban America: Evidence from Census 2000*, Volume 3 (Washington: Brookings Press, 2006).
20. Lang and Dhavale, "Beyond Megalopolis: Exploring America's New 'Megapolitan' Geography".
21. Ibid.
22. Regional Plan Association, "America 2050: A Prospectus" (New York, 2006). For more information on current efforts, see [www.america2050.org](http://www.america2050.org)
23. William R. Travis, *New Geographies of the American West: Land Use and the Changing Patterns of Place* (Washington: Island Press, 2007).
24. Donald W. Meinig, *The Shaping of America: A Geographical Perspective on 500 Years of History*, Volume 4: Global America, 1915-2000. (New Haven, CT: Yale University Press, 2004).
25. Margo J. Anderson, *The American Census: A Social History*. (New Haven, CT: Yale University Press, 1988).
26. Robert E. Lang, Edward J. Blakely, and Meghan Z. Gough, "Keys to the New Metropolis: America's Big, Fast-Growing Suburban Counties," *Journal of the American Planning Association* 71(4) (2005): 381-391. See also William H. Frey and others, "Tracking American Trends into the Twenty-First Century: A Field Guide to the New Metropolitan and Micropolitan Definitions." In Alan Berube, Bruce Katz, and Robert E. Lang, eds., *Redefining Urban and Suburban America: Evidence from Census 2000*, Volume 3 (Washington: Brookings Press, 2006).
27. Robert E. Lang and Dawn Dhavale, "Micropolitan America: A Brand New Geography." In Alan Berube, Bruce Katz, and Robert E. Lang, eds., *Redefining Urban and Suburban America: Evidence from Census 2000*, Volume 3 (Washington: Brookings Institution Press, 2005).
28. Ibid.
29. Robert E. Lang and Paul K. Knox, "The New Metropolis: Rethinking Megalopolis." *Regional Studies*. 41(1) (2008): 1-14.
30. Robert E. Lang, *Edgeless Cities: Exploring the Elusive Metropolis* (Washington: Brookings, 2003).
31. See Patricia Gober and Barbara Trapido-Lurie, *Metropolitan Phoenix: Place Making and Community Building in the Desert* (Philadelphia, PA: University of Pennsylvania Press, 2006); Travis, *New Geographies of the American West: Land Use and the Changing Patterns of Place*.
32. William H. Frey, "Melting Pot Suburbs: A Census 2000 Study of Suburban Diversity" (Washington: Brookings Institution, 2001); William H. Frey, "On the New Sunbelt: Suburbia Becomes More Complicated." *Milken Institute Review*, 2001, pp. 88-95; Robert E. Lang, "Open Spaces, Bounded Places: Does the American West's Arid Landscape Yield Dense Metropolitan Growth?," *Housing Policy Debate* 13 (4) (2003): 755-778.
33. Robert E. Lang, Deborah Epstein Popper, and Frank J. Popper, "Is There Still a Frontier? The 1890 U.S. Census and the Modern American West," *Journal of Rural Studies* 13 (3) (1997): 377-386.
34. Lang, "Open Spaces, Bounded Places: Does the American West's Arid Landscape Yield Dense Metropolitan Growth?."
35. Homesteading ended officially in 1976 with passage of the Federal Land Policy and Management Act.
36. U.S. Census Bureau, "Interim Projections of the Population by Sex for the United States, Regions, and Divisions: April 1, 2000 to July 1, 2030."
37. Brookings analysis of Bureau of Economic Analysis data.
38. Brookings analysis of Bureau of Labor Statistics data.
39. Brookings analysis of data from the Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School. Employment counts exclude agricultural and government employees. Cluster employment data are only available for metropolitan areas. To compute megapolitan figures, the megapolitan area's component metropolitan figures were summed.
40. Brookings analysis of Bureau of Economic Analysis data.
41. Michael Porter, "The Economic Performance of Regions," *Regional Studies* 37 (6) (2003): 545-546.
42. Analysis conducted for Brookings by the Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.
43. Brookings analysis of data from the Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.

44. Rankings are only available by metropolitan area.
45. Paul R. Krugman, *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s* (Cambridge, MA: MIT Press, 1997).
46. Brookings analysis of Bureau of Economic Analysis data.
47. Brookings analysis of data from Sperling's BestPlaces. Cost of living data was weighted by population.
48. Brookings analysis of data from the 2006 American Community Survey.
49. *Twenty-First Century Gateways: Immigrant Incorporation in Suburban America* (Washington: Brookings Press, 2008).
50. Brookings analysis of data from the Current Population Survey.
51. Ibid.
52. Brookings analysis of data from the 2006 American Community Survey.
53. U.S. Census Bureau, "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin: 2000-2050," available at [www.census.gov/ipc/www/usinterimproj/](http://www.census.gov/ipc/www/usinterimproj/) (June 24 2008).
54. Brookings analysis of U.S. Census Bureau data.
55. Jason C. Boozar, Jackie Cutsinger, and George Galster. "Where Did They Go? The Decline of Middle-Income Neighborhoods in Metropolitan America." (Washington: Brookings Institution, 2006).
56. Lang and Nelson, "The Rise of the Megapolitans."
57. U.S. Census Bureau, "National Population Projections II: Detailed Files." Available at [www.census.gov/population/www/projections/natdataDIA.html](http://www.census.gov/population/www/projections/natdataDIA.html) (May 1, 2008).
58. The Metropolitan Institute at Virginia Tech projected population and employment through 2040 for the five megapolitan areas, the five states, and the United States as a whole. The national population projections were initially based on the U.S. Census Bureau's 1999 projections through 2100, which identified low, middle, and high growth scenarios based on fertility, longevity, and immigration. For more information, see U.S. Census Bureau, "Population Projections of the United States by Age, Sex, Race, Hispanic Origin, and Nativity: 1999 to 2100." (Washington, 2000). The Metropolitan Institute assumed that growth through 2040 would track between the middle and high growth scenarios, based on rapid recent growth between 1999 and 2007. Growth through 2040 was then apportioned to states and to megapolitan geographies based on a constant-share analysis in accordance with each area's growth rates between 1996 and 2006. The employment projections were initially based on county population and jobs projections from Woods & Poole through 2030, and then extended to 2040 by multiplying the jobs per capita values for 2030 by the 2040 population estimates. For more information, see [www.woodsandpoole.com](http://www.woodsandpoole.com).
59. Using the growth projections, the Metropolitan Institute at Virginia Tech projected real estate investment in the nation's megapolitan areas based on a formula that calculates demand for both new and replacement structures and public infrastructure needs to accommodate this growth. The projection method assumes that not all real estate has the same durability. For example, residential development endures the longest without replacement. According to U.S. Census Bureau data, housing can last 150 years. By contrast, certain commercial real estate, such as big box retail, may need replacing in 10 to 15 years. Office buildings generally remain in use longer and are often occupied for several decades. The projection method first assessed the total volume of housing units and commercial space that would be needed in 2040, based on population and employment projections and using current ratios of housing units to population and jobs to commercial floor space from U.S. Census Bureau surveys. Decay rates for existing buildings were then computed based on surveys of building age to determine the share of existing building stock that would need to be rebuilt. The difference between the total needs in 2040 and the rebuilt shares is the "growth-related" stock.
60. The development cost projection estimates in Chapter 3 are reported in constant 2006 dollars.
61. Peter S. Goodman, "Fuel Prices Shift Math for Life in Far Suburbs." *New York Times*, June 25, 2008, p. A18.
62. Joel Garreau, *The Nine Nations of North America* (Boston: Houghton Mifflin, 1981).
63. American Association of State Highway and Transportation Officials, "Transportation - Invest in Our Future: America's Freight Challenge" (Washington, 2007).
64. For more information, see [www.canamex.org](http://www.canamex.org).
65. American Association of State Highway and Transportation Officials, "Transportation - Invest in Our Future: America's Freight Challenge".
66. Brookings analysis of 2007 data from the Amtrak Government Affairs Division.
67. Ibid.
68. For instance, much of the revenue for the 215 beltway around Las Vegas came from direct pass-through business improvement district fees to homeowners in master planned communities lining the route. Lang and LeFurgy, *Boomburbs: The Rise of America's Accidental Cities*.
69. Robert E. Lang, *Edgeless Cities: Exploring the Elusive Metropolis* (Washington: Brookings, 2003).
70. Michael Pawlukiewicz, "Ten Principles for Smart Growth on the Suburban Fringe" (Washington: Urban Land Institute, 2004).
71. Robert Grow. 2008. Personal communication. June 23. More information is available at [www.udot.utah.gov/mountainview/](http://www.udot.utah.gov/mountainview/) (June 25 2008).
72. Brookings analysis of Air Carrier Statistics data from the Bureau of Transportation Statistics.
73. The MITRE Corporation, "Capacity Needs in the National Aerospace System: 2007-2025." (Washington: Federal Aviation Administration, 2007).
74. For more information, see the "Southern Nevada Supplemental Airport Environmental Impact Statement." Available at [www.snvaairportis.com/about.asp](http://www.snvaairportis.com/about.asp) (June 24, 2008)
75. Ginger D. Richardson, "\$2 Bil Expansion for Sky Harbor; Terminal 2 to Be Replaced; 33 New Gates Planned." *The Arizona Republic*, April 13, 2006, p. 1A.
76. John D. Kasarda, "Aerotropolis: Airport-Driven Urban Development." *ULI on the Future: Cities in the 21st Century* (Washington: Urban Land Institute, 2000).
77. Ibid.
78. Robert Lang and Thomas Sanchez, "America's 'Global Metros' and Presidential Politics (Election Report 08:01)" (Alexandria, VA: Metropolitan Institute at Virginia Tech, 2008); Peter J Taylor and Robert E Lang, "U.S. Cities in the 'World City Network'" (Washington: Brookings Institution, 2005).
79. Ibid.
80. Kasarda, "Aerotropolis: Airport-Driven Urban Development."
81. Airports Council International, "Annual Traffic Data," available at [www.aci.aero/cda/aci\\_common/display/main/aci\\_content07\\_c.jsp?zn=aci&cp=1-5-54\\_666\\_2\\_](http://www.aci.aero/cda/aci_common/display/main/aci_content07_c.jsp?zn=aci&cp=1-5-54_666_2_) (April 2 2008).
82. Bureau of Transportation Statistics, "Air Freight Is Fastest Growing Segment of U.S. Cargo Economy; New Study Tracks Trends in \$29 Billion Dollar-a-Day Cargo Industry," available at [www.bts.gov/press\\_releases/2004/bts017\\_04/html/bts017\\_04.html](http://www.bts.gov/press_releases/2004/bts017_04/html/bts017_04.html) (April 2 2008).
83. Fred Witlox and Ben Derudder, "Airline Passenger Flows through Cities: Some New Evidence." In Peter J Taylor, Ben Derudder, and Pieter Saey, eds., *Cities in Globalization: Practices, Policies and Theories* (London: Routledge, 2007).
84. Ibid.
85. International Trade Administration, "Metro Exports Value," available at [www.ita.doc.gov/td/industry/otea/metro/Reports/2006/mv\\_value06.html](http://www.ita.doc.gov/td/industry/otea/metro/Reports/2006/mv_value06.html) (April 2 2008).
86. Ibid.
87. Brookings analysis of data from the National Oceanic and Atmospheric Administration's Climate Prediction Center.
88. Craig Childs, "Phoenix Falling?" *High Country News*, April 16, 2007.
89. Susan S. Hutson and others, "Estimated Use of Water in the United States in 2000" (Reston, VA: U.S. Geological Survey, 2004).
90. Grady Gammage, Jr and others, "Megapolitan: Arizona's Sun Corridor" (Phoenix: Morrison Institute for Public Policy, 2008).
91. Urban Land Institute, "Infrastructure & Western Growth Patterns: Los Angeles Forum Case Studies" (Los Angeles, CA, 2007).
92. Ibid.
93. Felicity Barringer, "Lake Mead Could Be within a Few Years of Going Dry, Study Finds." *The New York Times*, February 13, 2008, p. A18.
94. Patricia Mulroy. 2007. Personal communication. November 15.
95. Southern Nevada Water Authority, "Southern Nevada Water Authority Resource Plan" (Las Vegas, 2006).
96. One major problem with some water supplies in the Wasatch Front is that it is high in mineral content. High mineral content water is fine for agriculture use but poses a problem for human consumption. A

- process of reverse osmosis can remove dissolved minerals but it also produces a wastewater brine that must be discharged. Disposing of the brine will be difficult because it simply cannot be dumped back in to existing groundwater supplies. Forsyth, Bart. 2007. Personal communication. May 22.
97. Northern New Mexico relies on groundwater for much of its drinking water supply, but this groundwater is recharged by the Rio Grande. Bureau of Reclamation, "Proposed City of Albuquerque Water Resources Strategy Implementation, Drinking Water Supply Project, Albuquerque, New Mexico," available at <http://www.epa.gov/EPA-IMPACT/1999/September/Day-09/i23511.htm> (June 1 2008).
  98. John E. Cromwell, Joel B. Smith, and Robert S. Raucher, "Implications of Climate Change for Urban Water Utilities" (Washington: Association of Metropolitan Water Agencies, 2007); Patricia Mulroy, "Diving in the Deep End: Help Water Agencies Address Climate Change," available at [www.brookings.edu/~media/Files/Projects/Opportunity08/PB\\_ClimateChange\\_Mulroy.pdf](http://www.brookings.edu/~media/Files/Projects/Opportunity08/PB_ClimateChange_Mulroy.pdf) (February 11 2008).
  99. Brookings analysis of data from the National Oceanic and Atmospheric Administration's Climate Prediction Center.
  100. Ibid.; Jon Gertner, "The Future Is Drying Up," *The New York Times Magazine*, October 21, 2007, p. 68; Kirk Johnson, "Snow Is Great. But That Road Plan to Get to It?" *The New York Times*, February 13, 2008, p. A16; Richard Seager and others, "Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America," *Science* 316 (2007): 1181-1184.
  101. Erik Siemers, "Managing Albuquerque's Growth Poses Challenges with 1 Million People Projected for 2021," *Albuquerque Tribune*, September 17, 2007, p. A1.
  102. Barringer, "Lake Mead Could Be within a Few Years of Going Dry, Study Finds."
  103. "U.S., Mexico Launch Study of Western Monsoon." Associated Press, June 24, 2008.
  104. Cromwell, Smith, and Raucher, "Implications of Climate Change for Urban Water Utilities"; Mulroy, "Diving in the Deep End: Help Water Agencies Address Climate Change."
  105. Jim Holway, Peter Newell, and Terri Sue Rossi. "Water and Growth: Future Water Supplies for Central Arizona." (Tempe, AZ: Arizona State University, 2006).
  106. Mulroy, "Diving in the Deep End: Help Water Agencies Address Climate Change."
  107. Urban Land Institute, "Infrastructure & Western Growth Patterns: Los Angeles Forum Case Studies."
  108. In 1980, Arizona passed a landmark Groundwater Management Act that requires regional water planning and assessment of water needs for future development. Five active management areas were developed in or near the state's major urban areas to ensure that municipalities had reliable and renewable sources of water to support new population growth. Three irrigation non-expansion areas were also developed outside urban areas. For more information, see <http://water.az.gov/dwr/WaterManagement/Content/AMAs/default.htm>.
  109. Cromwell, Smith, and Raucher, "Implications of Climate Change for Urban Water Utilities"; Mulroy, "Diving in the Deep End: Help Water Agencies Address Climate Change."
  110. Kathy Jacobs. 2008. Personal communication. June 27. See also Mark Anderson and Lloyd Woodley, Jr., "Water Availability in the Western United States—Key Scientific Challenges" (Reston: U.S. Geological Survey, 2005) and National Research Council, Water Science and Technology Board, *Estimating Water Use in the United States—A New Paradigm for the National Water-Use Information Project* (Washington: National Academies Press, 2002).
  111. Brookings analysis of data from the Energy Information Administration.
  112. Ibid.
  113. Energy Information Administration, *Annual Energy Outlook 2008* (Department of Energy, 2008).
  114. For more information, see [www.westernclimateinitiative.org/Index.cfm](http://www.westernclimateinitiative.org/Index.cfm)
  115. For a map of renewable energy potential, see [www.eia.doe.gov/emeu/rep/rpmap/rp\\_mountain.html](http://www.eia.doe.gov/emeu/rep/rpmap/rp_mountain.html).
  116. Energy Information Administration, *State Renewable Electricity Profiles 2006* (Department of Energy, 2008).
  117. Ibid. U.S. Census Bureau, *Statistical Abstract of the United States: 2008* (Department of Commerce, 2008), pp. 589, table 918.
  118. Western Governors Association. 2008. Western Renewable Energy Zones. Available at [www.westgov.org/wga/initiatives/wrez/](http://www.westgov.org/wga/initiatives/wrez/) (July 5, 2008)
  119. U.S. Department of Energy. Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2006. (Washington, 2007).
  120. Estimates of Federal Tax Expenditures for Fiscal Years 2007-2011, prepared for the House Committee on Ways and Means and the Senate Committee on Finance by the staff of the Joint Committee on Taxation (Washington: Government Printing Office, 2007).
  121. For more information on the current stalemate over renewable energy tax credit extensions, see "Congressional Stalemate Over Renewable Energy," *San Francisco Chronicle*, June 18, 2008, page A1; and "Tax Stalemate Creates Friction Between GOP, Business Allies," *Washington Post*, June 21, 2008, page D1.
  122. For more information on federal renewable energy incentives, see the Database of State Incentives for Renewables and Efficiency, available at [www.dsireusa.org](http://www.dsireusa.org).
  123. Kenneth S. Deffeyes, *Hubbert's Peak: The Impending World Oil Shortage* (Princeton, NJ: Princeton University Press, 2003); Kenneth S. Deffeyes, *Beyond Oil: The View from Hubbert's Peak* (New York: Hill and Wang, 2005).
  124. Cambridge Energy Research Associates, "Why the 'Peak Oil' Theory Falls Down—Myths, Legends, and the Future of Oil Resources" (Cambridge, MA, 2006).
  125. Joe Carol, "Oil Shale—Colorado, Utah Deposits Rival OPEC Reserve." *Deseret Morning News*, June 10, 2007, p. B3.
  126. Mark Jewel, "Microwaves Used to Extract Oil." *Denver Post*, January 22, 2008, p. D1.
  127. Eric Hirst. "U.S. Transmission Capacity: Present Status and Future Prospects." (Washington: Edison Electric Institute, 2004).
  128. For more information, see [www.ee.energy.gov/nietc.htm](http://www.ee.energy.gov/nietc.htm).
  129. For more information, see <http://corridoreis.anl.gov/>.
  130. Energy Information Administration, *Annual Energy Outlook 2008* (Department of Energy, 2008).
  131. Maggie Eldridge and others. *The State Energy Scorecard for 2006*. (Washington: American Council for an Energy-Efficient Economy, 2007)
  132. Ibid.
  133. Southwest Energy Efficiency Project, "The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest" (Boulder, 2002).
  134. The Center for Measuring Research Performance ranks schools based on their federal research dollars generated, their endowments, and their faculty quality (using such measures as members in the national academies). The rankings apply to schools classified as "Research University/Very High" (RU/VH) according to the Carnegie Foundation's classification system. Only 96 schools (out of over 3,500 colleges and universities in the U.S.) meet the standards to receive RU/VH. These used to be referred to as "Research 1" universities under the old Carnegie Classification of Institutions of Higher Education to show which institutions received the most federal support for science research. The next level of research university is RU/H for Research Universities (high research activity), followed by DRU or Doctoral/Research Universities. The Center for Measuring University Performance, "American Research University Data," available at [http://mup.asu.edu/research\\_data.html](http://mup.asu.edu/research_data.html) (December 1 2007). For more information, see also [www.carnegiefoundation.org/index.asp](http://www.carnegiefoundation.org/index.asp).
  135. Brookings analysis of National Science Foundation data.
  136. National Science Foundation Division of Science Resources Statistics, "Academic Research and Development Expenditures: Fiscal Year 2006 (NSF 08-300)" (Arlington, VA, 2007).
  137. The Center for Measuring University Performance, "American Research University Data."
  138. Brookings analysis of National Science Foundation data.
  139. Association of University Technology Managers, "AUTM U.S. Licensing Survey, FY 2006 Survey Summary" (Northbrook, IL, 2007).
  140. Diane Palmintera, Jerrill Joy, and Echo XiaoXiang Lin, "Technology Transfer and Commercialization Partnerships" (Reston, VA: Innovation Associates, 2007).

141. Brookings analysis of U.S. Census Bureau 2006 American Community Survey data.
142. Brookings analysis of U.S. Bureau of Labor Statistics data.
143. Brookings analysis of U.S. Census Bureau 2006 American Community Survey data.
144. For more on the importance of industry clusters, see Karen Mills, Elisabeth Reynolds, and Andrew Reamer, "Clusters and Competitiveness: A New Federal Role for Stimulating Regional Economies" (Washington: Brookings Institution, 2008).
145. Michael Porter, "The Economic Performance of Regions," *Regional Studies* 37 (6-7) (2003): 549-578; and Mercedes Delgado, Michael Porter, and Scott Stern, "Convergence, Clusters, and Economic Performance," draft, July 20, 2007.
146. Information on strong cluster employment and average annual wages comes from the Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.
147. Virginia Tech analysis of data from the Las Vegas Convention and Visitors Authority.
148. Tamara Audi and Jeffrey McCracken, "Debt-Laden Casinos Squeezed by Slowdown." *Wall Street Journal*, July 1, 2005, p. A1.
149. Otis Port, "Solar Power's New Hot Spot." *Business Week*, August 19, 2005, p. 31.
150. Conde Nast, "Top Company Profiles - Stirling Energy Systems Inc.," available at [www.portfolio.com/resources/company-profiles/Stirling-Energy-Systems-Inc-637601](http://www.portfolio.com/resources/company-profiles/Stirling-Energy-Systems-Inc-637601) (April 7 2008).
151. Brookings Analysis of Census ACS 2006.
152. Singer, Hardwick, and Brettell. "Twenty-First Century Gateways."
153. Ibid. Twenty-first century gateways are U.S. metropolitan areas with at least 1 million residents, and that had substantial numbers of immigrants or substantial growth in their immigrant populations since World War II, and especially since 1990.
154. Jeffrey S. Passel, "The Size and Characteristics of the Unauthorized Migrant Population in the U.S.; Estimates Based on the March 2005 Current Population Survey" (Washington: Pew Hispanic Center, 2006).
155. *Securing the Future: US Immigration Integration Policy; a Reader* (Washington: Migration Policy Institute, 2007).
156. Exact numbers of undocumented migrants are difficult to pinpoint. Latest estimates indicate Arizona is home to approximately 500,000 while Colorado, Nevada, New Mexico, and Utah together have almost 500,000 more. Jeffrey S. Passel, "Estimates of the Unauthorized Migrant Population for States Based on the March 2005 CPS" (Washington: Pew Hispanic Center, 2006).
157. "Lawmakers Should Look to Arizona" *Las Vegas Review-Journal*, March 28, 2008, p. 10B.
158. Leslie Linthicum. "Other's Message to Illegal Immigrants: Leave!" *Albuquerque Journal*, November 18, 2007, p. A1.
159. Albuquerque, Santa Fe, and Rio Arriba County are sanctuary cities that instruct their city employees not to report the presence of illegal immigrants to federal authorities. Michael Coleman, "Emotions Flare Over Illegals" *Albuquerque Journal*, April 18, 2008, p. 1;
160. Miriam Jordan, "Arizona Squeeze on Immigration Angers Business" *The Wall Street Journal*, December 14, 2007; Randal Archibold, "Arizona Seeing Signs of Flight by Immigrants." *The New York Times*, February 12, 2008.
161. *Securing the Future: US Immigration Integration Policy; a Reader*.
162. Brookings analysis of state-level Census 2000 data. The baby boomer cohort was defined as born between 1945 and 1965, and its replacement cohort was defined as born between 1966 and 1986.
163. Brookings analysis of Census data, ACS 2006.
164. Brookings analysis of Census data, ACS 2006.
165. Brookings analysis of data from the Western Interstate Commission for Higher Education.
166. Brookings analysis of data from the Western Interstate Commission for Higher Education.
167. Western Interstate Commission for Higher Education, "Knocking at the College Door" (2008).
168. Brookings analysis of data from the U.S. Census Bureau.
169. Brookings analysis of data from Sperlings' Best Places and from U.S. Census Bureau.
170. Brookings analysis of Census Bureau and HUD data.
171. Brookings analysis of ACS 2006.
172. The share in Salt Lake City is 18.9 percent, in Tucson 19.3 percent, and in Albuquerque 20.4 percent. Brookings Institution MetroTax model.
173. Fulton and others, "Who Sprawls Most? How Growth Patterns Differ across the U.S."
174. Brookings analysis of county-level data from the 2000 Census Transportation Planning Package.
175. For more information, see [www.azdot.gov/inside\\_adot/fms/rarflink.asp](http://www.azdot.gov/inside_adot/fms/rarflink.asp).
176. Pawlukiewicz, "Ten Principles for Smart Growth on the Suburban Fringe".
177. Peter S. Goodman, "Fuel Prices Shift Math for Life in Far Suburbs." *New York Times*, June 25, 2008, p. A18.
178. Lang and LeFurgy, *Boomburbs: The Rise of America's Accidental Cities*.
179. Joseph Cortright and Heike Mayer, "Signs of Life: The Growth of Biotechnology Centers in the U.S." (Washington: Brookings Institution, 2002).
180. Jeffrey M. Jones, "Majority Says Population Growth Is Major Problem for U.S. Future," available at [www.gallup.com/poll/23770/Majority-Says-Population-Growth-Major-Problem-US-Future.aspx](http://www.gallup.com/poll/23770/Majority-Says-Population-Growth-Major-Problem-US-Future.aspx) (February 12 2008).
181. Robert Puentes, "A Bridge to Somewhere: Rethinking American Transportation for the 21st Century." (Washington: Brookings Institution, 2008).
182. Andreas Faludi, ed. *European Spatial Planning*. (Cambridge, MA: Lincoln Institute of Land Policy, 2002).
183. Ibid.
184. Puentes, "A Bridge to Somewhere."
185. For a brief primer on so-called "market failures" in energy prices and the need to rectify them, see Congressional Budget Office, "Evaluating the Role of Prices and R&D in Reducing Carbon Dioxide Emissions" (Washington, 2006). Additional excellent overviews of the un-priced costs of fossil fuels are Marilyn Brown, "Market Failures and Barriers as a Basis for Clean Energy Policies." *Energy Policy* 29 (14) (2001): 1197-1207; and David Greene and Sanjana Ahmad, "Costs of U.S. Oil Dependence: 2005 Update" (Oak Ridge: Oak Ridge National Laboratory, 2005).
186. For more information on university research commercialization models and possible federal involvement, see Ewing Marion Kauffman Foundation, "On the Road to an Entrepreneurial Economy: A Research and Policy Guide" (Kansas City, 2007); and Robert Litan, Lesa Mitchell, and E.J. Reedy, "Commercializing University Innovations: Alternative Approaches." National Bureau of Economic Research. Working Paper. 2007.
187. For more on realizing a national innovation policy, see Robert Atkinson and Howard Wial, "Boosting Productivity, Innovation, and Growth through a National Innovation Foundation" (Washington: Brookings Institution, 2008).
188. For more on New Mexico's WIRED project, see the New Mexico Department of Workforce Solutions at [www.dws.state.nm.us/NMWIRED.html](http://www.dws.state.nm.us/NMWIRED.html).
189. For more information on WIRED, as well as a detailed discussion of what a new federal cluster grant program could look like, see Mills, Reynolds, and Reamer, "Clusters and Competitiveness."
190. For more background on this concept see Next Energy Project Working Group, "Creating a National Energy Research Network: A Step Toward America's Energy Sustainability" (Unpublished work paper, April 2008).
191. Brookings Institution MetroTax model.
192. For a full reform agenda for the nation's transportation policy, see Puentes, "A Bridge to Somewhere."
193. For more in-depth descriptions of the sustainability challenge concept see Marilyn Brown, Frank Southworth, and Andrea Sarzynski, "Shrinking the Carbon Footprint of Metropolitan America" (Washington: Brookings Institution, 2008) and Muro and others, "MetroPolicy."
194. For a fuller account of the governance challenge proposal see Muro and others, "MetroPolicy."



# SELECT REFERENCES

Berube, Alan. 2007. "MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity." Washington: Brookings Institution.

Gammage, Grady, Jr, and others. 2008. "Megapolitan: Arizona's Sun Corridor." Phoenix: Morrison Institute for Public Policy.

Gottman, Jean. 1961. *Megalopolis: The Urbanized Northeastern Seaboard of the United States*. New York: The Twentieth Century Fund.

Muro, Mark, and others. 2008. "MetroPolicy: Shaping a New Federal Partnership for a Metropolitan Nation." Washington: Brookings Institution.

Regional Plan Association. 2006. "America 2050: A Prospectus." New York.

Lang Robert E., and Dawn Dhavale. 2005. "Beyond Megalopolis: Exploring America's New 'Megapolitan' Geography." Alexandria, VA: Metropolitan Institute at Virginia Tech.

Lang, Robert E., and Paul K. Knox. 2008. "The New Metropolis: Rethinking Megalopolis." *Regional Studies* 41(1): 1-14.

Lang, Robert E., and Jennifer B. LeFurgy. 2007. *Boomburbs: The Rise of America's Accidental Cities*. Washington: Brookings Press.

Lang, Robert E. and Arthur C. Nelson. 2007. "Beyond the Metroplex: Examining Commuter Patterns at the 'Megapolitan' Scale." Cambridge, MA: Lincoln Institute of Land Policy.

Lang, Robert E., and Arthur C. Nelson. 2007. "The Rise of the Megapolitans," *Planning* 73(1): 7-12.

Travis, William R. 2007. *New Geographies of the American West: Land Use and the Changing Patterns of Place*. Washington: Island Press.

## Acknowledgments

The Brookings Institution Metropolitan Policy Program and the authors especially wish to thank Brian Greenspun, Brookings trustee and chairman, Greenspun Corporation; Thom Reilly of Harrah's Entertainment, Inc.; Michael A. Saltman of the Vista Group; and Robbie Graham of Nevada Title, for their generous financial support of this project.

We would also like to thank our partners in each of the five regions for their tireless work to set up local briefings, bring together key stakeholders, and provide invaluable guidance to this effort. In Albuquerque, we thank Pat Bryan of the Bryan Law Firm and Jim Baca of the state of New Mexico. In Denver, we thank Tom Clark of the Metro Denver Economic Development Corporation, and Dr. Tom Clark of the University of Colorado, Denver. In Phoenix, we thank Rob Melnick of Arizona State University. In Salt Lake City, we thank Robert Grow of O'Melveny and Myers LLC and founding chair emeritus of Envision Utah, Alan Matheson of Envision Utah, and Neil Ashdown of the Utah Governor's Office. In Las Vegas, we thank Brian Greenspun and Martha Watson of the University of Nevada, Las Vegas.

The authors also wish to thank the many individuals who attended our briefing sessions, contributed research and ideas, provided comments and critiques, and offered invaluable assistance in one way or another. They include: Jeremy Agüero, Michael Allegra, Deanna Archuleta, David Ashley, Pamela Atkinson, Bruce Babbitt, Hank Baker, Ralph Becker, Gregory Bell, Leonard Blackham, Carlos Braceras, David Brown, John Brown, Tom Browning, Dennis Burke, Scott Butler, Brian Carrington, Todd Clark, Terri Cole, Nestor Davidson, Brian de Vallance, William DeBuys, Frank Fahrenkopf, Steve Farber, Ned Farquhar, Barton Forsyth, Ed Fox, Thomas Franz, Porter Friedman, Grady Gammage, Rick Garcia, Art Gardenswartz, Mark Gelernter, Jim Gibson, Oscar Goodman, Marek Gootman, Katie Greene, Daphne Greenwood, Deb Gullett, John Hall, David Harris, David Hassenzahl, Walter Hecox, Martin Heinrich, Brent Herrington, Jim Holway, Richard Hubbard, Pam Inmann, Kathy Jacobs, Michael Johnson, Andrea Kendall, John Kilduff, Susan Kirkpatrick, Stephen Kroes, Paul Larmer, Michael Leccese, John Leshy, Debra March, Alan Matheson, Kelly Matthews, Rich McClintock, Cindy McGill, Ron Montagna, Jackie Kirby Moore, Kevin Moran, Patricia Mulroy, Laura Nelson, Dianne Nielson, Tim O'Callaghan, Dinesh Patel, Peter Park, David Pershing, Jack Pfister, Chris Philibosian, Ngai Pindell, Randy Pye, Lawrence Rael, Ray Rasker, Key Reid, Rory Reid, Duke Reiter, Harry Relkin, John Restrepo, Jeff Romine, Thomas Sanchez, Brian Sanderoff, Brenda Scheer, Shannon Scutari, John Shepard, Jim Shulte, Mariko Silver, Paul Silverman, Neil Smatresk, Dennis Smith, Scott Smith, Jacob Snow, Rob Soloman, Christopher Stream, William Travis, Bruce Turner, James Van Hemert, Richard Walje, Stephen Weiler, Glenn Wertheim, Mark Winkleman, and Katherine Winograd. We acknowledge Arthur C. Nelson for providing the growth projection data used at the end of Chapter 3. We wish to acknowledge the late John Parr for his always helpful suggestions and insights, especially in the early stages of the project.

At Brookings we thank Alan Berube, Stefanie Feldman, Bill Frey, Alec Friedhoff, Elizabeth Kneebone, Amy Liu, Rob Puentes, Sarah Rahman, Audrey Singer, Adie Tomer, and Howard Wial for providing timely guidance, comments, and research assistance. We thank Sese-Paul Design for layout and David Jackson for editorial help. Finally, a special thank you goes to Rebecca Sohmer for her early work on the project and to David Warren for providing excellent and timely research, mapping, and editorial assistance.

## About the Authors

Robert E. Lang is the director of the Metropolitan Institute at Virginia Tech, and a nonresident senior fellow at the Metropolitan Policy Program at Brookings

Andrea Sarzynski is a senior research analyst at the Metropolitan Policy Program

Mark Muro is a fellow and the policy director at the Metropolitan Policy Program

## For More Information

Robert E. Lang  
(571) 296-1033  
[rlang@vt.edu](mailto:rlang@vt.edu)

Mark Muro  
(202) 797-6315  
[mmuro@brookings.edu](mailto:mmuro@brookings.edu)

For a full copy of the report and supporting materials, visit  
[www.brookings.edu/metro/intermountain\\_west.aspx](http://www.brookings.edu/metro/intermountain_west.aspx)

# BROOKINGS

1775 Massachusetts Avenue, NW  
Washington D.C. 20036-2188  
telephone 202.797.6000  
fax 202.797.6004  
**[www.brookings.edu](http://www.brookings.edu)**

## Metropolitan Policy Program at BROOKINGS

telephone 202.797.6139  
fax 202.797.2965  
**[www.brookings.edu/metro](http://www.brookings.edu/metro)**