

# IV. EMERGING CHALLENGES AND OPPORTUNITIES

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

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

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.

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	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?

The 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))*

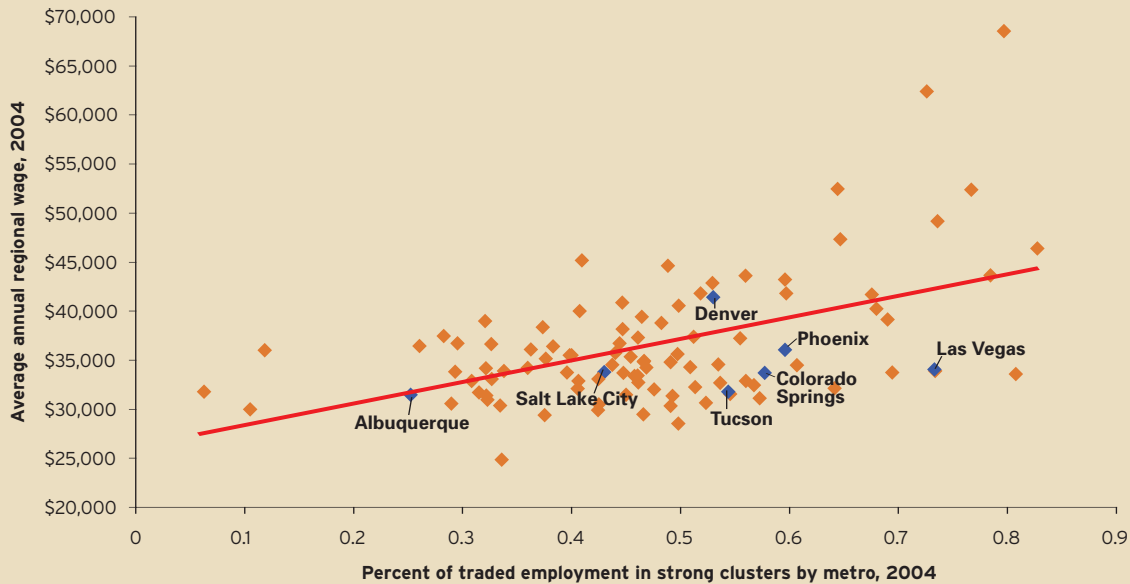
spending at academic institutions fell slightly from 4.7 percent in 1998 to 4.5 percent in 2006. This recent decline may help to explain why some of the region's universities declined slightly in ranking from 2002 to 2006 by the Center for Measuring Research Performance.<sup>137</sup> At the five major 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—its 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>

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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.

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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.