UNIFY
REGIONALIZE
DIVERSIFY

AN ECONOMIC DEVELOPMENT AGENDA FOR NEVADA

Metropolitan Policy Program at BROOKINGS

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An Economic Development Agenda for Nevada

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Executive Summary

Nevada stands at a crossroads yet it appears ready to remap its future.

Few would deny that the Great Recession has left the state grappling with a bona-fide "inflection point"—a deciding time.

Nevadans sense that lasting changes in U.S. industry structure, spending patterns, and economic behavior are all shaping a historic national "reset" to adapt to the shifting nature of the global economy, with huge implications for all places.

Likewise, Silver Staters sense that the current slump has not been just a temporary reversal but a challenge to the state's traditional growth model—one that has revealed an economy over-dependent on consumption sectors, prone to booms and busts, and too little invested in innovation and economic diversification.

And yet, for all that Nevadans have been early to recognize that the current slump will beget, in some places, innovation and renewal, and in other places erosion—and so requires action.

In that vein, Nevada leaders have been engaging in an unusually serious discussion about the nature of the Nevada economy; the need for diversification; and ways to unleash the business, technology, and government-sector innovation that will drive growth.

Reflecting this ferment was the passage by the Nevada Legislature of the Economic Development Bill (AB 449) that was signed into law on June 17, 2011 by Gov. Brian Sandoval.

AB 449 is a potential watershed because it undertakes to reorganize and elevate the importance of the state's economic development activities by, first, gathering them within the governor's office and, second, by providing them a first installment of new funding.

But the legislation is also important because it endeavors to place Nevada development work on a modernized new footing. Not only is the state's new Cabinet-level economic development executive director required to craft and implement a proper state economic development plan in the next few months. Also, the legislation conveys into Nevada development practice a new embrace of strategy, fact-driven analysis, and data-driven performance management.

Which is why in spring 2011 the state of Nevada turned to the Metropolitan Policy Program at Brookings, Brookings Mountain West, and SRI International to provide important analytic and policy background for the state's planning.

Intended as a credible third-party analysis of the state's competitive position and economic development opportunities, this report—"Unify / Regionalize / Diversify: An Economic Development Agenda for

Nevada"—speaks to the desire of Nevadans to "get on the same page" by providing a detailed accounting of the state's present situation and most plausible routes toward economic diversification.

To that end, the pages that follow draw on an intense five-month inquiry that sought to define the nature of the economic challenges the state and its major regions face; identify industries and industry clusters that have the highest potential for expansion as part of an economic diversification effort; and suggest policy options that will enable the state, its regions, and the private sector to work more effectively to build a more unified, regionally vibrant, and diversified Nevada.

In keeping with these objectives, this report draws a number of conclusions about the state as it considers ways to build the next Nevada economy:

1. Nevada possesses fundamental economic assets along with serious challenges as it seeks to build the next Nevada economy. To be sure, the recent national recession and sluggish recovery has hit Nevada exceptionally hard. Most notably, the state's heavy reliance on consumption-related sectors such as Construction and Real Estate, Tourism and Gaming, and Retail Trade—all of which are disproportionately affected by swings of the business cycle—has left the state prone to extreme economic volatility and lingering malaise. With that said, though, Nevada possesses substantial strengths—along with some serious deficits—as it considers a renewed economic development push.

In this connection, a systematic SWOT (strengths, weaknesses, opportunities, and threats) assessment reveals considerable assets and opportunities that the state can leverage as it seeks to renew its core industries and diversify by catalyzing growth in emerging ones. (See Figure 1). This assessment (summarized in Chapter III) confirms that Nevada's core strength for economic development has been and will remain its overall business-friendly environment, including low taxes, relatively low costs, light regulation, and ease of business start-up/permitting. Going forward, these advantages will continue to anchor Nevada's value proposition for business investment and economic development as will the state's extensive entertainment and recreation assets, proximity to West Coast population centers, and excellent airport infrastructure. With that said, these assets are not likely to be sufficient to support the kind of growth and investment Nevadans desire given the increasingly determinative role of knowledge, technology, and workforce skill in today's global economy. Key challenges include: spotty economic planning and cooperation; a weak innovation and technology commercialization enterprise; and substantial workforce skills shortfalls.

2. **Seven major industries and some 30 narrower target opportunities—distributed in varying mixes in the state's regions—hold out plausible potential for economic growth and diversification for Nevada.** Building on the SWOT analysis and stakeholder consultation aimed at understanding Nevada's statewide goals, the Brookings-SRI study team conducted an empirically grounded analysis aimed at identifying industries and sub-industries that have the highest potential to restore growth and jobs, spawn innovation in core or emerging sectors, or drive economic diversification. Along these lines, Chapter III of the study recommends the state focus its economic development activities on seven broad industries and 30 narrower target opportunities for growth, innovation, and diversification. (See Figure 2). These industries and target opportunities include:

Figure 1. Nevada Competitiveness SWOT Summary

Strengths	Weaknesses
• Low taxes • Business friendly regulatory climate • Historically a high-growth economy • Good quality of life (although this is under-recognized) • Extensive entertainment and recreation assets • Proximity to West Coast population centers, markets, transportation routes, and ports • Excellent airport infrastructure (in both Las Vegas and Reno) • Excellent natural and physical resources (for mining, energy, etc.)	• Economy is heavily oriented toward consumption-based industries • Lack of proactive, coherent economic development strategy and structures • Workforce skill level is low (though improving) • K-12 educational system is underperforming • Healthcare system is underperforming • Energy costs are relatively high for the region • Land transportation connections can be challenging (in some parts of state) • Innovation inputs and outputs are weak (and there has especially been underinvestment in innovation capacity in Southern Nevada) • Lack of risk capital to invest in start-ups/innovation (although improving) • Real estate bust (devastating to construction)
Opportunities	**Threats**
• Political leadership closely engaged in revamping and renewing economic development activities • Ease and cost of living is attractive compared to neighboring California • Relatively affordable housing and high residential/commercial/industrial vacancy rates • Growing innovation districts in North and South • Large number of tourists/visitors/conventions – an opportunity to "sell" Nevada • Infrastructure for innovation is in place (at UNR, DRI, UNLV), but not at its full potential • Relatively strong science and engineering (S&E) workforce and students in Reno • World-class Internet connectivity opportunities (such as the Switch data center in Las Vegas)	• Extreme economic cycles and volatility • Projected growth in the core consumption-based industries will not be sufficient to drive recovery • Limited state economic development resources dispersed through fragmented regional efforts • High unemployment • Underinvestment in higher education and lack of a top-tier Carnegie-ranked research university • Existing image issues can be a barrier in attracting higher-skilled workforce • Federal land ownership can hinder land usage/development in much of the state • Water shortages

- ***Tourism, Gaming, and Entertainment*:** Going forward the focus for this massive base industry in Nevada should be on attracting visitors from varied markets with new and diversified offerings as well as leveraging the world-class capabilities that already exist here to create new sources of growth. Target opportunities in this huge sector include: Nevada as the U.S. online gaming center; Las Vegas as the intellectual capital of global gaming; gaming manufacturing; diversifying into niche tourism markets; retirees and second home owners; and film and media development

- ***Health and Medical Services:*** Bringing the low level of medical service production in Nevada just somewhat closer to the national average would generate substantial, stable economic activity and high-quality jobs in the state while improving health outcomes. Target opportunities here include: surgical specializations and stemming the "leakage" of surgical procedures out of state; geriatrics and related services; the disaggregation of medical service delivery; and leveraging a strong medical/health sector to build other emerging industries

- ***Business IT Ecosystems:*** Nevada has a short-term opportunity to create numerous jobs in low-to-moderate-skill business services segments already established in the state while simultaneously capitalizing on under-recognized technology anchors and building an environment to support higher-end IT industry growth over the longer term. Target opportunities include call centers/customer service and back office/BPO/shared services; e-commerce operations/headquarters; data centers; cloud computing/high performance computing; and cyber security

- ***Clean Energy:*** Clean Energy is a high-potential target for Nevada because it capitalizes on the state's renewable resource base, its established geothermal expertise and headquarters strength, its proximity to large energy markets, and its capabilities in construction and project management. Key opportunities include: renewable component manufacturing; export of electricity; advancing and internationalizing geothermal development; and energy efficiency upgrades

- ***Mining, Materials, and Manufacturing:*** Given Nevada's wealth of mineral resources, its history and knowledge base in mining operations, and its existing materials and manufacturing activities, this target industry provides a strategic opportunity for growth, diversification, and innovation. Nevada's mining, materials, and manufacturing industries have common technical expertise and resources that are exchanged between their component sectors and also have synergies with the state's renewables and defense industries. Areas of focus include: expanding participation in upstream mining activities; medium-value mineral supply chain development; manufacture of advanced composite materials; and organizing and marketing of Nevada's manufacturing base

- ***Logistics and Operations:*** Nevada can be a West Coast hub of transport, distribution, and operations because of its locational and geographic advantages for easily reaching the entire Western U.S. Solid infrastructure, lower costs and regulatory hurdles (relative to neighboring states), lower congestion, and overall ease of doing business add to the value proposition. Focus opportunities include: warehousing and distribution; advanced logistics; air cargo; integrated manufacturing-distribution, assembly manufacturing, and food processing operations; and freight transportation (ground and rail)

- ***Aerospace and Defense:*** Finally, Nevada has a solid base of defense expertise, with a particular focus on testing and training, and the state's geographic characteristics and low population density enable extensive testing operations. The state can build on this base of infrastructure and

expertise to solidify an important role for the Aerospace and Defense industry in its economic future. Target opportunities include: unmanned aerial vehicle (UAV) supply, assembly, and testing; and maintenance, repair and overhaul (MRO) of aircraft systems

Figure 2. Summary of Recommended Industries and Target Opportunities for Nevada

1. Tourism, Gaming, and Entertainment
- Nevada as the U.S. online gaming center (should Congress move to legalize it)
- Las Vegas as the intellectual capital of global gaming
- Gaming manufacturing
- Diversifying into niche tourism markets
- Retirees and second home owners
- Film and media

2. Health and Medical Services
- Surgical specialties
- Geriatrics and related services
- Disaggregation of medical service delivery, creating new opportunities for middle-skill jobs
- Leveraging a strong medical/health sector to build other emerging industries

3. Business IT Ecosystems
- Call centers/customer service and back office/BPO/shared services
- E-commerce operations/headquarters
- Data centers
- Cloud computing/high-performance computing
- Cyber security

4. Clean Energy
- Renewable component manufacturing
- Expanding transmission capacity
- Advancing and internationalizing geothermal development
- Energy efficiency upgrading

5. Mining, Materials, and Manufacturing
- Expanding participation in upstream mining activities
- Medium-value mineral supply chain development
- Manufacture of advanced composite materials
- Organizing and marketing of manufacturing base

6. Logistics and Operations
- Warehousing and distribution
- Advanced logistics
- Air cargo
- Integrated manufacturing-distribution, assembly manufacturing, and food processing operations
- Freight transportation (ground and rail)

7. Aerospace and Defense
- Unmanned Aerial Vehicle (UAV) supply, assembly, and testing
- Maintenance, Repair, and Overhaul (MRO) of aircraft systems

It bears noting, meanwhile, that these industries and niches hold out a broad range of possible development and growth paths through their projected yield of a collective 80,000 to 125,000 jobs in the next five years (See Appendix C). Tourism, Gaming, and Entertainment, for example, may not seem to embody the goal of "diversification" into wholly new, high-value activities. However, the sheer size of this base sector that means that even with its modest projected 2011–2016 growth rate it will likely be the

largest near-term contributor of new positions among the recommended target industries. At the same time, the sector—far from representing "business-as-usual"—contains multiple sub-centers that hold out the possibility of valuable innovation and new growth. By contrast, while Business IT Ecosystems remains small, the variety and technology intensity of its projected longer-term job prospects make it a worthy focus.

It is also worth noting that the recommended industries and target opportunities do not occur evenly across the state. Instead, the target industries occur in unique mixes in the state's regions.

Current concentrations of expertise and existing firms (or strong potential for industry growth and development) in **Northern Nevada** suggest that the state and its northern partners should focus their economic development work especially on niches within Clean Energy; Mining, Materials, and Manufacturing; Logistics and Operations; Aerospace and Defense; and Business IT Ecosystems. By contrast, state and regional leaders should build on **Southern Nevada** particular opportunities in Tourism, Gaming, and Entertainment; Business IT Ecosystems; Health and Medical Services; Energy Efficiency; and Logistics and Operations. For its part, finally, state and local leaders attending to the economic future of **Rural Nevada** can build on strong bases in Mining, Materials, and Manufacturing; Tourism, Gaming, and Entertainment; and Clean Energy.

One final observation: Not all of Nevada's growth potential resides within the discreet target industries and segments focused on within this analysis. Other industries and segments may also contain, or see emerge, high-potential activity centers. For that reason, the state should remain open to new developments and fact-based business proposals about them. For example, at least three areas of economic activity outside of the seven priority industries merit additional mention even now. These include: Agriculture and Food Processing; Water and "Water Tech;" and Financial and "Intangible" Enterprises.

3. To leverage the state's opportunities, meanwhile, Nevada needs to upgrade its diffuse economic development system so that the state at once leads more vigorously, empowers its regions more fully, and also sets a state-wide platform for new growth. In this vein, this report calls for the state to "Unify," "Regionalize," and "Diversify" as follows:

- **Unify: Install an operating system for 21st *century economic development.*** First, the state needs to put in place the basic elements of a state-of-the-art statewide economic development operating system—just as AB 449 requires. Currently Nevada lacks such a system. Therefore, the state should move decisively to set out a clear and unified model for pursuing growth. Such a framework will entail both leadership from the top and decentralization to the regions, as well as the provision of better information. Along these lines, Chapter V of the report calls on the state to:

    - Set out a compelling strategy for innovation and diversification—and lead
    - Structure effective partnerships with and among regional actors—including regional development authorities (RDAs), strong non-profits, and the state's municipalities
    - Build the information base and use it to drive performance

    To set out the strategy and lead the state should: Produce a compelling state plan for economic diversification; brand and communicate the new vision relentlessly; help the regions align with the

strategy; and name industry-specific "sector champions" to spearhead cluster development in its regions. Finally, the state should deploy the Catalyst Fund to build target sectors and clusters.

To restructure its partnerships and improve their workings in the regions the state should: Use RDA selection to promote aligned collaborative execution and use RDA funding and performance management to drive impact and reward achievement. The state should also create prizes, innovation grants, or competitions to spur creative initiatives.

And to enhance the information base and use it to drive performance the state should: Improve the basic availability of economic development information and use these new information resources to define and drive success.

- ***Regionalize: Support smart sector strategies in the regions.*** Secondly, the state needs to foster and contribute to "bottom-up" sector initiatives in its regions. Nevada's regions are not only the true hubs of the state's economy but are also full of business, civic, academic, and economic development leaders able to promote growth and diversification. Given that, the state should support Nevada's regional development efforts as they develop sector- and region-specific strategies to spur growth, innovation, and job creation. To this end, Chapter VI of the report argues that Nevada should:

    - Support convenings of target industry and cluster actors in the regions—and their planning
    - Support well-conceived cluster initiatives in the regions
    - Support other types of bottom-up sector development, including regional innovation districts, business plans, and regional export plans
    - Align the state's existing economic development policies, programs, and initiatives with the regions' sector strategies and cluster initiatives

  To help convene regional industry networks and clusters—and support their planning—the state should: Foster cluster organization in target sectors; join working meetings with sector associations and business leaders in the regions; task "sector champions" to work with regional clusters.

  To support well-conceived cluster initiatives the state should: establish a competitive grant program to support cluster initiatives at all stages with planning grants, start-up and technical assistance grants, and competitive program grants.

  The state should also support other approaches to bottom-up sector development like regional business planning, regional export plans, and regional innovation districts.

  And finally the state should work to align its existing programs across departments by: prioritizing collaborative applications to program offerings; tuning department and program objectives to cluster needs; and organizing incoming federal resources to help coordinate local efforts.

- ***Diversify: Set a platform for higher-value growth through innovation and global engagement.*** Finally, since Nevada's regions can't "go it alone," the state needs to set the stage for broad-based growth by investing in effective innovation and commercialization infrastructure, attending to the state's global engagement, and working to align its education and workforce training efforts to its new economic strategy. Along these lines Chapter VII recommends that the state:

    - Bolster capacity for innovation and commercialization
    - Expand global engagement particularly with rising nations
    - Align higher education and workforce development resources for innovation and diversification

    To bolster its innovation capacity the state should: Make strategic investments in "impact scholars"; incentivize university-industry research collaboration; boost industry R&D through competitive tax incentives; leverage federal resources to catalyze high-impact R&D; and assist small business in winning SBIR/STTR funds. Likewise, the state should develop a strong commercialization infrastructure by developing relevant intermediary, networks, and support mechanisms and increasing access to risk capital.

    To expand Nevada's global engagement, the state should: Make global engagement a key priority by providing robust leadership, setting goals, and reaching out proactively to targeted exporters and foreign direct investors. The state should make FDI an explicit component of Nevada's global engagement policy and use it to build out target clusters. To support its efforts, the state should build the global engagement information base and use it to educate stakeholders. Finally, the state should leverage resources of other organizations involved in export promotion and FDI attraction and advocate at the federal level on behalf of global engagement priorities like infrastructure and visa processing.

    And to align higher education and workforce development to strategic economic opportunities, the state should: Raise standards throughout the K-12 system over the longer term; leverage community colleges to deliver a skilled workforce; expand research universities' role in workforce development; and reorganize and re-energize the state's workforce investment system.

Figure 3. Unify | Regionalize | Diversify: Policy Recommendations for Nevada

Legend: $ = $0-$50,000 $$ = $50,000-$250,000 $$$ = $250,000-$1 million $$$$ = >$1 million
Immediate = within 3-12 months Near-term = within 1-2 years Long-term = > 2 years

Unify: Install an Operating System for 21st Century Economic Development

Set a strategy for innovation and diversification—and lead		
RECOMMENDATION:	Produce a compelling state plan for economic diversification through innovation	Immediate $
RECOMMENDATION:	Brand and communicate the new direction	Immediate $
RECOMMENDATION:	Help the regions align with the state's economic development strategy	Immediate $$
RECOMMENDATION:	Name industry-specific "sector champions" to spearhead cluster development	Immediate $$
RECOMMENDATION:	Deploy the Catalyst Fund to build target sectors and clusters	Immediate $$$$
Structure partnerships with and among regional actors		
RECOMMENDATION:	Use RDA selection to promote aligned, collaborative execution	Immediate $
RECOMMENDATION:	Use RDA funding and performance management to drive impact and reward achievement	Near-term $
RECOMMENDATION:	Create prizes, innovation grants, or competitions to incite creative partner initiatives	Near-term $ - $$$
Build the information base and use it to drive performance		
RECOMMENDATION:	Improve the range of economic development information available	Near-term $$
RECOMMENDATION:	Improve the packaging of economic development information	Near-term $$
RECOMMENDATION:	Use information to define and drive success	Near-term $

Regionalize: Support Smart Sector Strategies in the Regions

Support convenings of target industry and cluster actors in the regions		
RECOMMENDATION:	Foster cluster organizations in target sectors	Immediate $
RECOMMENDATION:	Speak at sector convenings and join working meetings with sector associations or business leaders	Immediate $
RECOMMENDATION:	Task "sector champions" to work with regional clusters	Immediate $
Support smart, well-conceived cluster initiatives in the regions		
RECOMMENDATION:	Establish a competitive grant program to support cluster initiatives	Near-term $$$
Support other approaches to bottom-up sector development		
RECOMMENDATION:	Encourage regional business planning in regions	Near-term $$

RECOMMENDATION:	Support the development of regional export plans to boost global engagement	Near-term $$
RECOMMENDATION:	Use policy levers to support the building-out of a finite number of regional innovation districts	Near-term $$
Align the state's existing policies and programs with a cluster-based, regional approach		
RECOMMENDATION:	Prioritize collaborative applications in awarding competitive grants	Near-term $
RECOMMENDATION:	Tune department and program objectives and offerings to cluster needs	Immediate $
RECOMMENDATION:	Organize incoming federal resources to help coordinate local cluster-building efforts	Immediate $

Diversify: Set a Platform for Sustainable Growth through Innovation

Bolster innovation and accelerate commercialization		
RECOMMENDATION:	Make strategic investments in "impact scholars" to boost research output and new discoveries	Near-term $$$$
RECOMMENDATION:	Incentivize university-industry research collaboration	Near-term $$
RECOMMENDATION:	Boost industry R&D through competitive tax incentives	Near-term $$$
RECOMMENDATION:	Leverage federal resources to catalyze high-impact R&D	Near-term $
RECOMMENDATION:	Assist small business in winning SBIR/STTR funds	Near-term $
RECOMMENDATION:	Develop strong commercialization infrastructure, networks, and support mechanisms and establish an intermediary	Near-term $$$
RECOMMENDATION:	Increase access to risk capital	Long-term $$$$
Expand global engagement particularly with rising nations		
RECOMMENDATION:	Make international trade and global engagement a key priority	Immediate $
RECOMMENDATION:	Make FDI an explicit component of the state's global engagement agenda	Immediate $
RECOMMENDATION:	Build the global engagement information base and use it to educate stakeholders	Immediate $$
RECOMMENDATION:	Leverage resources of other organizations involved in export promotion and FDI attraction	Immediate $
RECOMMENDATION:	Advocate on behalf of global engagement priorities	Immediate $
Align higher education and workforce development to strategic economic opportunities		
RECOMMENDATION:	Raise STEM standards throughout the K-12 system	Long-term $$$$
RECOMMENDATION:	Leverage community colleges to deliver a skilled workforce	Near-term $$$
RECOMMENDATION:	Expand research universities' role in workforce development	Near-term $$$
RECOMMENDATION:	Reorganize and re-energize the workforce investment system	Near-term $$$

* * *

In the end, this report assumes wholeheartedly that renewal and diversification through innovation is possible in Nevada. To be sure, there is much work to be done. A strong state economic development plan needs to be crafted and followed, requiring hard decisions and painstaking execution.

There will also need to be plenty of careful staging and collaboration as the state moves to address the nearer-term, lower-cost work of putting in place a top-quality operating system for 21st century economic development at the same time as it prepares to tackle the heavier lifts of setting a platform for longer-term growth. Constructing a top-flight innovation and commercialization system will be a major task. So will expanding global engagement and better aligning the education and workforce training system to the state's new sector strategies. Ideally, system improvement in the next year or two will ensure that future investments are maximized.

Yet, while this hard work might seem like a hard task at a difficult time, the study team is confident that the moment is right. Having spoken with scores of Nevadans during the course of this work the team emerges from the process deeply impressed by the shared sense of commitment and good will evident among the state's business, civic, government, and economic development leaders.

Focused by challenge, Nevadans seem ready to reach for a new future.

I. Introduction

Nevada stands at a crossroads yet it appears ready to remap its future.

Few would deny that the breakdown of the state's real estate- and entertainment-oriented economy has left the state grappling with a bona-fide "inflection point" in its history—a deciding time.

Nevadans sense that lasting changes in U.S. industry structure, spending patterns, and economic behavior all look to be shaping a historic national economic "reset" with huge implications for all places.

Likewise, Silver Staters sense that the current slump has not been just a temporary reversal but a challenge to the state's basic growth model—one that has revealed an economy over-dependent on consumption sectors, prone to booms and busts, and too little invested in innovation and diversification. It does not appear likely that the years of automatic 5 to 6 percent annual real estate-driven growth will be returning any time soon.

And yet, what is impressive about the present juncture is that Nevadans have been early to recognize that the current emergency will beget, in some places, innovation and renewal, and in other places erosion—and so requires action.

In that vein, Nevada leaders have been engaging in an unusually serious discussion about the nature of the Nevada economy, the need for economic diversification, and ways to unleash the business, technology, and government sector innovation that will drive growth.

During the last year or so a series of thoughtful reports has probed the state's economic future, including analyses by the Nevada Vision Stakeholder Group; the New Nevada Task Force, launched by Lt. Gov. Brian Krolicki and the Nevada Commission on Economic Development (NCED); and the Nevada Institute for Renewable Energy Commercialization (NIREC) (commissioned by the NCED).[1] Likewise, a new urgency about strengthening and modernizing the state's economic development efforts manifested itself in several important convenings, including a high-level summit at the University of Nevada, Las Vegas (UNLV) entitled "Nevada 2.0: New Economies for a Sustainable Future" and hosted by Lt. Gov Krolicki, Senate Majority Leader Steven Horsford, and Assembly Speaker John Oceguera.[2]

Out of these discussions has emerged a new consensus among state leaders and key stakeholders that Nevada needs to put itself on a more sustainable growth path and to do that it needs to act now to reconfigure how it practices economic development.

Reflecting this commitment to action was the passage by the Nevada Legislature of the Economic Development Bill (AB 449) that was signed into law on June 17, 2011 by Gov. Brian Sandoval.

AB 449 is a potential watershed because it undertakes to do three things:

- Reorganize the state's economic development structures and activities so as to place them on a higher-tier of importance in the governor's office
- Guide the transition to the newly created economic development office in the governor's office
- Provide new funding for economic development activities[3]

Of most importance are the organizational and financial aspects of the legislation.

On the organizational front, the new system places economic development at the top of the state's agenda by moving these responsibilities from the lieutenant governor's remit to the governor's office. Starting on July 1, 2011, the new Governor's Office of Economic Development (GOED) began operating with a new cabinet-level executive director who will be in charge of crafting and implementing a new state economic development plan. In this capacity, the executive director will have substantial ability to shape the practice of economic development in the state with robust authority to:

- Develop, implement, and revise the new state development plan
- Designate and fund regional development authorities (RDAs) and enter into contracts with them to provide particular economic development services in support of the plan

Regarding funding levels, three other elements of AB 449 underscore the state's new seriousness about economic development. In this regard, the law:

- Adds an additional $2.5 million to the state's modest budget for economic development to bring the total appropriation to $7.5 million
- Creates a $10 million Catalyst Fund to finance grants or loans to help support firm relocations or expansions
- Creates an as-yet-unfunded Knowledge Fund that can be used to promote economic development efforts within the state's research universities and institutions[4]

In short, Nevada—sobered by crisis—has begun to develop the structures and economic development practices it will need to get itself onto a new, more balanced economic path.

What the state needs now, though, is a credible, fact-based strategy for restoring job creation, catalyzing innovation in core and emerging industries, and building new pillars of growth.

To provide such a strategy, the newly named executive director of GOED will soon craft a formal state economic development plan.

However, to inform the development of such a plan, the state of Nevada turned in spring 2011 to the Metropolitan Policy Program at Brookings, Brookings Mountain West, and SRI International to provide important analytic and policy background for the state's planning.

Along those lines, Brookings and SRI engaged in an intense five-month inquiry that sought to:

- Define the nature of the economic challenges the state and its major regions face

- Identify industries and industry clusters that have the highest potential for expansion as part of an economic diversification effort
- Suggest policies options that would enable the state, its regions, and the private sector to work more effectively to build a more unified, regionally vibrant, and diversified Nevada

Out of this inquiry—which drew on standard industry and market assessment, benchmarking analysis, stakeholder consultation, and other forms of research—has emerged a frank but relatively encouraging examination of the present position and most promising growth prospects of the Nevada economy. Some elements of this examination have already been detailed in previous technical documents produced by this study process; the recommended strategic direction for the state is new and set out here for the first time. All is now drawn together in one place.

Hence this report: Representing the final report of the Brookings-SRI analysis, "**Unify / Regionalize / Diversify: An Economic Development Agenda for Nevada**" speaks to the desire of Nevadans to "get on the same page" by gaining access to a credible accounting of the state's present situation and most plausible routes toward economic diversification. In addition, the report responds to the need of the new GOED executive director to secure a basic fact set and related policy discussion to inform production of the state plan.

To that end, the pages that follow draw into a single document the key findings of the Brookings-SRI sector study, including its sector assessment and policy recommendations. The section immediately following this one reviews the nature of Nevada's economic challenge and concludes that the state's overreliance on consumption-related sectors and paucity of innovation activities has left the state prone to perennial booms and busts. This chapter points to the need for both renewal in its mainstay industries and diversification into new ones.

Subsequent sections look forward toward opportunity. Chapter III, entitled "Industry Opportunities for Nevada," reviews the process by which seven broad sectors and 30 specific finer-grain opportunities were identified for targeting for near- to medium-term industry development. This chapter stresses the varied ways the target industries and clusters appear in and underpin the state's regions.

Chapter IV, entitled "Unify / Regionalize / Diversify," reviews some of the shortcomings of the state's current practice of economic development but notes that world and U.S. best practices suggest a new architecture for state-regional collaboration to set a platform for growth.

And for their part Chapters V, VI, and VII lay out the three high-level strategy themes that constitute the proposed state economic development stance going forward. Chapter V, "Unify," lays out how the state can draw together and mobilize a drifting and fragmented state and regional economic development system. Chapter VI, entitled "Regionalize," suggests how the state can unleash for the state's benefit the potential of "bottom up" initiative in the state's metropolitan and rural regions. And meanwhile Chapter VII, "Diversify," describes three major initiatives for putting in place a sturdy platform on which Nevada can grow vibrant regional economies and new industries for the future through a strengthened innovation and commercialization system, expanded global engagement particularly with rising nations, and enhanced education and workforce efforts.

In the end, this report assumes wholeheartedly that renewal and diversification through innovation is possible in Nevada. After all, these pages show the state possesses very real strengths along with the

undeniably tough challenges it faces. But make no mistake: Renewal is going to require hard thinking and hard work in the coming years. Above all, it will require a new spirit of focus, common purpose, and partnership among all sorts of stakeholders.

And yet, while such a spirit of collaboration might seem like a big leap at a difficult time, the study team is confident that the moment is right. Having spoken with scores of Nevadans during the course of this work the team emerges from the process deeply impressed by the shared sense of commitment and good will evident in the state's business, civic, government, and economic development leaders.

Sobered by challenge, in short, Nevadans seem ready to reach for a new future. For that reason, the study team hopes these pages will contribute to a great state's effort to unleash its full potential.

II. Nevada's Economic Challenge

The state of Nevada stands at a critical juncture. After faring significantly worse than the nation through the recent downturn, the state faces serious economic challenges but has real opportunity within reach.

To be specific, extensive research and analysis by the Brookings Institution and SRI International confirm that while the state must deal with serious structural issues as it weighs its economic future, it also possesses genuine centers of potential for diversification and future growth.

At least five major findings bear notice:

- The current recession has hit Nevada exceptionally hard
- Nevada's overdependence on consumption-related sectors leaves the economy prone to volatility
- A paucity of innovation activities contributes to the economy's lack of diversity
- Nevada's regions drive the state economy but their performance varies given differences in their industrial structures and innovation activities
- Nevada has an opportunity to establish new pillars of growth, building off of its regional strengths and assets

Together these challenges and opportunities describe a state in need of a new growth strategy.

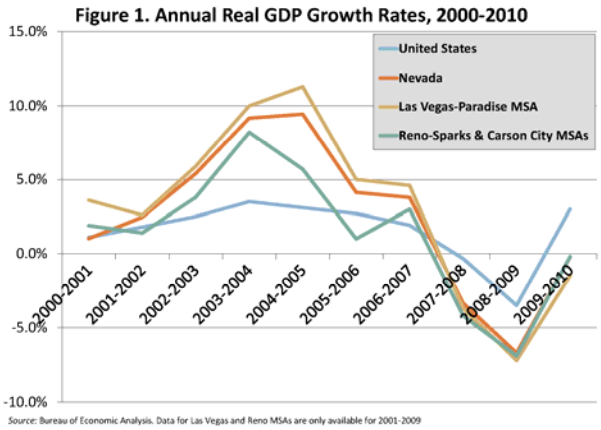
The current recession has hit Nevada exceptionally hard

Brookings-SRI analysis of recent trends shows that Nevada is emerging from the depths of an extreme boom-and-bust cycle. Nevada's population grew by more than 700,000 people over the past decade, and over half a million of them settled in Southern Nevada. The state boasted the greatest population growth in the nation from 2000 to 2010: 35.1 percent.[1]

Since the onset of the recession, however, Nevada has fared significantly worse than most other states and the national average in terms of job losses, unemployment, and real estate struggles.

In terms of real output, Nevada's economy grew an astonishing 40.9 percent from 2000 to 2007, posting an annual average growth rate of 5 percent.[2] Year-on-year real GDP growth reached highs of 9.2 and 9.4 percent in 2004 and 2005, respectively. (See Figure 1). The U.S. economy, by comparison, grew 17.7 percent over the period at an average annual rate of 2.4 percent.[3] Employment opportunities in the state expanded by 29.4 percent from 2001 to 2007, peaking in the second quarter of 2007, by which time the unemployment rate had fallen to 4.2 percent.[4] Home prices nearly doubled throughout the state from the fourth quarter of 2001 to their peak in third quarter of 2006.[5]

Once hit by the recession in 2007, however, Nevada's economy took a nosedive, and economic growth has ranked among the bottom four states in the nation over the last few years.[6] Output in Nevada crashed when the state's housing bubble burst and the financial crisis set in nationally. The state's economy shrank 10.0 percent in real terms from 2007 to 2010. In 2011 estimates suggest output will recover by 2.4 percent.[7]



In terms of employment, Nevada lost 10.4 percent of its jobs—nearly 170,000 of them—from 2007 through 2011.[8] Ninety-nine percent of the state's job losses were concentrated in its two major metropolitan areas.[9] In 2011 employment stood at 1,459,000, just above 2004 levels. Nevada's unemployment spiked more than 10 percentage points from 2006 to 2010 and by the summer of 2011 it hovered around 13 percent—the highest unemployment rate in the nation.[10] Home prices have fallen by more than half and the state and its metros have become epicenters of the nationwide foreclosure crisis.

Nevada's overdependence on consumption-oriented sectors leaves the economy prone to volatility

The recession in short exposed an economy dangerously out of balance. Most notably, a September 2010 study conducted by Moody's Analytics for the Nevada Vision Stakeholder Group found that the Silver State economy is more than twice as volatile as the national average and significantly more volatile than its neighboring western/southwestern states.[11] For example, in both boom and bust cycles, Nevada's growth rates have typically exceeded the national average by a factor of 1.5-2.0 or more.[12] The same study also found that Nevada's economy is significantly less diverse than the national average and less diverse than all other states except Alaska and the District of Columbia.[13]

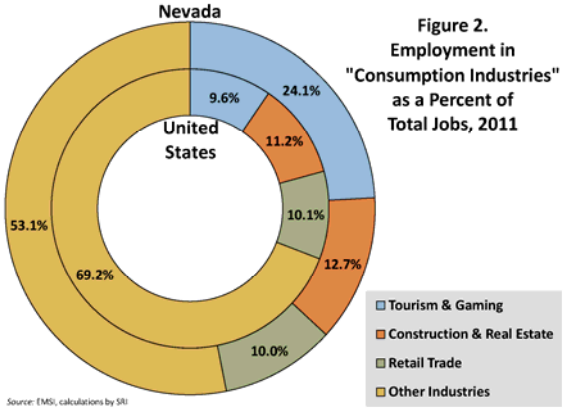


Figure 2. Employment in "Consumption Industries" as a Percent of Total Jobs, 2011

Nevada has experienced such a wrenching recession exactly because the downturn disproportionately impacted the very industries on which the state is overly reliant. Brookings-SRI analysis shows that Nevada's economy is heavily dominated by consumption-oriented industries, which are heavily influenced by consumer spending patterns and disposable income and hence disproportionately affected by swings in the business cycle. Nevada's three large consumption industries—Construction and Real Estate, Tourism and Gaming, and Retail Trade—account for 46.9 percent of all jobs in the state, compared to less than one-third of all jobs nationally. (See Figure 2). These industries accounted for half of the state's employment growth during the economic expansion from 2001 to 2007. Essentially, growth itself became a Nevada industry. Population and consumption growth fueled the housing bubble, and the housing bubble fueled even more population and consumption growth. Ultimately, these industries accounted for 83 percent of the state's job losses from 2007 to 2011. Over 55 percent of the jobs lost were in the Construction and Real Estate sector alone.

Definitions

Industry: a group of establishments that produce similar products or provide similar services, in this report used interchangeably with the word "sector." A "supersector" is an aggregation of industries or sectors based on common characteristics[14]

Industry cluster: a geographic concentration of interconnected businesses, suppliers, service providers, and associated institutions in a particular field

Target opportunity: specific opportunities for growth identified within an industry

Table 1. Nevada Industry Supersectors in 2011

Industry Supersectors	2011 Total Employ-ment*	Average Annual Percent Employment Growth (2006-2011) Nevada	(2006-2011) U.S.	*Predicted* (2011-2016) Nevada	*Predicted* (2011-2016) U.S.	2011 Location Quotient[a]	2010 # of Establish-ments	2011 Average Annual Pay
Knowledge- and Technology-Based	281,641	1.6%	1.4%	2.6%	1.9%	0.795	18,931	$64,394
Service-Based	1,123,358	-2.4%	-0.6%	1.3%	1.2%	1.141	51,749	$43,066
Traditional and Manufacturing	53,750	-3.8%	-3.0%	1.7%	-0.9%	0.520	2,158	$67,216
Total Economy	**1,459,214**	**-1.7%**	**-0.3%**	**1.6%**	**1.2%**	**N/A**	**73,080**	**$48,077**

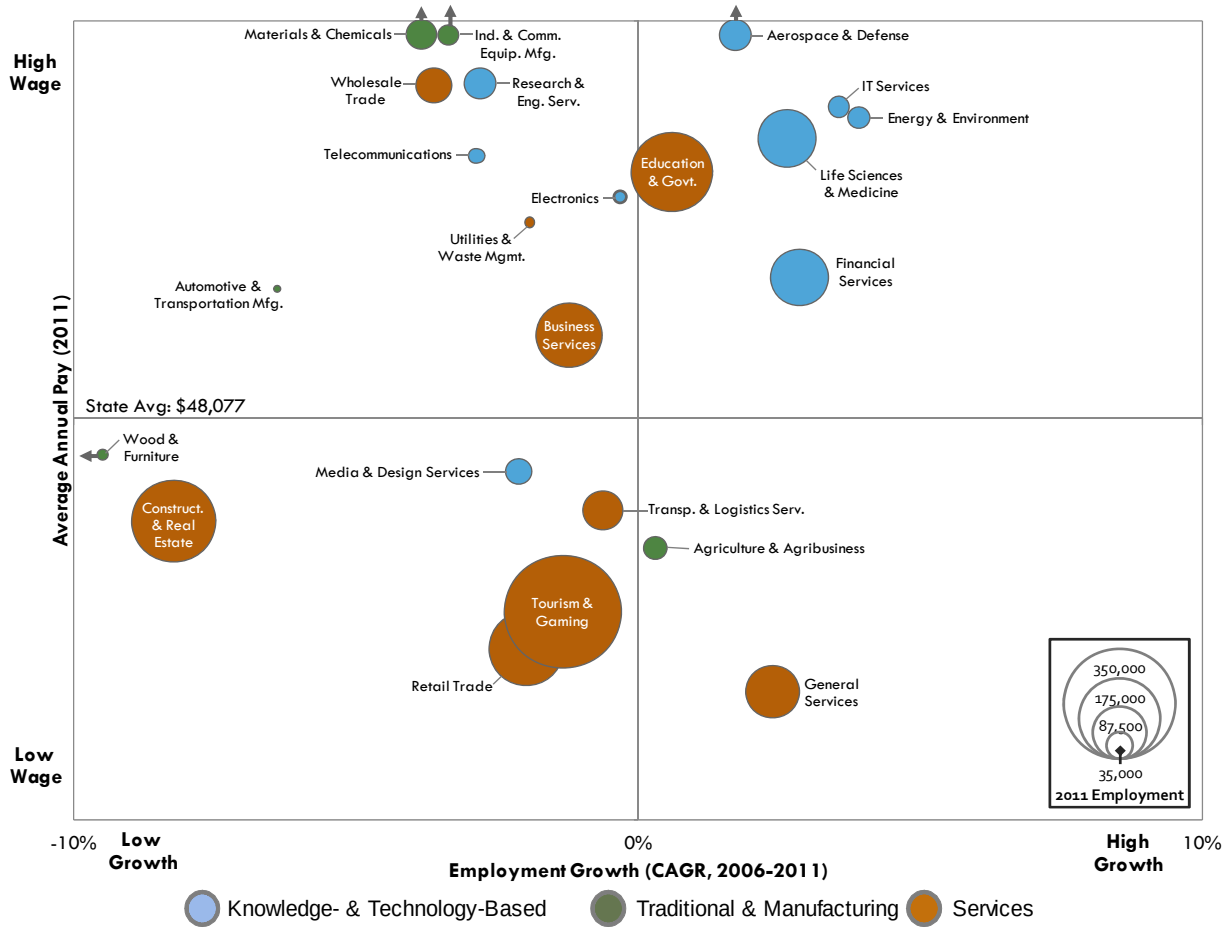
** Figures do not include industries or NAICS codes with <10 employees, so actual employment is slightly higher than the figures shown.*

[a] Location quotient (LQ) is a relative measure of the size of an industry in a specific geography relative to the United States economy. An LQ greater (less) than one indicates that an industry employs more (fewer) people in a particular place than it does on average.

Employment and Establishment totals may not sum, because some employment is in "unclassified establishments" and also due to the missing employment data for industries/NAICS with <10 employees (as mentioned above).

Source: Economic Modeling Specialists Inc. (EMSI), calculations by SRI

Figure 3. Overview of Nevada Industries, Q2 2011



How to Interpret the Industries Bubble Chart

- The size of each industry's "bubble" represents the employment size for that cluster in Q2 2011.
- The color of the bubble represents the supersector categorization of each industry: *knowledge- and technology-based industries* (blue), *traditional and manufacturing industries* (green), and *service industries* (orange).
- The horizontal axis represents employment growth expressed as a compound annual growth rate (CAGR) from 2006 to 2011. Industries falling to the right of the midpoint have a positive employment growth rate, and industries falling to the left of the midpoint have a negative employment growth rate.
- The vertical axis represents average annual pay in Q2 2011. Industries falling above the midpoint have an average annual pay that is greater than the overall average for Nevada ($48,077), and those falling below the midpoint have average annual pay levels falling below the state average.
- Thus, the industries that fall in the first quadrant (upper right-hand side) are higher-wage/higher-growth (e.g., Medicine and Life Sciences, Financial Services), and the industries that fall in the third quadrant (lower left-hand side) are lower-wage/negative-growth (e.g., Construction and Real Estate, Retail Trade).

Knowledge- and technology-based industries—including Aerospace, IT Services, and Life Sciences, for example—meanwhile today account for 19.3 percent of the jobs in Nevada versus 25.5 percent of the jobs in the U.S. as a whole. This sector has displayed the least volatility over the past decade, has the strongest future growth projections, and offers workers high wages—but it remains underdeveloped in Nevada. (See Table 1; Figure 3). The dominant service-based industries, which include those

consumption-oriented ones that form the mainstay of the Nevada economy, currently account for 77.0 percent of the state's jobs versus 67.5 percent of the country's. Traditional and manufacturing industries represent only 3.7 percent of Nevada's jobs versus 7.1 percent nationally.

In all, Nevada has very few specializations. Among major industry groups only Tourism and Gaming registers as appreciably concentrated in Nevada compared to the national average; Mining registers as a further narrower but significant specialization.[15]

A paucity of innovation activities contributes to this lack of diversity

The state's lack of sector diversity is not unrelated to the shortcomings of its current innovation system. Nevada lags other states and the nation on every indicator of innovation and R&D activity included in this study. The state's lagging innovation activity is intertwined with the dominance and the nature of its core industries, which do not typically attain competitive advantage through R&D investments. Knowledge- and technology-based industries, for their part, have not always received the support, attention, and critical inputs they need to flourish—despite higher growth projections, higher average wages, and the sector's potential to diversify and strengthen the state's economy. As a result, Nevada's innovation capacity remains underdeveloped.

Table 2. Innovation Analysis Summary

Innovation Metric	Las Vegas	Reno	Rural Nevada	Nevada	United States
Earned Doctorates (2006-2009) *(Per Capita – per 10,000 people)*	283 *(1.50)*	377 *(6.63)*	0	660 *(2.52)*	192,072 *(6.35)*
Science and Engineering Research Space (2009) *(Per Capita)*	273,441 ft^2 *(0.14 ft^2)*	841,804 ft^2 *(1.46 ft^2)*	0 ft^2	1,115,245 ft^2 *(0.42 ft^2)*	213,787,532 ft^2 *(0.70 ft^2)*
Federal R&D Funding (2007) *(Per Capita)*	N/A	N/A	N/A	$298.9 mil *($114.92)*	$111,428.4 mil *($369.91)*
University R&D Spending ($000s) (2009) *(Per Capita)*	$39,148 *($0.02)*	$142,868 *($0.25)*	$0	$182,016 *($0.07)*	$54,935,457 *($0.18)*
NSF Awards (2006-2010) *(Per Capita – per 10,000 people)*	69 *(0.36)*	176 *(3.08)*	0	245 *(0.93)*	60,628 *(2.00)*
SBIR/STTR Awards (2006-2010) *(Per Capita – per 10,000 people)*	14 *(0.07)*	46 *(0.81)*	1 *(0.06)*	61 *(0.23)*	25,570 *(0.84)*
Scientific Publications (2009-2010) *(Per Capita – per 10,000 people)*	1,172 *(6.02)*	1,372 *(23.74)*	20 *(1.18)*	2,529* *(9.39)*	566,468 *(18.41)*

* Because publications may be associated with more than one address, the total number of publications for Nevada is slightly lower than the sum of its geographic areas.

Turning to specific innovation inputs, overall Nevada produces a relatively low number of doctorate degrees, although strong programs exist in geosciences.[16] Innovators in the state must also contend with a low overall availability of research facilities, although lab space for research in the physical sciences is above average and lab space overall has been growing rapidly.[17] Per capita, federal R&D spending in Nevada is less than one-third the national average and stands at $115 per person, but the state receives higher than average R&D funding from the Department of Energy and Environmental Protection Agency.[18] Nevada's universities are especially dependent on this federal funding, which accounts 68 percent of their research budgets versus 59 percent for universities nationally. Nevada's 245 National

Science Foundation (NSF) awards between 2006 and 2010 reflected the state's research specialization in geosciences but lagged the nation significantly in per capita terms.[19] (See Table 2).

Nevada businesses won 61 Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards from 2006 to 2010, the majority from the Department of Defense. Nevada businesses meanwhile attracted only $38.8 million in venture capital from 2005 to 2010—0.2 percent of national VC investment.[20]

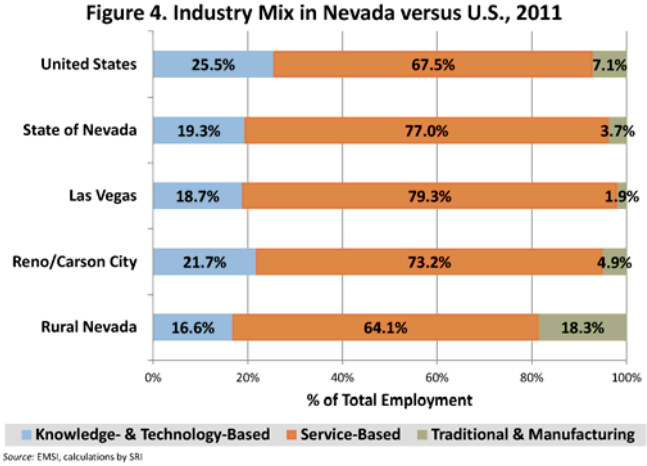
An undeveloped innovation capacity results in fewer new products and processes being brought to market—products and processes that, when commercialized by Nevada firms, could form a new base for growth in Nevada's non-core industries and serve to diversify and strengthen the economy.

Nevada's regions drive the state economy but their performance varies given differences in their industrial structures and innovation activities

Nevada's economy, like that of all states, amounts to the sum total of its regional economies. In the case of the Silver State, three distinct regional economies—those in Northern Nevada, Southern Nevada, and rural Nevada—will continue to determine the state's competitiveness.

Northern Nevada. Northern Nevada, anchored by the Reno-Sparks and Carson City metropolitan areas, has historically been the most diverse region in terms of industrial structure. (See Figure 4). The region is home to the bulk of the state's innovation and R&D activity and it has received the lion's share of public innovation investments. Northern Nevada's economy remains unbalanced, however: It is only half as diverse as the national economy.

Figure 4. Industry Mix in Nevada versus U.S., 2011



Source: EMSI, calculations by SRI

Earlier in the decade, Northern Nevada participated mightily in the boom: Reno/Carson City's population grew by 23.0 percent to 580,000 people over the past decade while employment expanded by 18.7 percent from 2001 to 2007.[21] Reno's economy grew 27.4 percent in real terms from 2000 to 2007, and annual growth reached a high of 8.2 percent in 2004.[22]

Once the recession hit, however, real output initially plummeted 11 percent from 2007 to 2010 before bouncing back an estimated 2.1 percent during the recovery in 2011.[23] Job losses, for their part, continue to pile up. As of 2011, employment stood 11.8 percent below its former peak.[24] Home prices in the region have lost over 50 percent of their value over the past five years.[25] Annualized unemployment shot 10 percentage points higher from 2006 to 2010 to 14.1 percent of the labor force. As of June 2011, the unemployment rate had fallen back to 12.9 percent.[26]

The recession has inflicted these severe and protracted dislocations on the Reno/Carson City economy in spite of the region having a slightly more balanced industrial profile than that of Las Vegas. In Reno/Carson City, 73.2 percent of jobs are in the service sector, 4.9 percent in traditional and manufacturing sectors, and 21.7 percent in knowledge- and technology-based sectors. Education and Government, which falls into the services sector, is Reno/Carson City's largest employer after Tourism and Gaming. The three major consumption industries that dominate the state economy are somewhat less prevalent in Northern Nevada, where they account for 37.6 percent of jobs (versus 46.9 percent for the whole state). Northern Nevada specializes in a number of promising industries: Tourism and Gaming, Industrial and Commercial Equipment Manufacturing, Transportation and Logistics, Electronics, and Aerospace and Defense. Northern Nevada is also a solid and diversified exporter: In 2009, it sold over $1 billion in goods and $1.1 billion in services abroad, accounting for 8.9 percent of the region's total output.[27]

In terms of innovation activity, Reno/Carson City is home to the majority of the state's innovation and R&D activities and is the driver of many of the state's strengths in environmental sciences and geology. Reno attracts 78 percent of the state's total R&D funding and is home to three-quarters of all laboratory space in the state. The University of Nevada, Reno (UNR) and the Desert Research Institute (DRI) together accounted for 66 percent of the state's NSF awards (2006-2010), while Reno-area firms won 75 percent of the state's SBIR/STTR awards (2006-2010).[28]

Southern Nevada. Southern Nevada, anchored by the Las Vegas-Paradise metro area, is one of the least economically diverse major metropolitan areas in the country. Dependence on a core group of consumption-oriented industries combined with the state's chronic underinvestment in innovation assets in the region exacerbated the recent business cycle and produced exceptional economic volatility.

The population of Southern Nevada exploded by over half a million people over the past decade, growing by 41.8 percent from 2000 to 2010 to over 1,950,000 residents.[29] Accordingly, the regional economy also boomed. From 2000 to 2007 real output growth averaged 6.1 percent annually—which reached a gravity-defying 11.3 percent from 2004 to 2005, the headiest year.[30] By the metro area's output peak in 2007, Las Vegas' economy had grown to be over one and a half times its 2000 size.[31] The number of jobs in the region grew at a similarly torrid pace: by 33.9 percent from 2001 to its peak in 2007.[32] The unemployment rate hovered just above 4 percent through late 2007.[33]

All that changed rapidly as boom went to bust. Real output plummeted by 11.9 percent from 2007 to 2010, and 10.7 percent of Las Vegas' jobs disappeared from 2007-2011.[34] The unemployment rate spiked over 11 percentage points from 2006 to 2011.[35] Net migration turned negative for the first time in decades.[36] Home prices have lost 60 percent of their value in Las Vegas over the past five years.[37]

Combined, the three major consumption industries—Tourism and Gaming, Construction and Real Estate, and Retail Trade—account for fully 51 percent of the jobs in the Las Vegas metro area; even after the bust they comprise more than half of the economy, compared to 30.8 percent nationally. Within that, the Tourism and Gaming industry alone accounts for 27.8 percent of all jobs in the Las Vegas region. The wider category of service-based industries—which includes the three consumption industries plus Business Services, Education and Government, Transportation and Logistics, and Waste Management, among others—is exaggerated in Las Vegas, where it accounts for 79.3 percent of all jobs.[38] A mere 1.9 percent of jobs in Las Vegas fall in traditional and manufacturing industries, and 18.7 percent are in the knowledge- and technology-based industries with high growth projections nationally.

Furthermore, Las Vegas—despite its strong position in Tourism and Gaming—derived only 7.7 percent of its gross metropolitan product from exports (which includes foreign tourism) in 2008 and ranked 84th among the top 100 metros on this measure of export intensity.[39] On *services* export intensity, however, Las Vegas ranked first: service exports generated 6.2 percent of Las Vegas' GMP. This is a testament to the international competitiveness of its hospitality complex, to be sure, but it also belies an undiversified export base and an underdeveloped goods-producing sector. Indeed the export intensity of Las Vegas' pre-recession economy was still 3.7 percentage points lower than the national economy.

Because of the dominance of service-based industries in the region, finally, innovation capacity remains underdeveloped—some significant strengths notwithstanding. Las Vegas produces 43 percent of all of the state's doctoral degrees, with the preponderance of the state's degrees in management and education. Las Vegas attracts less than one-quarter of all academic R&D spending in the state and relies far more heavily on federal funding for R&D activities than the state or the national average, deriving 80 percent of its funding from the federal government, (versus 68 and 59 percent, respectively). One-quarter of Nevada's lab space is housed between UNLV and the Nevada Cancer Institute—one half of that in biological and biomedical sciences and much of the rest in engineering. Las Vegas holds 26 percent of all NSF awards in the state and less than a quarter of all SBIR/STTR awards. Notably, Las Vegas produces a very high concentration of scientific publications related to water.

Rural Nevada. Rural Nevada hitched onto the boom as well, with jobs growing by 23.9 percent in rural counties from 2001-2008 and real output growing 24.9 percent.[40] Recession hit rural Nevada too, but not as severely as it did the state's metro areas. Employment contracted by 5.0 percent from 2007 to 2010 but real output dipped only slightly, by 2.5 percent from 2008 to 2009. Output in rural areas has since boomed, and by the end of 2011 it is expected to have grown by 22.2 percent over two years of recovery.[41] Employment recovery, on the other hand, has been slower to take hold: employment in 2011 is expected to have bounced back by 3.0 percent above its 2010 low.

Employment in rural Nevada is far more weighted toward traditional and manufacturing industries than in the state's metro areas (with 18.3 percent of rural employment in these sectors—almost entirely in the Materials and Chemicals and Agriculture and Agribusiness industries), while simultaneously less concentrated in service-based (64.1 percent) and knowledge- and technology-based industries (16.6 percent). At the same time, the three major consumption industries are still slightly more dominant in rural Nevada than would be expected (representing 34 percent of rural employment, as compared to the national average of 30.8 percent).

Export statistics reflect rural Nevada's orientation, notwithstanding its consumption bent, toward goods production: In 2009, rural counties' $1.4 billion worth of exports—three-quarters of which were goods—accounted for 15.6 percent of output; in comparison, nationally exports account for 10.5 percent of GDP.[42]

Rural Nevada's two largest employer industries (Education and Government and Tourism and Gaming) are similar to those in the state's metro areas, but Mining and Chemicals is a close third in terms of providing jobs for rural Nevadans. Rural Nevada is home to one of the highest concentrations of mining activities in the country, but has little related downstream processing and manufacturing activity from the minerals that are extracted. Energy and Environment activities are also highly concentrated in rural Nevada, although they represent a very small share (3.3 percent) of rural employment. Tourism and Gaming, Agriculture and Agribusiness, and Utilities and Waste Management also have above average concentrations of employment of rural Nevada.

* * *

Nevada has an opportunity to establish new pillars of growth, building off of its regional strengths and assets

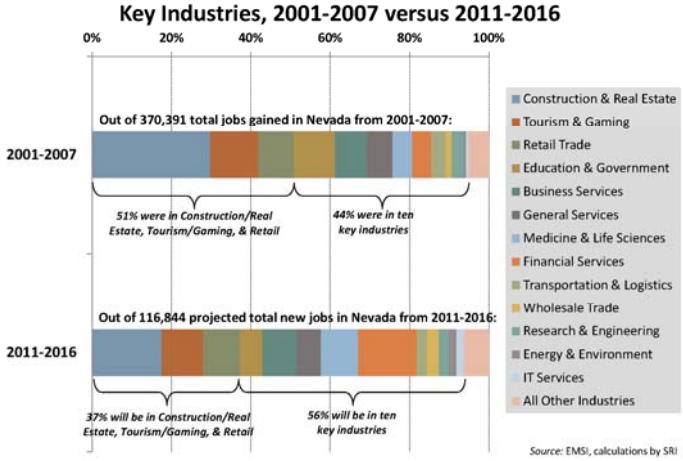
Given these trends, Nevada labors at a crossroads. The data and analysis presented here reveal that, while Nevada fared well on the upside of the business cycle, its economic model was built on shaky foundations: an undiversified economy overly reliant on consumption-dependent industries and lacking in coherent support for the innovation-driven knowledge- and technology-based industries of the future. The breakdown of this model leaves Nevada facing four realities that imply several needed responses:

- The current recession has hit Nevada exceptionally hard. The state must now restore jobs and growth in a strategic and future-oriented way
- Nevada's overdependence on consumption-oriented industries leaves the economy prone to volatility. The state must now diversify its economy to spur growth and provide a cushion against future swings in the business cycle
- A paucity of innovation activity contributes to the economy's lack of diversity. The state must move to innovate in both emerging and traditional industries
- Nevada's regions drive the state economy but they vary significantly in performance, industrial structure, and innovation activity. The state must harness and build on the strengths and power of its three distinct regions to drive growth in the future

In short, the current the moment presents Nevada—both metro and rural—with a unique opportunity to build new and more sustainable pillars of growth for the future and to catalyze innovation in the state without abandoning—but rather by renewing and repositioning—its core industries.

As it happens, future projections for Nevada's economy are solid. Employment growth is expected to resume this year (at a projected annual rate of 1.6 percent from 2011 to 2016), and these growth projections exceed the national average (1.2 percent annually over the same timeframe).[43] However, the nationwide recession has changed a number of economic realities, and Nevada's future growth is not likely to look like it did during the previous period of expansion. (See Figure 5). From 2001-2007, the state's dominant consumption-oriented industries accounted for over 50 percent of all job growth; during the coming five years, Nevada is projected to add nearly 117,000 jobs, but the

Figure 5. Percent of Total Job Growth in Nevada by Key Industries, 2001-2007 versus 2011-2016



consumption-oriented industries will account for only 37 percent of that growth. Instead, future job growth will likely be driven by a wide cross-section of industries—notably industries such as financial services, medicine and life sciences, and business services that are growing nationally—in addition to potential offered by emerging industries that do not yet appear in the data but can play to Nevada's unique strengths. After the recession Nevada will likely be more engaged globally too. By embracing foreign investment and exporting its goods and services to a growing world economy it can tap into increasingly important global economic currents.

Current projections suggest that it will take many years of growth simply to recover the jobs lost during the recession. So the challenge facing Nevada is to boost job creation in the short term while rebalancing the economy for the long haul. Accordingly, the state will need to complement its efforts to boost new and emerging technology-based industries with a renewed focus on exploiting opportunities for innovation, entrepreneurialism, exports, and growth within the core industries that already employ the majority of Nevadans and provide the state with unique competitive advantages. Only by upgrading existing economic clusters while also laying the foundations for a new more stable economy will Nevada emerge from the crisis resting on stronger pillars for economic growth. Ultimately, the transformation of Nevada's economy will come from the regions that are its economic engines—Northern, Southern, and rural—with their unique strengths and capacities for innovation and reinvention.

III. Industry Opportunities for Nevada

For all of its economic challenges, however, Nevada possesses genuine economic assets and significant potential for growth.

In keeping with that, a central task of this study has been to hone in on that potential and identify a series of leading opportunities for near- and medium-to-long-term industry development in the state.

To that end, an objective and systematic analysis of the state's assets and industries was carried out to assess the growth potential of dozens of Nevada's industrial sectors and sub-clusters in the light of several key strategic needs for the state. Also relevant to the assessment was the need for the state to mitigate the extreme economic volatility of its consumption-oriented economy by diversifying toward an increasingly export-oriented, lower-carbon, and innovation-fueled state.[1]

In this vein, this chapter reports that:

- A data- and consultation-driven process was employed to identify growth and diversification opportunities among the state's industries and clusters
- Seven industry opportunities for Nevada emerged from the process
- The target industries hold out varied time horizons for employment impact and occur in different mixes in the state's regions

Together these findings suggest a way forward for Nevada. All of these industries and clusters show promise in helping to restore growth to Nevada. At least three of the recommended target industries offer opportunities to renew and diversify Nevada's core industries; other targets represent opportunities to catalyze emerging industries. For that matter, at least three of the target opportunities can help the state increase international exports, while at least one of the target industries would contribute to the de-carbonization of the global economy. All of the industries present opportunities to increase innovation and yet are plausible and achievable targets for near- to medium-turn economic development in the light of a systematic assessment of the state's goals and competitive advantages.

A data- and consultation-driven process was employed to identify growth and diversification opportunities among the state's industries and clusters

To identify growth and diversification opportunities for the state, the Brookings-SRI study team adhered to a three-part process. Working in multiple dimensions, the team sought to understand Nevada's statewide goals; develop a systematic SWOT (strengths, weaknesses, opportunities, and threats) assessment to reveal Nevada's competitive advantage; and likewise conducted an empirically based industry analysis

that enhanced standard sector study with industry focus group discussions and individual stakeholder consultations. (See Appendices A and B for the lists of those consulted).

What did the inquiry find? On each front the analyses converged on a relatively clear set of priorities for the state.

Nevada's statewide goals are relatively clear. In seeking to identify the challenges facing the state and the economic goals those imply the study process confirmed a substantially clear set of basic challenges and desirable growth and development goals. Three overarching challenges and related goals emerged from the data analysis, stakeholder conversations, and review of other major state and regional studies. These call for the state to:

- ***Restore growth and jobs.*** Following the recent period of extreme economic volatility and recession, Nevada must restore growth and jobs in a strategic and future-oriented way, especially in order to maintain and improve quality of life for the state's citizens. Job gains in the coming years are likely to come from a broad cross-section of industries, and Nevada needs to think strategically about how it can cultivate these new industries—simultaneously building off of its traditional economic strengths and pivoting toward new high-potential drivers of growth

- ***Catalyze innovation in core and emerging industries.*** Nevada's reliance on its core consumption-based industries has meant that its technology- and knowledge-based industries have not always received the attention and support offered by many other states around the nation. As a result, Nevada's performance on a number of indicators of innovation activity has lagged behind most states and the national average. Nevada needs to step up its policies and programs supporting the development of critical high- tech and knowledge-based jobs, industries, and entrepreneurship in order to build the innovation ecosystem necessary to be competitive in the future economy. Innovation is critical for the future competitiveness of *all* industries (not just those typically labeled "high-tech")

- ***Diversify its economy by building new pillars of growth in Nevada's regions.*** Consumption-oriented industries (Construction and Real Estate, Tourism and Gaming, and Retail Trade) have traditionally been the core drivers of growth in Nevada's economy. While these strengths have served the state well in periods of economic expansion, they have also made the state more susceptible to extreme volatility and recession (as evidenced by the massive job losses over the last several years). In looking to the future, Nevada needs to support development of a more diversified economy, in order to spur long-term growth and provide a cushion against future economic cycles. Given that the state's two major metros account for around 94 percent of the state's jobs, pursuing appropriate targets of opportunity in Las Vegas and Reno/Carson City will carry the state a good ways toward catalyzing a new growth trajectory for the entire state. Rural Nevada's rich natural resources, meanwhile, can serve as a significant base for growth in other industries throughout the state

Together with an understanding of Nevada's competitive advantages, these statewide challenges and goals provide an important framework for identifying the highest-potential industry opportunities for Nevada and setting priorities going forward.

Nevada possesses substantial assets—and some deficits—as it considers a renewed economic development effort. The SWOT analysis of Nevada's economy reveals considerable assets and opportunities that the state can leverage as it seeks to renew and diversify its core industries and catalyze emerging industries. (See Figure 1). This SWOT synthesizes the qualitative and quantitative inputs gathered through a series of research efforts, including: stakeholder interviews, focus groups, economic foundations benchmarking of the Las Vegas and Reno metro areas, and a quantitative innovation systems analysis.[2]

Figure 1. Nevada Competitiveness SWOT Summary

Strengths	Weaknesses
• Low taxes • Business friendly regulatory climate • Historically a high-growth economy • Good quality of life (although this is under-recognized) • Extensive entertainment and recreation assets • Proximity to West Coast population centers, markets, transportation routes, and ports • Excellent airport infrastructure (in both Las Vegas and Reno) • Excellent natural and physical resources (for mining, energy, etc.)	• Economy is heavily oriented toward consumption-based industries • Lack of proactive, coherent economic development strategy and structures • Workforce skill level is low (though improving) • K-12 educational system is underperforming • Healthcare system is underperforming • Energy costs are relatively high for the region • Land transportation connections can be challenging (in some parts of state) • Innovation inputs and outputs are weak (and there has especially been underinvestment in innovation capacity in Southern Nevada) • Lack of risk capital to invest in start-ups/innovation (although improving) • Real estate bust (devastating to construction)
Opportunities	**Threats**
• Political leadership closely engaged in revamping and renewing economic development activities • Ease and cost of living is attractive compared to neighboring California • Relatively affordable housing and high residential/commercial/industrial vacancy rates • Growing innovation districts in North and South • Large number of tourists/visitors/conventions – an opportunity to "sell" Nevada • Infrastructure for innovation is in place (at UNR, DRI, UNLV), but not at its full potential • Relatively strong science and engineering (S&E) workforce and students in Reno • World-class Internet connectivity opportunities (such as the Switch data center in Las Vegas)	• Extreme economic cycles and volatility • Projected growth in the core consumption-based industries will not be sufficient to drive recovery • Limited state economic development resources dispersed through fragmented regional efforts • High unemployment • Underinvestment in higher education and lack of a top-tier Carnegie-ranked research university • Existing image issues can be a barrier in attracting higher-skilled workforce • Federal land ownership can hinder land usage/development in much of the state • Water shortages

Nevada's core strengths for economic development have traditionally been its overall business-friendly environment, including its low taxes, relatively low costs, low regulations, and ease of starting a business. These advantages will continue to reside at the center of Nevada's value proposition for business investment and economic development moving forward. At the same time, however, they are not likely to be sufficient to support the kind of growth and investment Nevadans desire given the increasingly determinative role of knowledge, technology, and innovation in national and global competitiveness. This is true across *all* industries—not only those that are considered to be "high-tech." Therefore, if Nevada is going to pursue growth of a broad cross-section of industries, the state will need to make a concerted effort to cultivate and market the assets and characteristics that are required by the businesses of the future. Key areas of concern include spotty economic planning and cooperation; a weak innovation enterprise; and substantial education and workforce challenges. Nevada has a number of strengths across all of these areas, but also significant room for improvement. The SWOT analysis provides a background and context for identifying strategic industry opportunities in the state.

Drawing goals and assets into the target industry selection process yielded a balanced, "reality-based" analysis. Having sought to understand the state's goals and assets the study team moved to recommend industries with special potential for the state given its goals and particular strengths. To that end, a step-by-step, iterative process was used to arrive at a set of seven recommended high-potential industry opportunities for the state of Nevada. Key inputs to this process included: on-the-ground insights from Nevada stakeholders (through interviews and focus groups);[3] review of Nevada's existing capacity and competitive advantages; research on national and global market trends; quantitative analysis of Nevada's past and projected industry trends; and review of existing regional studies and analyses.[4] The goal through this process was to arrive at a short list of recommended industry opportunities for Nevada that are future-oriented and growth-oriented, but also *reality-based*—meaning, they are grounded in the unique assets/advantages that Nevada already possesses or can feasibly nurture.[5] Along these lines, the recommended industry opportunities were required to answer to a number of basic requirements that link with the key statewide goals:

- Can the industry drive job-creation and recovery from the effects of the recent recession?
- Does the industry opportunity support innovation-based development, thereby enhancing Nevada's future competitiveness?
- Over the longer-term, can the industry generate economic diversification (reducing Nevada's dependence on its three core consumption-based industries and ramping up production-oriented activities in the state and its regions)?
- Does Nevada have the competitive advantages and locational assets necessary to compete in the industry (or, if not, can Nevada build up the necessary assets over the longer term)? In short, can the industry realistically serve as a new future pillar of economic growth at the regional level?

Seven industry opportunities for Nevada emerged from the process

So what emerged from the analysis and screening process? Seven major industry opportunities for Nevada's next era of economic development were identified. These include: (1) Tourism, Gaming, and Entertainment; (2) Health and Medical Services; (3) Business IT ecosystems; (4) Clean Energy; (5) Mining, Materials, and Manufacturing; (6) Logistics and Operations; and (7) Aerospace and Defense. The

following box displays the recommended industries and calls out 30 more specific target opportunities within them. Taken together these opportunities represent a broad range of possible development and growth paths—some of which can generate short-term, immediate results while others will require significantly longer-term time frames and larger investments. (For background on the scale and time horizon of job creation possibilities within the recommended opportunities see Appendix C).

On first examination, not all of the broad industries highlighted here may seem to embody what is typically seen as diversification into wholly new, high-valued activities. In fact, some of the target industries, such as Tourism, Gaming, and Entertainment and Mining represent industries that have long resided at the core of Nevada's economy. The inclusion of such industries as targets is not to recommend a continuation of a "business as usual" trajectory, but rather to encourage Nevada to take a fresh look at these industries and to focus on catalyzing particular growth nodes within them. For example:

- The Tourism, Gaming, and Entertainment industry is the state's iconic consumption-oriented industry and a major economic engine, providing thousands of jobs (but mostly low-skill and low-wage jobs) to Nevada's residents. Yet the six target opportunities recommended here within the Tourism, Gaming, and Entertainment industry (for example, becoming the U.S. online gaming center, becoming the intellectual capital of global gaming, or expanding gaming-related manufacturing) would help diversify this traditionally service-oriented industry into higher-value and innovative activities that would create higher-skill and higher-paying jobs, expand the state's exports, and even open up new opportunities for IT-based activities

- Mining has also long been a highly concentrated industry in Nevada and a major source of the state's exports, but has few well-developed supply chain linkages in the state. The target opportunities identified here within Mining, Materials, and Manufacturing would take the industry beyond natural resource-extraction and would link it with higher-value and innovation-based upstream and downstream activities, such as manufacturing activities related to advanced composite materials and clean energy, as well as the exploration and exploitation of medium-value minerals (such as lithium, boron, and vanadium) that could potentially develop a more complete supply chain of extraction and processing activities in Nevada

- The other five industries (as illustrated in the table below) include a wide range of target opportunities that would shift Nevada's economy into manufacturing and knowledge- and technology-based opportunities. All of these industry opportunities build on nascent and/or growing activities and assets in Nevada and, with stepped-up attention and support, could generate jobs, output, and exports that would diversify Nevada's industry base away from its dominant (and volatile) consumption-based sectors.

Taken together, these seven broad industries and 30 target opportunities amount to a variety of options for renewing and diversifying Nevada's core industries; catalyzing emerging industries; and so building a next Nevada economy that is at once export-oriented, lower-carbon, and innovation-driven, as well as opportunity rich. What follows are distilled snapshots of the seven industries and 30 target niches.

Figure 2. Summary of Recommended Industries and Target Opportunities for Nevada

1. Tourism, Gaming, and Entertainment

- Nevada as the U.S. online gaming center (should Congress move to legalize it)
- Las Vegas as the intellectual capital of global gaming
- Gaming manufacturing
- Diversifying into niche tourism markets
- Retirees and second home owners
- Film and media

2. Health and Medical Services

- Surgical specialties
- Geriatrics and related services
- Disaggregation of medical service delivery, creating new opportunities for middle-skill jobs
- Leveraging a strong medical/health sector to build other emerging industries

3. Business IT Ecosystems

- Call centers/customer service and back office/BPO/shared services
- E-commerce operations/headquarters
- Data centers
- Cloud computing/high-performance computing
- Cyber security

4. Clean Energy

- Renewable component manufacturing
- Expanding transmission capacity
- Advancing and internationalizing geothermal development
- Energy efficiency upgrading

5. Mining, Materials, and Manufacturing

- Expanding participation in upstream mining activities
- Medium-value mineral supply chain development
- Manufacture of advanced composite materials
- Organizing and marketing of manufacturing base

6. Logistics and Operations

- Warehousing and distribution
- Advanced logistics
- Air cargo
- Integrated manufacturing-distribution, assembly manufacturing, and food processing operations
- Freight transportation (ground and rail)

7. Aerospace and Defense

- Unmanned Aerial Vehicle (UAV) supply, assembly, and testing
- Maintenance, Repair, and Overhaul (MRO) of aircraft systems

1. Tourism, Gaming, and Entertainment

Tourism, Gaming, and Entertainment is a core industry in Nevada that accounts for more than 350,000 jobs and 24 percent of total state employment. It includes services and activities in accommodations, food and beverage, gaming, recreation and sports, arts and culture, and entertainment. Driven by consumer spending in the early 2000s, the boom of this sector (along with construction) was the engine for the phenomenal economic growth experienced in Nevada until 2007. Going forward, this industry is not likely to see the dramatic investments in new properties and expansion of room capacity that characterized the boom cycle in 2001–2007. Rather, the focus will be on attracting visitors and businesses from diverse markets with renewed and diverse offerings, as well as leveraging the strong infrastructure, capabilities, and expertise that already exist in this industry to create new sources of competitiveness and growth. By diversifying within this core industry, Nevada can leverage centers of growth within an otherwise slower-growing consumer sector.

Target Opportunities:

Internet Gaming. Online gaming is the new frontier of gaming, enabled by enhanced bandwidth, advanced web-based interfaces, and the proliferation of smart phones, and also spurred by the "anytime, anywhere" ethos of an emerging generation of gamers. While online gaming remains illegal in the United States, globally it is legal in approximately 85 countries and is estimated to be a $30 billion industry.[6] Efforts are underway in the U.S. Senate to develop a bipartisan proposal to legalize online poker in the United States. The American Gaming Association estimates that the legalization of online poker will generate as many as 10,000 high-tech jobs in the United States and an estimated $2 billion of annual tax revenues for state and federal governments.[7] As the state with the most sophisticated regulatory structure in place, Nevada will be a highly desirable and logical location for online gaming operations and appears to

Tourism, Gaming, and Entertainment

Target Opportunities

- Nevada as the U.S. online gaming center (should Congress move to legalize it)
- Las Vegas as the intellectual capital of global gaming
- Gaming manufacturing
- Diversifying into niche tourism markets
- Retirees and second home owners
- Film and media

Industry Advantages and Business Case

- A dominant exporter, employer, and anchor industry for other sectors
- A strong brand to capture projected growth markets
- Highly competitive infrastructure, assets, and financial resources
- Strong human resources and innovation capacity

Industry Constraints

- Current U.S. law prohibiting online gambling
- Onerous U.S. tourist visa procedures for international visitors
- Land transport congestion discouraging visitors from California
- Lack of tax credit to attract film production

be one of the best-positioned states to take advantage of its legalization, with the possibility of creating thousands of higher-skill jobs (from gaming designers and engineers to professionals in IT, marketing, and testing, to call centers and customer service).[8]

Las Vegas as the Intellectual Capital of Global Gaming. Gaming is Nevada's largest sub-cluster in the Tourism, Gaming, and Entertainment industry, employing 187,167 workers in 595 establishments (accounting for 52.3 percent of industry employment).[9] By most industry forecasts, the global market share of gaming will continue to shift to the emerging economies. Considerable publicity was generated when Macau, China overtook Las Vegas in 2007 as the largest casino gambling market in the world. Singapore is now expected to overtake Las Vegas by the end of 2011 as the world's second-largest gambling market, propelled by the success of its two new casino resorts. As its global share of casino revenues declines, Las Vegas has tremendous potential to re-orient its role as the intellectual capital of global gaming, much like Houston, TX has evolved into a business hub and intellectual powerhouse of the global energy market (a role that has become de-linked from the drilling and production of oil). Already, much of the success of Macau and Singapore's gaming industries can be attributed to the business model, industry knowledge and innovations, and operating expertise originating from Las Vegas. Las Vegas can build on its extensive gaming knowledge base, research, and innovation capacity and leverage the dynamism of global gaming to become the prime business and knowledge hub of global gaming. The jobs associated with the development of such a hub would be of a different nature and more highly-skilled and highly-paid than in casino operations, including experts in gaming design, engineering, finance, consulting, market and consumer research, communications and policy advocacy, as well as in gaming/hospitality research and education.

Gaming Manufacturing. Gaming-related manufacturing is well-anchored in Nevada, with its largest companies (Bally's, IGT, and Aristocrat Technologies) dominating the world market share. Most of the cards, chips, gaming machines, accounting and payout systems, and hardware used in casinos worldwide are made in Nevada. Firms in this sector design, develop, and manufacture slot machines, card counters, chips, automatic card shufflers, transaction systems, and gaming displays. According to Applied Analysis, a Nevada-based economic and gaming consulting firm, the U.S. gaming equipment manufacturing sector produced $11.5 billion in revenues and employed 29,400 workers who earned an average annual salary of $70,500 in 2010.[10] Until the recent economic recession, the gaming equipment manufacturing industry grew by 17.4 percent in revenues, 5.0 percent in employment, and 8.4 percent in wages in 2006; it grew by 27.3 percent in revenues, 3.8 percent in employment, and 7.6 percent in wages in 2007.[11] Gaming manufacturers in Nevada will continue to be a very important part of Nevada's gaming industry and will be strengthened by the continued success and healthy market expansion of Nevada's gaming enterprises overseas.[12] Ongoing emphasis on growing this segment will support opportunities to diversify Nevada's traditionally service-based gaming sector by expanding the state's manufacturing base and generating additional goods-based exports from the state.

Diversifying into Niche Tourism Markets. From its traditional gaming focus, Nevada's tourism industry has evolved into a dynamic and diversified cluster in which visitor activities are broadly distributed among: Casino-Resorts (52.7 percent of Nevada visitors experienced this activity/location), Dining and Restaurants (44.3 percent), Gaming (38.5 percent), Live Performance (21.4 percent), Shopping Malls (18 percent),and other activities.[13] Going forward, the priority in Las Vegas will be to fill the room capacity already built up in its inventory, by creating demand in diverse niche tourism markets for those interested in a variety of activities and experiences.[14] One potential niche market is culinary tourism; already, about one in six U.S. residents who travels for leisure enrolls in a cooking class, takes a food tour, or participates in some other culinary activity as part of their trip, according to the U.S. Travel Association.[15]

Las Vegas is particularly poised to leverage this opportunity, with its cluster of world-class restaurants on a two-mile stretch along Las Vegas Boulevard. Nevada's natural assets also offer strong advantage in the outdoor/adventure tourism segment. In Northern Nevada, Lake Tahoe is an internationally recognized destination for scenic views and outdoor activities, from hiking, to mountain biking, to snow sports. Besides the Tahoe area, Nevada is also blessed with other formidable assets for recreation, wilderness exploration, and outdoor adventures. Lying just outside of Las Vegas, the trails of Charleston Peak and the Red Rocks National Conservation Area draw adventurous hikers and climbers from all over the United States.

Retirees and Second Home Owners. Las Vegas has often been listed by various news outlets among the top ten retirement locations in the United States, due to a combination of nice weather, low taxes, affordable housing, and abundant recreational/entertainment opportunities. Las Vegas ranks third among ten key metro areas for the rate at which its age 65+ population has grown between 2000 and 2010.[16] The declining price of the housing market has made Nevada attractive to retirees.[17] With the decline in housing prices and the aging trend of baby boomers, Nevada should continue to target this segment, which tends to generate demand for local goods and services while having a smaller need for employment. An overlapping segment is the second home "tourism" market. The high quality of housing stock and Las Vegas lifestyle has always attracted foreign buyers looking for a second home.

Film and Media. Nevada has attracted an average of $80 million annually in TV/film production value for the last 12 years, and more than $102 million in 2011 alone, largely concentrated around Las Vegas.[18] This has been attributed to Las Vegas' proximity to Los Angeles, the infrastructure and skilled human resources embedded in the city's entertainment industry, sophisticated hospitality infrastructure, convenient air transportation, unique scenes such as the Las Vegas Strip, and (statewide) a minimum-bureaucracy permitting environment and the low cost of doing business. There is potential for Las Vegas to host more production activities by enhancing its studio space and infrastructure, and there is opportunity to expand to adjacent post-production, value-adding, and creative-class services, such as design, animation, graphics, editing, media and communications, and others (possibly by tapping into the world-class IT assets Las Vegas possesses at the Switch SuperNAP data center). There is also opportunity to capture a much larger share of the film production market if a competitive production tax credit is approved by the state legislature.

Industry Constraints:

Uncertainty in online gaming legality and regulatory environment. The regulatory environment for online gaming remains uncertain. Currently, online gaming is illegal in the U.S.; any financial transaction that supports online gambling, with the exception of horserace betting and state lotteries, is prohibited by the Unlawful Internet Gambling Enforcement Act of 2006 (UIGEA). Uncertainty remains until the U.S. Congress legalizes online gaming and authorizes a specific regulatory structure for the industry. Meanwhile, the existing Nevada gaming regulatory framework—from testing and licensing to taxation and workforce—needs to catch up with the technological advances and digitization of the industry technology and customer interface.[19] To position Nevada as the national platform and center when online poker becomes legalized, the state will need to take a hard look at its existing regulatory structure and infrastructure. The reactivation of the long-dormant Gaming Policy Committee by the Governor is a positive step and the committee will have an important role to play going forward.[20]

Onerous U.S. tourist visa procedures for international visitors. The much stricter, post-9/11 U.S. tourist visa approval process and the procedures for entering the country (fingerprints, iris scans, etc.)

have been blamed for a declining U.S. share of the global travel market. In fact, according to the Las Vegas Convention and Visitors Authority (LVCVA), the U.S. share of international travelers has steadily declined over the past decade from 17 percent to 12 percent. Nevada will be bucking this trend as it tries to capture an increasing share of the growing global tourism market.

Land transport congestion discouraging visitors from California. A large share of Las Vegas' visitors comes from Southern California, often traveling by car. Congestion during peak travel times is exacerbated by the location of the California Agricultural Inspection Station just east of Barstow, which can turn a 3-4 hour driving trip to a frustrating 6-8 hours for travelers from California. To avoid this risk, many Californians arrive by short-haul flights that are taking up valuable capacity at Las Vegas' McCarran Airport; this capacity could potentially be diverted to serve national/international markets instead. To assure Las Vegas' dominant position in the important California market, this surface infrastructure bottleneck will need to be addressed by examining alternatives such as high-speed rail, a widening of I-15 in California, or relocating the agricultural inspection station to Nevada along the California border to reduce the bottleneck on I-15.

Lack of tax credit for the film industry. Competition among communities to host film production is fierce and is increasingly defined by a "race to the bottom" mentality. This is because a high-end feature film or television series can spend an estimated $260,000 per day while on location, generating significant economic impact for the community. In order to capture these expenditures, many states (including California and New York) are offering tax credits of 20-40 percent to lure television and film production to their communities. Nevada will continue to find itself at a disadvantaged position to attract large-scale film projects in the absence of such a credit.

Bottom Line:

The Tourism, Gaming, and Entertainment industry is a dominant employer, exporter, and anchor industry for other sectors. Nevada has a strong brand to capture projected growth markets; offers highly competitive infrastructure, assets, and resources in this industry; and has strong human resources and innovation capacity in this industry. The state's next "move" must be to seize on new and diversified growth opportunities within the context of slower growth for more mature portions of the industry.

2. Health and Medical Services

The Health and Medical Services industry is a major opportunity to secure quality new employment by bringing the low level of medical services in Nevada closer to the national average. This industry also has the potential to grow a large, relatively stable base of economic activity and high-quality jobs in the state. The Health and Medical Services industry is less volatile than the consumption-based industries that dominate much of Nevada's economy, because it is driven largely by long-term population growth and demographic trends, as well as by government programs and policies. Jobs in Health and Medical Services cover a wide range of positions, from moderate- to very high-skill, and employment has grown steadily over the past decade in the United States, as well as in the state of Nevada, remaining positive even during the recent economic recession.[21] Statewide, the Health and Medical Services industry is significantly less concentrated in Nevada as compared to the national average. Nevada residents continue to experience a critical gap in health and medical services, and as a result health outcomes are suffering and many patients (if financially able) go out-of-state for specialty care and procedures.

Health and Medical Services

Target Opportunities

- Surgical specialties
- Geriatrics and related services
- Disaggregation of medical service delivery, creating new opportunities for middle-skill jobs
- Leveraging a strong medical/health sector to build other emerging industries

Industry Advantages and Business Case

- Large industry with rising demand aligned with demographic trends
- Capturing market leakage and reversing the import of health services
- New institutions have brought increased patient care and research capabilities
- Increased investment in and attention on the health/medical workforce
- Improving quality of life for Nevada residents

Industry Constraints

- Lack of a medical school in Las Vegas, the largest medical market in the state
- Vertically integrated market with a dominant, single payer
- High percentage of Medicare patients and low reimbursement rates
- The uncertainty of the legality of the PPACA going forward; High percentage of Medicare patients and low reimbursement rates
- Gaps between graduate skills and the workforce needs of the industry

Target Opportunities:

Surgical Specialties. Studies suggest that medium- and high-income Nevada residents routinely leave the state for specialty care and surgical procedures. Research has found that more than 50 percent of Nevada residents seeking care in California and Arizona are doing so for surgical procedures.[22] Recapturing this market by improving the capacity to perform surgical procedures represents a significant economic opportunity for Nevada.

Geriatrics and Related Services. The overall demographic trend of aging baby boomers and the attraction of retirees to Nevada create opportunities for the geriatrics specialty and related care and services in the state. Among the major metro areas across the United States, Las Vegas ranks third for the rate at which its age 65+ population has grown from 2000-2010.[23] The need for geriatrics care to

serve this population segment will continue to grow. New expansions have started to take place, particularly for military veterans with the opening of a VA medical center in southern Nevada.

Disaggregation of Medical Service Delivery, Creating New Opportunities for Middle-Skill Jobs. One emerging trend in the health and medical industry and elsewhere is the disaggregation of work, which is the breaking down of conventional jobs into discrete tasks that can be parceled out to other people. In the health/medical industry, this trend has manifested in the separation of the technical parts of the jobs that must be done by a physician, a nurse practitioner, or a nurse, and reassigning these tasks to other less skilled professionals.[24] This trend toward disaggregation creates opportunities in middle-skill, middle-income jobs that can help fill the current service gaps in the industry.

Leveraging a Strong Medical/Health Sector to Build Other Emerging Industries. Nationally, the Health and Medical Services industry is a stable, growing, and high-wage industry that provides people with critical services. By building a stronger Health and Medical Services industry in the state, complete with a robust educational pipeline and centers of excellence for care and research, Nevada will be well positioned to take advantage of opportunities in related segments such as executive care and medical tourism, biotechnology, clinical trials and testing, imaging/devices, and medical equipment and supply industries.

Industry Constraints:

Inadequate medical education and research activities in the state's largest medical market. The University of Nevada School of Medicine (UNSOM), while based in the UNR, has a footprint in Southern Nevada through its offerings of third and fourth year rotations and clinical clerkships, and residencies and fellowship programs. UNSOM recently opened its primary Clinical Simulation Center in Las Vegas. However, compared to similarly sized or smaller cities in the Western U.S. region—such as Denver, Albuquerque, Salt Lake City, Tucson, and Phoenix—all of which have highly research-oriented medical schools, Southern Nevada is undeniably placed at a disadvantage. The current levels of education and research activity have been insufficient for building a strong and vibrant medical and health cluster that would deeply engage the local communities, energize local philanthropic contributions, attract major research dollars, and spur adjacent biomedical research activities. Currently, there are active discussions among policymakers in the state to direct more medical resources and expand the footprint of the medical school in southern Nevada.

Vertically integrated market with a dominant, single payer. Historically, the healthcare market in Southern Nevada has been dominated by the vertically integrated network of a single payer, which is estimated to account for as much as 60 percent of the region's payer market. This dominance of a single payer, which is driven primarily by low reimbursement rates, is often cited as a reason for the slow entrance of new health and medical service providers in the region.

High percentage of Medicare patients and low reimbursement rates. A lower percentage of Nevada residents have health insurance than the national average and a large percentage of residents are on Medicare. In Nevada, 19.5 percent of the population is uninsured; nationally, 14.5 percent of the population lacks health insurance.

The uncertainty of the legality of PPACA going forward. Nevada is one of 27 states that have joined in a federal lawsuit to challenge the legality of the Patient Protection and Affordable Care Act of 2010 (PPACA). PPACA is expected to have a considerable impact on the health services market, both

nationally and in Nevada, with its provisions governing the private health insurance industry and mandated insurance coverage. Uncertainty regarding the legislation's fate hangs over the industry and hiring.

Gaps between graduates and the workforce needs of the industry. While health education programs at various levels are abundant in Nevada, the educational pipeline for health and medical careers is not functioning optimally in the state, largely as a result of workforce supply/demand gaps and poor coordination.

Bottom Line:

The Health and Medical Services industry is a stable, high-quality source of employment that can capture market leakage and reverse the trend of importing health services from other states. This industry, which affects all employers and residents, has the potential to ensure a high quality of life for the state and attract further economic activity.

3. Business IT Ecosystems

The Business IT Ecosystems industry spans a wide range of technological and skill levels. Given that Nevada has not yet built an image or reputation as a strong location for technology-based businesses, a logical development approach for this industry is to focus on attracting lower-to-moderate skill range (and higher job-creating) business services operations in the near term, while simultaneously establishing new marketing and entrepreneurship/innovation support mechanisms that will spur growth and attraction of higher-end IT-based businesses over the longer term.[25] This is currently a very small industry in the state of Nevada, representing 51,597 employees (in 3,857 establishments) and only 3.5 percent of total state employment. But despite this small size, there are promising opportunities for growth that have previously been under-marketed and unrecognized.

Target Opportunities:

Call Centers/Customer Service and Back Office/Business Process Outsourcing (BPO)/Shared Services. Based on existing assets and recent growth trends, this sector is a high-potential, near-term prospect for development in Nevada. Outsourcing and consolidation of business and administrative functions is a national (and global) trend that is expected to continue growing at a rapid rate due to business cost-cutting and streamlining efforts. Nevada is already attracting an increasing number of these kinds of businesses and has the necessary infrastructure and workforce to continue to grow this segment. Call centers have been growing steadily in Nevada at 3.6 percent annually from 2006 to 2011 (stronger than the national average of 1.8 percent) – and while employment numbers are low (5,466 workers in 2011) Nevada's employment concentration is 1.446, well above the national average. The outsourcing or consolidation of business processes, such as human resources, finance and accounting, IT operations and data storage, customer service, procurement, and other industry-specific functions, is also a growing trend in Nevada (and nationally). The best possible estimate using 2011 industry data is that there are approximately 9,000 workers in the back office/BPO segment in the state of Nevada (but the actual employment count is likely to be much higher), with a concentration ratio of 0.742.[26]

Business IT Ecosystems

Target Opportunities

- Call centers/customer service and back office/BPO/shared services
- E-commerce operations/headquarters
- Data centers
- Cloud computing/high-performance computing and data centers
- Cyber security

Industry Advantages and Business Case

- Strong and growing base of moderate-skill business services and IT-related activities
- Strong (but under-marketed) IT industry anchors
- World-class Internet infrastructure and other locational advantages

Industry Constraints

- Nevada has lagged other states in building this industry
- Need to improve the state's image and assets for attracting a creative class and high-tech workforce
- Relatively small (but growing) high-tech workforce
- Additional support for entrepreneurship and start-ups is needed

E-Commerce Operations/Headquarters. E-commerce operations/headquarters typically combine a range of functions that may include standard company headquarters activities, along with call center/customer support, IT and website management, retailing, and marketing operations. This is currently a very small segment in Nevada, but the industry registers a very strong concentration ratio of 2.131 in the state, which indicates good competitive advantage for further growth. A strong endorsement for Nevada's potential in this industry is the movement of Zappos.com's headquarters from San Francisco to the Las Vegas metro area in 2004. Zappos' decision was based primarily on the need to expand its call center/customer service operations, and Las Vegas was selected because it is a good location for those activities. Based on this example, real potential does seem to exist in using Nevada's strong foundations for call center/customer service operations as a platform for attracting the higher-value e-commerce company operations.

Data Centers. While data centers are not typically a long-term job engine for most regions, in the short-term they employ a large number of people in construction-related jobs. With its large skilled construction workforce and other locational advantages, data centers may represent an opportunity to deploy Nevada's currently under-employed construction workforce. The scale of the SuperNAP and Switch Communications' aggressive expansion plans indicate Las Vegas' suitability as a home for large-scale data centers. Meanwhile, some stakeholders suggest that Reno may also be well-suited for data center operations. To offset the advantages of established data center hubs in other regions, the state may focus its data center development efforts on Nevada firms looking to consolidate their physical facilities. The state's existing BPO service providers, for example, may find advantage to locating some of their infrastructure in local data center facilities.

Cloud Computing/High Performance Computing. Cloud computing is a "pay-per-use model for enabling, available, convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."[27] The cloud computing market is experiencing explosive growth, with International Data Corporation (IDC) estimating that the market for cloud computing will grow from $16 billion in 2009 to $55 billion by 2014. As a result of this and other technical factors, the scale of data centers is rapidly increasing to match demand, with a new generation of super data centers coming online in places like Washington, North Carolina, and Nevada. Thanks to a fortuitous combination of factors, including the growth of cloud computing, the collapse of Enron (leading to the auction and acquisition of Enron's unique confluence of telecommunications services at a single point), and entrepreneurial vision, Las Vegas is home to one of the most advanced and well-connected data centers in the world—Switch Communications' SuperNAP. While data centers are not necessarily associated with strong regional IT clusters, new cloud-based services do show some potential as drivers for regional economic and technology growth, and it is these opportunities that Nevada should tap into to pursue synergistic IT industry growth based on the technological capabilities housed at Switch. For example, some industries, such as video production, rely on extensive in-house computational capabilities. Companies like Weta Digital (Avatar, Lord of the Rings) and Lucasfilm (Star Wars) are home to some of the fastest computing systems in the world, representing a substantial investment in internal data center assets. The potential cost savings of cloud services are driving these types of firms to explore alternatives to their traditional in-house computing service approach. Because of the large quantities of data involved and the rapid iteration required among large teams of animators and other staff, high-bandwidth and low latency data connections between the cloud and the customer are critical for these applications, potentially driving growth in cloud-enabled jobs close to major cloud computing centers, such as the SuperNAP.

Cyber Security. According to the White House, "cyber threat is one of the most serious economic and national security challenges we face as a nation."[28] Due to government and private industry's increased reliance on information technology, the growth of cloud services, and other factors, cyber security is a rapidly growing industry. Federal government spending alone on cyber security is expected to exceed $13 billion by 2015.[29] No city or region has established itself as the leader in cyber security, and Nevada is home to several assets that could be leveraged to build a robust cyber security industry. These include solid and reliable internet and telecommunications infrastructure, a leading cyber security academic institution and home to two of the major cyber security conferences, DEF CON and Black Hat.

Industry Constraints:

Nevada has lagged other states in building this industry. To date, Nevada has not taken a proactive approach to marketing itself as a location for IT, high-tech, and knowledge-based businesses. Nevada competes against dozens of other states that have been marketing and growing these capabilities for years.

Need to improve the state's image and assets for attracting a creative class and high-tech workforce. Nevada's case for business attraction and growth has in the past focused almost exclusively on the state's low-cost, low-regulation, business-friendly environment. While these qualities are important, they will not be enough to attract the higher-end, higher-skill, high-tech businesses that the state is interested in growing.

Relatively small (but growing) high-tech workforce. A closely related challenge is the workforce issues faced by companies that require highly-skilled IT and knowledge professionals. Workers employed in "computer and mathematical occupations" represent only 1.4 percent of total employment in the State Nevada, while they represent a much higher share of employment in states such as California (3 percent), North Carolina (2.5 percent), Texas (2.6 percent), and Washington (4 percent). Backing up this data, most stakeholders interviewed for this study stated that it can be challenging to hire for IT and highly technical positions within Nevada, and they often rely on out-of-state recruitment for such positions (which can pose its own challenges). While Nevada firms do have easy access to the extensive and high-skill labor market in neighboring California (and high-level managerial and IT professionals can, and do, commute to jobs in Nevada from California), it would be preferable for Nevada to have its own in-state pool of such talent.

Additional support for entrepreneurship and start-ups is needed. Expanding the IT and high-tech sectors in Nevada is largely a function of providing an environment that is conducive for local start-ups and entrepreneurs to grow and thrive, rather than simply attracting business relocations from outside the state. Business incubation and entrepreneurial support services (especially as compared to other states) are small and fragmented.

Bottom Line:

The Business IT Ecosystems industry is a strong and growing base of moderate-skill business services and IT-related activities in Nevada. The state has strong but under-marketed IT industry anchors, a world-class internet infrastructure, and locational advantages due to a relatively low risk of natural disasters. Nevada has strong potential to attract businesses and jobs in the lower- to medium-skill business services segments in the short-term while simultaneously building an environment to support higher-end IT industry growth over the longer-term.

4. Clean Energy

The Clean Energy industry is a high-potential target for Nevada because of the state's renewable resource base, its established geothermal headquarters, its proximity to large energy markets, and the recent energy investments that have been made in the state. Nevada's renewable resources are fairly balanced between the north and south, with higher geothermal resources in Northern Nevada and higher solar and hydropower resources in Southern Nevada. Of all U.S. states, Nevada has the second highest (behind California) installed geothermal capacity. Given the number of projects in the design and permitting phase of the state's construction pipeline, though, Nevada is set to surpass California in installed geothermal capacity in the near future. To date, Nevada's demand for solar power has been driven by the state's renewable portfolio standard (RPS), which require that Nevada utilities get 20 percent of their power from renewable sources by the year 2015 (and then 25 percent by 2025), with at least 6 percent coming from solar energy through 2016–2025. The state is home to several solar projects, with a mix of concentrating solar (CSP) and photovoltaic (PV) technologies. The sector's greatest potential for job creation is in the manufacture and design of renewable energy systems and components.

Clean Energy

Target Opportunities
- Renewable component manufacturing
- Export of electricity
- Advancing and internationalizing geothermal development
- Energy efficiency upgrading

Industry Advantages and Business Case
- Nevada is at the epicenter of geothermal energy development in the United State
- High level of incident solar energy
- Some potential for wind energy capture
- Nevada's renewable manufacturing has attracted foreign investment to the state
- Nevada is proximate to a large amount of energy demand

Industry Constraints
- Nevada has lagged other states in building this industry
- Renewable projects require a lengthy and onerous licensing process
- Incentives for renewable power generation have not been very predictable
- Limited transmission capacity has constrained renewable development
- Difficulty in obtaining financing for geothermal projects

Target Opportunities:

Renewable Component Manufacturing. Several manufacturers of renewable components are already operating in Nevada. Windspire Energy (maker of the innovative Windspire wind turbines) is based out of Reno, and Amonix's branch in North Las Vegas makes concentrated photovoltaic panels. However, Nevada's manufacturing of renewable energy components could be greatly expanded to create jobs and export products for the state. Nevada already has a high concentration of employees (3.12 location quotient) working in the solar photovoltaic sector; its thirteen existing solar PV companies employed 630 people in 2010. Nevada's solar thermal sector and wind sector are less developed, though both have grown over the past seven years.[30] The component manufacturing opportunity includes power storage components as well as power generation components. Lithium-based batteries in particular have potential in Nevada, due to the substantial deposits of lithium in the state. A case in point: Altairnano is a Reno-based manufacturer of lithium-ion based batteries used

primarily in the electric vehicle industry. With several battery and solar PV-related patents, Altairnano is one of Nevada's leading non-gaming patent producers.

Export of Electricity. Nevada is very close to the power-hungry state of California. If the appropriate transmission infrastructure were put in place, Nevada might be able to generate electricity and send it across state borders. Nevada has recently begun developing intrastate electrical transmission lines through the One Nevada Transmission Line (ON Line) project, which is expected to significantly increase the ability to connect the state's renewable energy generators to the power grid.[31] The ON Line project is the first phase of a larger transmission project called the Southwest Intertie Project (SWIP) connecting Wyoming, Idaho, and Nevada to California. Developers anticipate exporting wind and solar power via the SWIP to California.

Advancing and Internationalizing Geothermal Development. Nevada has huge geothermal resources, and Reno houses the headquarters of many of the world's major geothermal development companies. Unfortunately, much of the equipment and expertise utilized across the globe by these Nevada companies comes from outside of the state. Aside from the construction and operation services that Nevada supplies, the geothermal value chain includes exploration equipment, drilling equipment, drill operation, pumps, pipes, heat exchangers, and other segments. Nevada has the opportunity to become the knowledge center for the global geothermal industry, and also to become a source for drilling equipment, expertise, design, and manufacture.

Energy Efficiency Upgrading. Improvements to energy efficiency save money for both users and suppliers of electricity. Many new commercial facilities were built during Nevada's recent construction boom from 2003-2007. However, many of these buildings were not constructed to high standards of energy efficiency. If Nevada's commercial and residential buildings were updated to comply with international energy codes, the energy savings would be huge.[32] Now that the state's construction industry is largely dormant and its outlook for commercial construction is poor, Nevada can take the time to evaluate the efficiency of its newer and older buildings, and to upgrade efficiency with improvements to lighting, insulation, water management, and other building systems. With the recent completion of Las Vegas Union Park and CityCentre projects, Nevada's construction industry has demonstrated its capacity to meet environmental standards such as LEED.

Industry Constraints:

Renewable projects require a lengthy and onerous licensing process. With the federal government owning or managing nearly 87 percent of Nevada's land, land use policies and permitting requirements by various federal agencies—Bureau of Land Management (BLM), U.S. Fish and Wildlife Service, U.S. Forest Service, and Department of Defense, among others—have the potential to significantly delay project development. These restrictions make it difficult to build solar plants (which are typically land-intensive) and difficult to route power transmission lines in the state.

Federal incentives for renewable power generation have been very unpredictable. Uncertainty surrounds federal subsidies that make renewable energy sources economically viable in the current market. Many tax credits, loan guarantees, and grants are set to expire in the next two to three years, which will make it difficult for clean energy projects to access funding. On a more positive note, Nevada's state-level renewable incentives have remained stable, including the Renewable Energy Sales & Use Tax Abatement, which has been in place since 2009.

Limited transmission capacity has constrained renewable development. Without adequate transmission infrastructure connecting Nevada both internally and to its neighbors, the development of renewable resources—for the state's internal consumption and for energy export—will be hindered.

Financing of geothermal projects has been an issue. While all clean energy projects are facing difficulty in accessing finance, geothermal in particular faces unique financing challenges. Geothermal exploration can be a risky expense; the front-end of a geothermal project is the most risky and costly, often requiring tens of millions of dollars in exploratory drilling. It is uncertain how many exploratory wells a company will drill before they find one suitable for geothermal development. Often this activity is not financed by banks or lenders due to high risks, making the developer dependent on high-risk venture capital. The potential for company failure could cause the formation (and subsequent burst) of an investment bubble in the geothermal sector.[33]

Bottom Line:

The clean energy industry is a high-potential target for Nevada since the state is the epicenter of geothermal energy development in the United States (with nine of the 11 top geothermal firms in the United States located in Nevada), has a high level of incident solar energy, and has some potential for wind energy capture. Renewable manufacturing has attracted a large amount of foreign investment to the state and Nevada is proximate to a large amount energy demand by neighboring state of California. Energy efficiency retrofits, especially of the state's commercial building sector, would not only create jobs but also slow the growth of electricity demand in the state.

5. Mining, Materials, and Manufacturing

The Mining, Materials, and Manufacturing industry is a natural target for Nevada given the state's mineral resources, combined with the state's knowledge base in mining operations and its existing materials and manufacturing activities. These related industries have common technical expertise and resources that are exchanged between their component sectors. For instance, several chemical businesses (with products such as lime, cyanide, and cement) are located in the Reno area because of their close relationship to mining. Though these are consumption-based industries that rely on consumer demand, they are also export-based industries that can improve Nevada's trade balance over the long term. The mining industry is closely tied to Nevada's history, and it remains an important part of the state's economy today. Mining employment is 10 times more concentrated in Nevada than the national average.

Target Opportunities:

Expand Participation in Upstream Mining Activities. The opportunities for new development are limited in the downstream of the value chains for low- and high-value materials. However, because Nevada holds mineral resources, the state has the opportunity to capture activity in the upstream of the mining value chains, by targeting exploration and mine-site services. This includes further development of the state's mine support services, including: construction of buildings and surface facilities, provision of mining services (both surface and underground), design and manufacture of mining equipment (both vehicles and components of extraction equipment), and provision of specialized services (i.e., drilling, blasting, engineering, analytical, metallurgical, environmental, and management). There is significant overlap of expertise and activity between Nevada's mining industry and its geothermal industry. Both mining and geothermal development rely on drilling and extraction technologies, and both sectors depend on the ability to assess underground resources.

Mining, Materials, and Manufacturing

Target Opportunities

- Expanding participation in upstream mining activities
- Medium-value mineral supply chain development
- Manufacture of advanced composite materials
- Organizing and marketing of manufacturing base

Industry Advantages and Business Case

- The presence of significant mineral resources in the state
- Strong geosciences knowledge base
- Nevada has demonstrated manufacturing strengths in several areas, such as gaming, food, metals, and plastics

Industry Constraints

- State and federal land-use projects hinder the growth of the mining industry
- Fragmented manufacturing industry
- Limited pool of high-skilled workforce
- Limited water resources

Medium-Value Mineral Supply Chain Development. In the mining industry, Nevada's downstream opportunities (such as refining and manufacturing) vary depending on the minerals in question. There is significant opportunity for Nevada to expand its supply chain for medium-value materials, such as lithium, boron, and vanadium. These material resources are abundant in Nevada, and lithium in particular could prove to be valuable to the clean energy industry. As discussed in the clean energy section, the demand

for lithium is increasing, as lithium-based batteries are increasingly used in consumer electronics and hybrid-electric vehicles. Nevada has a wealth of medium-value material resources and has the opportunity to develop downstream refining and manufacturing activities to process them.

Manufacture of Advanced Composite Materials. Nevada has established strengths in the manufacture of plastics, resins, and structural components. The state's existing metals and plastics manufacturing industry could be a natural building block for supporting the development of an advanced composites industry in the state. Composite materials have applications in materials for wind turbines, lightweight automotive products, and aircraft. The national composites industry is projected to grow by 7.8 percent annually from 2011 to 2016.

Organizing and Marketing of Manufacturing Base. Industry observers have noted that Nevada's manufacturing base is fragmented, with no common directory of the suppliers and service providers that operate in the state and spotty linkages to national and global supply chains. Nevada has the opportunity to develop a more cohesive cluster of manufacturing activity by improving the organization of its existing manufacturing base and connecting its manufacturers and tool shops to component buyers and broader supply chains, both inside and outside of the state.

Industry Constraints:

Lack of a fully-developed mining supply chain. In spite of the historical and ongoing significance of Nevada's mining industry, the industry has remained largely extraction-based. In particular, there are few developed upstream and downstream linkages for Nevada's highest value minerals, such as gold and silver, and this means that the state is not reaping full benefit from its precious natural resources that are extracted and exported out of state. For example, although Nevada is the nation's largest producer of gold, the state is not home to any major gold mining company headquarters (the state's two largest gold mining companies are headquartered in Denver and Toronto, and Barrick Gold—which extracts the majority of its North American gold in Nevada—has its North American headquarters in Salt Lake City). The nature of the industries for high-value minerals such as gold and silver may make it challenging to relocate downstream activities to Nevada, but supply chain linkages for other medium- and low-value minerals should be explored.

State and federal land-use policies. State and federal land-use policies (especially those from the Bureau of Land Management) hinder the growth of the mining industry. Similar to the Clean Energy industry, the uncertain cost and timeline associated with getting approvals, permits, and licenses can make mining projects difficult to finance.

Fragmented manufacturing industry. Nevada's manufacturing industry is fragmented and consists of mostly small companies. While the state has done well in attracting larger companies to relocate to Nevada, it has sometimes lacked the post-sales support to keep them there. The Nevada Manufacturers' Association serves as a common voice for the industry on some issues, but more could be done to organize and promote the state's existing manufacturing base.

Absence of a developed high-skilled workforce*.* Companies have a limited supply of entry-level workers, since many students trained at UNR leave Nevada after graduation. Nevada's manufacturing industry is particularly sensitive to the state's shortage of high-skilled workers and the high workforce costs associated with retraining and relocating workers. Stakeholders noted that it is difficult to recruit

senior management and workers to Nevada for mining industry, especially with the lack of worker housing near mining operations, as well as the low quality of K-12 education for children of employees.

Limited water resources. Nevada is one of the most arid U.S. states, and its constrained water resources make Nevada an unattractive location for many water-intensive manufacturing operations, such as food processing and mineral refining. Entities across the state face a myriad of technical, regulatory, and legal hurdles in the effort to secure water resources.

Bottom Line:

The Mining, Materials, and Manufacturing industry is a strategic opportunity for Nevada since the state leads the nation in gold production and a large amount of other minerals that feed into manufacturing and defense-related industries. Nevada has a strong geosciences knowledge base giving it a solid foundation for innovation in the industry. Nevada also has key strengths in manufacturing of gaming-related products, food processing, metals, and plastics.

6. Logistics and Operations

Logistics and Operations encompasses logistics, distribution, transportation, and related manufacturing operations. This industry exists across both Northern and Southern Nevada, although there are some significant differences across the two regions in terms of available infrastructure and industry critical mass and momentum. Northern Nevada's critical mass and competitive advantage in these segments is evident in the wide range of national-name logistics/distribution companies that have already set up operations in the region. Linked with these activities are a number of assembly-based and light manufacturing operations that have also set up facilities in Northern Nevada, primarily to serve as a West Coast hub and take advantage of the region's strong distribution and transportation network. In Southern Nevada, the industry is much more dominated by activities related to the region's tourism industry. A large share of Southern Nevada's growth and activities in warehousing, distribution, logistics, and freight transport are also very much linked to the Tourism and Gaming industry (bringing in the food and other goods that are demanded by tourism and hospitality businesses). There are also, however, a growing number of "export-oriented" distribution, warehousing, and logistics companies in Southern Nevada.

Target Opportunities:

Nevada's main opportunity in this industry is to attract a wide range of warehousing, distribution, and manufacturing operations that are seeking a West Coast hub of operations. Nevada can especially compete against California and other neighboring states to attract these operations because of the available infrastructure, lower costs and regulatory hurdles, lower congestion, and overall ease of doing business.

Warehousing and Distribution. Operations serving a broad range of goods/industries could locate in Nevada, but particular opportunities may include warehousing/distribution operations for e-commerce/retail fulfillment, chemicals, electronics, pharmaceuticals/medical equipment, and food/agricultural products (especially linking in with Northern California's agriculture industry). Essentially, any company looking for a West Coast distribution hub to serve the broad Western U.S. market could be a potential target.

Logistics and Operations

Target Opportunities

The overarching opportunity is to serve as a West Coast hub of operations for the following segments:

- Warehousing and distribution
- Advanced logistics
- Air cargo
- Integrated manufacturing-distribution, assembly manufacturing, and food processing operations

Industry Advantages and Business Case

- Locational and geographic advantages, including easy access major West Coast markets
- Strong existing infrastructure, including airports, road and rail connections, and available land for industrial/warehouse space
- Cost and regulatory advantages

Industry Constraints

- Workforce availability is weaker at higher skill level
- Need to improve business retention and expansion support for companies investing in Nevada
- High energy costs and water availability issues

Advanced Logistics. These include a wide range of companies that focus on logistics and distribution services, such as freight forwarders, third-party logistics providers (3PL), supply chain management/consultants, etc. Northern Nevada has especially seen a lot of recent growth in this segment, and growth opportunities will continue as the broader air cargo, warehousing/distribution, and manufacturing industry expands in the region.

Air Cargo. There is a strong opportunity in Northern Nevada to expand the amount of air cargo throughput at the Reno-Tahoe International Airport, and especially to position the region as a strong alternative West Coast air cargo hub to Los Angeles, as Reno's airport is significantly less congested, costly, and bureaucratic. The Reno-Tahoe Airport also has potential to attract an increasing amount of international air cargo from China, especially as a gateway for goods moving from China through the United States to South America (because planes must stop for fuel along this route). Excellent air cargo opportunities also exist in Southern Nevada, although until recently the emphasis on passenger traffic at McCarran Airport has been so strong that there has been little interest among airport officials in expanding or dedicating any extra space for air cargo flights (however, capacity to expand these operations certainly exists if regional stakeholders build momentum and interest in this sector). In the near term, the strongest opportunity at McCarran Airport is to expand the amount of small cargo packages being carried in passenger planes. With every new international passenger connection at McCarran, capacity to carry international air cargo in the belly of planes also expands (without competing with the airport's passenger focus). Given the high volume of passenger flights in/out of McCarran, Southern Nevada could also be attractive for distribution companies that bring in freight over land and then ship out small packages by air (for example, e-commerce fulfillment companies).

Integrated Manufacturing-Distribution, Assembly Manufacturing Operations, and Food Processing. An additional opportunity emphasized by stakeholders in Northern Nevada is that a wide range of manufacturing and assembly operations could potentially be attracted to the region based on the same advantages that serve the logistics/distribution segment. Manufacturing companies that have integrated supply chains, with manufacturing and distribution functions conducted within a single facility, would be good targets because they largely depend on the same locational advantages and networks as standalone distribution operations. Assembly/kitting-type manufacturing are a possible target, as these firms depend on a streamlined transportation and distribution infrastructure to bring in components, assemble them, and ship them out again. Another possible related target would be food processing operations, especially linked with the large Northern California agricultural industry, as well as Nevada's agricultural industry (although the fact that many food processing operations are heavy water users could pose challenges for attracting large-scale operations of this nature).

Freight Transportation (ground and rail). The transportation segment is essentially a downstream opportunity from the other segments listed above. As distribution, air cargo, and manufacturing operations grow and expand in Nevada, the transportation businesses serving these operations will also grow.

Industry Constraints:

Workforce availability is weaker at higher skill levels. Workforce availability and skills for distribution, logistics, and related manufacturing operations are generally considered to be quite good in Nevada, and firms investing in the state are generally able to find the workers they need (unless they are looking for hundreds of new employees at one time, which could be a challenge). As Nevada moves into higher-end manufacturing, though, higher-skill labor will be needed, and these workers are generally less available locally.

Need to improve business retention and expansion support for companies investing in Nevada. Nevada does not always do a good job retaining distribution, warehousing, and related manufacturing facilities after investments are made (although sometimes these closures are due to broader market pressures, cost cutting, and consolidation efforts). It may be wise to step up follow-up efforts with firms to ensure that the companies that do invest in Nevada have the conditions and operating environment they need to stay and grow in the state. In cases where such firms are encountering cost pressures, perhaps proactive efforts could be made to address these concerns head on rather than losing these jobs and companies.

High energy costs and water availability issues. While the infrastructure and cost environment for these firms is overall quite good in Nevada, two possible areas of concern are Nevada's relatively high energy costs (which can be important for manufacturing operations) and water availability issues (which are important for manufacturing activities that require high water usage, such as many types of food processing).

Bottom Line:

Nevada can be a western hub of transport and operations—an inland port—because of its locational and geographic advantage of having the transportation infrastructure for reaching the entire West Coast by air and ground. There is a strong existing infrastructure both in Northern and Southern Nevada for a wide range of distribution, logistics, and related manufacturing operations, as well as for air cargo and passenger transportation, with significant cost and regulatory advantages vis-à-vis neighboring states.

7. Aerospace and Defense

The Aerospace and Defense (A&D) industry holds high potential for Nevada because of the state's existing base of defense expertise, its established testing and training infrastructure, and its geographic characteristics that enable extensive testing operations. Nevada's A&D industry has traditionally focused more on testing and support operations than on weapons and systems manufacture. The state's support operations have served to attract branches of larger systems integrators, though, and companies such as Boeing have benefitted from the state's testing infrastructure. Nevada's test ranges host specialized testing and training activities for unmanned aerial vehicle (UAV) platforms. The Aerospace and Defense industry has potential to play a significant role in Nevada's future.

Target Opportunities:

Unmanned Aerial Vehicle (UAV) Supply, Assembly, and Testing. Unmanned systems are next-generation technologies emerging in the aerospace field, with applications in the military and also for police and border patrols and for search-and-rescue operations. The United States alone is planning to spend just under $4 billion each year through 2013 on the development, procurement, and operation of UAVs, and worldwide UAV expenditures are expected to more than double over the next 10 years.[34] Many of the U.S. systems will be tested on Nevada ranges, and industry stakeholders indicated that there is an opportunity for businesses in Nevada to partner in the development and assembly of UAVs, and to participate in supplying and maintaining the ranges and the sensors with which they are tested. This opportunity dovetails well with the advanced composite materials opportunity described in the Mining, Materials, and Manufacturing industry section. The use of advanced composite materials in UAVs helps to decrease vehicle weight and increase fuel efficiency. Unmanned Aerial Systems, Inc. (UAS) of Las Vegas builds the Nightwind 2 aircraft, a blended wing aircraft with 100 percent composite construction.[35]

Aerospace and Defense

Target Opportunities

- Unmanned Aerial Vehicle (UAV) supply, assembly, and testing
- Maintenance, Repair and Overhaul (MRO) of aircraft systems

Industry Advantages and Business Case

- Existing base of defense expertise
- Existing test ranges and infrastructure required to test aerospace systems
- Nevada's geography and low population density are well suited for A&D system testing

Industry Constraints

- Tough competition from established, larger defense contractors
- Limited collaboration amongst A&D companies, or with Nevada universities, on workforce training and research
- Tax-related barriers for aircraft and components

Maintenance, Repair and Overhaul (MRO) of Aircraft Systems. Though aircraft MRO is a mature industry, the back-shop maintenance of flight and navigation systems is a growth opportunity for Nevada, since the developmental aircraft tested on Nevada's ranges will require specialized (typically) on-site services. These activities include maintenance and repair, overhaul of aircraft and aircraft parts, inspection and testing, and sourcing of parts and supplies. Nevada already has some activity in this area;

for example, Chromalloy's Carson City facility builds, repairs, and provides parts and coatings for aircraft engines used in the defense industry.[36]

Industry Constraints:

Competing with larger defense contractors is difficult. Industry stakeholders reported that several larger defense contractors have cut or withdrawn their Nevada operations, and that many of Nevada's homegrown defense companies are small businesses that have trouble competing with major defense contractors.

Little collaboration takes place among A&D companies, or with Nevada universities. Industry stakeholders indicated that the secretive nature of A&D development frequently prevents companies in Nevada from teaming together or from sharing knowledge or resources on projects. Stakeholders also cited a low level of interaction between A&D developers and universities in Nevada.

Tax-related barriers for aircraft and components. Although Nevada's tax structure is generally considered to be quite business friendly, some aircraft/aerospace-related manufacturing operations (e.g., aircraft manufacturing, maintenance/repair/overhaul) have found that sales and use tax-related costs for new operations that require a high level of capital investment can actually be quite high. Once an operation is up-and-running, the tax climate is favorable, but the initial start-up costs related to these taxes can be a barrier for these firms. Nevada does have a sales and use tax abatement program, but it does not apply to aircraft and aircraft components, so further development of this segment could be inhibited by this barrier.

Bottom Line:

Nevada can play a significant role in the Aerospace and Defense industry because there is a large base of defense expertise. The state has a geography and low population density that is ideal for testing hazardous A&D systems and already has existing test ranges and the infrastructure that is required to test aerospace systems.

The target industries hold out varied time horizons for employment impact and occur in different mixes in the state's regions

The seven major industries and the 30 sub-sector opportunities named in this chapter hold solid prospects for accelerating the growth of Nevada's next economy. However, these industries will not yield growth on the same timetable and do not occur evenly across the state. The map below shows the current concentration of the target industries across Nevada's three regions—Northern Nevada, Southern Nevada, and Rural Nevada. As shown on the map and in the location quotient numbers, each region has its own unique concentrations of industry strengths and assets to build upon. Understanding the regions' diverse industry mixes will therefore be important as state and regional leaders move to craft interventions and leverage regional concentration into state gain.

Particular industry strengths and recommended industry development focuses within each of the three regions are discussed further below. The recommendation of these regional industry focuses does not exclude the potential development of other sectors and opportunities, but flows from a realistic assessment of where Brookings-SRI believes the best near-term and future prospects reside regionally, drawing upon existing industry and sub-sector strengths/weaknesses, assets, opportunities, and momentum in each region.

Northern Nevada

Northern Nevada has large concentrations of expertise and existing firms (and/or strong potential for industry growth and development) in the following target industries:

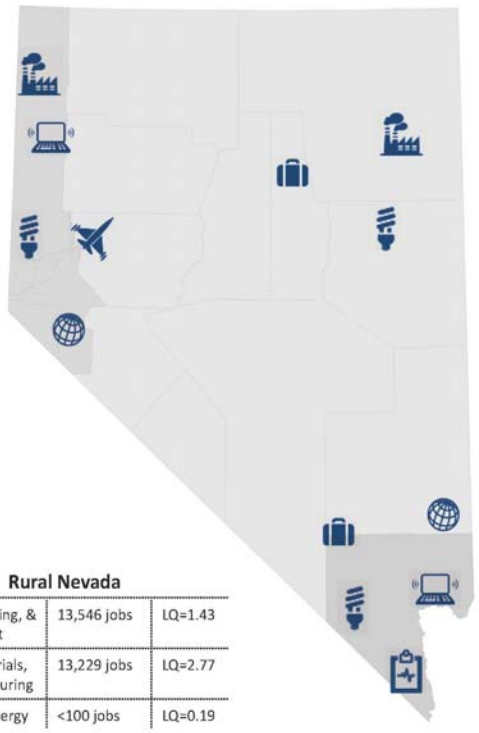
- **Clean Energy:** Nevada already enjoys preeminence as the epicenter of geothermal energy development in the country. The state has the second highest installed geothermal capacity (behind California) and is set to surpass California in installed geothermal capacity in the near future; most of these plants are based around the Reno area. With additional focus on developing the geothermal value chain (e.g., exploration equipment, drilling equipment, drill operation, pumps, pipes, heat exchangers, and other segments), Northern Nevada has the opportunity to become the knowledge center for the global geothermal industry, and also to become a source for drilling equipment, expertise, design, and manufacture.

- **Mining, Materials, and Manufacturing:** Northern Nevada has the highest concentration of manufacturing companies in Nevada, with established strengths in areas related to metalworking, plastics, and other materials as well as electronics/medical equipment manufacturing and industrial/commercial equipment. The region's manufacturing industry is currently small and fragmented, with many disconnected small companies and pockets of strengths that are not widely known about (even within the state). Stepped up support for, and organization of, the region's manufacturing industry could help the industry grow by tapping into opportunities in broader national/global supply chains, expanding into higher-growth/higher-tech manufacturing opportunities (such as advanced composite materials), and building off of manufacturing linkages with other key industries in the state (including mining, energy, logistics/distribution, tourism/gaming, construction, and agricultural sectors).

- **Logistics and Operations:** Northern Nevada has an established and growing critical mass and competitive advantage in logistics, distribution, and transportation, as evidenced by the wide range of national-name logistics/distribution companies that have already set up operations in the region. Linked with these activities are a number of assembly-based and light manufacturing operations that have also set up facilities in Northern Nevada, primarily to serve as a West Coast hub and take advantage of the region's strong distribution and transportation network. The region has strong near-term opportunities to build on this momentum and existing infrastructure/assets to continue to attract investment and expand this industry, with a wide range of opportunities related to logistics, distribution, air cargo, assembly/kitting-based manufacturing, food processing, and related activities.

- **Aerospace and Defense:** While A&D-related assets and activities exist throughout Nevada (and many testing facilities are located in Southern Nevada), particular opportunities to develop this industry reside in Northern Nevada because the region is home to about 75 percent of the state's A&D manufacturing activities and many of the state's larger and most innovative A&D companies. A key opportunity is to focus on niche areas of technology and services to complement and expand the defense-related activities that already exist in the state, especially an activities such as unmanned aerial vehicles (UAV) supply, assembly, and testing as well as maintenance, repair, and overhaul (MRO) of aircraft systems.

Figure 3. Industry Opportunities in Nevada's Regions



Rural Nevada

Tourism, Gaming, & Entertainment	13,546 jobs	LQ=1.43
Mining, Materials, and Manufacturing	13,229 jobs	LQ=2.77
Renewable Energy	<100 jobs	LQ=0.19

Northern Nevada

Logistics & Operations	23,913 jobs	LQ=1.13
Mining, Materials, and Manufacturing	16,130 jobs	LQ=0.96
IT & Business Ecosystems	14,160 jobs	LQ=0.93
Aerospace & Defense	1,921 jobs	LQ=0.37
Renewable Energy	539 jobs	LQ=1.99

Southern Nevada

Tourism, Gaming, & Entertainment	291,626 jobs	LQ=2.81
Health & Medical Services	59,794 jobs	LQ=0.64
Logistics & Operations	57,301 jobs	LQ=0.87
IT & Business Ecosystems	34,943 jobs	LQ=0.74
Renewable Energy	1,148 jobs	LQ=1.36

Note: Location quotients (LQ) are ratios that compare the concentration of employment in a defined region (i.e., Northern, Southern, and rural Nevada) to that of the national industry employment base.

- **Business IT Ecosystems:** Northern Nevada possesses a very high concentration of call center/customer service and e-commerce-related companies, as well as a solid and growing base of activities in back office/business process outsourcing and other IT-related companies. The region can build on its existing assets in the near-term to continue to attract companies and expand employment in a wide range of business services and back office activities (with a particular focus on pushing these activities into higher-value/higher-skill niches) while also seeking to attract more IT-based activities such as e-commerce operations and data centers.

Southern Nevada

The Southern Nevada region retains large concentrations of expertise and existing firms (and/or strong potential for industry growth and development) in the following target industries:

- **Tourism, Gaming, and Entertainment**: Las Vegas remains the epicenter of Nevada's tourism, gaming, and entertainment sectors as well as an established global hub for the gaming industry. For this reason the sector stands out as a logical target for the region to support both job creation and diversification aims. Recommended focuses in areas such as online gaming, becoming an intellectual capital of global gaming, film/media, niche tourism (especially culinary tourism), and retirees/second homes can support the longer-term diversification of the region's existing industry into new higher-value activities and higher-skill jobs.

- **Business IT Ecosystems**: Las Vegas already has an established and growing base of business services activities, and is also home to world-class (but little known) technology assets—most notably the Switch SuperNAP (possibly the most advanced and well-connected data center in the world), as well as the headquarters of Zappos.com. Opportunities exist to build on these assets by continuing to expand back office and call center activities (and pushing these sectors into higher-value/higher-skill niches) while simultaneously pursing longer-term development of IT-based activities that could include e-commerce headquarters, cloud/high-performance computing, and cyber security. By expanding and marketing existing IT assets, over time Las Vegas could position itself as the country's "cloud city" with a sophisticated ecosystem of firms conducting high-end data- and technology-intensive activities.

- **Health and Medical Services**: The Health and Medical Services industry is critical for all regions of the state, but is especially critical to the Southern Nevada region due to the concentration of population in the Las Vegas metro area. The health/medical industry in Southern Nevada is inadequate to meet the needs of the existing population and to support attraction of the higher-skilled workers that will be needed for developing the region's future target industries. Expansion of service availability and quality is needed in many facets of the region's health/medical industry, with particular opportunities to expand surgical care and specialties, geriatric specialties, and the training/availability of highly-skilled doctors and medical personnel at all levels.

- **Clean Energy**: Southern Nevada has well-established strengths in the solar and hydropower segments of clean energy. The region is among the best places in the country to harness solar energy; the state ranks second in the nation (after California) in installed solar capacity and is home to the world's largest concentrating solar plant, as well as the nation's largest operating solar photovoltaic plant. In addition to the continued expansion of such facilities, regional opportunities also exist in areas such as increasing the manufacture/design of renewable energy

systems and components, expanding transmission capacity to supply the California market, and attracting additional foreign investment into the sector.

- **Logistics and Operations:** Southern Nevada already has solid infrastructure and assets in place to potentially attract and expand activities related to distribution, logistics, transportation, and air cargo – with the aim of serving as a West Coast hub of operations for such activities. Due to the region's traditional focus on tourism, gaming, and other service-based activities, this industry does not yet have a widespread degree of momentum and support from regional stakeholders for its development beyond its role in serving passenger and tourism-related functions. As such, this opportunity is more likely to be a longer-term target (as compared to the industries described above), but the necessary pieces are in place for industry development if desired by the region. In the near-term, strong opportunity exists to attract distribution centers that can tap into the excess outgoing capacity in the belly of passenger planes (for small packages) and outgoing freight trucks (which often return from Las Vegas to their origins empty)

Rural Nevada

Rural Nevada has large concentrations of expertise and existing firms (and/or strong potential for industry growth and development) in the following target industries:

- **Mining, Materials, and Manufacturing:** Rural Nevada has one of the highest concentrations of mining activity in the country, but has little related downstream processing and manufacturing activity from the high-value minerals that are extracted. The region can seek to expand upstream activities in the mining value chain (e.g., exploration and mine-site services) in order to reap greater benefits from its existing mining activities. Another key opportunity in this industry is to expand the extraction and upstream/downstream supply chain for medium-value minerals (such as lithium, boron, and vanadium), as these materials are abundant in Nevada and could have development linkages with the clean energy industry.

- **Tourism, Gaming, and Entertainment:** Nevada's natural landscape is a tremendous asset for outdoor/adventure tourism. There are numerous national parks, conservation areas, and scenic destinations that offer opportunities for skiing, hiking, rock climbing, boating, and wildlife-watching. Some of these destinations are widely known while others remain hidden gems. Rural Nevada stands to benefit from the expansion of the rural/outdoor segment of the tourism market, and there are many opportunities to leverage the visitor traffic to Las Vegas and Reno to promote these destinations.

- **Clean Energy:** While the larger renewable energy generation facilities will be located near metropolitan population centers, there is also an opportunity to develop off-the-grid renewable installations that provide power to smaller settlements in rural regions of Nevada. In particular, the residential developments for employees of the mining industry might be served by moderate-sized wind and solar power facilities. Most of Nevada's wind resource is also located in rural areas, but this segment of the clean energy is in a more nascent stage of development, and the level of investment to develop and link these resources to the larger electric grid would be significant.

* * *

Additional Industry Opportunities

One final observation: It bears noting that the Nevada economy is swirling, complex, and varied, and that not all of its growth potential resides within the discreet target industries and segments focused on within this analysis. Other industries and segments may also contain, or see emerge, high-potential activity centers, and so the state should—while focusing its efforts on the target industries—remain open to new developments and fact-based business proposals about them. Most notably, at least three areas of economic activity outside of the seven priority industries merit additional mention right now:

Agriculture and Food Processing. Agriculture and Food Processing remains a very small industry in the state of Nevada (representing less than 1 percent of the state's jobs, or 13,593 workers). However, the industry retains considerable strategic importance to the rural areas of the state. Around 4,100 people in Rural Nevada work in Agriculture and Food Processing (4.4 percent of all rural employment). The majority of these jobs reside in primary agriculture (crop and animal production and related supporting functions), and this segment is very highly concentrated in rural Nevada (rural LQ=2.167). On the other hand, the majority of the state's jobs and companies in food processing are located in Northern and Southern Nevada, but this segment represents only about 4,800 jobs statewide and has a very low concentration in Nevada relative to the national average (state LQ=0.304).[37] Nevada exported just under $19 million in agricultural and livestock products in 2010, and these exports have doubled over the last five years, but Nevada still ranks 49th in the nation for its level of agricultural/livestock exports. Nevada's manufactured food exports were just under $60 million in 2010 (more than triple their 2005 levels), and Nevada also ranks in the bottom ten of all state for these exports.[38]

Employment in Nevada's primary agriculture segment has been declining over the last five years during the recession, but a small positive growth rate is projected in rural Nevada over the next five years (+0.31 percent CAGR from 2011-2016).[39] Range livestock production (cattle and sheep ranches, as well as dairies) has historically been the largest component of Nevada's agriculture industry, but this segment has been in decline over the last several decades (primarily due to federal regulations on grazing and water easements), and headcounts for cattle and sheep are now at a fraction of their peak levels historically. Revival of this traditional industry in Nevada could create jobs and income in rural areas, and according to local stakeholders, could also have positive impacts on wildlife populations, water yields from watersheds that supply irrigation and recharge aquifers, and other benefits. This industry may also benefit from the growing market interest in sustainably-, organically-, and locally-produced meat. On the other hand, local stakeholders also see potential to attract additional large feedlot, poultry, and slaughtering operations to Nevada, especially by attracting relocations from California (due to land constraints and regulatory pressures there).

In terms of crop production, leading cash crops in Nevada currently include hay (mainly alfalfa hay), potatoes, and wheat, along with oats and fruits and vegetables on a smaller scale.[40] According to local stakeholders, future growth opportunities exist in a wide range of crops, including alfalfa, potatoes, lettuce, biofuel crops, and niche crops (such as teff). A small but growing number of individuals are engaging in specialty crop operations in Nevada, with an estimated 150 or more specialty producers statewide in 2008 – primarily selling their products through farmers markets, roadside stands, and

community-sponsored agriculture projects. A key future consideration for Nevada's crop industry will be focusing on lower-water-use crops, to account for the state's arid environment.

In contrast to primary agriculture, food processing has maintained positive job growth trends in Nevada (+0.61 percent CAGR statewide from 2006-2011) even during the recession when the industry was shrinking nationally, and this segment has solid growth projections in the coming years in both Northern and Southern Nevada (+2.07 percent CAGR in the North and +1.37 percent CAGR in the South from 2011-2016). Nevada's current food processing employment is primarily in segments related to bakeries, dairy-related manufacturing (ice cream and frozen desserts, fluid milk manufacturing), perishable prepared foods and frozen specialty foods, coffee and tea manufacturing, and confectionary manufacturing from chocolate.[41] The food processing segment is closely linked with serving the state's large tourism/hospitality/gaming industry, as well as with processing the crops and animal products that are actually grown in Nevada. Nevada's assets and advantages for food processing are very much linked to its broader distribution, logistics, and assembly-based manufacturing industry – including excellent access to regional West Coast markets, strong transportation and distribution infrastructure, and cost and regulatory advantages. For this reason, food processing has already been highlighted as an opportunity in this report, within the context of the Logistics and Operations target industry. Particular opportunities may exist to tap into the large agricultural market in neighboring California. As with other segments of Nevada's agriculture industry, attention would need to be paid to seek out food processing operations that do not require heavy water usage.

Water and "water tech." Nevada is well-positioned to develop its water industry, given its local expertise and the constraints on water resources that exist in some areas of the state. Water-related industries involve the products and technologies used to test, treat, transport, and supply water. According to the Pacific Institute, water-related industries are growing at a rate of 3 to 4 percent per year.

With a hydrologic sciences division and its own data-gathering research vessel, the DRI has the capacity to study and advance water technologies. DRI has the second-highest institutional concentration of hydrologists and related geo-hydrological experts in the United States (second to the U.S. Geological Service). UNLV has a Master's program of study in Water Resources Management that trains students to enter the water industry, and the Southern Nevada Water Authority has deep expertise in water testing, treatment, and delivery. Nevada researchers produced 95 scientific publications on the topic of "water resources" in 2009-2010, and Nevada has a very high concentration of publishing activity in this field (location quotient, or LQ, of 5.03) as compared to the national average. The majority of these publications were in the Las Vegas metro area, and this region alone produces 1.44 percent of all U.S. water publications, far higher than would be expected given its size. A number of companies with water-related activities have offices in Nevada, and it would be advantageous for the state to leverage its local expertise to inventory its water and "water tech" holdings and explore whether to actively build an industry cluster around water technology.

Financial and "Intangible" Enterprises. A recent stakeholder-driven effort in Nevada has identified a relatively large category of businesses in Nevada that are being defined as "intangible" enterprises—essentially, enterprises that can conduct business from virtually any physical location and can relocate at will. These businesses would typically be very small operations (sole proprietorships, partnerships) but would generally represent knowledge-based, highly-skilled, and high-paying activities—in particular, finance-related operations (e.g., investment management, investment pools and hedge funds, mutual funds, securities/insurance brokerage, financial advising); intellectual property management; professional and consulting services; professional arts/sports agents, managers, and promoters; trade brokers; and

other similar activities. Other larger operations might include industrial banks, captive banks, financing companies, and holding companies. Nevada currently has very high concentrations of employment in a number of these kinds of activities, including: trusts, estates, and agency accounts (LQ=6.917); insurance funds (LQ=4.935); health and welfare funds (LQ=4.118); miscellaneous intermediation (e.g., investment clubs, royalty dealing, etc., LQ=3.818); and promoters of performing arts, sports, and similar events (LQ=2.342).[42]

These kinds of enterprises generally require no infrastructure other than office space and basic utilities, and they may be a good fit for Nevada because of its large inventory of vacant office space (at favorable rates); the state's overall low taxes and business-friendly regulatory climate would also be an attraction. Financial and Intangible Assets Enterprises of Nevada (FIAE) has recently been set up as a non-profit corporation to advocate for this industry and recruit additional businesses to the state. Care should be taken in promoting this sector to ensure that the businesses being supported are enterprises that are actually physically located and conducting real business in Nevada, rather than shell companies or businesses that are just registered in Nevada for the tax benefits.

IV. Unify | Regionalize | Diversify: An Approach to Growing the Next Nevada Economy

Nevada has intriguing assets, a compelling set of industry development opportunities, and a visible path forward. The time has come, therefore, for the state to move aggressively to restore growth, catalyze innovation in core and emerging industries, and so diversify its economy in order to foster a more sustainable prosperity.

However, in order to do that the state needs to reboot, as was recognized with the passage this year of AB 449.

Which is to say: Nevada needs to modernize and bolster its economic development system and do so by developing a more organized and cohesive state and regional approach.

Such a new approach should improve on the relatively passive efforts of the recent past by applying relevant best practices. Along these lines, Nevada—in line with the new logic of development world-wide—should install a new, integrated operating model for economic development in the state; regionalize its efforts in new ways; and set a platform for sustainable economic growth through innovation, global engagement, and human capital development.

Along these lines, this chapter observes that:

- Years of automatic growth have left the state with a weak and passive economic development system
- Current best practices suggest the outlines of a more effective approach
- Nevada should embrace a new economic development model in which the state at once leads and empowers its regions while setting a state-wide platform for innovation-driven growth

Years of automatic growth have left the state with a weak and passive economic development system

The need to modernize the state's economic development system flows not only from the urgency of the present economic challenges but also from the weakness of the system currently available for addressing them.

It goes without saying that the sheer scale of the dislocations caused by the Great Recession has made it imperative for the state to locate new pillars of growth.

At the same time, though, the need to act has exposed the inadequacies of the state's diffuse recent efforts at improving the state's economic standing, the relative thinness of which almost certainly owes to habits and priorities reinforced by the state's incredible recent booms. After all, massive growth in the gaming and construction industries has in most years seemed to make it unnecessary to develop a cohesive economic development system.

But at any rate, the state's historically passive approach to economic development has left the state facing the present moment without key elements of an effective development presence.

Most crucially, the drift licensed by easy past growth has at once fragmented the state's economic development efforts and stunted efforts at diversification.

On the one hand, years of automatic 4 to 5 percent average growth engendered a laissez-faire rather than a cohesive or disciplined approach to economic development that has led to disunity and incoherence:

- Going back decades the state has lacked an overarching strategy for growth and economic diversification

- A general absence of quality information—and basic performance management—has allowed the combined state-local system to drift

- Drift, meanwhile, has led to fragmentation, since at least in the two largest regions funding has typically been allocated to regional development authorities (RDAs) through automatic transfers rather than on the basis of performance criteria. This high degree of autonomy in the absence of a statewide strategy has resulted in a proliferation of disparate visions, missions, and approaches among state and regional development actors that many officials say has undercut focused collaboration[1]

- And for that matter the critical foundational role of investments in university knowledge enterprises in economic development has been lacking. As concluded the recent "Silver Spark for Nevada" report by NIREC, "Innovation efforts in Nevada … remain fractured and underfunded."[2] A case in point: State and local government R&D funding at Nevada's universities and research institutions by the state and local government, at $4.13 per capita in 2009, lagged significantly below the U.S. average of $11.89 and left Nevada among the bottom five U.S. states.[3]

At the same time, years of easy, migration-driven growth likewise appear to have stunted the state's economic diversification efforts and diverted attention from needed efforts to foster the emergence of new firms and industries:

- The dedicated state economic development budget—even including FY 2012 budget increases that bring total outlay to roughly $7.5 million (of which some $3 million is conveyed to the state's regional partners)—remains modest in comparison to that of other states.[4] A 50-state review of total expenditure on a broader range of economic development-related activities prepared by c2er notes that Nevada ranks just 36th in the nation in per capita terms, spending around $21 per resident. By contrast, the average U.S. state spends $29 per capita and nearby states like Utah and Colorado spend $58 and $37 on economic development-related activities per person.[5]

- Economic "diversification" work in Nevada has typically meant enticing businesses to relocate to Nevada rather than helping home-grown and existing businesses and industry clusters to expand

- Regional development efforts have frequently focused heavily on Nevada's low taxes and business-friendly environment rather than around efforts to build the state's skills base and leverage in-state innovation into sustainable growth and new industries

In short, notwithstanding the earnest work of numerous dedicated professionals all over the state, Nevada's overall economic development effort in recent years must be judged as largely ad hoc and diffuse—without an overarching strategy or strong leadership; light on accountability; fragmented and parochial; and negligent about the critical role university- and private-sector-based innovation plays in regional and state economic development.

Current best practices suggest the outlines of a more effective approach

And yet, the outlines of reform are discernable. Current best practices around the nation and the world suggest them. So does AB 449 itself.

AB 449, to begin with, has already begun to address some of the shortcomings of Nevada's economic development approach with its location of a new Cabinet-level development director and office in the governor's office; call for the preparation of an official state economic development plan; its modest resource increases; and its supervision of the production of outside research and best practices work, such as this report.

At the same time, a significant body of regional, state, national, and global economic development practice increasingly points in a discrete number of key directions when it comes to the design of effective economic development systems.

Most notably, the sharpening need for both centralized leadership and decentralized problem-solving to cope with the big problems and the fast-moving challenges and opportunities that characterize state and regional economies has been driving the emergence of a distinctive 21st century style of state development practice.[6]

Most notably, states have been experimenting with simultaneously "tight" and "loose" forms of management that seek to maintain state leadership while devolving significant authority to regions—the real engines of growth—and working to set a sound platform for growth. (See Figure 1).

Multiple trends can be observed in current best practices:

- The central role of state government in economic development persists but it is increasingly being focused on system-setting and "enterprise management." Frequent activities include: setting strategy and direction; approving local partners' goals and monitoring progress; and performance management, often through the provision of top-quality information and knowledge- and best-practice exchange.[7] Exemplifying the new style of "enterprise leadership" are governors in states as diverse as Massachusetts, Nebraska, and Utah who have all personally advanced major new

development strategies. For her part Washington Gov. Christine Gregoire immersed her government in a performance management system aimed at holding state agencies directly accountable for achieving results[8]

Figure 1. State Economic Development Best Practice		
State	**Initiative**	**Description**
Provide Strong "Enterprise Leadership"		
Massachusetts	Powering High-Technology Growth	Under Gov. Patrick's leadership, MA has created targeted initiatives that play to the unique strengths that have made MA a leader in biotechnology, IT, and clean energy. Among his initiatives are a 10-year, $1 billion program to promote the state's life sciences industry, the Green Communities Act for greater investment in energy efficiency, and support for the nation's first off-shore wind farm.[9]
Nebraska	A Competitive Advantage Assessment and Strategy for Nebraska	During Gov. Heineman's tenure, NE has undertaken a detailed assessment process with other statewide stakeholders to understand NE's strengths and competitive advantages and offer ideas for accelerating new economy innovation across the state. The governor's Talent and Innovation Initiative is especially geared toward business innovation and workforce recruitment strategies.[10]
Utah	Utah Science, Technology and Research (USTAR); Cluster Accelerator Partnership (UCAP)	Under Gov. Herbert's leadership, UT has addressed its economic development priorities through programs like USTAR, which focuses on research and developing new technologies to transfer into the marketplace, and UCAP, which aligns the activities of universities with the economic needs of the state.[11]
Support Bottom-Up Sector Strategies		
Colorado	Colorado Blueprint: A Bottom-Up Approach to Economic Development	Created a new statewide economic development strategy that facilitates regional strategic plans and emphasizes creation of industry clusters to better focus efforts on growing jobs in CO. Based on local and regional input, six focus areas have been identified to promote economic development, with specific goals identified for each region.[12]
New York	Open for Business: A New State Government Approach to Economic Development	Created 10 Regional Councils (RC) across the state, moving from a top-down development model to region-based approach emphasizing each region's unique assets, harnessing local expertise, and empowering regions to set plans and priorities. RCs can apply for $1 billion in state funding for projects through a Consolidated Funding Application that combines resources from dozens of existing programs.[13]
Tennessee	Jobs4TN	Established "Jobs Base Camps" in nine regions across the state that will work with local partners to develop and/or revise regional economic development plans and align federal and state resources around those plans. Recruitment efforts target six clusters in which the state has a competitive advantage.[14]

Set a Platform for Higher-Value Growth		
Innovation and Commercialization		
Georgia	Georgia Research Alliance	A 20-year nationally recognized partnership among research universities, industry, and government that helps universities recruit world-renowned scientists, serves as a catalyst for creating collaborative centers of research excellence, invests in university research infrastructure and technology, and helps launch new companies.[15]
Ohio	Ohio Third Frontier	A 10 year-old initiative with focus on expanding the availability of investment capital needed to form new companies, supporting product innovation in established companies, facilitating commercialization of new products, funding collaborative projects between private companies and OH universities, and nurturing OH's pool of entrepreneurial management.[16]
Washington	Innovate Washington	A new technology-based economic development agency that pursues a statewide mission to examine areas of expertise in the state and ramp them up to compete globally, assist technology companies across the state with their commercialization needs, and optimize the delivery of technology transfer between research institutions and businesses.[17]
Global Engagement		
Florida	Florida Trade Partners Alliance	A unique statewide alliance spearheaded by Enterprise Florida to integrate the export promotion activities offered to FL's exporters. The partnership combines different organizations' strengths, non-confidential databases, and information resources, and coordinates the events and marketing services of its partners.[18]
Pennsylvania	Envoy Program	Designed to increase PA companies' global competitiveness by providing them with PA Department of Community and Economic Development-supported envoy services. Envoy services vary but include country-based specialists who implement each company's sales plan, pursue leads, and develop a customer base.[19]
Washington	Washington Export Initiative	Enhances WA-based companies' export capacity through data analysis, training, and buyer matchmaking and engages a multitude of public and private organizations involved in export promotion and economic development in the state and at the federal level. Increased agricultural exports, greater foreign student enrollment in state universities, more governor-led trade missions, and improved engagement with the federal government are other goals.[20]

Higher Education and Workforce Development		
Georgia	Intellectual Capital Partnership Program	Connects the intellectual resources of GA's 35 public colleges and universities to the state's business community in innovative ways. Among the services offered are GeorgiaHire, a free online recruiting tool that matches employers with college-educated employees, and ICAPP Advantage, which allows a company and a learning institution to together design a curriculum that fulfills the company's hiring needs.[21]
North Carolina	UNC Tomorrow	An extensive planning process to develop a vision and strategy for increasing the 17 campus-University of North Carolina system's role in economic development. Currently, the UNC system and its individual colleges are reviewing missions and operations and preparing plans on how UNC will "reposition" itself to be actively engaged in advancing the economic transformation of the state's regions.[22]
Ohio	Ohio Skills Bank	Compares regionally distilled Bureau of Labor Statistics data and other regionally validated employer data on occupational demand against program completion data from the region's postsecondary institutions. If workforce shortages are predicted, OSB works with employers to develop strategic and tactical approaches to meet demand in a timely manner.[23]

- Top-down state systems, meanwhile, are giving way to decentralized, "federated" systems that seek to leverage "bottom-up" initiative at the regional level and build in space for on-the-ground responsiveness and problem-solving.[24] Most notably, new governors in Colorado, Michigan, New York, and Tennessee have all moved decisively in the last year to empower regions to chart their own course for economic development[25]

- And at the same time states have in recent years been paying extensive attention to such critical market-shaping "platform" matters as innovation, international engagement, and human capital policy. [26] On this front, no "platform-setting" theme has recurred more in states' economic development agendas than a strong emphasis on the innovation enterprise.[27] Most notably, both big and small states such as the likes of California, Connecticut, Delaware, Georgia, Maryland, New York, Ohio, and Washington are placing innovation in the center of their economic development by creating their own funds to seed cutting-edge research, encouraging collaborative and cross-disciplinary research endeavors, and making strategic R&D investments in areas where the state can effectively compete.[28] At the same time, global engagement through exports and foreign direct investment has emerged as a top state priority. Among state export initiatives, Pennsylvania's stands out for its performance measurement practice, Washington's for its embrace of data analysis and competitive grant-making, and Florida's for its pooling of resources across organizations. And finally, on workforce education and skills training, a number of states—including Minnesota, North Carolina, Ohio, and Washington—have undertaken bold comprehensive strategies to align their broad higher education system (including community colleges, four-year colleges, and research universities) with their state's economic goals and so strengthen them as agents of innovation and workforce preparation[29]

As to what these broad trends in state practice suggest for Nevada, they argue that the state should engage in three main ways as it seeks to upgrade its economic development system.

First, the state should:

- *Unify a drifting and fragmented state economic development community*. Nevada has an attractive business environment, low taxes, and some strong assets and actors but they are inadequately leveraged. The state needs therefore to better align its efforts. To do this it needs to set out an overarching strategy; mobilize multiple partners while holding them accountable for success; and making sure the necessary information and data-sharing is available to all players. That AB 449 requires the state's new economic development executive director to prepare a formal state development plan and reconfigure the state's relationships with the state's various regional development authorities (RDAs) holds out a perfect moment to craft a better-aligned system.

Second, the state should:

- *Regionalize its economic development activities and so unleash the potential of "bottom up" initiative in the state's metropolitan and rural communities.* Nevada's urban and rural regions contain distinctive mixes of the state's top industry sectors, knowledgeable development officers, and active and engaged business leaders. Nevada—like other leading-edge states—needs to empower, support, and channel the regions' smartest sector strategies as a critical route to statewide growth and diversification. Such devolution is helping numerous states keep their development efforts responsive to the local dynamics of a region-based economy

And third, the state must begin to:

- *Diversify the economy for the long haul by greatly strengthening its innovation, global engagement, and workforce training capacity.* Innovation, global connection, and skills upgrades represent a crucial platform for the state's growth. They are prerequisites for the sort of lasting enhancement and diversification of the Nevada economy. Given the importance of the knowledge enterprise and the state's spotty performance on it, Nevada should join the list of states that are working to both scale up and substantially reform their higher-ed and training systems

In sum, recent best practices suggest quite clearly that the state of Nevada would do well to focus its economic development efforts on a three-part agenda of leadership and alignment, empowerment, and platform-setting. That is the new look of state-side economic development in the U.S. and it is one highly appropriate for Nevada.

Nevada should embrace a new economic development model in which the state at once leads and empowers its regions while setting a state-wide platform for innovation-driven growth

With all of this in mind, then, the strategy framework set forth in this report has three major components. It recommends that Nevada:

- Align the multiple actors of its economic development with strong "enterprise leadership"
- Support smart sector strategies in the regions
- Set a platform for sustainable growth through innovation, global engagement, and skills-building

In this vein, this report calls for the state to at once "Unify," "Regionalize," and "Diversify" as follows:

Unify: Install an operating system for 21st century economic development. First, the state needs to put in place the basic elements of a state-of-the-art, state-wide economic development operating system—just as AB 449 requires.

Currently Nevada lacks such a system. Therefore, the state should move decisively to set out a clear and unified model for pursuing growth. Such a framework will entail both leadership from the top and decentralization to the regions as well as the provision of better information.

Along these lines, the state needs to establish a stable operating system for the conduct of economic development that:

- Sets out a compelling strategy for growth, innovation, and economic diversification in Nevada and aligns policies, programs, and initiatives with it
- Structures a flexible set of high-performance partnerships with and among regional economic development actors
- Optimizes the performance of the whole system with data, measurement, benchmarking, and information sharing

Regionalize: Support smart sector strategies in the regions. Secondly, the state needs to foster and contribute to smart, "bottom-up" sector initiatives in its regions.

Nevada's regions, after all, are not only the true hubs of the state's economy. They are also full of business, government, and economic development leaders who know their local economies well and bring important knowledge and relationships to the work of promoting growth and diversification.

Given that, the state should leverage this knowledge and these relationships to help Nevada regions build the next Nevada economy, both locally and for the state's common good. The state should therefore aid and abet Nevada's regional development efforts as they develop sector- and region-specific strategies to promote growth in state and regional target sectors, spur innovation, and accelerate diversification.

In this regard, modest but directed state actions and resources to support locally led industry development strategies can be catalytic and help spur growth, innovation, and job creation.

To this end, Nevada should:

- Support convenings of target industry and cluster actors in the regions—and planning by them
- Support smart, well-conceived cluster initiatives in the regions

- Support other types of bottom-up sector development including regional innovation districts, business plans, and regional export plans

- Align the state's existing economic development policies, programs, and initiatives with the regions' sector strategies and cluster initiatives

Diversify: Set a platform for higher-value growth through innovation and global engagement. Finally, the state must begin the essential work of upgrading its innovation and workforce systems—the most essential needed platform for future industrial diversification. At the same time, to buttress its diversification efforts, Nevada needs to exploit more fully the opportunities offered by close and strategic engagement in the global economy.

Currently the state's weak innovation capacity and low workforce skill-levels (especially at the higher education level) represent a major obstacle to the state generating a more sustainable, higher-quality brand of growth through innovation. Most notably, significant economic diversification almost certainly requires significant innovation and skills system improvements. Seizing export opportunities with a global engagement strategy, meanwhile, promises to boost jobs across sectors, while FDI—strategically leveraged—can be employed to actively build Nevada's target sectors.

And so the state should begin the work of constructing the solid knowledge and commercialization, global engagement, and skills-building platform it has needed for years.

Specifically, the state should:

- Bolster capacity for innovation and commercialization

- Make international trade and global engagement a key priority for Nevada

- Align higher education and workforce development resources for innovation and diversification

* * *

The time has come, then, for Nevada to adopt a new operating model for the conduct of economic development even as it supports a variety of industry- and cluster-specific sector initiatives in the state's regions and moves to set a platform for diversification by investing in the foundations of such growth: innovation, global engagement, and human capacity. The following chapters explain in greater detail what state leaders—along with their partners in local and regional economic development organizations, private industry, higher education, and the philanthropic sector—need to do to make it real.

V. Unify: Install an Operating System for 21st Century Economic Development

Nevada has for a while recognized the need to install a new operating system as it reboots its economic development effort. Now AB 449 mandates this change.

Key aspects of the state's current competitive challenge are now widely attributed to the past absence of a sound state-level architecture for mobilizing a diverse state behind a single economic vision. The absence of a clear strategy for growth and diversification reflects this lapse. The fragmentation of the state's various state and local development initiatives also reflects it. And so does the state's variable use of data and performance management for its activities.

And so the state needs to install the basic elements of a unified 21st century economic development operating system that sets and conveys strategic objectives; links and aligns the activities of the state's key economic development actors; and manages it all through facts, analysis, measurement, and learning. With those elements in place, it will then likely be time to reexamine the state's below average investment level in economic development institutions—though not until the system is reconstructed on a 21st century footing.

In all of this, moreover, the state needs to promote a "systems" approach to organizational excellence that seeks to balance leadership and accountability with decentralization and flexibility so that the state's overall efforts profit from both the focus of top-down direction and the energy, creativity, and local buy-in that comes with "bottom-up" empowerment, which galvanize local capacity and tap varied municipal and private sector actors with their rich reserves of on-the-ground knowledge.

In this fashion, then, the following pages lay out three agendas for installing a cohesive operating system for the state's many economic development players. They suggest the state should:

- Set a strategy for innovation and diversification—and lead
- Structure partnerships with and among regional actors—including the RDAs, strong non-profits, and the state's larger cities and towns
- Build the information base and use it to drive performance

The section also suggests that once those elements of a 21st century economic development operating system are installed it will likely be time to consider investing more as a state in such necessary work.

Set a strategy for innovation and diversification—and lead

Nevada first needs to establish a well-articulated economic development strategy—and high-level leadership to drive it forward—if it is to restore growth, spur innovation, and so diversify its economy.

Unfortunately, the state has not always advanced a clear vision, and without such a compelling intentional vision the state has lacked a sense of unity and direction in its economic development efforts.

Without a clear strategy communicated by top officials, for example, the myriad state, local, and private organizations that comprise the state's economic development system have not always possessed a sense of common purpose. Moreover, the state has too often lacked a sense of priorities as it sought to choose between budget or program options and focus its own activities.

And yet, all of that can and must now change. Specifically, the reforms enacted by the landmark economic development bill AB 449 essentially require that the state and its top leaders provide the state with a sense of economic direction.

And so the state must act: Together, the governor, the economic development director and board, and the state's entire leadership should make the most of the opportunity provided by AB 449 and unite around a compelling vision of economic diversification.

To this end, the state's reconfigured economic development leadership should work decisively to provide the state and its complex web of development partners at least five main sorts of leadership. First, the state economic development director needs to produce a compelling state economic development plan. Second, the state's top leaders must brand and communicate the new direction constantly, both within the state and outside it. Third, the state needs to celebrate successes that epitomize the new direction. Fourth, the state needs to convene the relevant stakeholders. And fifth, the state needs to align its own policies, programs, and activities with the new strategy.

The time has come, in short, to get focused. Here are some ways for the state to get started:

Produce a compelling state plan for economic diversification through innovation. The first step toward constructing a state-of-the-art economic development enterprise in Nevada is already mandated. The state's new executive director for economic development needs to produce a credible, balanced, and diversification-oriented state economic development plan. This is a potential game-changer. Fact-based and focused, the new strategy should identify the state's best opportunities for growth given its real-world strengths and weaknesses and it should do this with reference to the state's documented industry opportunities and the particular target opportunities within them. Crucial to the strategy should be an emphasis on the urgent need to diversify the economy and to foster new sources of growth through innovation in both existing base industries and newer emerging ones. Also important will be a strong emphasis on the regional nature of the state's economy and a plan for greatly strengthening the state's innovation capacity, global engagement, and associated workforce training—three pillars of a platform for future growth. An encouraging sign: Gov. Sandoval has already taken a first step by appointing a Board on Economic Development that includes members from a majority of the recommended industries in this report.

All of this, meanwhile, must recognize and enlist the many diverse sorts of local and regional actors that actually "do" economic development on the ground: the RDAs for sure, but also the state's municipal

economic development departments, its chambers of commerce, its workforce organizations, its strong non-profits, and trade associations. With such a plan in hand, the state's leadership as well as hundreds of local partners can unite around a common vision of growth and diversification through innovation.

Brand and communicate the new direction relentlessly. Yet a plan in itself is just a document. What is critical is that the new direction be communicated consistently and constantly—first internally and then externally. This is the education task that lies ahead. Such education work will be necessary not just to convey new priorities to the state's many development actors but to convince businesses, investors, and skilled workers that the state is now serious about supporting their strategic growth industries.

In-state communication must come first. Formal occasions will include: the governor's state of the state message, executive budget, and legislative program releases as well as internal cabinet meetings. Meanwhile, all state officials will have many less formal but equally important opportunities to convey the new storyline of diversification through innovation. Early on top leaders should seek to create or join major regional economic development forums and use them to get the word out. After that there will be a steady flow of more routine opportunities to highlight the new direction, including local chamber and trade association meetings, firm relocation or expansion visits, and news media press conferences or editorial board visits. In using these opportunities, state officials should reiterate the new direction and celebrate successes that epitomize it. For example, instead of showcasing just business relocations into the state, the state's leadership should seek out opportunities to celebrate such other priorities as in-state firm expansions in target sectors, innovation activities at the universities, new sector or cluster organizing, or new international partnerships. The bottom line: The state's top leaders should consistently, energetically, and unanimously describe the state's new strategies—and what needs to be done to execute them—to the state itself, the strategy's "internal customers."

At the same time, it will be important to communicate the vision externally, whether through external speaking engagements; trade or recruitment missions outside the state; attending relevant trade fairs; hosting site selectors; calling on companies' headquarters; or through glossy but economically substantive advertising and brochures. In all of this the outreach should be tightly tuned to the state's new strategies and priorities. Smart use of a compelling GOED website will also be important. The state clearly needs a compelling new portal for conveying a single unified story and soliciting inquiries. That portal, meanwhile, like all of the state's next communications, should highlight the state's new focus on supporting and growing strategic growth sectors by mounting a sound, fact-based business case and story of opportunity and new beginnings in Nevada. Through it all, finally, the state would do well to distill its strategy down to a forceful, compelling mantra useful for conveying the gist in a few words to all stakeholders.

Help the regions align with the strategy. With its own economic development strategy in place, the state should also help its regions develop their own strategies for growth through innovation. It is in the state's interest to extend such help since Nevada's economy remains intensely local and regional, with 94 percent of the state's economic activity transpiring in its two major regional economies. For that reason, no progress toward achievement of the state's economic goals will occur without the aligned, cohesive engagement of the state's key regional actors. Accordingly, Nevada's regions (with their various RDAs, municipal economic development shops, and other actors) should be encouraged to work in parallel with the state's efforts and to do that they should be encouraged to develop in the next nine months their own parallel regional plans for sector-based development and economic diversification. To this end, the state GOED should make available a set of special $50,000 to $150,000 grants (size would vary by the size of the region) to support the preparation—most likely (though not necessarily) by the RDA in each area,

contingent on the engagement of all major stakeholders in the region including local municipalities, chambers, industry leaders, non-profits, and education and workforce entities—of a new or revised economic development strategy aimed at advancing the broad goals of the state plan as the relevant opportunities appear locally. These plans need not mechanically mimic the state plan but they should parallel it in spirit and direction. In that sense, these three-year strategic plans should include:

- A clear vision for regional economic development tuned to the state's goals
- Significant focus on the state's target industries and opportunities as they appear locally
- Significant empirical analysis of opportunities and challenges
- Regional strategies aimed at achieving the region's and state's vision
- Specific priority initiatives targeted on the need to diversify the economy and foster new sources of growth through innovation in both base industries and newer emerging ones. Critical here will be plans for strengthening the region's innovation and commercialization enterprise, its global engagement, and associated workforce training capabilities
- A roadmap for implementing the initiatives, built on extensive business, local government, higher-education- and training-system, and economic development community buy-in
- Metrics for performance assessment

Upon the plans' completion, finally, the GOED executive director may choose to award an additional $50,000 to the most compelling of the strategies. In this fashion, a proactive nudge from the state will serve to stimulate and channel the "bottom-up" economic development creativity of the state's regions, with the many smart organizations working within them. As a result the state of Nevada and its regions will have gotten "on the same page" on economic development.

Name industry-specific "sector champions" to spearhead cluster development. Planning, talking, and educating won't suffice for state leadership, though. The state also needs to organize itself to execute on the mechanics of sector- and cluster-based economic development. The state needs, in short, to focus intently on the nitty-gritty details of marshalling and targeting state and other resources; linking, aligning, and modifying programs; seizing opportunities; and clearing away obstacles.

To that end, a new model for focused execution on sector and cluster development would be for the GOED to hire a set of dedicated "industry champions" or "cluster product managers"—one for each of the state's target industries—to spearhead state and local efforts to address the needs and opportunities of the state's target clusters.

Single-mindedly focused, these sector champions or cluster managers would be responsible for aiding and abetting region-based cluster initiatives and working out the state dimension of their execution. Their task would be to do whatever it takes to facilitate growth in Nevada's strategic industries.

Along these lines, these full-time professionals would be tasked with carrying out proactive in-state outreach, stateside problem-solving, and helping with strategic business recruitment for each cluster. Each full-time professional would work to identify a cluster's current dynamics, supply chain gaps, and

common needs through dialogue with region cluster leaders, company officials, units of local government, and others. Then, these resource people would focus on channeling better support to the cluster, whether through interagency work on state program offerings, work on legislative issues, and problem-solving on workforce issues, or through engagement on strategic firm recruitment. On the first point, the product managers might find they need to convene multi-department work groups or task forces to address internal state policy barriers and shape ways to provide better support to the cluster, say by gathering appropriate state and local workforce and higher-education staff to deal with a skill-shortage. On the latter recruitment front, the sector champion might work with the local cluster leaders to mount a solid business case to targeted businesses in proactive outreach marketing, tied to the clusters' strengths and needs.

In most cases the product managers should be stationed in the regions—perhaps co-located in the RDAs—where they can work directly with the clusters on a daily basis to drive growth.

In short, the naming of dedicated sector champions has the power to drive Nevada's new diversification strategy forward and make it real.

Deploy the Catalyst Fund to build target sectors and clusters. Finally, the state will need to make direct investments in growing its target industries if it is to exercise its needed leadership role in economic development. Fortunately, AB 449 has created two vehicles for carrying out such investments.[1] One of these—the Knowledge Fund (See AB 449 sections 19–22)—is reserved for investments in science and technology research and commercialization and is as yet unfunded. However, the other vehicle—the Catalyst Fund, aimed more generally at job creation, with a presumptive use for "deal closings" in firm-relocation competitions—has been capitalized at $10 million (see AB 449 sections 9, 16, 17 and 17.5)—and stands ready for deployment. This is an important opportunity and Nevada leaders should make sure the fund is deployed to maximum effect.

Deployment of the Catalyst Fund will require some care, however. For one thing, many commentators observe that very small percentages of states' annual job gains can be attributed to business relocations nationally while the vast majority comes from the expansion of existing businesses and the birth of new establishments.[2] Moreover, questions have been raised about the implementation of many business relocation or expansion incentive programs.[3] Among the criticisms have been poor or undocumented job-creation results, a tilt toward large corporations rather than smaller growth firms, poor-quality job creation, and weak accountability practices. Put it all together and it's clear the state needs to carefully structure the use of the Catalyst Fund and put in place thoughtful guidelines for its administration.

Fortunately, it is easy both to see beneficial uses of the fund and to identify design and implementation recommendations for making it a success.

To begin with, the reality of inter-state competition and the increasing speed of companies' location decisions clearly justifies the creation of a mechanism for providing upfront cash grants and-or forgivable loans to desirable firms in highly competitive situations.[4] In a world where cash is king, such a fund should allow the state to engage in faster, more direct, and flexible dealings with companies considering Nevada locations. Ideally such a fund will help it win important business. To the extent the fund's use is reserved for attraction of firms and expansions relevant to the state's target industries and clusters, moreover, its impact will be magnified.

In terms of the fund's implementation, the state's broad new direction and emerging strategic plans reinforce the need for astute administrative guidelines. These guidelines should be clearly set out and should clarify key questions about the fund's targeting and accountability.

On the matter of the fund's targeting, awards should be considered only in "deal-clinching" situations and only for projects that accord with the state's new focus on high-value diversification through disciplined sector and cluster strategies and innovation. Important here is the need to build critical mass in the state's key regional clusters by adding firms and workers but also by filling in critical supply-chain gaps, service providers, or innovation resources. In keeping with that, the criteria for Catalyst awards should include the following:

- Significant projected creation of good-paying jobs with wages significantly above the average wage for the relevant occupations in the county in which the new business plans to locate
- Significant projected capital investment
- Significant project relevance to sectors and clusters targeted by the state plan for economic development. Projects should enlarge and advance target industries and clusters
- Significant regional sector and cluster—as well as local government, community, and RDA—approval and support
- Significant overall return-on-investment over a three-year-period

On all of this it might be noted that a focus on smaller growth companies might at once allow the fund's most funding to go farther and amplify its impact, since the great job creation tends to result from smaller-sized "gazelle" firms.[5]

Turning to accountability provisions, these provisions should be viewed as ways to maximize returns. In that fashion, every Catalyst Fund application should be put through a disciplined selection and performance management process aimed at maximizing the likely returns on investment. Initial analyses should assess the financial soundness of the applicant. Decisions should then be made in the systematic way prescribed by AB 449 with grants over $100,000 approved by the new Board of Economic Development and grants of less than that decided by the GOED executive director. And once awards are made, the GOED should maintain careful transparency and accountability practices.

Transparency should be ensured by the early and regular public disclosure of relevant information about the award, including:

- Early on: Recipient company and ownership, award amount, agreed-upon performance requirements (job creation, wage levels, capital investment)
- Annually: Information on how all awards have been spent and progress made on all agreed-upon performance requirements (job creation, wage levels, capital investment). Annual ROI calculations should be publically available

Accountability should be ensured by the preparation of a formal contract with each Catalyst Fund awardee prior to the distribution of an award. This contract should obligate the grantee to:

- Deliver on the promised job creation and capital investment targets
- Pay back the grant in the event the business does not meet the performance targets. Legally binding "clawback" provisions will allow the state to recover all or a portion of any upfront incentive if the promised jobs and capital investment do not materialize

Quick Action Closing Fund: Attracting and Retaining Businesses in Florida

In a world where cash is king and business recruitment a highly competitive process between states, deal-closing funds are used to help attract, retain, and provide favorable conditions for the growth of high-impact companies which provide widespread economic benefits to the state. The Quick Action Closing Fund (QACF) performs a similar mandate in Florida and is tasked with the responsibility of closing deals that would greatly benefit Florida.

A feature that distinguishes Florida's QACF from other state deal closing funds is that it prioritizes companies that are viewed as important to the state's previously defined industry sectors for receiving grants, thereby leveraging scarce resources in a targeted manner. Accordingly, projects eligible for receipt of funds fall in the following industry sectors: cleantech, life sciences, infotech, aviation/aerospace, homeland security/defense, and financial/professional services.

In addition eligible projects must meet the following criteria:

- Must have a payback ratio of at least 5 to 1
- Must pay an average annual wage of at least 125 percent of the area wide or statewide private sector average wage
- Be an inducement to the project's location or expansion decision in Florida
- Be supported by the local community; preference given to projects that include at least a 20 percent local match of cash or in-kind contributions

Florida requires that companies receiving money from the QACF sign performance agreements specifying the investment, employment, and wage levels that the company will meet. Florida's Department of Economic Opportunity monitors each company's compliance with these agreements and, if targeted investment and employment levels are not realized, can clawback all or a portion of the funds.

Recent changes to QACF have further streamlined the incentive process and enabled the state to respond quickly to competitive and time-sensitive projects. QACF projects now require recommendation to the Governor within seven business days after evaluating a project. In addition, the Governor can approve projects under $2 million. Projects ranging between $2 million and $5 million require notification to the Legislative Budget Commission (LBC), while projects totaling more than $5 million must be approved by the LBC.

While details of the QACF awards and contracts can remain confidential for a year or longer if the company requests it, Enterprise Florida, Inc. provides an annual assessment of the effectiveness of QACF program through its annual incentives report. In FY 2010, 10 projects selected Florida in part due

to QACF incentives. These projects taken together are creating and retaining 4,528 jobs at an average expected wage of $43,903 and making capital investments of more than $69 million.

Since its inception, QACF has supported 51 projects that have created 16,004 new jobs, retained 12,034 existing jobs, made capital investments of more than $1.9 billion in the state's economy, and have demonstrated a good 10-year payback ratio of $11 : $1 (includes all incentive awards).

Bottom line: QACF has served as an important tool in Florida's economic development incentives toolbox.

For more information visit
www.eflorida.com/IntelligenceCenter/download/ER/BRR_Incentives_Report.pdf

In sum, a properly managed Catalyst Fund will add important leverage to the state's campaign to advance diversification by bolstering target sectors and regional industry clusters. While most job growth will emerge organically from home-grown expansions and start-ups strategic recruiting of companies from outside Nevada will always have a place in cluster development—and the Catalyst Fund will be an important tool in that recruiting. As such, it will put edge and resources behind the state's new strategy and leadership push.

Structure partnerships with and among regional actors—including the RDAs, strong non-profits, and the state's larger cities and towns

The state of Nevada can and should only control and affect so much, though. In truth, much of the hard work needed to renew and diversify the state's economy—convening regional business leaders; developing strategic industry clusters; supporting local business expansions; and strengthening local workforce systems—will take place outside state government.

Specifically, much of the needed work is going to transpire in Nevada's metropolitan and rural regions through partnerships with regional development organizations, local governments, workforce intermediaries and other actors.

Yet here is the problem: While much well-intentioned work has gone on in the state's regions, few would say that work has been optimized. Few would claim, for example, that the work of the state's largest RDAs has been coordinated adequately with any overarching strategy or that it has in all cases entailed sufficient regional inclusiveness and buy-in. Instead, the combined state-regional push on economic development has been diffuse and fragmented—less than the sum of its parts.

Which means that the state should redefine its partnerships with the major-metro RDAs and other key partners like municipal economic development shops and strong non-profits to better coordinate the varied and high-powered work that needs to go on to build a new Nevada economy.

AB 449 has already ended the longstanding arrangement by which several of the authorities were funded through automatic or largely pro forma transfers of resources. Now, while the authorities' autonomy and local perspective should be celebrated, their activities need to be better managed by the state so they

become at once better aligned with the state's overarching strategy and more truly collaborative in their regions. In that way, the power of "bottom-up" development can be at once channeled and maximized in Nevada.

To that end, then, the GOED should move quickly to restructure the state's relationships with its regional partners in several basic ways. First, the GOED should use the terms by which it selects RDAs to ensure that the RDAs' efforts at once align with the state's new strategic direction and maximize the level of collaboration in the regions. Second, the state should use performance data and performance-tied funding as a way to incentivize effort and reward success. And third, the GOED should consider using additional competitive contracts and even performance awards to further incite excellent development work and creativity.

Each of these partnership and network improvements represents an important step toward sharpening up the state's operating system in advance of potential added investment.

But for now, here is some guidance on the immediate work of system improvement:

Use RDA selection to promote aligned, collaborative execution. Governing regional development work is a complex task. Getting such work right entails optimizing both "vertical" relations between the state and regional actors and "horizontal" relationships between diverse stakeholders in the regions.[6] Fortunately, AB 449 hands the state a perfect opportunity to revamp the state's relationship to the RDAs in a way that would at once better align the authorities' work to the state's diversification strategy and make the entities focal points of collaboration in Nevada's regions.

Prior to now, the state has with only variable performance management advanced contributions of some $3 million a year to local entities like the Nevada Development Authority (NDA), the Economic Development Authority of Western Nevada (EDAWN), the Northern Nevada Development Authority (NNDA) as well as various rural development entities. On the one hand, about one-third of this money flowed to the NNDA and the 11 rural authorities through the Local Development Grant Fund with operational guidance to the partners in the form of NCED's Eight Building Blocks of Economic Development rubric.[7] On the other hand, more than $2 million a year has flowed to the NDA and EDAWN in the two largest metropolitan areas as a separate line item in the budget, with a much lower level of performance accountability and only a general expectation that the money would be aimed at marketing and firm recruitment. Overall, the system has been variable in its accountability and focus.

With AB 449, however, much can be changed for the better. Not only has RDA designation and money flow been conveyed to the new GOED and its executive director. In addition, the legislation requires that all funding from the GOED be goal-oriented and performance-based. Along these lines, then, the state should structure the selection and contracting of its RDAs to ensure that these designated intermediaries serve the interests of inclusive, aligned, bottom-up diversification to the maximum degree.

To do that, the GOED executive director in consultation with his board should issue a request for proposals (RFP) from potential RDA organizations or consortiums of organizations and local governments that requires bidders to demonstrate they have the organizational capacity and relationships to advance the cause of economic diversification in Nevada in ways that comport with the best practices of contemporary regional economic development. To make clear the state's new priorities the GOED executive director should develop specific criteria for RDA selection aimed at requiring that RDAs align

their work with the state's diversification strategy and carry it out in ways informed by the best practices of regional economic development.

To promote alignment, a crucial criterion for RDA selection could be that the bidder be able to coordinate the development of a regional strategic plan that supports the state plan even as it focuses on its particular region. Essential to the region's plan would be plans for strategic sector and cluster development.

To promote good practice, other criteria would require that prospective RDAs exhibit the core best practices of the high-impact economic development organizations. Necessary qualifications would surely include: legitimacy as the lead development intermediary in a region; broad stakeholder representation and partnerships; ability to execute ability the regional development plan; ability to "manage by facts." Especially important would be the ability of the RDA organization or consortium to draw together diverse stakeholders into a coordinated development push. Overall, in short, the state should look to call out the best possible partners in Nevada's regions to execute the basic activities of regional development including: business retention and expansion; sector development; business recruitment; workforce coordination; and regional branding. (See the nearby box). In these ways, then, the state's designation of RDAs—if managed well—holds out great promise for increasing the effectiveness of economic development in Nevada by drawing together and coordinating the state's diverse but under-coordinated actors.

RDAs: What They Should Do and How They Should Do It

To effectively execute its new economic strategy, Nevada will need strong partners and none of those will be more important than its contracted regional development authorities (RDAs).

The RDAs matter because, with 94 percent of the state's economic activity concentrated in the state's major population centers, they represent the state's principle on-the-ground intermediaries for influencing the state's growth dynamics. For that reason, it is important to clarify what these important organizations should be doing and how they should be doing it since their activities hold out a key opportunity for the state to catalyze growth, both locally and statewide.

Begin with *what* the RDAs should be doing: What sort of functions should the authorities be carrying out? Of course, each RDA's mix of activities will and should vary, depending on the institutional map and needs of the particular region. For example, the assets and challenges with which EDAWN or NNDA works in Northern Nevada differ markedly from those with which the NDA works. Still, it is possible to distill from global and national best practices and the related economic development literature a baseline "job description" for general purpose economic development organizations.[8]

And so it can be said that RDAs—depending on the activities of other local entities and their own strengths—should in general carry out a well-rounded set of economic development functions in their regions including:

- Development of a regional economic development strategy
- Maintenance of regional economic development information clearinghouse

- Sector and cluster development
- Workforce development and training
- Partnering with higher education on R&D planning and technology transfer
- Global engagement
- Business incubation, commercialization, and acceleration
- Business retention and expansion
- Site and infrastructure intelligence
- Regional branding and marketing
- Business recruiting

But that is *what* the RDAs should do. *How* Nevada's RDAs should operate is another hugely important matter to which voluminous best practice literature speaks.[9] And on that front the literature suggests that Nevada's RDAs will have maximum impact if they:

- Operate with a clear and broadly shared vision of their community's economic future and how they will work toward that
- Have a focused mission which in Nevada should include economic diversification through strategic sector and cluster development
- Have written strategic plans that guide their activities
- Prioritize inclusiveness through the engagement of all major stakeholders
- Cultivate strong business-community "buy-in," including significant private-sector funding
- Manage by fact and measure results

Nor are these "virtues" merely academic. The best practice literature suggests that important benefits flow from the operating methods of successful organizations. Strategic plans, for example, are a powerful tool since they help organizations of all kinds understand their position in the economy, their key assets and challenges , and the steps needed to improve performance, shape operations, and discipline execution.[10] Likewise, inclusiveness and collaboration through partnerships are important because they widen the array resources that can be leveraged and engage the support of more actors, including the private sector.[11] And finally, managing and measuring performance serves as the "brain center" for aligning an organization's strategic objectives with its operations.[12] Performance indicators promote learning and inform an organization's leaders on how to revise its short-term and long-term objectives.

And so it matters intensely that the state contract with the right organizations or consortia of organizations when it designates its next group of RDAs. Which means the state should develop a thoughtful set of criteria for designating and guiding its partners, and ensure that those criteria reflect not just the needed activities but the organizational qualities that will be needed to succeed. Along those lines, then, criteria for RDA selection should be aimed at securing both the right RDA skill sets and the right operational character.

To the need to secure partners with the right skill sets, GOED could require, for example, that potential

RDA contractees demonstrate a proven ability to:

- Develop an economic development strategy for the region
- Maintain a regional information clearinghouse
- Implement sector and cluster development
- Create and optimize workforce development and training programs
- Partner with higher educational institutions on R&D planning and technology transfer
- Coordinate business incubation, commercialization, and acceleration programs
- Retain and expand businesses
- Develop site and infrastructure intelligence
- Brand and market their region
- Recruit new businesses

Moving beyond functions to operational approaches, the state should also stipulate that prospective RDAs demonstrate a readiness and ability to:

- Lead by articulating and gaining support for a clear vision for the region's economic development and how they will work to advance it
- Plan by publishing a quality written strategy for regional sector and cluster development in keeping with the state plan for economic development
- Collaborate with and engage stakeholders to execute the regional plan
- Measure progress through the development of performance measures and a knowledge management system for the region

In short, national conventions and international best practices point to a set of sensible selection criteria for RDA contractees that can help clarify and focus the work of these critical state partners.

And yet there is one more step toward optimizing the relationship between the state and its lead development partners. This is what is called "performance management." To ensure the RDAs are functioning and carrying out their objectives, the best practice literature suggests that the state and its contractees should together develop sensible performance assessment criteria and indicators as a way of measuring the RDAs' success.[13] Along these lines the year-to-year effectiveness of the RDAs' performance of its basic *functions* can be assessed by tracking indicators such as:

- Alignment of the RDA's regional and institutional vision and plans to the state plan for economic development
- Quality and number of regional convenings and networking in targeted sectors and clusters ; number of assisted sector or cluster initiatives that win state competitive grants; number of businesses and entrepreneurs served by targeted regional cluster directors; frequency of outreach to local business community on target sectors opportunities
- Number of workforce development or training program graduates hired in target-sector or –cluster

companies; percentage of graduates in entrepreneurial training courses or recipients of business planning and technical assistance who opened or expanded or improved a microenterprise by increasing sales or providing new jobs in targeted clusters

- Number of R&D programs at higher education institutions developed through industry partnerships; number of patent applications filed and patents awarded through such partnerships; examples of academic research that has been commercialized; number of licenses executed by such partnerships; number of programs and service initiatives conducted in collaboration with public and private universities
- Number of business incubation, commercialization, and acceleration programs developed to fill the target sector or cluster needs; number of new companies that have been developed through these programs
- Number of businesses in target industries that have expanded in the region as measured by new jobs created; increased office space occupied; new business start-ups as measured by percentage of all businesses in the region; new business registrations as a percentage of all active taxpayer businesses
- Number of new inquiries or web hits based on a regional marketing strategy; jobs created as a result; number of companies that inquire about relocating to region based on regional brand
- Number of new companies re-locating into the region from other states in the target industries; jobs created as a result; fiscal impact created by the wages of those jobs; projected 5-year local and state tax revenue from companies re-locating; total active leads

Besides monitoring and reporting their functional performance through output tracking, RDAs can also assess themselves and be assessed by the state on how effective they are operationally.[14] Possible indicators for measuring the quality of the RDA's *operations* might include the following:

- Leadership: indicators of community and private sector support marshaled for the state and regional economic vision; frequency of board evaluation of progress on annual objectives; number of different type of stakeholders involved in developing the region's vision; independent checks of all this
- Planning: quality of published regional development strategy and alignment of its objectives with the state plan; quality of mechanisms by which the RDA monitors and tracks progress in implementing the strategic plan and adjusts its plan accordingly; extent that all stakeholders contributed and participated in planning; how well the RDA identified the assets and resources needed to target sector opportunities
- Collaboration and inclusiveness: number and effectiveness of relationships developed between state and regional economic development partners; effectiveness of relationships with local governments; representation of board, including of target sectors and clusters; degree of business-community "buy-in," measured by the variety and effectiveness of public-private partnerships established to accomplish the RDA's objectives and the amount of private-sector funding the RDA is able to attract for its programs; how well the regional strategic plan sets forth a meaningful organizational structure and operational arrangements between various stakeholders
- Management by fact: indicators of how well the RDA's performance tracking system provides all information needed to measure the RDA's work; how well the RDA's measures align with the state system for tracking performance and tailored to regional objectives; how well the RDA develops

performance monitoring mechanisms and measurements for targeting industry opportunities

In the end, RDAs will be crucial contributors to and partners in implementing Nevada's economic development plan. By following accepted best practices on what high-quality regional economic development organizations tend to do, how they operate, and how their performance is frequently measured the state and its RDAs will maximize the power of their partnership as they move to build the next Nevada economy, region by region.

Use RDA funding and performance management to drive impact and reward achievement. Once the RDAs are selected, their work needs to be optimized through smart performance management. One way such management can be implemented is through the introduction of some basic process and output measures into the RDA contracts.[15] To date there has been little of this sort of monitoring in the funding of the major-metro RDAs. Therefore, the state should now introduce into all the RDA contracts a basic array of mutually chosen measures that will allow the state to assess the impacts of partners' work as well as the process by which it has been undertaken. (See the nearby box on RDA functions and operation). Such impact measures would likely stress a finite number of true "outcome" measures (e.g. jobs in strategic industries created) as opposed to service "inputs" (e.g. meetings held). With information in hand on a number of such indicators, the GOED will be better able to better assess the RDAs' performance during the course of their contracts so as to make a more informed decision on whether to renew them. Such a use of performance indicators will at once ensure a clearer understanding of what the RDAs are to be doing, stimulate maximum effort, and generate useful information for the whole system.

And here is another idea: It could be that the GOED executive director should hold back 10 percent of his pool for RDA contracting each year and reserve it for a two or three specials additional awards to the most creative and effective RDA work at the contracts' end. More narrowly drawn awards could go to RDA's that overachieve based on the performance metrics in their contracts. Such incentives would further stimulate and focus the RDA's efforts.

"Bottom up" Economic Development: A New Approach in States

More and more states across the nation are recognizing the crucial role that regions and metropolitan areas play in state economies. In just the last year, for example, no less than three states—Colorado, New York, and Tennessee—have each embarked on innovative, "bottom-up" economic development strategies that aim to place regions at the center of their economic development planning, service delivery, and execution.

In each case, new governors have taken a fresh approach to state-local relations in economic development by seeking to tap and unleash region's dynamism.

In Colorado, Gov. John Hickenlooper has moved to construct a state economic plan out of regional ones and so asked every county in the state to put together a summary of the vision, strengths, and weaknesses of its local economy.[16] These summaries were then rolled into 14 regional statements that were aggregated into the "Colorado Blueprint"—the state's economic development strategy.

In New York, Gov. Andrew Cuomo has rejected Albany's tradition of imposing economic development

strategies on its regions and moved to empower regions by helping them come together to build and execute regional five-year strategic plans. In this fashion, the state has established 10 regional economic development councils—public-private collaborations tasked with developing regional strategic plans focused on leveraging the particular strengths of each region.[17] In each case, regional co-chairs appointed by the governor, one each from the business and academic communities, are required to work with a diverse mix of regional leaders from major industries, small businesses, higher education, community organizations, and labor. To incentivize energetic planning the state intends to provide the best plans a larger share of a $200 million pool of capital funds and tax credits it will be making available to the regions. In this fashion the state will both strongly improve regional planning and collaboration and provide new resources to support locally developed initiatives.

And finally, in Tennessee, Gov. Bill Haslam's Jobs4TN plan aims to strengthen the state economy by moving to unleash and support the entrepreneurial energies and dynamism of the state's regions by aligning state resources in the service of regional priorities.[18] Along these lines, the Haslam administration is moving to prioritize key industry clusters, establish regional "jobs base camps" to support regional coordination, and investing in innovation through the INCITE initiative. Central to INCITE will be the funding of a regional business accelerator in each of the nine regions identified in the Jobs4TN plan. Going forward, the Department of Economic and Community Development will place a regional director in each of the nine regions to work with local partners to develop regional plans that align with existing funding sources at the state and federal levels.

In a word, "bottom up" is becoming the state-side norm in economic development.

Create prizes, innovation grants, or competitions to incite creative partner initiatives. Finally, prizes, innovation grants, and competitions are proven, low-cost ways to call forth special effort on important challenges.

Nevada should consider using them too.

Prizes and performance awards have proven effective in inciting innovation and entrepreneurship in science, technology, and related business fields and this report has some ideas along that line. However, the GOED should consider utilizing prizes as a fresh way to evoke new and improved forms of regional development work, whether from the RDAs or other actors in Nevada's regions.

Does the state want to see more economic planning in rural Nevada? Then why not offer $10,000 prizes for that?

Does the state want to inspire new degrees of collaboration and stakeholder collaboration in regional economic development work? Then why not establish a $20,000 "X" Prize for the most inclusive, truly collaborative regional development initiative?

Does the state want the RDAs to focus much more on the new sector and cluster strategy? Why not offer a $30,000 prize to the authority with the most extensive and catalytic engagement in its region's sector and cluster initiatives?

The bottom line: Performance awards and innovation grants offer an important way to inspire new and exemplary ways of doing business among the state's critical economic development partners. They will help draw additional returns on investment from Nevada's critical portfolio of state-metro economic development relationships.

Build the information base and use it to drive performance

To link state leadership and regional execution, finally, and to make it all smart, the state needs to maximize its use of information and data. After all, quality information—whether in the form of rich data flows, indicator systems, best practices, or benchmarking—represents the most fundamental way states can generate a common point of reference for stakeholders, identify challenges, and develop and evaluate action steps.

Extensive data analysis is already proving invaluable in identifying Nevada's target industries and in developing strategy. Going forward, information of many sorts will be increasingly important as the state moves to designate its RDA partners, evaluate applications to the Catalyst Fund, choose which regional initiatives to support, and consider what investments to make in designing new innovation infrastructure or targeting export promotion or improving the workforce system.

And so the state should ramp up both its production and use of information resources in decision making and service delivery in support of the new economic strategy.

Fortunately, Nevada agencies concerned with economic development—including the Department of Employment, Training and Rehabilitation (DETR); the Nevada Commission on Economic Development (NCED); the Nevada Commission on Tourism; and the Secretary of State's office (SOS)—already collect vast amounts of economic development data, including Nevada census data, and state labor market information (covering unemployment, employment, wage, and occupations) and in many cases do a solid job of making it available. In this respect, there are millions of data points for the state to work with in creating the information products it needs in order to design and monitor smarter economic development execution.

All of which points to a relatively bounded task of reorganizing and aggregating Nevada data (and filling in a few holes) to support its easier use in optimizing the state's new sector and cluster development campaign. Along those lines the state should pursue two agendas to improve its development, packaging, and use of information to maximize the impact of its economic development work. First, it should improve the basic availability and accessibility of its information base for economic development. And second, it should employ that data more assertively in setting policies, resource allocations, and actors; monitoring implementation; and accounting for results.

In all, data and information provide a cheap, catalytic way for the state to decide, learn, adjust, and then improve. Here are the agendas:

Improve the basic availability of economic development information. While in many ways extremely credible, Nevada's existing data availability and structure suffers from some limitations that pose a hurdle to effective economic development. These limitations should be addressed.

In terms of the availability of information, several outright gaps characterize the state's generally sound offerings. Most notably there is at present:

- Little data pertaining to the state's target sectors and regional industry clusters. Sector and cluster strategies need to be grounded in detailed empirical information and analysis. This requires providing to all actors high-quality, timely, and fine-grained industry, workforce, and market-growth information "cut" to the shape of the state's target industries and clusters. Nevada agencies will need to produce much more information attuned to the state's new industry and cluster development agenda, and especially as it exists region by region

- A lack of data on key labor market variables. Executing the state's sector and cluster strategy is going to require tuning education and training programs to the needs of the state's target industries. However, the state currently does not have detailed intelligence on such relevant indicators as local labor force dynamics, the occupational profiles of existing jobs, the skills requirements of those jobs, and any related skills gaps

- A shortage of "longitudinal," or time-series, data. The economy is always changing, and economic development must too. Unfortunately, most of Nevada's currently available databases lack consistent time series data frustrating ability to evaluate changes and impact over time. One exception seems to be the solid Nevada Workforce Informer website maintained by DETR which has data on a variety of economic and workforce information since 1990. However, even here there is a snag. While one can extract time-series data by geography, this applies to only a few employment variables. To conduct robust analysis, it is necessary to compare and draw correlations between multiple series of variables across time

- A shortage of best practice information. Few of Nevada's economic development related agencies post relevant best practices or case studies either from around the state or the nation. This is a gap given the state's recommended status as a leader and enabler of good economic development practice. Best practice sharing is cheap and can at once empower and inform good implementation among multiple actors and across places

At the same time, there are shortcomings in the way the state packages the data and information it does maintain. These include:

- A lack of integration. Currently in Nevada there is lot of stand-alone data on different agency websites and in miscellaneous publications. Duplicated effort and high variation in quality are natural results of these isolated and uncoordinated systems. For instance, the State Data Center (a division of Department of Administration) and the Nevada State Demographer (funded by Nevada Department of Taxation) both package demography, census, and population data, thereby duplicating efforts. Likewise, DETR provides a Nevada firm registry and workforce directory that works in the same way as does the SOS registry, thereby duplicating efforts. While the SOS office has begun planning the development of a comprehensive business services "portal," at present the offerings on the department's current "Why Nevada?" site remain only a start. Finally, links from state websites to RDA and other regional portals are few and far between.

- A lack of sectoral and cluster packaging. Related to the general lack of aggregation is a more specific problem: The state lacks rich bundlings of sector- and cluster-specific data and

information offerings. Such bundlings would make plain the structure of the new diversification strategy; "sell" the state's and regions' story and strengths; and empower sophisticated marketing, analysis, organizing, and development work. However, state websites' few sector-oriented offerings—as at NCED's website and the "Why Nevada?" pages on the SOS site—remain thin in their descriptions and data offerings

- Minimal regional packaging. The state's offerings are also thin in their presentation of regional data, oriented to the state's target sectors and regional industry clusters. Regional economies literally *are* the state economy but the state's information resources at this geography need to be better aggregated and attuned going forward to the challenges of advancing the regions' particular clusters

In view of these issues, the state should embark on a steady drive to enhance Nevada's information base for economic development. Fortunately, information remains cheap in the scheme of things. And so the state should move to at once improve the range of information available and better package it for use in sector-oriented economic development:

Improve the range of economic development information available. To improve the range of relevant data available to economic development practitioners and outside inquirers, the state should move to fill some of the key information gaps it currently contends with. To that end the state should:

- *Begin assembling detailed sector and cluster intelligence.* Getting the state primed to execute an astute economic development strategy will require assembling a wealth of data on the state's targeted industries and clusters: standard industry and cluster definitions, trend data, specializations, occupational mixes, firm lists, and other variables. Multiple state agencies will therefore need to sit down with the GOED executive director and other development leaders to develop the needed data products. To help with this work, meanwhile, the state might want to utilize the strong presence of university based economic research organizations. To name just a few, the Center for Regional Studies and Bureau of Business and Economic Research at UNR and the Center for Business and Economic Research at UNLV all offer excellent in-state research and evaluation capabilities. Establishing a joint program to collect, sort, and aggregate data on the state's sectors and regional clusters could be a smart way to link state-level and regional expertise in a powerful way. Modest competitive grants from the GOED—whether for data development or survey work—could get the ball rolling

- *Bolster monitoring of labor force dynamics.* To support efforts to tune the education and workforce training systems to industries' needs the state needs to build up its knowledge of labor force dynamics, the state's occupational mix, and related skill gaps. This may require restoring DETR's survey capability (enacted in the mid-1990s but since cut) or instituting more reporting from employers and colleges

- *Compile more longitudinal series.* DETR already supports longitudinal data on employment and unemployment numbers by counties and metro areas, but in the absence of matching time-series data related to education and workforce training programs it is unable to provide sophisticated analyses explaining the long-term employment and unemployment trends. In a similar fashion, matching wage records over time with data from the educational and workforce training systems can yield the state important information to help support policy and decision making statewide. The bottom line is that GOED should build on the longitudinal data collected by DETR and add

other important indicators of economic development, spanning human capital, demographics, and labor market information, to its suite of data.

- *Assemble best practices.* Such sharing should be an important activity of the new GOED. And here again, the GOED could easily assemble a comprehensive archive of best practices tuned to the state's strategies and approaches. For modest cost such an archive could be developed either through a modest-sized contract with a well-informed national research organization or through an in-state grant competition opened to the state's academic, RDA, and other economic development professionals

Improve the packaging of economic development information. At the same time, now is the perfect moment for the state to commence the work of better packaging its data holdings in user-friendly ways that support action and the new economic development strategy. Several initiatives make sense:

- *Create a single economic development portal with links to centralized regional ones.* To begin with, the GOED should spearhead work aimed at aggregating the state's currently fragmented economic data holdings into a single well-branded, user-friendly website. Ideally this site—which might logically be managed by the GOED although it could evolve out of the SOS' office's "business portal" planning—would take the form of a glossy, one-stop web portal into which would be bundled a clear presentation of the state's new sector strategy; links to regional portals developed by the RDAs; links to all of the state's relevant agency programs; and finally a rich array of user-friendly data resources organized to support the state strategy. To be sure, such a production would be a major undertaking, and would require significant effort and collaboration, strong prioritization, and resources. However, the value of such a site to the state's efforts to renew its economy and economic development practice would be significant. With one integrated site the state could "tell its story" to external and internal audiences; demonstrate its seriousness about what matters; and bolster its own and its partners' research and analysis capabilities to ensure effective policy formulation. For models the state might look at strong economic development hubs that have been developed by Minnesota and Colorado.[19]

- *Develop new information products focused on the state's target sectors and clusters.* A second desirable new packaging of information would present the state's enhanced sectoral and cluster data in prominent, compelling ways—recurrently. Currently the state's economic monitoring and public reporting focuses heavily on the backward-looking indicator of the unemployment rate. Going forward, the state should begin to stress with equal prominence the dynamics and growth of the state's target sectors and regional clusters. To do that the state should consider developing a modest set of special information products tracking the sector strategy. For example, the GOED and its state and regional data partners might begin to produce a bi-annual or annual "Diversify Nevada" dashboard or monitor focused on the target industries. Going even further, the GOED might begin to use detailed industry data to define regional specialties and prioritize clusters for regional development purposes. The GOED might consider creating and funding regional labor market analyst positions who would be tasked with providing regions with accessible expertise, analysis services, training, and presentations on Nevada's target sectors and clusters. Such products would have the triple benefit of reiterating a common frame of reference, informing practice, and stimulating effort by multiple actors.

Use information to define and drive success. With more and better data in hand, the state will also be better positioned to reap one of the most important benefits of strong information resources: their ability

to improve decisionmaking, enhance resource allocation, and increase accountability through communication and feedback.[20]

High-quality data and other kinds of information, in this respect, have numerous uses in a drive to improve the performance of the state's economic development system, as notes the Organization for Economic Cooperation and Development.[21]

Quality information can be used to inform policy development and the selection among policy choices, possible initiatives, or possible partners. It allows for implementation to be monitored. It permits accountability. And importantly, it allows for learning, adjustment, and improvement.

However, at present the state's use of information to drive excellence in economic development appears sporadic. Since the existing base of economic development data has been scattered and inconsistent, its use in policy development and performance management has also been inconsistent too. That the important matter of RDA funding has proceeded mostly without significant performance management and accountability suggests the depth of the need for reform in Nevada.

And so the state should begin to use more and better data much more consistently to inform economic development decisions and manage performance. Four strategies seem relevant:

Use information in policy design and decisionmaking. Choices among policies, funding proposals, and possible partners should be informed by quality analytics. For example, when issuing competitive funds, the state should require that applicants submit significant relevant information about the proposed project even as it conducts its own analysis of the context in which implementation will occur. For instance, the decision to fund a particular Catalyst Fund application—as noted above—will need to be informed by data related to the project's proposed impact, data related to the company's financial background, and data related to the project's location and sectoral setting. Assessing the project's "fit" within an existing Nevada cluster will improve the likelihood that the award will play out well. Similarly, the state's solicitation of RDA service providers, published information request, and announced criteria for selection will evoke information about the capabilities and goals of the applicant that will allow the GOED to select those whose interests best align with those of the state.

Use information to monitor implementation. Vigorous information exchange for monitoring purposes will also maximize performance, whether it is a line of work within the new GOED or a contract with a Catalyst Fund award recipient. Here, agreement at the outset of contracts, awards, and partnerships on a short list of key, measureable, mutually agreed-upon performance metrics will enable progress to be assessed. The annual Catalyst Fund impact reporting recommended in this report would be an example of such monitoring. So would assessment of the RDA performance information.

Use information to ensure accountability. Meanwhile, information on performance should have consequences. Awards, initiatives, and partners that turn in verifiable accomplishments or excel should be rewarded. Those that do not should not be. An RDA that over-performs and convening aligned regional collaborations should receive a prize or special award. RDAs that consistently fail should not be rewarded, and in time should lose their contract. A Catalyst Fund grantee that refuses to pay a clawback should be barred from further applications for a set period.

Using Data in Maine: Analysis, Evaluation, Learning, and Accountability

Since its founding in 1999, the Maine Technology Institute (MTI)—an industry-led, publicly-funded, non-profit organization—has awarded $106 million in grants for 1,295 projects in support of the state's technology clusters.[22] Yet that is not the only state-of-the-art aspect of its activities. Every two years the University of Southern Maine conducts for MTI a rigorous, independent evaluation of the impact and effectiveness of its programs. Criteria include the number and value of grants awarded; total matching funds (public or private) leveraged; employment growth, revenue attracted; and new products commercialized.[23] Once the analysis is complete MTI prepares a major public report on the findings over and above the university's published analysis.

The evaluation is not a pro-forma exercise. Armed with the university's independent evaluation of its cluster related activities, MTI constantly assesses and tunes its investments, sharpening their focus, and balancing the overall portfolio. Using the evaluation information, MTI has been able to repeatedly demonstrate to the legislature real value to the state economy and robust return on taxpayer investment. With figures reporting that, for example, every $1 awarded by MTI leverages more than $14 in public and private investment into Maine's innovation economy, MTI has garnered considerable buy-in across party lines, legislative terms, and throughout this largely rural state.[24]

For more information visit: www.mainetechnology.org.

Use information to facilitate learning, adjustment, and improvement. Finally, information tools can be used to maximize learning and course-correction. The simplest form of information use for learning might well be the sharing of best practices. In that sense, the dissemination by the GOED of favored examples of, say, exemplary economic development organization activity or state-of-the-art workforce development for an emerging technology sector or a top-quality regional export-promotion program can inspire smart program design among local partners, just as the study of other state's innovation and commercialization intermediaries can inform its own program development. But actors throughout the state can learn and react through other exchanges. Striking returns on investment for programs in NCED's Global Trade and Investment section, for example, could first be used by the state itself to alter its own programming, and to invest more in the program. At the same time, access to comparative performance data for programs or partners may suggest what is working, and encourage actors to increase their own efficiency and seek out alternative strategies. The bottom line: Information exchange can produce intelligence that feeds back into the policy cycle, improving the quality of decisionmaking in both the near and longer term.

* * *

In conclusion, information strategies facilitate the communication and exchange that makes a necessarily decentralized state-regional economic development system work.

Going forward, the State of Nevada should lead more actively, devolve more real responsibility to its regional partners, yet keep it all simultaneously tight and loose with strong information strategies.

And here is a final point about budgets: To the extent all of this is done well, and real results follow from real reforms, a new baseline of solid performance will likely be established in the next year or two that would allow for a discussion of possible increases in the base funding level of the economic development system, say in the 2013 legislative session.

In that fashion, demonstrated performance within a revised system and with the modest budget increases now being provided would allow for the economic development system to mount a strong business case for greater investment in the next budget cycle.

VI. Regionalize: Support Smart Sector Strategies in the Regions

Growth and prosperity in the Silver State emanates almost entirely from the state's metropolitan hubs of work and commerce in the north and south, as well as from its vast resource-rich rural territory.

Not only that, Nevada's regions brim with strong business, local government, and economic development leaders who know their local economies well and bring important knowledge and relationships to the work of promoting growth and diversification.

And there is one more reason the state should focus its work with the state's target industries on the regions: They are the location of the state's most dynamic regional industry clusters.

Clusters—the geographic concentration of interrelated firms, suppliers, institutions like universities and community colleges, and other coordinating agencies like trade associations or university tech transfer offices—unleash powerful synergies among firms within an industry in a region. These synergies foster knowledge exchange, increase rates of patenting and innovation, and increase entrepreneurship in a region. Ultimately these dynamics have been shown to accelerate job growth and produce higher wages for workers.[1]

And so the state should leverage its leadership networks and local industry clusters to help build the next Nevada economy region by region. In this way, the state Nevada can bolster its target sectors where they appear in the state's regions and in the specific places where the state's key business and economic actors can deliver home-grown, responsive, and smart interventions.

Which is why a significant element of the state's new economic development strategy should be to aid and abet the Nevada's regions as they develop sector- and cluster-based strategies to promote growth, spur innovation, and accelerate diversification.

In that fashion, relatively inexpensive but smartly targeted investment and partnering by the state can have a catalytic effect on innovation and job creation.

To this end, Nevada should:

- Support convenings of target industry and cluster actors in the regions—and planning by them
- Support smart, well-conceived cluster initiatives in the regions
- Support regional planning efforts and other types of bottom-up sector development including regional innovation districts, business plans, and regional export plans

- Align the state's existing economic development policies, programs, and initiatives with the region's sector strategies and cluster initiatives

A Cluster-Based Approach to Economic Development

Regional industry clusters—geographic concentrations of interconnected businesses and associated institutions—provide the framework for this analysis because clusters offer policymakers a direct route to the real economy. Cluster thinking grounds policymaking in the day-to-day interactions by which real firms in real places complete transactions, share technologies, develop innovations, start new businesses, and ultimately create jobs and hire workers in a place.[2] Cluster thinking matters because it orients economic development policy and practice towards groups of firms and away from individual firms, towards addressing common obstacles to growth and away from expensive subsidies of questionable merit.[3]

Support convenings of target industry and cluster actors in the regions—and planning by them

Critical to the success of a bottom-up, regionalized economic development strategy is the existence of strong capacity in the regions. Capacity, in this sense, is the simple ability to execute and to get big things done relying on a consensus-driven, stakeholder-informed, fact-based approach. Fortunately, Nevada is already home to a number of solid organizations of this nature, ranging from the NNDA and EDAWN in the north to NIREC state-wide and the Las Vegas Chamber in the south. Several municipalities such as the cities of Henderson and Las Vegas also maintain excellent economic development operations. This existing capacity and the human resources in which it is embodied provide a solid foundation upon which to build.

Nevada's targeted, industry cluster-based strategy will require bringing *all* relevant stakeholders on board. This includes private sector entities such as trade associations that may have remained on the sidelines of previous economic development discussions. It will, after all, be these entities that go about the actual building of the next Nevada economy from the bottom-up, business decision by business decision and job by job. And so to carry out its sector strategy, the state as a whole will need to build capacity in the specific target clusters in each region. Nevada's RDAs can and should assist in fostering the emergence of strong networking and leadership capacity in each region's target clusters but state engagement will also be important.

The state should therefore support the emergence of new or stronger cluster and industry organizing in three ways. First, it should foster the emergence and maturation of cluster organizations in targeted sectors. Second, it should host high-level sector convenings and regular working meetings. And third it should task its new "sector champions" to work with target regional industry clusters.

Foster cluster organizations in target sectors. To begin with, the governor, GOED executive director, and other state leaders should work to strengthen—or in some cases create—cluster organizations in the state's target sectors. Such organizations—associations of all relevant stakeholders—are critical as they will become collaborators in the state's efforts and partners in implementing the economic development

strategy. Strong cluster organizations will likely be wellsprings of low-cost ideas about how to jumpstart employment in target sectors. Consultation with cluster organizations would enable the state to optimally outfit a business incubator, for example, or identify weak linkages in an industry's venture capital or angel funding network. Such strong region-based partnerships will be essential in designing and implementing the state's strategy.

An example of a strong cluster organization is the Southern Nevada Medical Industry Coalition (SNMIC). SNMIC is a non-profit group of healthcare professionals, healthcare consumers, committed citizens, local government representatives, educators, and chamber of commerce representatives that concerns itself with the major issues that affect the entire healthcare industry in Southern Nevada: workforce training and development, electronic health records, legislative advocacy, networking, and the economic opportunities of medial tourism.[4]

Top officials should speak at sector convenings and join working meetings with sector associations or business leaders. To facilitate the formation and boost the profile of these cluster organizations or sector/stakeholder associations, the governor and GOED executive director should play a lead role hosting early gatherings. The governor should use his drawing power to ensure the participation of executive-level private sector leaders. Hosting such high-level sector convenings will signal the importance of the target sectors to the state.

Such gatherings will further benefit the state by providing private sector leaders forums through which to highlight opportunities and express concerns in ways that will allow the state to learn industry priorities early on and better understand the obstacles to job creation encountered by Nevada businesses. The GOED director should use this executive-level input to set strategic directions and broad priorities.

Organizing in the Regions: Tennessee's "Jobs Base Camps"

Under Governor Bill Haslam, Tennessee has established nine "jobs base camps" in regions across the state.[5] Each base camp is led by a regional director who serves as a single point of contact for all jobs and business related issues in a region. The regional director works directly with local chambers of commerce, existing businesses, elected officials, and economic development field staff. The regional director serves as a direct link between these local partners and the governor's office.

The first priority of each base camp is to work with local partners to develop and/or revise a regional economic development plan and align existing federal and state resources around that plan.

Altogether, the jobs base camps focus on six key activities:

- Developing a regional economic development plan
- Identifying and maintaining a database of shovel-ready sites in each region
- Reaching out to existing businesses to understand their needs and constraints on reinvestment or expansion
- Creating or supporting an entrepreneurial incubator in each region
- Enhancing coordination between workforce investment boards and the base camps through regular meetings; also using data to ensure that workforce funds align with employer training

needs

- Aligning existing funding sources and exploring new ones to support the implementation of the regional economic development plans

By streamlining the state's presence in regions and forging partnerships with the relevant regional stakeholders, Tennessee has reorganized its economic development structure in service of its regions—all while saving resources.

For more information visit www.tn.gov/ecd/Jobs4TN.html

To institutionalize the dialogues, the GOED should hold regular working meetings with sector associations and business leaders, chaired by appointed "sector champions." These meetings should be informative, issue-based, and purpose-driven. In the end, such outreach will help the GOED better understand the common needs of Nevada businesses and provide useful information for tweaking existing offerings and designing new ones for maximum job creation impact.

Task "sector champions" to work with regional clusters. One of the state's most important assets is its convening power. The governor's and other high officials' ability to bring all stakeholders to the table will be an especially effective tool in getting early sector efforts in the regions off the ground. Over the long haul, though, the state through the GOED will need to formalize and institutionalize a steady relationship with regional and industry leaders so as to advance regional sector and cluster strategies and continually get things done. Much work of this effort should fall to the "sector champions" or "cluster product managers" whose hiring is recommended by this report.

These champions or product managers will serve as both the state's emissaries to the target sectors or clusters and, conversely, the target industries' key "go-to" contacts and advocates in state government. Along these lines, the champions would as a first order of business spearhead further organizing work, but they would do more. As the sectors' appointed champions, these professionals would work relentlessly—one with each target industry—to identify and respond to key cluster opportunities as well as binding constraints, especially in state policy and process. With those opportunities in constraints in their sights, the champions would work to seize the opportunities and to work through the policy constraints that impede growth. On the one hand, they might coordinate a targeted business attraction effort to complete a regional supply chain. On the other hand, they might drive a needed regulatory tweak with likely benefits to a prized cluster. In all, the champions will ensure that the state's strategic industries in the regions have not just a direct line into state government but a dedicated, focused, and action-oriented point person waking up each day focused on driving the industry forward.

Support smart, well-conceived cluster initiatives in the regions

Regional clusters are one crucial leverage point for boosting sectors as they appear in the state's regions, which function as forums for all stakeholders to work on critical sector dynamics, supply chains, and relationships.

Cluster *initiatives*—because they touch the real economy at crucial leverage points—are therefore powerful vehicles for implementing economic development strategy because they place industry in the lead and address the barriers to growth faced by not just one or a few firms but an entire regional industry complex. Along these lines, Nevada's support of cluster initiatives should focus on viable, distinctive, and competitive industry specializations in which there is objectively measured evidence of under-capacity and unrealized growth potential. Work to upgrade and strengthen a cluster should be private sector-informed and -led and tightly focused on attacking specific, documented constraints, institutional deficiencies, or resource shortcomings—for example shortcomings in R&D, gaps in local workforce skills, or particular institutional problems relating to policy.[6]

Cluster Initiatives: What They Are and How to Identify Them

Cluster initiatives are formally organized efforts to promote cluster growth and competitiveness through collaborative activities among cluster participants. Cluster initiatives may facilitate technology-based economic development initiatives in partnership with universities; sponsor education, training, and workforce development activities in partnership with employers and educational institutions; develop sector- or cluster-based export plans; facilitate market development through joint marketing, regional branding, and market assessment activities; or encourage relationship building, among many other activities.

Strong cluster initiatives improve the competitiveness of a cluster, boost the growth of a cluster, or fulfill the initiative's self-described goals.[7] Such initiatives typically choose their objectives wisely and focus on getting the process right.

Common objectives of cluster initiatives include network building; regional branding; talent attraction; firm (domestic or foreign) attraction; export promotion; technical training; spin-off promotion; and government lobbying.

On the process front, cluster initiatives initiated by the public sector, private sector, and joint public-private perform equally well, and the source of financing typically does not affect performance. Cluster initiatives that must compete to win government money tend to perform better, and cluster initiatives boasting strategic support from governments attract more outside firms. Limiting membership has a negative effect on performance.

Cluster initiatives must have the right resources to carry out their responsibilities as well. Successful cluster initiatives have their own office, sufficient budget to conduct significant projects, and access to peer networks of other cluster initiatives in the same industry.

Effective cluster initiative leaders must be knowledgeable, able to facilitate strong networks of contacts, and should be respected members of the industry community.

An effective cluster initiative is constructed around a cluster's unique strengths. It explicitly formulates a vision, sets quantified targets, and acts with consensus.

Cluster initiatives will often fall short of their goals if they fail to establish a common framework, if they lack consensus, or if resources are insufficient. Cluster initiatives that do not include regional branding as part of their goals are most likely to fail. Initiatives built around weak clusters face a higher chance of failure.

Cluster initiatives, finally, do not exist in a vacuum; their performance depends in part on issues outside of their direct leverage like state economic policy promoting competition and science and technology.

Policymakers will need to map the characteristics of effective cluster initiatives into criteria for identifying and assessing actors' capacity and proposals.

For more information visit www.cluster-research.org/greenbook.htm

Nevada has already announced its intention to review and improve upon conventional and often costly tax incentive and industry attraction economic development practices in order to maximize the job creation and diversification impacts of its efforts. A smart cluster strategy, built off of the existing strengths of Nevada's three distinct regional economies, is closely aligned with these objectives and will carry the state a long way towards meeting them.

To get started, though, Nevada needs to prioritize rigorous data and analysis in order to inform its interventions. Three types of information are necessary: objective market analysis to document and position its industry clusters; fine-grained information about clusters' institutional or resource deficiencies; and performance management measure to evaluate the efficacy of any interventions and hold strategies accountable for impact. [8]

Once the information infrastructure is in place, Nevada should support the emergence and maturation of region-led cluster initiatives through the provision of modest-sized competitive grants to existing cluster intermediaries or consortia of public and private entities that have credible plans to address binding constraints on a clusters growth or to execute smart growth strategies.

Competitive grants could support a wide variety of activities. For example, IT and defense companies interested in exploring Nevada's assets and opportunities in the cyber-security market could compete for a planning grant to conduct, in collaboration with a university department, an initial cluster initiative feasibility study. Or a renewable energy incubator, like REA250 in Reno, could compete for a technical assistance grant to increase the services it offers start-up tenants. An effective competitive grant program enables regional industry clusters to identify the interventions that will take growth to the next level—and enables the state to answer.

Establish a competitive grant program to support cluster initiatives. Informed by strong market information, Nevada's new economic development agency should establish a program that provides modest grants on a competitive basis to support a small number of cluster initiatives across the state's regions and established and emerging industries. The awards should expand the capacity of the actors (often public-private partnerships) that represent the state's economic regions and key industry clusters.

Three different types of grants could be offered according to the maturity of the cluster actors and the development stage of the cluster itself:

Planning grants. Planning grants of $30,000 to $60,000 would fund initial feasibility studies to evaluate the viability of any cluster initiative aimed at strengthening particular regional industry concentrations and bolstering coordination mechanisms. These grants would be offered:

- To regional development authorities or consortia of local governments, universities, and/or industry players overseeing new cluster initiatives
- As one-time awards for any particular cluster initiative
- Without any matching requirements
- On an open, rolling basis

Start-up and technical assistance grants. Start-up and technical assistance grants of $60,000 to $100,000 would be made to new and early-stage cluster initiatives to sharpen and energize management, facility, and program operations. These grants would be offered:

- To early-stage cluster initiatives with well-informed plans based on quality market data and commitments from key regional stakeholders including businesses, civic organizations, universities, and the public sector
- With at least a 1:1 matching fund requirement
- As a one-time award for any particular cluster initiative in any given year
- On an open, rolling basis

Competitive program grants. Competitive program grants of $100,000 to $500,000 would support well-defined, collaborative activities to strengthen clusters in areas like training, R&D, technology transfer and adoption, and marketing, among others, to overcome identified cluster gaps and documented constraints—and in doing so boost growth. The grants would be offered:

- To established cluster initiatives that have commitments from key regional stakeholders including businesses, civic organizations, universities, and local governments (Grants should flow only to genuine multi-actor regional intermediaries and cluster representatives and never to single municipalities or specific companies.)
- According to transparent evaluation on the basis of strict criteria that assess the sponsoring entity's organizational capacity; the degree of regional buy-in around the cluster initiative; the market case for the proposed activity; and the expected ability to raise future funds to sustain the activity once the award is expended
- With a 1:1 matching fund requirement
- On a competitive annual basis based on the innovativeness and viability of the proposal, in addition to expected ROI

How might such a program be utilized? Planning grants should be offered to entities investigating the existence of incipient clusters in regions or groups seeking to stoke collaboration in related industries where little previously existed. An example of the former could be a project to inventory private sector activity in the water technology space and explore whether a true cluster exists that builds off of expertise

housed in the DRI and the Southern Nevada Water Authority. An example of the latter could be a planning grant to map linkages among mining, materials, and manufacturing firms across rural counties.

Start-up and technical assistance grants could be made to jumpstart a digital high-tech cluster arrayed around the Knowledge + Discovery Center in Carson City, for example, or help a business incubator provide technology commercialization assistance to researchers or companies. Southern Nevada could benefit from a "big data" or Business IT Ecosystems cluster organizing effort in and around Las Vegas, further supported by a competitive program grant to establish a "cloud college" at UNLV.

Finally, matching funds from a program grant could augment international marketing efforts targeting foreign tourists. In general, start-up and technical assistance grants and competitive program grants should be awarded to emerging or established cluster initiatives that involve firms with a documented and measurable presence in regions.

Support regional planning and other types of bottom-up sector development including regional business plans, regional export plans, and regional innovation districts

Yet straight cluster initiatives are but one sort of region-based, bottom-up economic development activity that the state should endorse and foster. In fact, Nevada should be receptive to all sorts of bottom-up policy innovations and self-starting strategies developed in its regions. Beyond basic regional economic development planning exercises, three types of related strategies stand out as deserving special state attention for their promise: regional business plans, regional export plans, and regional innovation districts.

Encourage regional business planning in regions. Regional business plans are a new form of bottom-up economic development practice being developed by the Metropolitan Policy Program at Brookings that adapts the discipline of private-sector business planning to the task of regional strategy setting.[9] Such planning provides a rigorous framework through which regional business, civic, and government leaders can analyze the market position of their region; identify strategies by which to capitalize on their unique assets; specify catalytic products, policies, and interventions; and establish detailed operation and financial plans. As such, business planning is especially suited to the data and performance driven economic development model being adopted by the state of Nevada. The business planning process, for its part, instills the sort of good economic development principles and practice in regional and state entities that will serve Nevada well into the future.

A regional business planning effort involves three major elements:

- A strategic overview containing a concise trend scan of each region's economic performance and market positioning to reveal regional challenges and opportunities, which then inform a broad vision of the region and a carefully designed array of mutually reinforcing economic growth strategies

- Detailed development initiatives (DDIs) that identify lead strategies and complete the business plans for carrying them through. A DDI should include products and services, operations, financials and performance metrics for implementing a strategy

- Investment prospectuses based on the business plan that present the regional investment opportunities (particularly the DDIs) to potential government, industrial, and philanthropic partners

The business planning process yields investment opportunities attractive to a range of potential investors: business, government, and philanthropic. By encouraging the development of assertive and comprehensive business plans in regions and standing ready to invest in attractive opportunities on the basis of promised returns, the state can simultaneously encourage best practice and capacity building at the regional level while supporting strategies that are designed to leverage scarce resources from other public, private, and philanthropic partners and attract follow-on investment. A model business plan out of the Puget Sound region, for example, has garnered significant federal and private investment that the state of Washington has now matched (see sidebar). Encouraging such resource leveraging by design maximizes the impact of every dollar of state investment.

Puget Sound Regional Business Plan: Carving a Niche in the Clean Economy

One region that has taken bottom-up cluster development to a rigorous new level is the Puget Sound area, which has devised a hard-edged action plan (as part of a larger business planning effort in coordination with Brookings) to make itself a world center for a particular sub-area of the massive energy-efficiency (EE) industry.

Working through the disciplined regional business planning process, Seattle's move has been to employ detailed data and analysis to reveal and begin to seize on its strong positioning for exporting building systems software and technology to the world—a $14 billion growth market.[10]

In this niche, the region already enjoys significant competitive advantage, ranging from a world-class array of large and small software and IT firms; a significant EE consulting and services cluster; a world-beating international business infrastructure; and the presence of progressive utilities and numerous military bases that are serving as early adopters for technology demonstration and deployment.

And so the region has devised a catalytic, bottom-up strategy to achieve its goal of world export preeminence: the creation of the Building Energy Efficiency Testing and Integration (BETI) Center and Demonstration Network. BETI will allow EE IT innovators in the region to test, integrate, and verify promising products and services before launching them to market, providing a potentially game-changing boost. BETI would be a self-financing entity whose real-world facilities firms and entrepreneurs would pay to access and whose validation would become industry standard, establishing the region as a global EE IT hub.

BETI's ambition and grounding in rigorous market analytics are exemplary in their own right. Even more significant, however, is what the region's complete business planning effort represents: a region coming together, taking the initiative to fundamentally understand its economy, and acting intentionally on the findings.

In this respect, the Puget Sound region has acted coherently and for its part the State of Washington has

been an active participant and supportive partner, with everyone a winner. In September 2011 the U.S. Economic Development Administration awarded an i6 Green grant totaling $1.3 million to Washington's Clean Energy Partnership for the building out of BETI. The state quickly followed with a pledge of an additional $5.5 million investment.

For more information visit www.psrc.org/econdev/beti

The state should consider setting two pools of money aside to support regional business planning: one to support regions in the development of their plans and another to invest in smart strategies when they emerge. The principles underlying regional business planning—market assessment, building on strengths, visioning, strategy-setting, performance measurement, etc.—should be incorporated as requirements into all of the state's offerings. Lastly, the state should encourage regional entities to fold isolated initiatives into a more comprehensive regional business plan as well.

Support the development of regional export plans in regions to boost global engagement. Another sort of bottom-up strategic initiative relevant to Nevada and worth encouraging by state government is the production of regional export plans—detailed game plans by which regions aim to tap into the robust and growing demand for goods and services that lies outside of the United States. Also in development by the Metro Program through regional partnerships in a number of metropolitan areas, support of such plans could become a hallmark of strong strategy to internationalize Nevada's economy.[11]

Competition in the next economy will, in any event, require an unprecedented degree of global fluency. Nevada should embrace this and strive to promote its regions' renowned brands and unique specializations to the world.

A regional export plan should resemble a business plan in design and process, with export promotion as its lead initiative.[12] Foreign direct investment (FDI) attraction will frequently comprise an additional component. These localized export plans will apply market intelligence to develop better, targeted, integrated export-related services and strategies to help regions better connect their firms to global customers. Ideally, these initiatives will be spearheaded by business groups with support from universities, local governments, and other stakeholders. They should also clearly lay out the kinds of state reforms needed to support their effective implementation, which sector liaisons must then communicate directly to the governor and the legislature.

State export strengths tend to align with regional industry clusters and specializations.[13] As a result, an export plan should either complement or become an integral part of a cluster development and upgrading strategy.

A regional export initiative might tackle such challenges as collective marketing, tailored technical assistance, export financing assistance, workforce training, and freight prioritization, working closely with state and federal export promotion offices.[14] The state should aid and abet regional efforts as appropriate: in some cases with financial support, in others by being a lead advocate, and in all by being responsive.

One candidate for a state-supported export plan would surely be the tourism, gaming, and entertainment industry. In the face of the current slump in consumer demand in the United States—which is likely to

continue for years as households reduce their debt burdens—the Las Vegas hospitality complex should aggressively market itself to foreign tourists and consolidate its market position. (International tourism, which entails selling U.S. goods and services to foreign nationals, counts as an export). As it happens, LVCVA, a public-private partnership promoting Southern Nevada as a destination, already has a plan along these lines: to raise international visitor volume from 15 percent of visitors in 2008 to 20 percent by 2015 and 30 percent of all visitors by 2021.[15] Such ambitious regional industry cluster efforts are exactly the sort of initiatives that the state should determine how it can best aid and abet.

But opportunities exist in all of Nevada's target sectors. The geothermal industry in Northern and rural Nevada could develop a plan to market its expertise and wares to the world, for example. In yet other sectors, attracting foreign investment to fill in supply chain gaps or bring external expertise to a cluster will take priority. With the prospect of slower growth at home, Nevada needs to globalize—strengths first—starting now. Regional and sector export plans are a way to accomplish this in a strategic, evidence-driven manner.

Use policy levers to support the building-out of a finite number of regional innovation districts. One other sort of regional initiative the state could support would be strategic "place-making" programs to create the sort of vibrant urban spaces that attract and concentrate innovative firms and talented individuals. Such an "innovation district" program should focus public and private investment across economic, cultural, and infrastructure spaces in distinct, well-defined urban geographies. Building out a regional innovation district is another potential lead initiative of a regional business plan. As it happens, efforts along these lines are already underway in both Northern and Southern Nevada, and the state can embolden them with smart policies and programs.

An "Innovation District" would be designated through a competitive application process. In designing the competition, the state should pay special attention to the issue of leverage: Does the proposed district leverage existing physical, social, economic, and even environmental assets within, and adjacent to, the site? Leveraging assets will be the key to transforming the space into a thriving, synergistic innovation district integrated into the surrounding urban fabric.

A successful innovation district will also plug into existing economic activity, often connecting to strong regional industry clusters. Such a cluster-based approach promises to maximize the value of the site by concentrating industry actors and accelerating cluster dynamics like knowledge exchange and face-to-face contact. The innovation district should be planned around anchor institutions, such as universities, business incubators, and research centers, and leverage these institutions to foster cross-fertilization between learning, research, and economic innovation.[16]

A prime example of such an innovation district is taking shape in downtown Las Vegas, where the city of Las Vegas is working closely with Zappo's to use the company's downtown relocation to transform the East Fremont district into a sought-after, dynamic place to live, work, and play.[17] Policy tools at the state's disposal to support such an innovation district include zoning, priority permitting, targeted location incentives, and catalytic place-based investments in public spaces. Any strategy should have both residential and commercial components and target the sort of innovation-based creative commercial activity that benefits from close clustering and face-to-face interaction.[18] Establishing an innovation district may be a central component of a cluster strategy in IT, for example.

Candidates for designation as an innovation district are underway in Northern Nevada too. Reno's downtown revitalization push, for one, could benefit from an infusion of state support tied to a competitive

grant that encourages best practices in design. Carson City's drive to build a downtown incubator for tech entrepreneurs at the Knowledge + Discovery Center—itself a hypothetical candidate for a cluster grant—could similarly benefit from coordination with the state on this physical planning front.

The state should be on the lookout for opportunities for such alignment—and chance to economize on resources that they present.

Align the state's existing policies and programs with a cluster-based, regional approach to economic development

Finally, over and above modest financial support, the state should swing its many assets and capacities behind smart regional plans and initiatives. In this respect, a cluster-based approach to economic development—properly viewed and implemented—need not by confined to specifically titled "cluster" programs and policy products.[19] Instead, it can and should be adopted as a paradigm for informing, drawing in, and organizing multiple activities. In that sense, the state's new engagement with its regions should entail program alignment and tuning as much as material support.

As a first order of business, the new sector champions should work closely with their regional colleagues to indentify the full universe of relevant funding, resources, and programs offered by the state that impact regions and sectors and could be leveraged to support bottom-up sector and cluster initiatives.

Imbuing a regional literacy into state R&D and tech transfer initiatives, export promotion efforts, venture-related financing regulations, tax policy, or education and workforce policy, for example, promises to boost the economic impact of each through targeted and customized offerings.

Critically, the Catalyst Fund should be deployed strategically to build out regional clusters by filling gaps in supply chains or securing expertise that augments existing knowledge bases in key sectors. Further efficiencies can be exploited by, for example, aligning permitting, incentives, and planning regulations in support of an innovation district with a competitive cluster grant in support of a business incubator—all in a single location. Harnessing cluster dynamics in such a way promises to amplify the impact of every state dollar.

Concrete actions that Nevada can take to link, leverage, and align its existing offerings include:

- Prioritizing collaborative applications across departments that tackle cross-cutting cluster-relevant issues like workforce training or infrastructure when awarding competitive grants
- Tuning department and program objectives and offerings across the administration to cluster needs
- Organizing incoming federal resources to help coordinate local cluster-building efforts

These steps promise to not only bolster innovation, entrepreneurship, and job creation cost-effectively but also to focus and streamline state economic development policy for maximum efficiency in an era of scarce resources.[20]

Hubs of Innovation and Opportunity: Organizing Investments in Ohio

Ohio's Hubs of Innovation and Opportunity program aims to give an overarching direction to the state's array of economic development offerings by imbuing local and state policy with a more strategic, asset-based approach that builds on regional strengths and concentrates the state's scarce resources on existing clusters of excellence. Over the past year, Ohio has designated each of its seven major metropolitan areas a hub in a particular area of expertise, such as consumer marketing in Cincinnati, solar technology in Toledo, and biomedicine in Cleveland, and awarded $250,000 in discretionary grant money to each.

In practice, the hubs program proposes a classic effort to link, leverage, and align existing state efforts in service of bolstering cluster dynamics. Going forward, the program will target the application of traditional economic development tools such as brownfield redevelopment incentives and neighborhood revitalization tax credits to discrete geographies anchored by major hub players like universities, R&D centers, and groups of related firms. By encouraging related business to locate centrally in these hubs, the state also hopes to foster knowledge spillovers and other benefits of proximity to simultaneously grow its major regions and revitalize their urban cores. Such a model could be followed by Nevada's innovation district program, for example.

Hub offerings take into account the locus of Third Frontier venture capital awards (the state's flagship technology-based economic development program) and intentionally seek to maximize the impact of these investments. In this way, the hubs are already becoming a popular organizing principle across multiple state agencies and programs: The Department of Transportation intends to start linking a portion of its investments directly to hub needs. In sum, Ohio's Hubs of Innovation and Opportunity program underscores that regional strategy properly conceived entails leveraging and aligning existing programs as much as creating new ones.

For more information visit www.development.ohio.gov/Urban/OhioHubs.htm

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In sum, once Nevada's streamlined operating system is in place, the state should embrace the regional paradigm as an organizing principle for its economic development strategy and move to craft its policies to support, leverage, and build on the unique strengths of its three major regions. Informed by this regional paradigm, the next task facing Nevada is to fundamentally revamp its innovation and education platforms.

VII. Diversify: Set a Platform for Growth through Innovation, Global Engagement, and Aligned Education and Training

Nevada's metropolitan and rural regions are the engines of the state economy. These regions concentrate the innovation capacity and the entrepreneurship, the global connections, and the people that will help Nevada build a new future.

However, the regions can't "go it alone." Instead, they need the state to set the stage for renewal and competitiveness. And so Nevada leaders need to establish a platform for broad-based growth in the Silver State that at once furnishes an effective innovation and commercialization infrastructure, attends to the state's global engagement, and aligns its education and workforce development efforts to its new economic strategy.

Each of these "platform" priorities is related and each remains among the most promising ways to drive economic growth in the 21st century. Innovation—the deployment of new ideas into commercial use—is increasingly recognized as one of the fundamental drivers of growth and one of the key determinants of regional, state, and national living standards.[1] Global trade and foreign direct investment (FDI) likewise drive growth by enabling local firms and projects to connect with vast global markets and capital pools, while exporting calls forth and rewards innovation, as it forces companies to stay on the cutting edge of competition.[2] And meanwhile progress on all of these fronts and more is wholly dependent on the productivity and creativity of a well-trained workforce whose varied skills dovetail with the occupational needs of local industries and clusters.[3]

And so the following sections advance a three-part agenda for putting in place a sturdy platform upon which Nevada can grow vibrant regional economies and new industries for the future. This agenda calls on the state to:

- Bolster innovation and accelerate commercialization
- Expand global engagement particularly with rising nations
- Align higher education and workforce development to strategic economic opportunities

Progress on these fronts is essential and will begin the work of truly repositioning the state's economy for success in the 21st century.

Bolster Innovation and Accelerate Commercialization

Enhancing innovation and commercialization levels in existing core industries, as well as in emerging "sunrise" clusters, must be the first priority as Nevada assembles a platform for growth through diversification.

In the past decade, innovation—or the development and introduction into the market of new products, services, and business models—has become even more of an imperative for the success of firms, industries, regions, and nations.[4]

Increasingly, regions and states must assemble an economic base of companies and clusters that constantly innovate and maximize their use of technology and advanced processes—or risk decline. More and more, too, successful innovation regions and states are characterized by close collaborative linkages between scientists and researchers, entrepreneurs, economic development leaders, governments, venture capitalists, and firms.

And yet, the fact is that Nevada's current innovative capacity remains weak, as concludes the competitive analysis conducted for this report.

In terms of its basic innovation enterprise, the state currently suffers its lack of a top-tier Carnegie-ranked doctoral research university; its low overall levels of R&D activity; and its low per capita production of PhDs, scientific publications, and patents.[5] At the same time, Nevada also has had a poor track record of turning discoveries from academic research into commercializable products and ventures that create new companies and jobs.[6]

To be sure, the state posses plenty of entrepreneurial spirit and capacity—in fact, Nevada ranks among the top U.S. states for its overall entrepreneurial activities (e.g., entrepreneurs per capita, new business start-up rate).[7] However, Nevada lags behind most U.S. states in metrics of technology commercialization and entrepreneurial activities related to innovation, such as university invention disclosures, licenses and options executed, licensing income, and spin-off companies.[8]

All of which suggest the outline of the needed platform-building work for Nevada. First, the state needs to increase the size and quality of its basic and applied research activity. Through such expansion will come highly trained people, ideas, and patents. But simply conducting large amounts of R&D or producing large numbers of patents and publications will not guarantee that innovation will translate into tangible economic benefits or spawn new companies and jobs. Innovation also requires the ability to create new knowledge *relevant to the needs of business and society*. Which is why the search for innovation cannot occur in a vacuum but must be rooted in an ecosystem that fosters partnerships and nourishes new ideas and entrepreneurial attitudes and activity.

And so the need of the hour is for Nevada to build a true technology-based economic development (TBED) system by increasing the size, quality, and relevance of its basic research enterprise even as it works to enhance the broader ecosystem within which innovation is nourished, developed, and sustained. What does this mean? It means that Nevada will need to step up its efforts to support researchers, entrepreneurs, and knowledge/technology-based industries—and the interactions among them—if it wants to execute a serious drive toward economic diversification through innovation.

Such a push will require two sorts of commitment. First, the new innovation drive will require a multi-year commitment to a higher level of investment in the state's capacity for knowledge creation. This will almost certainly require substantial new support of the state's universities and DRI. Related interventions will also need to encourage greater university-industry collaboration in order to link R&D investments to the needs of the state's strategic industries, incentivize industry R&D, and support universities and small businesses in leveraging resources for research. Second, the state needs to increase its capacity to guide and support researchers and entrepreneurs on the road to commercialization, including through the

provision of access to start-up capital. Put them together and these dual efforts will help turn Nevada-grown knowledge into Nevada-born businesses within the fertile confines of increasingly vibrant regional innovation clusters.

Along these lines, then, the following section suggests seven recommended approaches (elaborated in detail below) for helping Nevada bolster its innovation capacity and accelerate commercialization. Five of these will directly invest in or foster the state's innovation capacity:

- Make strategic investments to boost research output and new discoveries
- Incentivize industry-university research collaboration
- Boost industry R&D through competitive tax incentives
- Leverage federal resources to catalyze high-impact R&D
- Assist small business in winning SBIR/STTR funds

At the same time, two more strategies will attend to the state's commercialization infrastructure:

- Develop strong commercialization infrastructure, a relevant intermediary, networks, and support mechanisms
- Increase access to risk capital

One final note: To affirm the importance of innovation-based economic development and to make it effective, many states have created an organization or structure dedicated to planning, advancing, executing, and organizing their strategies, programs, and activities in technology-based economic development. Some states place this entity under the Department/Office of Economic Development (e.g. Ohio Third Frontier). Other states have created entirely separate entities (e.g, Utah's USTAR and the Oklahoma Center for the Advancement of Science and Technology—OCAST). It will therefore be up to Nevada's leadership to determine whether the important "brain" functions of its innovation/commercialization initiatives will be best performed within the newly formed Office of Economic Development (which is already tasked to administer both the Knowledge Fund and the Catalyst Fund under AB 449) or in a separate but parallel structure.

This decision should be made after careful consideration of the merits of alternative approaches and Nevada's unique situation. In either case, the most critical considerations for designing an effective structure are to ensure that: the entity is private-sector driven and staffed with strong professionals with private sector experience; its operation is aligned with the state's overall economic development strategy and activities; and the criteria for decisionmaking and resource allocation are completely objective, transparent, and determined by people with knowledge and expertise.

But that is only the institutional setting for the innovation agenda. Here, meanwhile, are the needed strategies for increasing the state's basic innovation capacity:

Make strategic investments in "impact scholars" to boost research output and new discoveries. Research universities and institutes form the nucleus of a state's innovation capacity and top-flight researchers anchor top research universities. Such top scholars are the linchpins of how universities draw R&D funding from federal and private sources, attract and train top talent, and produce discoveries with potential for commercialization in the regional economy.

To bolster the state's innovation capacity and research output, Nevada should establish and fund an "impact scholars" recruitment program (i.e., an "Eminent Scholar" or "Star Faculty" program) that would attract star researchers to the state's three major academic research institutions. The targets would be top-notch research talent who can lead and build world-class research teams in science and technology areas critical to the state's key industry clusters, create knowledge, take discoveries to commercialization, and spinoff new businesses.

This program can be funded under Section 22 of AB 449, which stipulates such use under the Knowledge Fund. Given the importance of this initiative it is critical for Nevada's leadership to commit adequate resources to the Knowledge Fund in order to revitalize its research universities and institute, and jumpstart its research enterprise.

There is a long history of other states and regions establishing aggressive programs of this nature to recruit and retain research leaders in strategic science and technology fields. Leading examples, which have served as the centerpieces of state efforts to foster innovation, include the Georgia Research Alliance Eminent Scholars Program, the University of Texas System Eminent Scholars Program, the Ohio Research Scholars Program (under Ohio Third Frontier), and Utah's USTAR All-Star Faculty Program. Nevada should look closely at the "impact scholars" model as it seeks to design its own drive to systematically bolster its innovation enterprise with investments tuned to the state industry strategy.

Utah Science Technology and Research: A Statewide Model for Innovation and Technology Development

The Utah Science Technology and Research initiative (USTAR) embodies Utah's commitment to strengthen the state's "knowledge economy" and generate high-paying jobs over the long-term. Funded in March 2006 with an allocation of $179 million by the Utah Legislature, USTAR mainly comprises three program areas that together drive innovation statewide.

The first program area, funded at $15 million annually, is for strategic investments at the University of Utah and Utah State University to recruit world-class researchers. In the first five years of the program, USTAR has recruited 45 faculty in five targeted innovation areas. The faculty have collectively won more than $90 million in competitive federal funding—to support groundbreaking research in energy, nanotechnology, medical imaging, biopharma, and digital media—and acted as catalysts to engage other entrepreneurial faculty in commercialization activities.

The second program area was funded through $160 million of bonds to build state-of-the-art interdisciplinary facilities at these institutions. Each facility provides the research teams with strategic core infrastructure to advance innovation and commercialization in their respective focus areas and each is also designed to be an "industry magnet" for innovative collaboration.

The third program area—called the Technology Commercialization Grant (TCG) program and funded at

$1.8 million annually—involves business teams that work with companies and entrepreneurs across the state to promote commercialization activities in defined regional economies. The business teams are based at five regional higher education institutions and have become the go-to people in the region for driving expanded industry and higher education collaboration. They have also helped to organize four cluster-based "Concept to Company" contests that averaged over 40 ideas per contest and brought together entrepreneurs, industry experts, and the financial capital community. In FY11, the TCG program deployed approximately $3.2 million in grants to 87 projects that have resulted in more than 78 prototypes, 21 new companies, 114 patent disclosures, 109 jobs, and over $18.7 million in new private capital, with increased results being added monthly.

In short, since its inception, USTAR has rapidly emerged as not just the state's primary innovation driver but a national best practice. To the latter point, USTAR is attracting the attention of other states because of its long-term focus; relatively small price-tag and use of bond financing; its strategic investment in innovation and technology-based research; and its apparent ability to successfully navigate the "lab-to-market" commercialization pathway. Nevada is right to examine the outline and implementation of USTAR as it explores the creation of its own solution.

For more information visit *www.innovationutah.com*

Incentivize university-industry research collaboration. And yet, investments in university research will not by themselves catalyze the sort of economic impact the state desires. Equally important is collaboration—strong interactions between academic and private sector technical work.

Unfortunately, Nevada ranks near the bottom of all U.S. states for the amount of industry-sponsored R&D conducted at its academic research institutions while numerous stakeholders see a wide divide in many areas between academic and business investigators. And so Nevada needs to work proactively to enhance and deepen the connection between industry and research universities and institutes in order to make sure that academic research leverages private sector resources and supports business, and also to shorten the length of time from making discoveries, commercializing these discoveries, and ultimately creating new competitive advantages, firms, jobs, and profits.

To this end, Nevada can work very directly to create an university-industry collaborative research grant program with the goal of creating technologies that will be transferred to the private sector and commercialized. Multiple research grants can be made in relatively modest amounts of $50,000-$100,000, funded under the Knowledge Fund (AB 449, Section 22.4). Based on successful programs around the country, Nevada's industry-university collaborative program should: [9]

- Be competitively awarded and merit-based. Funded projects need to have both technical and business merit. An evaluation board can be set up to make decisions on the award, with input from two panels of evaluators. The technical feasibility of the project should be reviewed by a panel of technical domain experts of the highest caliber. A separate panel of reviewers consisting of individuals with private sector experience will evaluate the business feasibility, cost, and economic impact aspects of the proposal

- Maintain very high bars of technical merit and business feasibility. Stringent award standards send positive signals to other potential funders, making it easier for the research teams and businesses to get follow-up funding from sources such as SBIR/STTR and venture capitalists

- Focus on technology or scientific concepts that will contribute to a strategic industry sector (not limited to high-tech sectors), and have the ability to improve Nevada companies' competitive position and potential to create jobs in Nevada

- Prohibit the transfer of funds to business. All grant funding will be channeled to fund researchers and their activities conducted at one of Nevada's academic research institutions

- Require that all applications be submitted by a Nevada faculty member as a co-PI (Principal Investigator) with industry providing matching funds (cash and in-kind contributions). This will maximize the collaborative nature of the work. More than just leveraging private research dollars, private sector match provides an important validation that the research project may have commercialization potential and will lead to economic impact. The minimum threshold of industry match can be established on a sliding scale, requiring a higher match from larger companies and smaller co-funding from start-up and small firms.[10] To be eligible, business must be based in Nevada or agree to establish operations in the state within one-year of the award

Boost industry R&D through competitive tax incentives. Ramping up the state's academic research and tuning it to industry needs will not be sufficient to grow the Nevada innovation enterprise. The state also needs to stimulate the private sector research enterprise. To that end, Nevada should consider implementing research and development (R&D) tax incentives to stimulate R&D in existing Nevada companies and attract private-sector R&D activity to the state.

The state's current tax "offer" on this front could be better. While Nevada's low corporate taxes serve as a general incentive for business activity, the state stands to improve its competitive position by implementing tax incentives that specifically target research and development. Case-by-case tax incentives are currently available in Nevada for new and expanding firms in "strategic" sectors (including "R&D companies"), but no across-the-board incentives are available for any company conducting R&D in the state. R&D tax credits are an effective means of increasing the level of private-sector R&D, and the number of high-tech establishments[11] in a state. These credits also have also been linked to the attraction and retention of private-sector R&D operations from out-of-state.[12]

The requirements, structures, and levels of state R&D tax incentives in the U.S. vary widely, and designing incentives that balance Nevada's economic objectives and resource limitations will require well-informed, careful crafting. Review of other states' approaches suggests three basic R&D tax incentive structures, which can be implemented individually or in concert:

- *R&D Sales & Use Tax Exemption:* A sales and use tax exemption for the purchase of machinery and equipment used primarily for R&D would provide substantial benefit to companies engaging in research and development in Nevada. Exemptions can be full or partial, apply to all research and development or target areas, and may also include items such as fuel, utilities, and property. The breadth and depth of the exemptions should be determined based on the desired level and area of impact, as well as the availability of resources. R&D sales tax exemptions are a very commonly used incentive in many U.S. states.[13]

- *R&D Property Tax Abatement:* To encourage investment in research facilities, Nevada could implement property tax abatement for newly acquired, constructed, or expanded research facilities in the state. Such abatements can be based on a percentage of the new facility cost, or can be structured to offset the cost of newly assessed property value for a set period of time. Again, the level/percentage of credit offered will require a careful cost-benefit analysis by the state.[14]

- *R&D Expenditure Tax Credit:* Over three-quarters of U.S. states currently provide some form of R&D expenditure-based tax incentive, generally in the form of a credit towards state corporate income or franchise taxes. Nevada is unusual in that it does not levy a state corporate income tax or corporate franchise tax, and would therefore need to think creatively about what taxes and R&D expenditure incentive could be credited toward, and how that credit should be structured. For example, Nevada could potentially offer a credit against the state's modified business tax.

Based on practices in other states, meanwhile, a number of design issues need to be carefully weighed during the development phase of any new state R&D tax credit:

- *Eligibility:* A Nevada R&D tax credit should apply only to in-state research and development activity. State-level eligibility should also be aligned with federal requirements, which are generally broad and inclusive. Any additional priorities or objectives that are unique to Nevada (and thus not reflected in federal criteria) should be included as modifications or additional conditions for eligibility. For example, some state policies are linked to the federal R&D credit, but also include requirements related to employment levels, firm size, or specific sectors

- *Incremental/Non-incremental:* Based on state objectives and careful market analysis, Nevada must determine whether R&D tax credits should be based on overall research expenditure versus incremental expenditure. For example, Nevada may wish to focus resources on incentivizing growth and new sources of private-sector R&D by basing credit values on incremental R&D expenditures. However, if Nevada determines that current, high-value research activities are in danger of being cut or relocated, the state may wish to provide tax credits dependent on overall R&D levels, providing support for new and existing programs and activities. A balanced approach may also be appropriate; a number of states provide some credit for overall R&D activity but place a higher value on new activity/growth

- *Specialized Rates:* If Nevada wishes to prioritize small and medium-sized businesses, start-ups, or a certain sub-segment of R&D activity, it may do so via specialized rates. This can be done directly, by offering higher rates for firms that meet specific target requirements, or by or creating dollar amount caps above which firms receive a reduced rate or no additional credit. A number of states have utilized such tools to focus resources on R&D activity by small and medium-sized businesses, considering this to be a higher-impact use of state funds

- *Level/Percentage:* The percentage of R&D expenditure used to calculate state-level tax credits should be determined based on rigorous cost-benefit analysis to ensure that Nevada achieves the desired level of impact but remains within budget requirements. The allowable percentage of R&D expenditure for tax credit varies widely across U.S. states, ranging from 1 percent to over 20 percent

- While a coalition of agencies and institutions could lead the investigation and development process of crafting new state-level R&D tax incentives, enactment of these measures lies with the state legislature. A passed R&D tax credit would be administered by Nevada's Department of Taxation, in coordination with the GOED. In order for the credit to have the desired effect of encouraging in-state research, the GOED must clearly communicate the benefits of the credit to private-sector institutions that require such incentives to place, grow, or retain a research presence in Nevada.

Leverage federal resources to catalyze high-impact R&D. Nevada also needs to do more to access available federal resources for innovation. The federal government, after all, is a major source of R&D funding through programs in the NSF, Department of Energy, National Institutes of Health, and numerous other agencies. However, Nevada's research institutions and companies have not adequately tapped into these federal funding sources (especially as compared to other states), despite having the opportunity. Adding to the problem is the fact that many federally-funded R&D grants and awards require cost-sharing or matching funds—funds that have rarely been available.

In view of these problems, then, the state may want to help Nevada's researchers and firms better leverage federal resources, establishing a mechanism to support cost sharing through matching grants available through a competitive proposal process.

How might it work? Competitive matching grants could be awarded from the Knowledge Fund to universities, research institutions and public-private consortiums based on merit, market potential, relevance to strategic industries, and the ability to secure federal grants/awards or private funds.[15] These state-level incentives would directly support high-impact research, as well as enhance the position of Nevada-based competitors in applying for federal funding in strategic research areas—such as from NSF, Department of Energy, and Department of Defense programs—by contributing to programmatic preferences or requirements for cost-sharing or matching funds.

Assist small business in winning SBIR/STTR funds. Similar issues need attention in the domain of small business. Each year, the federal government provides more than $2.5 billion of research funding to small businesses for feasibility testing, prototype development, and collaborative research with non-profit research institutions through the SBIR and STTR programs.[16] Eleven federal agencies participate in SBIR/STTR, and the awards are highly competitive. Many states provide networking and application assistance to small businesses to help them access this substantial pool of research funding. State websites disseminate SBIR/STTR program information, provide online tutorials, and link to key information. Some states, such as New York and Utah, have dedicated specialists to guide businesses through the application process.[17]

Nevada should respond in kind. The state should create an SBIR/STTR resource center to help its small businesses identify SBIR/STTR funding opportunities, compete successfully for these awards, and transition from proof-of-concept/feasibility awards to the full R&D and commercialization phases of the program. Along these lines, the SBIR/STTR resource center can build off the already existing Nevada Small Business Development Center—a statewide business assistance and outreach program of UNR's College of Business—which provides a wide variety of technical assistance to support Nevada's businesses.

Key services to be provided by an SBIR/STTR resource center would include:

- Reaching out to Nevada's small businesses to raise awareness of the SBIR/STTR programs, as well as available support and services
- Assisting companies in identifying which SBIR/STTR elements are best suited to their needs, and identifying corresponding agency solicitations
- Helping companies to develop successful SBIR/STTR proposals, including overall strategy and proposal structure/writing
- Provide easy access to information (e.g., deadlines, registration/submission guidelines) about the registration and proposal submission processes

Nevada's SBIR/STTR resource center can be comprised of an online "one-stop-shop" backed up by a knowledgeable technical staff available to provide customized assistance to businesses. The online resource center should contain comprehensive information about the SBIR/STTR programs, agency solicitations, proposal guidance, as well as information about additional services available through the center. Experienced technical staff would conduct SBIR/STTR workshops and seminars, as well as work one-on-one with companies on strategy development and proposal writing and editing. The SBIR/STTR resource center must work closely with small business support and economic development organizations throughout the state to ensure that businesses are aware of SBIR/STTR opportunities and have access to the center.

* * *

But beyond building new innovation capacity, Nevada also needs to put in place infrastructure to support the emergence of a true commercialization ecosystem adjacent to the enterprise in the state's regions. Two final strategies will help with that:

Develop strong commercialization infrastructure, a relevant intermediary, networks, and support mechanisms. To achieve economic impact knowledge needs to be drawn into use, and into the orbit of entrepreneurs, private firms, and financiers. Then it may prove transformative. Yet here is Nevada's challenge: Much of the R&D that takes place in Nevada's research institutions is not adequately connected to industry needs and strengths, the wider innovation ecosystem, and commercialization opportunities. There is an overall lack of resources and coordination to connect knowledge creation that takes place in Nevada to entrepreneurs and capital. Nevada also lacks a formal statewide commercialization assistance network that can support researchers and entrepreneurs to build a start-up company and to connect with risk capital, talent, markets, and resources for technology development, prototyping, testing, etc. These kinds of programs are offered in many states, such as the Entrepreneurial Signature Program in Ohio, USTAR in Utah, Ben Franklin Technology Partners in Pennsylvania, and i2E (Turning Innovation into Enterprise) in Oklahoma.

To support economic diversification and innovation-based growth, Nevada needs to follow the example of such innovation-focused states to establish a strong statewide intermediary and various related support mechanisms to foster and accelerate commercialization. Key steps toward the creation of such infrastructure are as follows:

- *Establish a statewide intermediary to deepen innovation connections.* Nevada's combined innovation-commercialization ecosystem is fragmented, with many of its players unable to connect the dots in the absence of a designated, statewide intermediary. The state should consider filling that gap. To that end, a new statewide innovation intermediary should be created and supported through the Knowledge Fund (under Section 21.2 of AB 449) to facilitate technology transfer, through close connections with the state's universities and research institutions (their R&D capabilities, potential discoveries, and would-be entrepreneurs), as well as with other organizations and programs in the state that provide support services and capabilities.

  What would such an intermediary do? The intermediary would focus on identifying existing R&D capabilities and providing the necessary connection, screening, brokering, match-making of partners, and coordination between the players and existing statewide resources that can help to bring discoveries to market.[18] Many programs of this kind embed the mentoring and coaching services described below, are connected to state-funded start-up capital programs (also discussed below), as well as other resources such as assistance in applying for SBIR/STTR funding. To maximize synergy and interactions, the intermediary services should be located near Nevada's core research capabilities and/or in a high traffic area for experienced and aspiring entrepreneurs. To maximize its effectiveness the intermediary would ideally be staffed with specific liaisons who have subject matter expertise in the industries and technologies that are targeted by the state. Utah's USTAR program offers a nice model for developing a regional network of technology outreach and innovation centers.

- *Provide mentoring and coaching to entrepreneurs.* Aspiring entrepreneurs (including many researchers) often lack the experience, guidance, and resources they need to develop their ideas into viable businesses. To fill this gap, Nevada should create a mentoring and coaching program for entrepreneurs. This can take the form of an entrepreneur-in-residence service, whereby a team of experienced businesspeople provide assistance in such areas as: technology development; market and customer analysis; guidance and review of business and financial models, marketing plans, and investor presentations; building a management team; and connecting with angel investor networks or other seed capital sources. To some extent, such mentoring has been undertaken by NIREC with some initial success, and these efforts should be supported and built upon. A number of other states' programs, meanwhile, offer good models for entrepreneurial mentoring and coaching, such as the Venture Advisory Service under Oklahoma's i2E. This activity can be supported through the Knowledge Fund (under AB 449 Section 21.2).

- *Create virtual resources and networking space for entrepreneurs*. Many states provide a centralized web-based resource for researchers and entrepreneurs to seek information, services, funding, technology capabilities, and potential partners. An online space can be set up to link the various players in Nevada's commercialization networks so that potential clients can find what they need by starting at a web-based one-stop-shop. In other states, many of these web resources are run as part of a state or regional technology outreach program, and include databases on patent disclosures, handbooks and how-to guides, templates for developing business plans, grants and solicitation announcements, links to investor groups, sample contracts/agreements, training, and other resources. *InnovationUtah.com*, for example, directs potential clients to the most relevant information by segmenting information for academics, entrepreneurs/inventors, industry experts, and investors. The website can also be used as the platform for delivering web-based training for potential entrepreneurs.

- *Support the development of incubators and accelerators.* The state should support the development of regional technology commercialization support programs, organizations, and mechanisms such as incubators and accelerators, provided that they are well-articulated, based on a sound business plan and best practices, receive buy-in from regional stakeholder groups (business, universities, local community), and that they support regional economic development priorities and the state's target industry clusters. Support for these efforts can be provided as a regional grant or under Section 21.2 of AB 449.

- *Boost entrepreneurial education and resources.* The state should support efforts that empower, prepare, and develop entrepreneurs by providing business and commercialization training to students, researchers/faculty members, and aspiring entrepreneurs. Programs such as UNLV's Center for Entrepreneurship and UNR's Entrepreneurship Initiative can be leveraged to develop specific short training courses to guide students through the commercialization process, as well as on the topics specific to Nevada's priority industry clusters, such as renewable energy, IT, and medical/health technologies.

Diversifying Metro Orlando's Economy: Making State Investments in Innovation

Metro Orlando has a lot in common with Las Vegas, including a similar population size and a strong dependence on tourism and consumption-related sectors. At the same time, though, it stands out as an example of a region that has been working to transform itself through a strong state-metro partnership to diversify the economy and boost innovative activities.

In 2003, Orlando stakeholders realized that they had the potential to build a biomedical industry when the city was short-listed by Scripps, a world-class biomedical research institute, as a branch campus location. Although the city did not land the Scripps project, city leaders recognized the importance of establishing a medical school in Orlando and, with funding support from the state, established the College of Medicine at the University of Central Florida (UCF). The investment and demonstrated commitment by the State of Florida and the region launched Central Florida as a new magnet for the biosciences and biotech industry. The first major anchor attracted was the Sanford-Burnham Research Institute in 2006 and other major investments followed. The 50-acre UCF Health Sciences campus is now a flourishing "medical city" that also includes the Burnett Biomedical Sciences Building, a VA Medical Center, as well as several other research hospitals and facilities—and soon the Nemours Children's Hospital.

Simultaneously, public and private investments were made to cement Orlando's dominance in tourism and hospitality. In 2004, the Rosen College of Hospitality Management was founded at UCF with a $25 million gift that was matched by state funds. The result was a gleaming new campus that also attracted other private donations to build the Disney Dining Room, Universal Orlando Library, Darden Auditorium, and the state-of-the-art Anheuser Busch Beer & Wine Lab.

Orlando provides an instructive example of how strategic investments in higher education and innovation capacity by the state can be leveraged regionally to support diversification of a major metropolitan area by strengthening its core industries. These investments have turned UCF into a top-tier Carnegie research university and a major innovation asset in Central Florida. UCF was recently named the 4th ranked "up-and-coming" school in the nation by *U.S. News and World Report's* "Best Colleges 2012" rankings.

Increase access to risk capital. Access to angel, seed, and venture capital is a final necessity if researchers and entrepreneurs are going to translate their innovative ideas and technologies into commercial ventures and to grow young, early-stage start-ups into larger job-creating companies. On this front, and similar to the situation in many other states, the level of venture capital (VC) investment has historically been low in Nevada. Between 2005 and 2010, for example, the state averaged only six VC deals annually (for an average of $38.8 million in funding each year), which garnered only 0.2 percent of all VC investments in the nation each year. Even during the tech boom of the early-2000s, when VC investments crested nationally, VC investments in Nevada were not significantly higher than they are today. To be sure, increasing the availability of risk capital in Nevada will depend, in part, on increasing the quality and amount of commercializable R&D and innovations coming out of the state's research institutions.[19] On the other hand, many states have helped to address the market gap for risk capital by launching proactive mechanisms to increase the supply of venture, seed, and angel capital in their regions. So should Nevada.

Building on successful approaches used in other states, then, Nevada should work to increase access to seed, angel, and venture capital in the state through two mechanisms:

- *Build and support state or regional VC/angel networks to close information gaps between investors and entrepreneurs.* Nevada stakeholders give mixed opinions on whether there is truly a dearth of risk capital in the state; some claim that venture and seed funding is readily available (both from in-state sources and from nearby Silicon Valley or elsewhere) for entrepreneurs with high-potential ventures and access to the right networks. Recent efforts, such as the new VC fund being established under the auspices of Switch Communications and founder/CEO Rob Roy, will also expand local capital availability (at least in Southern Nevada). However, venture capital generally requires a strong and well-developed regional network of investors and entrepreneurs, and this network remains latent (but is starting to grow) in Nevada.

  There is no shortage of financial resources present in Nevada, and these resources could be better tapped if potential investors are educated about venture capital investing and become better organized. Nevada's venture capital community currently includes a collection of individuals, initiatives, and trusts; three early-stage investment groups; and only one National Venture Capital Association member firm (located in Las Vegas). Nevada does not have any local, regional, or statewide venture capital organizations.[20] The lack of organization and depth in Nevada's investor community seems to be a key challenge. Even when there are good deals to be made in Nevada, investors may not have good ways to find out about them, and Nevada entrepreneurs do not always have clear channels to find out about potential sources of capital. Closing this information gap could make great strides toward expanding capital availability with little investment required on the part of the state.

  One approach in this regard is to establish and/or sponsor statewide or regional venture/angel forums, which would hold periodic regional events where investors and entrepreneurs can meet, network, and present/showcase new ideas; such forums can also be hosted on an ongoing basis through web-based networking platforms.[21] The forums could also serve as a channel to provide educational seminars for accredited investors interested in angel or VC investing.[22] In addition, a higher-profile annual statewide venture/angel/entrepreneurs conference could be launched to attract a wider, national audience of investors. States that have been successful in establishing these kinds of venture forums have typically launched the forum initially as a state-funded third party organization that incubates and screens business deals; provides advice and connections

to services for refining business ideas; and provides some seed capital financing for the best deals. Once the venture forum is well established and has built credibility within the VC community, then its management and operations can be fully transferred to private VCs.[23]

- *Leverage additional financing sources for Nevada start-ups through the state's new venture capital "fund-of-funds."* Nevada has already taken an important step to increase the availability of in-state risk capital with SB 75, which authorizes the creation of a private equity investment fund by leveraging up to $50 million of non-tax dollars in Nevada's Permanent School Fund (PSF). Set up as a "fund of funds," Nevada will invest in and partner with one or more private venture and equity funds that focus on in-state company investments (rather than independently and directly selecting companies to fund).[24] By channeling the investment through a non-profit public entity (the Nevada Capital Investment Corporation), which will hire professional private equity fund managers and seek partnerships with capital investment firms to invest in select Nevada companies, Nevada will be able to leverage significant private sector resources and potentially attract additional out-of-state investors.

- Importantly, the new fund-of-funds can provide a vehicle through which additional sources of investment capital can be channeled. One potential source is the alternative investments made by Nevada's Public Employees Retirement System (PERS).[25] PERS currently has commitments to approximately $1.6 billion to venture capital firms, with $800 million already extended. Nevada should consider directing part of those venture investments into in-state companies through the Nevada fund-of-funds. Additional resources that may be considered include the $13.8 million made available by the federal State Small Business Credit Initiative (SSBCI), designed to leverage private dollars (at a 10:1 ratio) to enhance financing availability for small businesses, including through venture capital programs. All of this provides an opportunity for advancing the state's efforts to increase the pool of risk capital available for scaling up innovative Nevada companies. While the new fund-of-funds should and must maximize its investment returns, it can also tune into state economic priorities, making sure that entrepreneurs in the state's target sectors and clusters are fully considered by professional venture investment firms.

In sum, the state should begin the work now of constructing an effective, sector-focused, private sector-connected infrastructure for spawning innovations in Nevada and efficiently helping them scale up.

Expand global engagement particularly with rising nations

Global engagement matters because Nevada firms sell their goods and services in an increasingly globalized market. The United States and Europe may be confronting a prolonged slump, but emerging economies in the developing world are roaring ahead. The share of global GDP produced by China, India, and Brazil together surpassed that of the United States in 2010. By 2012, the United States will account for only 21.0 percent, or just about one-fifth, of global market activity.[26] The growing global middle class is eager to spend and travel.[27] Companies and sovereigns have amassed huge quantities of savings and are scouring the globe in search of returns on capital.[28] Nevada—the state and its businesses—needs to react to the new economic reality of which it is a part.

What is more, global engagement helps build a platform for growth through innovation because exporting in particular forces companies to innovate.[29] Anticipation of higher demand allows companies to invest in

new product development.[30] And evidence suggests that exporting—by exposing firms to more intense competition and more sophisticated market information—makes companies more competitive. Selling to foreign consumers boosts production at home and allows companies to hire more workers. Inward FDI, too, brings with it technologies and knowledge that can spillover into the regional economy.[31] Exporting firms and foreign-owned plants alike pay higher wages.[32]

All of which means that global engagement can accelerate Nevada's diversification by growing the market for state exports and attracting investments into Nevada's promising target industries.[33]

As it happens, Nevada stands in a decent position to take its global engagement to the next level.

Not only an entertainment capital, Las Vegas' convention industry lends it a unique significance on the global business stage.[34] People come to Las Vegas to do business—to network, meet suppliers, discover new technologies, keep abreast of market developments—all in one place. The state and the region should consider innovative ways to capitalize on Las Vegas' position as the world's premier venue for "temporary clusters" and knowledge exchange.[35]

As the global hub of entertainment, gaming, and conventions, Nevada is a destination in every sense of the word and boasts the connectivity to match. In 2009, McCarran International Airport welcomed 1.1 million international destination passengers on direct flights.[36] Currently, Nevada's primary international airport offers non-stop flights to 14 international destinations in five countries plus good connections to Asia.[37] The opening of Terminal 3 in the summer of 2012 will add capacity for new long-haul flights.[38] International visits are sure to increase as the global economic recovery picks up pace.

In terms of exports, Nevada firms sold $9.5 billion worth of goods and services to foreign customers in 2009. The 5.1 million foreign travelers who visited Southern Nevada alone in 2009 spent an estimated $5.1 billion on goods and services.[39] Statewide, Northern Nevada specialized in manufactured exports, Southern Nevada in travel and tourism services, and rural regions in agricultural goods and commodities. These exports generated 8.4 percent of the state's GDP in 2009.[40] Exports accounted for 10.5 percent of national GDP, however, which means that Nevada's economy is slightly less export-intensive than the country's. This provides the state an opportunity to catch up, which it is doing: Between 2005 and 2010, Nevada exports of goods and most services have grown 26 percent faster than the U.S. counterpart.[41]

Nevada has long been a destination for foreign capital as well. As of 2008, foreign companies employed 3.3 percent of the state's workers.[42] Currently, there are over 200 foreign-owned firms operating in Nevada in everything from high-end retail to mining, from real estate development to manufacturing. But the state's embrace of FDI, too, has been incomplete: In the average state, foreign-owned firms employ 4.6 percent of workers.[43]

The state has begun to leverage foreign direct investment for economic diversification in big ways. Seeking to build ties with fast-growing and cash-rich emerging Asia, Lt. Governor Brian Krolicki signed a Memorandum of Understanding (MOU) with the Chinese Investment Promotion Agency in September 2009 to promote investment in renewable energy, mining, and tourism—all target sectors. In the time since, two major Chinese power companies have come forward with plans to invest in renewable energy manufacturing and R&D. If both plans come to fruition, they have the potential to create 4,000 new permanent jobs—serving North and South American Markets while building a manufacturing and innovation workforce in Southern Nevada.[44] Foreign capital built much of City Centre, Las Vegas' newest

landmark and tourist attraction. Foreign expertise helps extract minerals from Nevada's soils and tap the state's vast geothermal resources. And the list goes on.[45]

Nevada, then, can and should build off of these strengths. To do that, it needs to get focused in five regards:

- Make international trade and global engagement a key priority for Nevada
- Make FDI an explicit component of Nevada's global engagement policy
- Build the global engagement information base and use it to educate stakeholders
- Leverage resources of other organizations involved in export promotion and FDI attraction
- Advocate on behalf of global engagement priorities

Make international trade and global engagement a key priority for Nevada. Nevada has boosted its global engagement particularly through the efforts of the NCED. NCED maintains a top-class web portal for global business development. The commission coaches firms to export, holds counseling sessions, organizes trade missions, assists exporters in obtaining visas, and helps firms navigate both U.S. and foreign export regimes.[46] The winning of a recent State Trade and Export Promotion grant has enabled NCED to expand its services to small businesses.[47] NCED has trade representatives in Shanghai, Beijing, Hong Kong, Germany, Brazil, and Italy, and the Office of Diplomatic Relations and Protocol facilitates commerce with consular representatives in twenty four countries.[48] NCED accomplishes all it does on a shoe-string budget.[49]

However, Nevada could do more. NCED, currently the state's primary export and FDI promotion agency, is short-staffed and under-resourced. Its resources are spread too thin even while its services remain underutilized. While some parts of the state government have actively embraced globalization, others remain unaware of the opportunities it presents as well as the services that export promotion offices provide. So, too, are too many Nevada firms unaware of their own export potential, unintentional about seizing the export opportunity, and uniformed about how to export. Trade missions are too few and far between and tend to focus on agricultural goods. Consular offices are concentrated in Europe. And for a state dominated by the service sector, the lack of data on services exports and services firms that export is problematic.

Therefore, Nevada should include a global engagement strategy as part of its state plan for economic development.[50] To create and implement a successful global engagement strategy, the state should undertake a series of actions:

Provide robust leadership. The governor and the GOED should create a vision around exports and FDI and communicate it to all other organizations involved in global engagement around the state. Making this an explicit theme of the forthcoming state economic development plan would be a start. While the GOED should lead in strategy design and implementation, meanwhile, the governor can provide crucial support by leading trade missions, emphasizing global engagement in speeches, and acknowledging successful exporters by reinstating the Governor's Exporter of the Year Award, for example. All this serves the first step in taking Nevada's global engagement to the next level: raising awareness.

Reach out to targeted clusters proactively. Nevada companies are the entities that ultimately export goods and services from the state to the world. Exporting, meanwhile, remains for many companies an unnatural act. Therefore even the best state policy will fall short if it fails to reach firms themselves—and fails to motivate them to adapt their business models to a new globalized reality. The GOED needs to proactively communicate both export opportunities and "how-to" information to potential exporters. Sector champions are optimally positioned to play a part here, able to communicate perceived barriers in one direction (from firms to the GOED and the governor's office) and market information and state (and regional) service offerings in the other.

Quantify goals and set clear metrics to track progress. The governor should set medium-term goals relating to increased value of exports, new jobs in exporting firms and their suppliers, and number of new exporters over a period of 2-5 years.[51] Similar and appropriate targets should be set for FDI as well, with the understanding that some projects will take longer to generate jobs than others. Internal goals like holding more export readiness training sessions, increasing and diversifying the number of trade missions abroad, and increasing the number of Nevada firms that utilize export assistance centers should be set too.[52]

Outfit global engagement operations with adequate resources. The GOED should fully staff the state's global engagement team and outfit them with adequate resources. The state should make a clear funding commitment to this priority since closing FDI deals and building networks of exporters at home and customers and investors abroad requires long-term investment in relationships. Dedicated support should be allocated to add new FDI and consular representatives in the Middle East, Korea, and elsewhere in capital-rich emerging Asia to cultivate investor networks.

Make competitive grants available. Organizations that provide training, marketing services, commercial advocacy, and any other services to increase firms' export capacity should be eligible for competitive grants from the state to boost their activity. These grants should be especially targeted at those organized around or in support of target industry sectors or clusters at the regional level. Criteria for winning the grant would include the applicant's organizational capacity; the export potential of the proposed activity; and the expected ability to raise future funds to sustain the activity once the ward is spent.

Emphasize target industries and regional clusters. The state can reasonably expect its export promotion efforts to be most productive if they are targeted towards boosting Nevada's already-established regional strengths. FDI in particular, though, offers substantial promise as a way to build-out Nevada's target industries because of its contribution to cluster dynamics, whereby a critical mass of related firms and institutions catalyze hyper-growth. Already FDI is actively building Nevada's renewable energy cluster (and a manufacturing workforce).

Align global engagement strategies with other state policies. A proper global engagement strategy would include policies to boost the quality of the goods and services produced in the state, policies to increase workforce skills, and policies to facilitate the movement of goods to market. An intra-governmental coordinating body with representatives from all state agencies could be tasked with identifying cross-cutting issues affecting global engagement.

Leverage federal resources. The GOED should review how Nevada's efforts connect with, complement, or duplicate federal efforts through the U.S. Commercial Service. Nevada need not do everything in

house, but the state must coordinate its offerings with those elsewhere, and leverage and build upon federal resources wherever possible.

Make FDI an explicit component of Nevada's global engagement policy. FDI should be made a significant and explicit component of Nevada's sector-based economic development strategy because of the role foreign capital can play in building out target clusters. The state may consider staffing the GOED with a dedicated FDI specialist to work with the RDAS, sector champions, and others to bring a more concerted effort to FDI attraction. An intentional FDI strategy should support the collection of data, adopt a cluster-based approach, and take advantage of immigrant investor programs.

Support the collection of data. Strengthening Nevada's global engagement first requires a solid understanding of where the state currently stands on FDI. NCED maintains data on the names and numbers of foreign-owned firms operating in Nevada. The state should continue compiling such data and augment it with facts about job numbers and types, wages, and sectors. This data would provide a baseline from which the state develops performance measures to track progress on specific goals, like growth of FDI-related jobs and increases in tax revenue due to FDI.

Adopt a cluster-based approach. Nevada's FDI attraction efforts should be targeted by industry in order to maximize the state's return on its investment and also to take full advantage of spillover effects from the foreign investment within target sectors. Specifically, the state should leverage FDI as a way to fill supplier gaps in these emerging clusters, for one, and to import expertise, on top of other benefits.

In that vein, encouraging FDI from similarly water-scarce locales like Israel and the Middle East could help Nevada commercialize its own expertise—embodied currently in public authorities and research institutions—in water technology, for example. FDI can also be used to boost clusters by adding to a critical mass of activity and increasing Nevada's profile in an industry. In this sense, investment attraction efforts like missions abroad should be targeted by country and industry simultaneously. The MOU with China and subsequent FDI announcements in renewable energy is a prime example.

Take advantage of immigrant investor programs. Of course, foreign investment can come by way of individuals too. Nevada should embrace immigrant investors as job creators by strategically exploiting the EB-5 Immigrant Investor Visa Program. Concretely, the state should set a strategy to build EB-5 investment portfolios for target sectors in its three regions.

The federal EB-5 Immigrant Investor Visa Program allows foreign nationals who invest $500,000 to $1 million in a new commercial enterprise and create at least 10 full-time jobs or preserve 10 jobs in troubled businesses to enter the United States with their spouses and children under age of 21 with a provisional green card. After two years, EB-5 investors and their families can obtain legal permanent residency if the investment and employment generation is sustained.[53]

The EB-5 program can have a major impact in regions that are trying to revitalize recession-hit economies.[54] The federal government authorizes private corporations or government agencies to become EB-5 regional centers, which manage and facilitate the pooling of foreign investor money into specific projects in specific geographic locations. In the tourism sector, for example, Vermont was able to attract millions of dollars through EB-5s to transform the Jay Peak Ski Resort into a year round destination.[55] EB-5 dollars constructed a biotech manufacturing plant in the state as well.[56] In California, North Bay Resources, a regional center, is on track to raising about $7.5 million in EB-5 funds to expand the Ruby Mine in Sierra County.[57]

Nevada has not fully exploited this opportunity: Between 2006 and 2010, Nevada received only 21 EB-5 investments from South Korea, Japan, China, the United Kingdom, and Mexico through its eight regional centers.[58] The state and its regions can more strategically take advantage of this underutilized program to attract much needed inward investment into target sectors.

The NNDA is currently creating a new Nevada EB-5 regional center in partnership with the Hop and Mae Adams Foundation that would target immigrant investments into five regional projects: hotel parking lots and garages, wind turbine generator manufacturing, renewable bio-energy manufacturing, meat processing, and research and development in biotechnology and outpatient care centers.[59] Other RDAs can follow suit.

Two action items relating to the EB-5 immigrant investor program stand out:

- RDAs should coordinate with EB-5 regional centers and businesses within their regions to identify projects in target sectors that need capital
- The state should coordinate with EB-5 regional centers to market approved projects abroad through trade representatives

Fully taking advantage of the EB-5 visa program is another avenue for attracting foreign investment into Nevada's target sectors.

Build the global engagement information base and use it to educate stakeholders. Nevada leadership should embark on a serious education effort to explain the importance of global engagement to legislators and the business community as right now it is now broadly recognized. To that end, the state's information and communication platform should rest on four pillars: educational workshops for policymakers and businesses, proactive outreach to potential exporters and investors, the collection and provision of market information, and performance measurement:

Hold educational workshops. The governor's office or the GOED should hold workshops with key stakeholders including the legislature, RDAs, cluster organizations, and individual businesses to increase awareness about the importance of global engagement and the potential for growth via exports and FDI. These workshops should also be used as forums for reporting on the impact of and getting feedback related to related programs.

Proactively reach out to stakeholders with the information they need. One of the primary barriers to exporting confronting firms is a lack of information on *how* to export. Navigating trade regimes and import bureaucracies in rising nations like China, India, and Brazil—where the market growth is greatest—can seem especially daunting. For many firms, in this regard, exporting remains an unnatural act and will require a culture shift. Part of Nevada's global engagement strategy should therefore be proactive outreach to firms with information about "how" and "why" exports. The state should do all it can to assist (especially first-time) exporters through the ins and outs of selling abroad. The state may decide to coach RDAs to provide this training instead. Sector champions may play an important role too. At any rate, all of the state's offerings should be made known to Nevada businesses clearly in a well-advertised one-stop-shop on the web.

In addition, firms should be made aware of the full universe of federal offerings from the U.S. Department of Commerce, the Export-Import Bank of the United States (Ex-Im Bank), the Small Business

Administration, and other agencies, all involved in export promotion. Regarding FDI, at its most circumspect the state should compile FDI target opportunities on the web; it may also choose to proactively reach out to international investors.

Provide the necessary market information. The state should conduct a market analysis to identify goods *and services* produced in the state, exporting firms and their trading partners, international business and investment trends in the target sectors, and FDI opportunities in the state. The state should assess the human resources it requires to gather, maintain, and disseminate this information.

Nevada, along with the majority of other states, does not track services exports.[60] Consequently, the true value of exports generated by Nevada's largest industry sector, travel and tourism, goes unknown.[61] Clearly this knowledge gap precludes the effective use of basic performance metrics like growth in exports or number of new exporting firms. Once the state has gathered this information, it should be made public on the web.

Measure performance and demonstrate impact. After creating the information base, the state should get smart about assessing the performance of its own global engagement efforts against quantified goals. These metrics should be used to assess a return on investment and inform strategy redesigns and policy priorities. Demonstrating impact will help win buy-in from the legislature.[62]

Early metrics may include: overall jobs impacted by exports, export value growth, number of new firms exporting, and customer satisfaction with state services. Pennsylvania's Center for Trade Development, for its part recognized as one of the nation's top state export promotion organizations, tracks the number of firms that have requested services; the number of requests for assistance from a client sent by a regional office to a foreign office; the number of measurable and significant actions taken to help clients; the number of companies reporting an export sale within the fiscal year as a result of assistance; and value of assisted export sales as reported by clients.[63]

These empirics and others will enable decision-makers to communicate their vision and show the importance of exports to the state economy, create more focused policy interventions, and develop an objective assessment of the state's export promotion program.

Leverage resources of other organizations involved in export promotion and FDI attraction. A patchwork of entities is currently engaged in global engagement in Nevada. Tourism, for example—the flag bearer of Nevada's globally-recognized brand—falls under the remit of the NCOT at the state level and the LVCVA and Reno-Sparks Convention and Visitors Authority (RSCVA) at the regional level. Export assistance is provided by NCED, federal Export Assistance Centers in Reno and Las Vegas, regional development authorities, public-private partnerships, business associations like the Nevada District Export Council, and more.

These many organizations, with their unique and complementary strengths, can be powerful allies in the state's global engagement efforts. Currently, however, many efforts remain disparate, un-integrated, and duplicative. Farther afield, few states pool their resources in foreign countries to exploit economies of scale. In places where language barriers are great and regulations the most foreign—like the rising nations of Asia—the potential benefits of streamlining Nevada's presence, and leveraging the presence of the U.S. Commercial Service or other states, are high.

The state should work to weave together various efforts and foster collaboration among them. A collaborative system that uses state leadership to leverage and align resources across organizations promises greater impact across the board. After establishing a database of all organizations involved in export promotion and FDI attraction in the state to better understand existing services and resources, Nevada could pursue several actions along these lines:

Support the linking, leveraging, aligning, and connecting of various regional efforts. Comprehensive action plans like regional export initiatives can serve as vehicles for linking, leveraging, and aligning export-related efforts in a place. For example, LVCVA maintains a network of 12 contracted international offices responsible for promoting Southern Nevada in markets abroad. This is not only a model of intentionality for other target sectors to emulate, but also the sort of large-scale effort that other initiatives should take into account—and, if possible, leverage and build upon—when planning their own activities.[64] Opportunities to coordinate actions and pool resources among entities acting in related spaces should be pursued.

Collaborate with and create a council of in-state players. Florida, for example, has created the Florida Trade Partners Alliance (FTPA), which is led by Florida's state export promotion agency, Enterprise Florida. FTPA works to unite disparate entities engaged in export promotion under a common vision. Nevada should instate something similar to work with RDAs and sector champions to better coordinate, align, and target existing resources to priority clusters and firms in each metro or region.

Collaborate with other states or foreign partners in developing networks abroad. Beyond sharing leads and contacts, pooling resources alone can yield benefits as mundane as economizing on overhead by sharing office space, like Maryland and Pennsylvania have done with a Chinese partner.[65]

Partner more closely with the federal government. For starters, Nevada needs to integrate the federal Export Assistance Centers' work into its own export plan and devise a better division of labor and responsibilities. The state should support firms' applications for federal export financing. The STEP grant provided a much-needed infusion of funds to NCED for small business assistance, but more can be done.

Connect with commercial banks. More aggressive outreach to commercial banks can help ensure access to credit for exporters, especially small and medium-sized companies.

Florida's Trade Partners Alliance: Integrating Export Promotion Efforts

At the initiative of Enterprise Florida, the main state export promotion agency, a group of entities involved in export promotion created the Florida Trade Partners Alliance in 2003.[66] This unique statewide alliance aims to integrate the export promotion activities offered to Florida's exporters.

This network brought Enterprise Florida together with the federal Export Assistance Centers, U.S. Department of Commerce, the International Trade Administration, and the United States and Foreign Commercial Service; business organizations (such as the Florida District Export Council, the Latin Chamber of Commerce, the International Business Council of Florida); non-profits (the World Trade Association of Florida, the Florida Small Business Development Center Network); and metropolitan organizations (the Metro Orlando Economic Development Commission, the Economic Development Commission of Florida's Space Coast, the Broward County Office of Economic Development and the metropolitan Chambers of Commerce). The network has gained new partners over the years (such as

the U.S. Small Business Administration, the Export-Import Bank, Pinellas County Office of Economic Development, and Florida-China Association), and some, such as the U.S. Department of Commerce, have left.

This partnership combines different organizations' strengths, non-confidential databases, information to other parties, and coordinates the events schedule and marketing services of the partners. The parties involved committed direct funding (to cover administrative costs for using business equipment and travel expenses for staff participating in joint events) and in-kind efforts to support the collaboration. As a result, the state export agency leverages the activities of the other export promotion organizations active in Florida and is involved in a much wider range of activities than its budget would allow.

For more information visit www.eflorida.com/Why_Florida.aspx?id=4280

Advocate on behalf of global engagement priorities. Nevada can and should press the federal government to adopt policies that respond to the transformational changes underway in regions, states, and across the globe. Nevada's global engagement efforts are obstructed by a few large and a number of smaller issues requiring federal action:

Build a 21st century infrastructure. Transportation bottlenecks afflict Southern Nevada more than the north, at the moment. And this is a problem. Southern Nevada's full potential as a hub of transportation and logistics—and hence ability to move goods for export cost-effectively—will go unrealized as long as two major gaps and one bottleneck in the regional transport infrastructure network persist.[67] Firstly, Southern Nevada needs to forge an intermodal connection that links freight (rail) and air transport. Secondly, Interstate 11 needs to be completed to link Las Vegas to Interstate 40 at Kingman, AZ, and Phoenix and Mexico beyond. Thirdly, congestion needs to be relieved along Interstate 15 to Los Angeles.

- *Build a connection between air and rail in Southern Nevada.* Las Vegas is limited in its ability to move freight by a lack of strategically placed rail spurs off the main lines that run between the Port of Los Angeles to the south and Salt Lake City to the north. There is also currently no interface between rail and McCarran Airport. One recently discussed option includes a spill over airport in the Ivanpah Valley just south of Las Vegas that would handle freight and would be built adjacent to the rail line. However, the pressure to build such an airport has diminished with the recession. Unfortunately, the area around McCarran Airport is relatively constrained and a direct rail link to the air cargo facilities on the east side of the airport is not possible. The state and the region should work together and with the federal government to find a solution.

- *Complete Interstate 11.* Of primary importance for the region, however, is a direct interstate link between Las Vegas and Interstate 40 at Kingman—the proposed Interstate 11. This link would provide the metro Las Vegas with unimpeded surface access to one of the most heavily traveled east-west highways in the U.S. It would also free a bottleneck on the heavily traveled "CANAMEX" transcontinental freight corridor.

  Currently Las Vegas and Phoenix are the two largest adjacent metropolitan areas in the country not connected by an interstate highway.[68] The proposed Interstate 11 would lower friction of movement and thus produce greater cost efficiency and access that could help spur the region's

logistics industry. This would accelerate the region's diversification by making Las Vegas a more attractive site for production: a strategic node linked to Los Angeles (and its port) to the West and fast-growing markets in Latin America to the South.

Most of the route of the would-be I-11 currently consists of near-Interstate-grade highway. A few critical improvements such as a bypass around Boulder City and a full Interstate-gauge interchange at I-40 in Kingman would complete the link. The all important bridge over the Colorado River just south of Hoover Dam was completed in 2010, so the most costly and difficult section of what will become Interstate 11 has already been built. State and regional leaders should work with Arizona colleagues and advocate at the federal level to complete the link and receive federal designation.

- *Relieve congestion along Interstate 15*. Interstate 15 is a crucial link between Las Vegas and the large West Coast market in addition to the port at Los Angeles/Long Beach. Freight rail connections to the port are solid, but passenger bottlenecks choke traffic flow at the border and the California Agricultural Inspection Station just east of Barstow.[69] These bottlenecks have knock-on effects across the entire regional infrastructure network and obstruct the surface transportation of freight. Southern Nevada will have difficulty establishing itself as a logistics and operations hub as long as this bottleneck to major western markets persists. The high speed passenger rail line to Victorville could go a long way towards relieving the pressure on I-15.

Extensive stakeholder consultation revealed that Northern Nevada, for its part, has much of the physical infrastructure it requires to expand its global engagement—especially at Reno-Tahoe International Airport, crucial to the region's goal of becoming a logistics and operations hub—already in place.

Facilitate exports and FDI. There are a number of actions the federal government could take to facilitate export growth and FDI.

- *Negotiate trade agreements, especially in key services.* First and foremost, Nevada exporters and potential foreign investors would alike benefit from trade agreements in goods, services, and capital. Nevada businesses should therefore advocate to the federal government for the negotiated reduction of foreign tariffs. An international regime on trade in online gaming services would be of especial interest to Nevada, in service of its target opportunity to become the intellectual capital of global gaming, but is of course contingent upon online gambling being legalized in the U.S. first.

- *Expand the export assistance resources available to firms.* Furthermore, Nevada would benefit from an expansion of the U.S. Commercial Service, the trade and investment promotion arm of the federal government, which provides valuable services and information to companies at home from its consular outposts abroad.

- *Increase the capacity of the Ex-Im Bank.* Similarly, the President's Export Council recently noted that the Ex-Im Bank, the principal U.S. export credit agency and a crucial source of financing for small and medium enterprises entering export markets, should have its financing cap doubled to $200 billion annually.[70] Loan processing times too, need to be shortened by increasing the number and authority of underwriters.[71] Nevada's SMEs would clearly benefit from such an expansion of credit and faster loan processing times.

- *Set a national infrastructure agenda that leverages private capital.* In addition, Nevada stands to benefit from a larger federal infrastructure agenda that opens the door for private financing to build out key links in the nation's transportation network. As an inland state, the ease of exporting in Nevada depends on ports and border crossings in neighboring states. Policy proposals in these states and at the federal level that leverage public and private capital to upgrade key infrastructure—like state or national infrastructure banks, or a liberalizing of federal regulations (often related to national security) that deter foreign investment in strategic infrastructure—should be supported as part of Nevada's economic development strategy.

- *Expedite the processing of tourist visas.* On top of that, faster visa processing for tourists will be critical to boosting services exports (i.e. selling tourism and hospitality services to foreigners). From 2000 to 2009, McKinsey, a consultancy, reports that foreign visitors to the United States fell by two million.[72] During the same period, global spending on travel increased 87.2 percent. What is more, 11 million potential visitors are estimated lost each year, deterred from visiting by onerous visa requirements and neglected in the absence of a national destination promotion strategy.[73] State- and regional-level groups as well as business associations should advocate for sensible visa regime that facilitates travel without compromising national security.[74]

Nevada's global engagement strategy would be bolstered with federal partnership on all these fronts, among others. With such federal contributions to the state's platform-setting work on international engagement Nevada could make real progress in tapping new sources of business activity and ultimately repositioning itself for future growth and diversification.

Align higher education and workforce development to strategic economic opportunities

States and regions that desire to expand innovation, entrepreneurship, and export-based growth need to focus intensely on the availability of adequate human capital—appropriately trained workers. Abundant, appropriately trained researchers, managers, entrepreneurs, and workers are especially important in the sort of industries on which the state is now focusing. For that reason, it is essential that Nevada retool its entire education pipeline ranging from the K-12 system to its community colleges and its four-year universities and research institutions in a way that strategically matches students, degrees, skills, and research to an innovation economy and the particular sectors of the state's next economy.[75]

Unfortunately, Nevada's current workforce and educational assets need significant attention and investment to attract and grow the kinds of knowledge- and innovation-based firms that the state is seeking to develop. Confronting these new aspirations, however, is the reality that the overall level of education of Nevada's workforce and the state's preparation of its workforce for critical STEM-related fields remains severely deficient. While education attainment has improved over the last several years, Nevada still remains well below the national average for the share of its population holding a higher education credential.[76] Currently, only 29 percent of adults over 25 in Nevada hold at least an associate's degree or higher, and at current rates this share will grow to 31 percent by 2018.[77] An estimated 54 percent of all jobs in Nevada will require post-high school training in 2018, however, which means that there will be a large shortfall of qualified candidates to fill Nevada's future employment opportunities.[78]

Looking more specifically at the STEM workforce needed for innovation and knowledge creation, Nevada is similarly weak and places among the bottom 10 states for indicators of its S&E student pipeline and

degree production, as well as for the performance of the state's 8th graders on national math and science exams.[79]

The weaknesses of Nevada's workforce are closely associated with Nevada's relatively low—and falling, based on the biennial 2012-2013 budget—levels of spending on higher education compared to peer states (see table below).[80] With $558.9 million of state funding for higher education in FY2010–2011, Nevada provided the lowest amount of public support for higher education among states of a similar size (2–3 million people), and it ranked 35th among all 50 states for its level of state higher education funding on a per capita basis ($211.44).

State	Population (millions)	Higher Education spending (millions)	Higher Education spending as % of GSP
Mississippi	2.97	$932.5	0.96%
Arkansas	2.92	$901.8	0.88%
Kansas	2.85	$754.8	0.59%
Utah	2.76	$714.8	0.62%
Nevada	**2.70**	**$558.9**	**0.44%**
New Mexico	2.06	$874.8	1.10%

Source: James C. Palmer, Ed., "Summary Tables, Fiscal Year (FY) 2010-11," *Grapevine: An Annual Compilation of Data on State Fiscal Support for Higher Education*, www.grapevine.illinoisstate.edu/tables/index.htm. 2010 GSP (Gross State Product or output) data from the Bureau of Economic Analysis. Peer states selected based on population.

Against this backdrop, as a first step Nevada should evaluate its existing resources and programs to ensure that they are aligned with and effectively support the state's economic development and diversification goals. Such a realignment should incorporate the following principles:[81]

- Higher education and workforce development resources need to be developed and mobilized in ways that address the future needs of Nevada's most strategic industries and target niches[82]

- Educational and training institutions must be ready to adapt content and delivery mechanisms quickly, using real time economic data and frequent communications with industry stakeholders to best respond to their needs.[83] This is imperative given the speed of change in the current economy

- Educational and workforce institutions must develop mutually agreed protocols for collaboration across jurisdictional and institutional boundaries. This will limit leaks in the educational pipeline as students advance through the system and will allow resources to be delivered to industry clusters and regions as needed, regardless of location

- Appropriate metrics of progress and impact should be built into the education and workforce system, to promote accountability, assess results, and ensure ongoing alignment of institutions with broader economic and workforce development goals. A grant from the National Governors Association's Complete to Compete initiative to study just such metrics presents a prime opportunity for Nevada to strengthen its performance measurement[84]

In addition, it is clear that significantly ramped up investments in education will be needed in order to bring Nevada's workforce skills to the level required by its most strategic future industries and companies. Most notably, unaddressed investment deficits in the workforce system and higher education will likely have an especially harmful impact in the area of innovation, in which the creative application of new

technologies plays a critical role. Low availability of the appropriate human capital serves as a drag on the growth of innovative, technology-intensive businesses. Workers employed in S&E occupations represent only 2.2 percent of total jobs in Nevada, half the national average (4.4 percent) and ranking 49th among all states.[85]

And so Nevada needs to move concertedly to establish a 21st century workforce training system. At least four priority avenues should be explored for improving and re-aligning the state's system of higher education and workforce development in support of its economic and workforce goals. These include:

- Raise STEM standards throughout the K-12 system
- Leverage community colleges to deliver a skilled workforce
- Expand research universities' role in workforce development
- Reorganize and re-energize workforce training mechanisms

Raise STEM standards throughout the K-12 system. To be competitive in a knowledge-based global economy, workers are increasingly required to be skilled in critical thinking, quantitative reasoning, and scientific thinking. In particular, proficiency and education in science, technology, engineering, and mathematics (STEM) are important prerequisites to enter many well-paid, high-growth occupations and industries. Increasing the entry of STEM students into higher education requires a solid grounding in STEM concepts and basic STEM skills during the K-12 years. In this respect, Nevada's challenges in graduating STEM students from its institutions of higher education are directly connected to challenges further up the pipeline. Eighth grade math scores for higher income students in Nevada are lower than for any other state except Hawaii and Washington, DC.[86]

The need for enhancing STEM education is now a matter of U.S. national priority. While the current funding situation in Nevada will not make it feasible to make dramatic new investments in STEM education, a number of approaches should be considered to leverage the resources that are currently available and build on initiatives that are currently underway in the state—such as the design of a statewide evaluation system, and a longitudinal data system for P-20 data. A number of strategies should be either extended or adopted and include:

Ensure appropriate performance measures are in place. Nevada has been unable to meet the standards set by federal mandates under No Child Left Behind (NCLB) and is considering a waiver from its requirements.[87] Many states share criticisms of this federal program. However, given the struggling performance of Nevada's public schools, any waiver from the federal program should be accompanied by alternative performance measures that are commensurate with measures adopted by other states as well as the needs of the state's strategic industries. In this regard, it should be said that Nevada has been trying for years to improve its K-12 system and reverse the lackluster performance of its public schools. For instance, the Legislature has adopted a statewide teacher evaluation system to be tied to student achievement—but it will take two years to implement.[88] In the interim, Nevada is one of four states chosen by the National Governors Association (NGA) to participate in an initiative to design a teacher evaluation system.[89] Together these efforts amplify the state's education reform agenda.

Establish schools with a STEM focus. STEM-focused schools can engage students in rigorous STEM learning, prepare them for success in college, and encourage the pursuit of STEM careers. Fortunately,

there exist good STEM-focused school models around Nevada and across the country that Nevada can look to. Closest to home, the multiple Technical Academies at the high school level and STEM academies at the middle school level in Clark County are good examples of schools focused on science and math. Looking farther afield, the North Carolina New Schools Project—launched in 2003 by the Office of the Governor and the North Carolina Education Cabinet—is a statewide public-private partnership providing a broad range of STEM-specific support services to schools.[90] More recently, Arkansas has launched a pilot program—STEM Works—whereby participating school districts create New Tech High Schools with an interactive STEM focus.[91] Resource constraints may make it difficult in the near term to establish a more specialized and selective institution similar to the North Carolina New Schools Project. However, targeting resources wherever possible into magnet or charter schools with a STEM focus should be an important strategy for Nevada in the interim. In this regard, the selection of students from Las Vegas' Rancho High School to participate in the Real World Design Challenge—a nationwide competition to design an environmentally friendly, super-light sport aircraft—reflects efforts by Nevada's K-12 system to spark interest among high school students in STEM subjects and prepare them for future careers in the state's key industries such as aerospace.[92]

Recruit and train STEM teachers from non-traditional sources. Nevada has suffered a severe shortage of math teachers over the last ten years, often accompanied by a shortage of science teachers.[93] Nevada has an alternative path to licensure, meanwhile, but critics charge that it is merely "symbolic"—no easier than the standard pathway to a credential.[94] That must change. Given the very high levels of unemployment now existing in the state, every effort should be made to smooth the way for qualified mid-career professionals to acquire a teaching certificate through non-traditional pathways. Other sources of recruits include younger retirees, present in Nevada in significant numbers, or former military personnel looking for a new career in civilian life. Leadership at a high level will be required to accelerate the recruitment of these non-traditional candidates into the classroom. Such candidates can speed the state's reorientation toward STEM teaching.

Establish performance-based pay for STEM teachers. Nevada ranks 28th among U.S. states for average teacher salaries. Under present fiscal conditions, it is unlikely that new resources will be available to improve Nevada's position versus other states. Nevada can, however, adopt other practices, which can be equally effective. In particular, differential pay for STEM teachers, based on a strong subject area background and combined with performance-based evaluation, is increasingly employed as one solution to a general teacher shortage in this area.[95] In order to qualify for a "Race to the Top" grant under NCLB, Nevada already requires all school districts and charter schools to use student performance data as part of their principal and teacher evaluation systems. These data could be used to refine any differential pay scheme. In this regard, Nevada can also draw lessons from Idaho's adoption of pay-for-performance methods—merit pay plans that determine teacher bonuses and raises.[96]

Support new models of STEM skill development. Recent studies have shown that new models of STEM-skill development—such as combining academic rigor with career and technical education, work-based learning, and mentoring to move students toward postsecondary goals—can be very effective in improving K-12 STEM education. The "early college" high school model is one such program which provides students with the opportunity to earn one to two years of transferable college credit or an associate's degree by the time they graduate high school.[97] Some states support innovative career and technical education pathways that meet both postsecondary and career requirements.[98] Taking advantage of the potential of virtual education is another way to increase student participation in STEM courses, both at the K-12 and higher levels.[99] As Nevada looks at these programs, it should keep in mind

that multiple approaches may very well be necessary to ensure that the state engages a broad range of high school students in acquiring in-demand STEM skills and degrees.

Leverage community colleges to deliver a skilled workforce. Community colleges—as well as private and technical colleges, which are typically similarly career- and training-oriented—are critical players in preparing the workforce for an innovation-based economy, particularly in delivering STEM-skilled students and workers to address the current and projected shortage.[100] With increasing realization about the need to closely align economic development and workforce development policy, states everywhere are paying close attention to their local community and technical colleges for improving the efficiency and effectiveness of their local labor markets, and aiding the growth of their industry sectors and regional clusters.[101]

In Nevada, many well-paid jobs remain unfilled and/or require recruitment out-of-state, simply because Nevada's pool of workers is not equipped with the type and level of education and skills required. For that reason, the NSHE chancellor established the Fresh Look at Nevada's Community Colleges Task Force to determine if the state's four community colleges were truly aligned with the future employment and learning needs of Nevadans.[102] The task force came to the conclusion that Nevada's community colleges cannot meet the needs of either learners or employers without serious changes.

Nevada needs to begin making the needed changes. To be sure, the state's present strained fiscal circumstances have made it challenging for community colleges to function optimally and to achieve these goals, even as demand for their services grows. Along with other educational institutions in the state, community colleges are facing funding cuts that force program and faculty cutbacks; and many willing students are unable to enroll.[103]

Nevertheless, Nevada should leverage its community colleges as a key part of the solution to the state's economic diversification strategy. A STEM pipeline in K-20 education aligned with regional industry clusters and businesses can use community colleges as a primary resource for educating and re-training workers for knowledge- and innovation-intensive industries and firms. Community colleges are often more flexible than four-year institutions and can more easily adapt to changing economic and workforce conditions. Their renewal and reform should be driven and shaped by the state's new emphasis on sector-oriented industry strategy.

Build channels for industry to communicate workforce needs to community colleges. Setting education priorities to reflect labor market needs requires going beyond just awarding degrees and teaching specific occupational skills. It also requires actively engaging with and incorporating employers' input. In this regard, Nevada's community colleges should cultivate active contacts with local business and industry, and work with them to identify growth fields and the skill sets they require. This is especially important in key, high-growth sectors of the economy—science, technology, manufacturing and production—where businesses have very specific and changing labor needs. Doing this will bestow multiple benefits, including strengthening courses and programs geared toward skills employers have identified, expanding opportunities for internships and apprenticeships, and strengthening relationships with local businesses. Many states have already moved in this direction and have established formal and-or informal channels to draw upon business inputs to strengthen their curricula and training programs.[104] Community colleges in Nevada should build upon current efforts with even more emphasis on making special accommodations for local business and industry by creating customized programs for local employers; programs to fill skill gaps to facilitate workers moving from one field to another closely related field; or even providing free training to certain businesses or industries.[105] The Nevada Industry Excellence

Program will play a key role in this effort, as will the current efforts to build industry support for the National Career Readiness Certificate to be used in Nevada. Finally, "Earn & Learn" programs, which allow some degree of paid employment in the student's field of study while in school, may encourage enrollment by students who under other circumstances would not have the time and resources to both work and study.

Establish outcome metrics and accountability to ensure programs address industry and workforce needs. Community college performance—and possible added investment—is also going to have answer to calls for greater performance accountability. With scarce resources and the need for alignment and accountability, an outcome-based measurement methodology and system for community colleges is more critical than ever before. This can serve a variety of purposes such as informing curricular development, driving better outcomes, deciding higher education funding allocation, and facilitating understanding of educational pathways and labor market outcomes.[106]

With this in mind, Nevada should move towards establishing a system of accountability for its community college system that includes predetermined performance measures for each community college to track and report annually. To do this, Nevada can either adopt the NGA common metrics for assessing programs, or take advantage of national initiatives—such as Complete College America Alliance of States and various foundation-funded initiatives like Achieving the Dream, Breaking Through, and Shifting Gears—that help states use student data to inform continuous improvements processes at the state and institutional levels, or benefit from the experience of other states like the North Carolina Community College System's Critical Success Factors program. To its credit, Nevada has already begun the process of strengthening its higher education performance measures through its membership in Complete College America and its selection in a NGA Policy Academy to improve postsecondary accountability systems. In this NGA Policy Academy, Nevada will work to identify ways to use efficiency and effectiveness metrics as part of the state's higher education policy agenda.[107]

Nevada should also take this work a step further and tie community college funding to performance indicators—and not just enrollment—as is already being done in many states.[108] As it happens, work in this direction is already underway with the creation by SB 374 of a legislative Committee to Study the Funding of Higher Education. Work through this panel on the formula for funding higher education will afford policymakers the opportunity to make this change. Yet the state can push farther as well: It can encourage further innovation through competitive grants to institutions that pursue new performance management solutions, track outcomes, and share lessons learned.[109]

Throughout it all, performance data should be used to create a clear link between institutional funding and performance. Funding should be based on observable indicators, such as degree completion, the number of graduates earning credentials in skills identified as critical for the state's long-term economic plan, the number of graduates placed with local employers, the number of graduates leaving to continue more advanced studies in their field at a four-year institution, and graduates' income levels. As an example, Indiana already allocates 15 percent of state community college funding based on degree completion measures.[110]

Engage community colleges in regional economic development efforts. Yet community college performance must not be addressed generically; it must be considered in relation to the specific agenda of contributing to regional growth. In this connection, community colleges must play a greater—and more deliberate role—in helping regions and their particular sectors and industry clusters innovate and thrive in an increasingly globalized, competitive economy. Viewing their economic development role on a regional

scale, community colleges in Nevada can act in a variety of manner to foster regional economic growth including promoting regional partnerships that align employer needs and workforce and higher education capacity, and aligning their curricula with priority clusters and industry sectors' needs.[111] As outlined above, Nevada can also award competitive funding to colleges when they undertake strategic, sector-based initiatives. Through all, their purpose must be to support the training needs of the specific local economy in which they are embedded.

Leverage outside resources to support program development. Finally, an acute need is going to persist to draw more resources into the community college system. Fortunately, while the funding environment is challenging, there are opportunities for augmenting state resources. For example, several federal funding streams exist which are often deployed separately by states, but which could be aligned under this broad initiative to work more efficiently, such as aligning education and workforce training funds or leveraging infrastructure investments; similar synergies might be found with state social services funds. Nevada may want to study the Arkansas Career Pathways Initiative—jointly administered by the Arkansas Department of Higher Education and the Arkansas Department of Workforce Services—which enables community colleges to provide those who qualify with career training and college classes.[112] Nevada may also consider leveraging public investments in infrastructure to support skills development programs.[113] Nevada's community colleges can play a critical role in the design and delivery of such programs that will support highway, infrastructure, and clean energy constructions projects.

Washington Centers of Excellence: Building a Competitive Workforce in a Global Economy

Washington state has emerged as a national model in developing partnerships between industry and education for the purpose of enhancing statewide workforce development initiatives to meet the needs of industries critical to the state' economy. Through its Centers of Excellence, the state has created a single point of contact and resource hub for innovative curriculum tied to industry needs, industry trends, best practices, and professional development opportunities.

Centers of Excellence are designated by the Washington State Board of Community and Technical Colleges as statewide leaders in specialized workforce education and training for the state's critical industries. The 10 Centers of Excellence are located in the state's community and technical colleges. Each center focuses on a targeted industry that drives the state's economy. So while the Center of Excellence for Clean Energy at Centralia College brings together the clean energy industry and college partners, the Renton Technical College's Construction Center of Excellence serves as a resource hub for the construction industry, the Allied Health Center of Excellence at Yakima Valley College addresses healthcare workforce needs, and so on.

The Centers are guided by industry representatives who provide input on their workforce needs that helps the Centers develop new curricula to meet those needs and provide education and training to prepare students for job openings in the industry. For their part, businesses receive technical assistance, expertise, information and research on current regional, state, and even national industry-specific initiatives.

In most cases, the Centers are expected to share the curricula and standards developed with the state's 34 community and technical colleges, thus improving responsiveness throughout the system and reducing duplication. The Center of Excellence for Clean Energy, for instance, has established energy industry skills standards—defined through focus groups of employees—that specify the critical work

functions, key activities, performance indicators, and knowledge, skills, and abilities an individual needs to succeed in clean energy-related occupations. These standards will be used by the state's colleges and training organizations to make sure their programs are up-to-date and provide high quality training.

In short, the Centers of Excellence are helping build and sustain Washington's competitive advantage through the building of a robust, skilled workforce for driver industries in the state.

For more information visit *www.coewa.com*

Expand research universities' role in workforce development. Moving farther down the education pipeline, research universities also have a huge role to play in workforce development. In this respect, universities—beyond their role in the discovery and transfer of ideas—can contribute massively to statewide and regional economic development goals by engaging in efforts that help align workforce development with strategic economic opportunities and goals. Along these lines, universities are increasingly seeing the need to participate much more fully and actively in knowledge-based regional economic development activities.[114] To take just one compelling example, the University of North Carolina (UNC) system's UNC Tomorrow planning process stands out as an especially instructive model for Nevada with its 20-year strategic plan to make the UNC system more responsive to the emerging and future economic needs of a growing state.[115] Closer home, the establishment of the National Geothermal Academy at UNR—as the first of its kind university training program for the geothermal industry—reflects the critical role that Nevada's research universities have begun to play in educating and training the next generation of workers for the state's key industry sectors.[116]

And so the state is going to need to pay close attention to a number of key agendas in the next few years as it moves to position its research universities as important stakeholders in regional economic development. Of top priority will be work to:

Deepen university-industry partnerships. To begin with, Nevada's higher education institutions should intentionally engage business leaders (particularly those in the state's key industry clusters) to articulate upcoming skills needs in high-demand occupations; participate in the design of curricula and requirements for certification; and more broadly, to help develop education pathways that are matched to career pathways. For example, higher education institutions will likely learn through such engagement that creating tailored curricula and sector-relevant programs for strategic industries may require a creative mix of online instruction, hands-on experience through internships, and more traditional academic advising and coaching performed through a variety of media.

Research institutions in Nevada have already established connections with certain economic sectors.

For example, the College of Hotel Administration at the UNLV thrives on its relationship with the hospitality sector in Nevada. DRI has a wide range of clients and represents a successful model for balancing intellectual rigor with industry engagement and entrepreneurship. The College of Engineering at UNR is a leader in design for extreme seismic events, and collaborates with many private companies, while the MacKay School of Earth Sciences and Engineering is tightly linked to the mining industry. All three research institutions house significant, nationally and globally recognized expertise in important market niches.

Indeed, a number of the existing centers of excellence in Nevada's universities already map onto the target industry cluster opportunities identified for Nevada. UNR has recently established a renewable energy center; the UNLV College of Sciences is also proposing cluster hiring in the area of clean energy science. UNR has a variety of computer science assets in the area of networks, software, and visualization; and UNLV has an excellent School of Informatics, to be bolstered by cluster hires in the areas of computation and material science, that will help yield skilled workers for emerging and high-opportunity industry clusters such as cloud computing or medicine and health.

With that said, however, Nevada's research universities and institutions will further need to leverage partnerships with business and industry associations with the purpose of creating world-class programs that are tightly linked to regional economic development and the labor force needs of the state's identified target industries and sectors. In turn, such efforts will attract world-class talent and produce skilled professionals for Nevada's emerging and high-opportunity industry clusters such as cloud computing, or medicine and health.

Create workforce development research centers. Research universities are uniquely positioned to establish research centers that are entrusted with the task of advancing understanding about the state's workforce needs. These research centers can provide an independent source of analysis for reform and innovation in workforce development policymaking and employ cutting edge research and evaluation to identify best practices in workforce development and training. And, needless to say, these research centers would engage in significant partnerships with the private sector to design effective education and training programs. The John J. Heldrich Center for Workforce Development at the State University of New Jersey and the Ray Marshall Center for the Study of Human Resources at the University of Texas are two such examples.

Establishing such research centers, which typically have an interdisciplinary focus and draw upon faculty and researchers from diverse academic backgrounds, will enable Nevada to meet the emerging workforce needs related to the state's identified industry opportunities head-on. After all, opportunities in developing renewable energy projects will require a workforce that has an interdisciplinary training, from scientific and engineering backgrounds to project development aspects such as environmental impact, financial feasibility, law, land use management, and so on. Similarly, the evolution of the gaming cluster—from a bricks and mortar model to becoming the global intellectual capital of gaming and future online gambling—will require a workforce that is skilled in fields that are more knowledge-based than has been needed in the past, including IT/engineering, design, law, business, marketing, consulting, management, regulatory compliance, etc. In sum, new structures for understanding new needs and responding to them will be necessary all across the university system.

Get the structure right. Nor is the need for structural reform to serve the state's emerging new economic goals confined to level of programs and centers. Properly aligning all institutions of higher education in Nevada in the ways outlined here will require a deeper rethinking: a rethinking of funding practices and institutional structures. Most notably, the present higher education funding formula does not now link resource allocation with tuition generation in particular academic units and centers of excellence/competencies. As a result, excellence and relevance are not necessarily rewarded. For that reason the state should consider how to better align resources with relevance to help ensure that the programs that are successful and have significant market demand receive the resources needed to sustain and enhance their strengths and competitive advantages in the higher education market.

At the same time, Nevada currently makes no clear distinction between the four-year, research-intensive institutions such as UNLV, UNR, and DRI (institutions that should be nationally recognized research universities) and the state college and community colleges (institutions that should have a fine-grained, regional focus and the flexibility to meet the training needs of client businesses). Many states have separated these into different systems, so that the research universities are charged with achieving and advancing research excellence (e.g., Carnegie rankings) and are provided the resources and incentives to do so, while community colleges focus on workforce preparedness with a regional focus and are given more regional autonomy and financing. This sort of structural rearrangement may also be relevant to Nevada. In any event, the state needs to think deeply about the institutional as well as the programmatic implications of its new economic development vision. And regardless of how Nevada's higher education institutions are organized, the most important requirement must be that the state's leaders place on the system high expectations of performance and service relevant to the state's strategic industries—with appropriate performance benchmarks for all.

Reorganize and re-energize Nevada's workforce investment system. Finally, the state should revitalize its workforce training system by reorganizing it around the specific recruitment and training needs of its target industries and regional clusters. Under the federal Workforce Investment Act (WIA) of 1998, the Governor's Workforce Investment Board (GWIB) provides the overarching structure and coordinates with other state agencies such as the NCED and DETR to develop policies and strategies related to workforce provisions. Two Local Workforce Investment Boards (LWIBs)—workforceCONNECTIONS in the south and Nevadaworks in the north—share the funds allocated by WIA under current federal guidelines, set policy for their respective areas, and provide one-stop service locations.

Currently, the federal government provides much of the money used by states to provide workforce training but does so in ways that undercut effective economic development.[117] The current system constrains the use of these funds to target training that helps bridge the gap between the skills of the unemployed and the requirements of available jobs. Furthermore, the present system has not adequately consolidated workforce programs squarely around the needs of specific regions and industries, with active engagement of business and local civic leadership to craft and oversee new programs. The result is a system that could be better attuned to both clients' need for job-wise skills and state and regional economic development needs.

A top priority for Nevada should be to strive for greater alignment between the GWIB, as the Governor's chief policymaking body for workforce development, and the two LWIBs coordinating workforce development in their respective regions. These entities should aim to find common ground and align their collective workforce efforts to reflect the state's economic development strategy and vision. Equally important is the fact that membership in both should reflect the state's emphasis on key industry sectors in order to be more responsive to the recruitment and training needs of those sectors.

Fortunately for Nevada, there is growing recognition of these concerns and there has ensued an animated conversation on the need for greater alignment and collaboration in crafting the state's workforce development strategies. The fact that the Governor has directed that the state's Workforce Investment Plan be overhauled and reflect coordination with economic development, higher education, and K-12 signals a move in the right direction.[118]

At the same time, there still remain some key priorities for reorganizing the state's workforce investment system that will help the state to maximize the benefits of the reforms already underway. Here are several needed agendas:

Allocate more funding to Employer-Based Training (EBT) programs. Until now state and federal training dollars have primarily focused on entry-level positions and basic job skills—and have been geared toward short-term training opportunities—and not so much on advanced technical skill enhancement and position upgrading through EBT programs. EBT programs can directly address the skill mismatch that currently pervades Nevada's industry sectors—more so in health care, information technology, and manufacturing—where many people applying for jobs do not have the required skill sets.[119] Advanced skill training through EBT programs would incentivize employers to upgrade the skills of existing employees and also hire those individuals with skill gaps that can be trained in lieu of experience.[120]

In this manner, spending on EBT programs can give bigger bang for the buck as training existing employees leads to a "two for one" employment opportunity for the state and provides for a more effective use of funds. A worker who upgrades skills creates a job opening in the position that individual left, allowing another worker to fill the vacant position. Given Nevada's current high unemployment level, allocating more funds towards EBT programs and especially coordinating it with targeted industry sectors and clusters thus make perfect economic development sense.

Along these lines, Nevada may consider securing "incumbent training waivers" from the Department of Labor for current employees that will allow the use of traditional training funds to provide skills for career advancement for workers in contrast to traditional training for primarily entry-level positions. This type of waiver—by incentivizing employers to upgrade the skills of their existing workforce—will improve retention in the workplace while creating new labor openings related to lower-tier vacated positions.[121]

Link higher education with the state's workforce investment system. Existing practice, moreover, has the federally-funded LWIBs as separate entities, not tightly connected with institutions of higher education, and only weakly aligned with the priorities of regional or state economic development organizations. There are significant opportunities for the NSHE to increase its participation as a strategic partner in the state's workforce development, job training, and placement efforts.[122] The NSHE can be an important partner in designing specialized training programs, especially with many employers—more so mid- to small-sized firms—unable to invest in employee training programs in current economic climate.[123] Nevada should thus move toward urging the allocation of a significant portion of WIA training dollars to NSHE to utilize existing curriculum opportunities and also design and implement new educational courses to support incumbent worker training.

Related to this, NSHE can play a more direct role in creating well-defined programs for targeted industry sectors keeping pace with the increasing interest shown by Nevada's workforce agencies in the use of industry sector and cluster strategies for workforce development. All this will require the NSHE to develop new proposals for state and federal funding in a coordinated and more involved effort with DETR, the two LWIBs and industry associations. In this regard, the on-going partnership between Western Nevada College and Northern Nevada Manufacturers Forum in creating a manufacturers' certification program can be particularly illustrative for designing similar partnerships and training programs for other industry sectors.[124]

Design well-defined programs for targeted industry sectors and clusters. Equally problematic, in the present system workforce training initiatives are organized around population groups rather than around

economic sectors or geographic regions. There have been some significant recent changes that call for providing a more targeted approach toward selected industry sectors and provide hope on this front. During the 2009 legislative session, Senate Bill 239 (SB 239) was passed mandating the creation of industry sector councils that would provide recommendations and directions to GWIB to ensure that WIA planning is focused effectively on meeting the workforce needs of Nevada's key industry sectors.[125] A report published in January 2010 by the GWIB further emphasized this new direction by recommending a focus on selected sectors/clusters for Nevada, including renewable energy, healthcare, manufacturing, and mining.[126]

Along these lines, workforceCONNECTIONS has begun the transition toward an industry-sector model with its focus on green economy and healthcare.[127] These are positive steps and need to be incorporated into future planning of the LWIBs in collaboration with GWIB, DETR, and the Governor's Economic Development Board. In addition, the LWIBs must work in close concert with industry sector councils—such as the Health Care Sector Council and the Green and Renewable Energy Sector Jobs Council—to ensure that workforce training is aligned effectively with key industry sectors. The industry sector councils can provide strategic direction and assist in the identification of workforce deficiencies which in turn would help drive the allocation of training resources and ensure that the skills sets of the workforce are being developed to meet the current demands as well as the future workforce needs of each sector.

* * *

To conclude, Nevada should make concerted efforts to set a platform for broad-based growth through investment in innovation and commercialization infrastructure, attention to the state's global engagement, and alignment of its education and workforce development efforts to industry needs. Attention to these priorities remains the most promising way to drive the state's economic growth and reposition its economy for success in the 21st century.

Appendix A. Steering Committee Members and Board on Economic Development

Steering Committee Members

Chuck Alvey	President and Chief Executive Officer, Economic Development Authority of Western Nevada
Bill Anderson	Chief Economist, Department of Employment and Training Rehabilitation
Bill Arent	Director of the Office of Business Development, City of Las Vegas
Fred Boyd	Interim Director, Reno Sparks Chamber
Chris Brooks	Director of Renewable Energy, Bombard Electric
Glenn Christenson	Chairman, Nevada Development Authority
Bob Cooper	Economic Development/Redevelopment Manager, City of Henderson
Jim Croce	President and Chief Executive Officer, Nevada Institute for Renewable Energy Commercialization
Stacey Crowley	Director, Nevada State Office of Energy
Tony Dazzio	Commissioner, Commission on Economic Development
Jeff Fontaine	Executive Director, Nevada Association of Counties
David Fraser	Executive Director, Nevada League of Cities
Jason Geddes	Chairman of the Board of Regents, Nevada System of Higher Education
Pete Goicoechea	Assemblyman, State of Nevada
Leroy Goodman	Commissioner, Commission on Economic Development
Steve Hill	Commissioner, Commission on Economic Development
Somer Hollingsworth	Chief Executive Officer, Nevada Development Authority
Rob Hooper	Chief Executive Officer, Northern Nevada Development Authority
Steven Horsford	Senator, State of Nevada
Brian Krolicki	Lieutenant Governor, State of Nevada

Mike McGinness	Senator, State of Nevada
Ross Miller	Secretary of State, State of Nevada
Charlie Myers	Commissioner, Commission on Economic Development
John Oceguera	Assemblyman, State of Nevada
Dan Klaich	Chancellor, Nevada System of Higher Education
Dennis Perea	Interim Director, Department of Employment and Training Rehabilitation
Rossi Ralenkotter	President and Chief Executive Officer, Las Vegas Convention and Visitor Bureau
Tony Sanchez	Senior Vice President, Nevada Energy
Brian Sandoval	Governor, State of Nevada
Len Stevens	Executive Director, Sparks Chamber of Commerce
Stan Thomas	Vice President of Business Development, Economic Development Authority of Western Nevada
Paul Thomsen	Public Policy Administrator, Ormat Technologies
Patty Wade	Commissioner, Commission on Economic Development

Board on Economic Development

Kathleen Drakulich	Attorney at Law, McDonald Carano Wilson
Daniel Klaich	Chancellor, Nevada System of Higher Education
Brian Krolicki	Lieutenant Governor, State of Nevada
Ross Miller	Secretary of State, State of Nevada
Heather Murren	Chief Financial Officer, Nevada Cancer Institute
Sam Routson	Chief Administrative Officer, Winnemucca Farms
Rob Roy	Chief Executive Officer and Founder, Switch Communications
Brian Sandoval	Governor, State of Nevada
William Weidner	Chief Executive Officer, Gaming Asset Management
Frank Woodbeck	Director, Department of Employment and Training Rehabilitation
Benny Yerushalmi	Owner, The Jewelers of Las Vegas

Appendix B. Focus Group Participants and Interviewees

Focus Group Participants

Reno Focus Group Sessions, July 24, 2011

Jim Annis	The Applied Companies
Ray Bacon	Nevada Manufacturers Association
Darryl Bader	ITS Logistics
Greg Beattie	Charles River Laboratories
Walt Borland	Nevada Institute for Renewable Energy Commercialization
Steve Cerocke	IQ Technology Solutions
Susan Clark	Dynamic Competence Consulting
Michael Dermody	DP Properties
Norm Dianda	Q&D Construction
Jon Enloe	Stantec
Michelle Erlach	Sierra Nevada Corporation
Scott Heinze	St. Mary's Health Plans
Collie Hutter	Click Bond
Tina Iftiger	Reno Tahoe Airport
Dave Keselica	EP Minerals
Jeff Lawrence	Nevada Industry Excellence
Kevin LeVezu	Bank of the West
Joel Madison	Ebara
Lowell Moore	Griffin Global Logistics
Frank Partlow	Catamount Enterprises

Dan Schochet	Ram Power
Bob Seybert	Barrick Gold
Stephen Smith	Kleinfeld
Roxanne Spring	Microsoft Licensing
Terry Surles	Desert Research Institute
Ken Tavener	ITS Logistics
Michael Thomas	Noble Studios
Paul Thomsen	Ormat
Darik Volpa	Understand.com
Patty Wade	Wade Consulting
Roger Wittenberg	Boulder Bay Resort

Las Vegas Focus Group Sessions, July 25, 2011

Bo Bernhard	UNLV William F. Harrah College of Hotel Administration
Chris Brooks	Bombard Electric LLC
Tim Cashman	LV Harley-Davidson
Li Han Chan	Nevada Institute for Renewable Energy Commercialization
Tom Clark	Sempra Energy
Kirk Clausen	Wells Fargo
Eric Culberson	Amonix
Lawrence Epstein	Ultimate Fighting Championship
Phil Flaherty	Cantor Gaming
Scott Garrison	Ling 360
Jim Gibson	Vegas.com
Tom Kaplan	Wolfgang Puck Fine Dining Group
John La Gatta	Catamount Enterprises
Jim Lamb	Nevada Bio Consortium

Richard Lassiter	Vegas Fasteners
John Laub	Nevada Bio Consortium
Glenn McKay	Selling Source
Tim Porter	University of Nevada, Las Vegas
Ted Quirk	University of Nevada, Las Vegas Board of Trustees
John Restrepo	Restrepo Consulting Company
Rob Roy	Switch Communications
Tony Sanchez	Nevada Energy
Matt Schissler	Cord Blood
David Shafer	Vegas Fastener Manufacturing
Ruben Sigala	Caesars Resorts
Kim Sinatra	Wynn Resorts
Stan Smith	University of Nevada, Las Vegas
Keith Smith	Boyd Gaming
Bill Widener	Las Vegas Sands

Interviewees

State and regional governments; development authorities

Chuck Alvey	Economic Development Authority of Western Nevada
Lindsay Anderson	Nevada Commission on Economic Development
Bill Anderson	Department of Employment, Training and Rehabilitation
Bill Arent	Office of Business Development, City of Las Vegas
Michael J. Bonner	Las Vegas Chamber of Commerce and Nevada Development Authority
Christi Bozes	Northern Nevada Development Authority
Lori Brazfield	Nevada System of Higher Education
Glenn C. Christenson	Nevada Development Authority
Bob Cooper	Economic Development Division, City of Henderson

Stacey Crowley	Nevada State Office of Energy
Curtis Cummings	North Las Vegas Chamber of Commerce
Alan Di Stefano	Nevada Commission on Economic Development
Mark Doubrava	Nevada System of Higher Education
Larry Friedman	Nevada Commission on Tourism
Heidi Gansert	Office of Governor, State of Nevada
Jason Geddes	Nevada System of Higher Education
Charles Geocaris	State of Nevada Film Office
David Gustafson	State of Nevada Department of Information Technology
Steve Hill	Commission on Economic Development
Somer Hollingsworth	Nevada Development Authority
Rob Hooper	Northern Nevada Development Authority
Tina Iftiger	Reno Tahoe Airport
Christopher Ipsen	State of Nevada Department of Information Technology
Patrick Jankowski	Greater Houston Partnership
Paul Kinne	Economic Development Authority of Western Nevada
Daniel Klaich	Nevada System of Higher Education
Brian Krolicki	State of Nevada
Nicole Lamboley	Office of Secretary of State, State of Nevada
Mark Lipparelli	Gaming Control Board
Brian McAnallen	Las Vegas Chamber of Commerce
Kristin McMillan	Las Vegas Chamber of Commerce
Ross Miller	State of Nevada
Jane Nichols	Nevada System of Higher Education
Brian Pratte	Reno Tahoe Airport
Rossi Ralenkotter	Las Vegas Convention & Visitors Authority
Cara Roberts	Las Vegas Chamber of Commerce

Vic Redding	Nevada System of Higher Education
John Restrepo	Restrepo Consulting Company
Brian Sandoval	State of Nevada
Michael Skaggs	Nevada Commission on Economic Development
Michael Walsh	Nevada Development Authority
Robert E. Walsh	Office of Secretary of State, State of Nevada

Private Sector/Academia

Dave Abeloe	Patagonia
Jeremy Aguero	Applied Analysis
Ray Bacon	Nevada Manufacturers Association
Bo Bernhard	UNLV William F. Harrah College of Hotel Administration
Walt Borland	Nevada Institute for Renewable Energy Commercialization
Steve Bundy	Toys 'R Us
Li Han Chan	Nevada Institute for Renewable Energy Commercialization
Susan Clark	Nevada Venture Accelerator at 250 Bell
Jim Croce	Nevada Institute for Renewable Energy Commercialization
Tim Crowley	Nevada Mining Association
Eric Culberson	Amonix
Frank Fahrenkopf	American Gaming Association
Alan Feldman	MGM Resorts International
Phil Flaherty	Cantor Gaming
Scott Garrison	LINQ360 Innovation Center
Jim Gibson	Vegas.com
Len Gilman	Tahoe-Reno Industrial Center
Hilarie S. Grey	Nevada Cancer Institute
Reid Hamilton	Hamilton Solar

Steve Hamilton	Hamilton Company
Tom Kaplan	Wolfgang Puck Fine Dining Group
Jeff Lawrence	Nevada Industry Excellence
Robin Leach	Vegas Deluxe
Robert Maricich	World Market Center Las Vegas
Lenny Mendonca	McKinsey & Company
Fred Mossler	Zappos.com
Pat Mulroy	Southern Nevada Water Authority
Maureen Peckman	Cleveland Clinic
Giusseppe Pizzorno	Nevada Cancer Institute
Tim Porter	University of Nevada, Las Vegas
Amanda Pratt	Tahoe-Reno Industrial Center
Steve Rapp	Joint Strategy & Integration, Integrated Defense Systems, Boeing
Rob Roy	Switch Communications
Philip Satre	International Gaming Technologies
Wayne N. Sawka	Digital Solid State Propulsion LLC
David R. Scherer	Grubb & Ellis Company
David Simard	Marnell Properties
Kim Sinatra	General Counsel and Secretary, Wynn Resorts
Don Snyder	UNLV William F. Harrah School of Hotel Management
Paul Thomsen	Ormat Technologies
David Ziel	Urban Outfitters

Appendix C. Potential Job in Recommended Industries

Projected Potential Job Growth in Nevada's Target Industries

	Baseline Employment Projection			Projected Potential Jobs Added from 2011-2016		
	# of Jobs		Baseline Growth Projection (CAGR) 2011-2016[c]	*Baseline Growth Scenario*[c]	*Moderately Aggressive Growth Scenario*[d]	*Strongly Aggressive Growth Scenario*[e]
	2011	2016				
Tourism, Gaming, & Entertainment	357,638	370,213	0.7%	**+12,575**	**+15,500-16,000**	**+18,500-19,000**
Multiplier Impact[f]				*+18,566*	*+22,500-23,500*	*+27,000-28,000*
Health & Medical Services	86,710	97,456	2.4%	**+10,746**	**+13,500-14,000**	**+16,000-16,500**
Multiplier Impact[f]				*+20,262*	*+25,500-26,500*	*+30,000-31,000*
Logistics & Operations	85,653	92,787	1.6%	**+7,134**	**+8,500-9,000**	**+10,500-11,000**
Multiplier Impact[f]				*13,913*	*+16,500-17,500*	*+20,500-21,500*
Business IT Ecosystems	51,597	57,083	2.0%	**+5,486**	**+6,500-7,000**	**+8,000-8,500**
Multiplier Impact[f]				*+9,290*	*+11,000-12,000*	*+13,500-14,500*
Mining, Materials, & Manufacturing	47,343	51,861	1.8%	**+4,518**	**+5,500-6,000**	**+6,500-7,000**
Multiplier Impact[f]				*+9,785*	*+12,000-13,000*	*+14,000-15,000*
Clean Energy[a]	3,910	7,242	10.8%	**+3,332**	**+3,500-4,000**	**+5,000-5,500**
Multiplier Impact[f]				*+8,198*	*+8,500-10,000*	*+12,000-13,000*
Aerospace & Defense[b]	863	1,112	5.2%	**+249**	**+300-350**	**+350-400**
Multiplier Impact[f]				*+578*	*+700-800*	*+800-900*
TOTAL	634,137	677,754	1.3%	**+43,617**	***+53,300-56,350***	***+64,850-67,900***
Multiplier Impact[f]				*+80,592*	*+96,700-103,300*	*+117,800-124,400*

[a] SRI estimates are based on historical data for 2007-2010 and exclude temporary green architecture and construction jobs associated with the building of CityCentre

[b] Aerospace & Defense data represents private sector employment only and excludes persons in the military. Note that A&D employment in Nevada is likely higher than the figures shown here because many A&D-related activities related to electronics, communications, engineering, drafting, testing, etc. are subsumed within broader industry categories and cannot be isolated from other non-A&D activities.

[c] *Baseline Growth Scenario* is a projection by EMSI, which assumes no change in Nevada's policy environment or investments in the development of these industries. EMSI projections are based on recent industry trends, national industry projections by the Bureau of Labor Statistics, and state and sub-state regional projections produced by states.

[d] *Moderately Aggressive Growth Scenario* assumes a moderate level of policy interventions and investments are made in Nevada's industry development, and the baseline CAGR increases by +25%. This scenario also incorporates assumptions of overall economic recovery and national and global economic conditions.

[e] *Strongly Aggressive Growth Scenario* assumes there are extensive policy interventions and investments made in Nevada's industry development, and the baseline CAGR increases by +50%. This scenario also incorporates assumptions of overall economic recovery and national and global economic conditions.

[f] *Multiplier Impact* is the direct jobs created in the industry + the indirect jobs created throughout the economy.

Sources: EMSI, Bureau of Economic Analysis, and Brookings Institution; calculations by SRI International

Appendix D. Potential Job Growth and Sample Interventions in Recommended Industries

1. Tourism, Gaming, and Entertainment

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Tourism, Gaming, & Entertainment	Near-Term	X	X		Strong potential for near-term job creation	**NV employment in 2011:** 357,638 jobs **2011-2016 Projections:** *Baseline:* +12,575 jobs (0.7% CAGR) *Moderately Aggressive* +15,500-16,000 jobs *Strongly Aggressive:* +18,500-19,000 jobs	• Support regional convenings of stakeholders	$
Online Gaming	Medium-Term		X		If legalized, strong potential for medium-term job creation		• Provide competitive grants for needed cluster initiatives	$
Las Vegas as the Intellectual Capital of Global Gaming	Near- to Medium-Term		X		Shift towards higher-skill, knowledge-based jobs		• Advocate at the federal level for legalization of online gambling	$
Gaming Manufacturing	Near-Term	X	X		Strong potential for near-term job creation		• Study the potential economic impact of a film tax credit	$
Diversifying into Niche Tourism Markets	Near- to Medium-Term	X	X	X	Moderate near- and medium-term job creation		• Collaborate with industry to anticipate workforce needs and deliver on-demand education and training	$$
Retirees & Second Home Owners	Near-Term	X	X	X	Moderate near- to medium- term job creation and stabilizing real estate/ construction market		• Support regional/local niche product development and enhancements	$$
							• Market Las Vegas' convention-hosting profile as the global capital of "temporary clusters"	$$
							• Tourism product packaging and marketing to niche segments	$$$
Film & Media	Near- to Medium-Term		X		Small- to moderate job creation; Long-term diversification		• Targeted investments and support to ensure Nevada's position as the intellectual capital of global gaming	$$$
							• Regional land transportation infrastructure improvements	$$$$

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

2. Health and Medical Services

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Health & Medical Services	Medium- to Long-Term	X	X	X	Moderate to strong job creation, but over longer-term	**NV employment in 2011:** 86,710 jobs **2011-2016 Projections:** *Baseline:* +10,746 jobs (2.4% CAGR) *Moderately Aggressive:* +13,500-14,000 jobs *Strongly Aggressive:* +16,000-16,500 jobs	• Support regional convenings of stakeholders	$
							• Provide competitive awards for needed cluster initiatives to identify industry opportunities/ constraints	$
Surgical Specialties	Medium- to Long-Term	X	X	X	Moderate job creation impact		• Provide competitive awards for cluster initiatives targeting market niches	$$
Geriatrics & Related Services	Medium- to Long-Term	X	X	X	Moderate job creation impact		• Build mechanisms for industry and education/ training institutions to communicate workforce needs	$$
Disaggregation & Middle Skill Jobs	Near- to Medium- Term	X	X	X	Strong potential for job creation in near- to medium-term		• Increase investment and strengthen support structure for the training and retention of physicians and specialists	$$$
Leveraging the Sector to Build Other Emerging Opportunities	Long-Term	X	X		Long-term economic diversification		• Develop strong medical education programs with proximity to key markets	$$$$
							• Enhance university research and innovation capacity	$$$$

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

3. Business IT Ecosystems

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Business IT Ecosystems	Near-Term and Long-Term	X	X		Near-term job creation in lower-tech segments; longer-term diversification in high-tech segments	**NV employment in 2011:** 51,597 jobs **2011-2016 Projections:** *Baseline:* +5,486 jobs (2.0% CAGR) *Moderately Aggressive:* 6,500-7,000 jobs *Strongly Aggressive:* +8,000-8,500 jobs	**For Business Services / Lower-Tech Segments:** • Support regional convenings of stakeholders • Proactive/targeted marketing and investment promotion • Targeted incentives and streamlined permitting • Support for business retention and expansion **For IT / Higher-Tech Segments:** • Provide competitive awards for needed cluster initiatives: research, strategies, training, other • Cultivate ties to West Coast technology hubs • Build VC/financing networks • Strengthen support mechanisms for start-ups and entrepreneurs • Incentives and zoning to build innovation districts • Enhance commercialization and tech transfer processes • Support business incubation facilities • Build related university programs to support workforce and innovation development	$ $$ $$ $$ $ $ $$ $$$ $$$ $$$ $$$$ $$$$
Call Centers / Customer Service and Back Office / BPO / Shared Services	Near-Term	X	X		Strong potential for near-term job creation			
E-Commerce Operations/ Headquarters	Near- to Medium -Term	X	X		Economic diversification, with potential for near or medium-term job creation			
Data Centers	Near-Term	X	X		Near-term prospect, but not a significant job creator (other than construction jobs)			
Cloud / High-Performance Computing	Long-Term	X	X		Long-term economic diversification			
Cyber Security	Long-Term		X		Long-term economic diversification			

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

4. Clean Energy

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Clean Energy	Medium- to Long-Term	X	X	X	Economic diversification and moderate job creation potential	**NV employment in 2011 (est.):** 3,910 jobs * **2011-2016 Projections:** *Baseline:* ++3,332 jobs * (10.8% CAGR) * *Moderately Aggressive:* +3,500-4,000 jobs *Strongly Aggressive:* +5,000-5,500 jobs	• Support regional convenings of stakeholders • Lobby federal government to streamline licensing/ permitting • Targeted support for firms/researchers pursuing research grants and awards • Build VC/financing networks • Leverage existing manufact. commitments to attract more cluster investment • Incentivize deployment with supportive policies (tax credit) • Evaluate options for financing transmission expansion • Support the development of a renewables demonstration facility in Las Vegas • Outreach to attract FDI • Enhance commercialization and tech transfer processes • Build and consolidate R&D, innovation capacity, and centers of excellence in renewables	$ $ $$ $$ $$ $$ $$ $$ $$$ $$$$
Renewable Component Manufacturing	Short- to Medium-Term	X	X		Diversifying manufacturing base and short- to medium-term job creation			
Expanding Transmission Capacity	Medium- to Long-Term	X	X	X	Medium- to long-term job creation			
Energy Efficiency Upgrading	Short- to Medium-Term	X	X	X	Job creation for unemployed construction workers			
Advancing & Internationalizing Geothermal Development	Medium- to Long-Term	X		X	Build brand/reputation as global geothermal hub; Long-term diversification; creation of higher-skill jobs			

* Note: This figure is estimated by SRI, based on 2010 from the Brookings-Battelle Sizing the Clean Economy database and exclude temporary green architecture and construction jobs associated with the building of CityCentre. Future employment growth projections are not available in this dataset; therefore, SRI has projected baseline future growth by assuming that the cluster's job CAGR from 2007-2010 will continue to grow at the same rate through 2016.
Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

5. Mining, Materials, and Manufacturing

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Mining, Materials, & Manufacturing	Near- to Medium-Term	X	X	X	Potential for moderate-level job creation in medium-term	**NV employment in 2011:** 47,343 jobs **2011-2016 Projections:** *Baseline:* +4,518 jobs (1.8% CAGR) *Moderately Aggressive:* +5,500-6,000 jobs *Strongly Aggressive:* +6,500-7,000 jobs	• Support regional convenings of stakeholders with emphasis on strategic opportunities and diversification • Provide competitive awards to support cluster development and strategic planning efforts • Federal outreach/lobbying to streamline licensing/ permitting for projects • Proactive marketing and investment promotion (domestic and foreign) • Increase commercialization of research outcomes • Attract upstream suppliers or downstream manufacturers with incentives • Build/strengthen related university programs to support workforce and innovation development	$ $ $ $$ $$ $$$ $$$$
Expanding Participation in Upstream Mining Activities	Medium-Term	X	X	X	Potential for moderate-level job creation in medium-term			
Medium-Value Mineral Supply Chain Development	Medium-Term	X	X	X	Potential for moderate-level job creation in medium-term			
Manufacture of Advanced Composite Materials	Medium-Term	X	X		Medium- to long-term economic diversification			
Organizing & Marketing of Manufacturing Base	Near-Term	X	X		Potential for moderate-level job creation in medium-term			

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

6. Logistics and Operations

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Logistics & Operations	Near-Term	X	X		Strong potential for near-term job creation	**NV employment in 2011:** 85,653 jobs **2011-2016 Projections:** *Baseline:* +7,134 jobs (1.6% CAGR) *Moderately Aggressive:* +8,500-9,000 jobs *Strongly Aggressive:* +10,500-11,000 jobs	• Support regional convenings of stakeholders • Provide competitive awards for needed cluster initiatives: planning, networking, research, workforce training, other • Regional marketing/branding emphasizing proximity to West Coast markets • Lobby for LV-PHX-LA transportation infrastructure upgrades (especially Interstate) • Build university-industry research partnerships for technology development (e.g., RFID, supply chain) • Targeted incentives and streamlined permitting • Focused, consistent, and individualized support for business retention; expansion • Proactive investment and FDI promotion (targeting specific regions and companies) • Build university and technical-level programs to support workforce development	$ $ $$ $$ $$ $$ $$ $$ $$$$
Warehousing & Distribution	Near-Term	X	X		Strong potential for near-term job creation			
Advanced Logistics	Near-Term	X	X		Strong potential for near-term job creation			
Air Cargo	Near-Term	X	X		Strong potential for near-term job creation			
Integrated Manufacturing-Distribution and Assembly Manufacturing Operations	Near-Term	X			Strong potential for near-term job creation, longer-term diversification			
Freight Transportation (ground and rail)	Near-Term	X	X		Strong potential for near-term job creation			

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

7. Aerospace and Defense

Industry/Sub-Sector Opportunity	Time-frame	Regional Emphasis: Northern	Regional Emphasis: Southern	Regional Emphasis: Rural	Expected Impact	Potential 5-Year Direct Job Creation Impact	Sample of Possible Industry Interventions (state & regional)	Scale of Resources Required
Aerospace & Defense*	Long-Term	X		X	Long-term economic diversification	**NV employment in 2011:** 863 jobs * **2011-2016 Projections:** *Baseline:* +249 jobs (5.2% CAGR) *Moderately Aggressive:* +300-350 jobs *Strongly Aggressive:* +350-400 jobs	• Support regional convenings of stakeholders	$
							• Building cluster networks and directories (incl. networking with existing military assets)	$
Unmanned Aerial Vehicle (UAV) Supply, Assembly, & Testing	Long-Term	X		X	Long-term economic diversification		• Support development of a broad-based technology/ defense cluster initiative	$
							• Proactive marketing and investment promotion	$$
							• Review/evaluate tax policies and incentives related to aircraft/parts	$$
Maintenance, Repair, & Overhaul (MRO) of Aircraft Systems	Long-Term	X		X	Long-term economic diversification		• Targeted industry attraction	$$$
							• Strengthen support mechanisms for start-ups and entrepreneurs	$$$
							• Support business incubation facilities	$$$$
							• Strengthen university research and commercialization capabilities; support centers of excellence	$$$$

* Aerospace & Defense data represents private sector employment only and excludes persons in the military. Note that A&D employment in Nevada is likely higher than the figures shown here. However, it is extremely difficult to quantify the A&D industry using NAICS-based data, because many A&D-related activities related to electronics, communications, engineering, drafting, testing, etc. are subsumed within broader industry categories and cannot be isolated from other non-A&D activities.

Legend for *Scale of Resources*: $ = $0-$50,000 * $$ = $50,000-$250,000 * $$$ = $250,000-$1 million * $$$$ = >$1 million

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Endnotes

Chapter I

[1] See Nevada Vision Stakeholder Group and Moody's Analytics, "Envisioning Nevada's Future: Goals and Strategies for Advancing Our Quality of Life" (Carson City, 2010); New Nevada Task Force, "New Nevada Task Force Report on Initiatives" (Carson City, 2011); Nevada Institute for Renewable Energy Commercialization (NIREC), "The Silver Spark for Nevada: Sustainable Innovation Leading a Vital Economic Renaissance" (Carson City: Nevada Commission on Economic Development, 2011).

[2] Visit the Nevada 2.0 summit website at nv20.unlv.edu/ to view the program, presentations, readings, and video presented at the convening.

[3] Assembly Bill 449 (Chapter 507, *Statutes of Nevada 2011*, pages 3425-3489), available at http://leg.state.nv.us/Statutes/76th2011/Stats201128.html#CHz507_zABz449.

[4] In addition to the Catalyst and Knowledge Funds, SB 75 authorized the creation of a private equity investment fund leveraging $50 million from Nevada's Permanent School Fund (PSF). This fund will also be available for some qualifying economic development investments in companies. See page 117 for more content.

Chapter II

[1] U.S. Census Bureau, *2010 Census State Demographic Profiles.*

[2] Brookings-SRI analysis of Moody's Analytics data.

[3] Output, or gross metropolitan product, is reported in real terms from Bureau of Economic Analysis.

[4] Brookings-SRI analysis of EMSI and Bureau of Labor Statistics *Local Area Unemployment Statistics* data.

[5] Federal Housing Finance Agency, *Historical House Price Index Reports.*

[6] Brookings-SRI analysis of Bureau of Economic Analysis data.

[7] Brookings-SRI analysis of Moody's Analytics data.

[8] Brookings-SRI analysis of EMSI data.

[9] Mark Muro and Kenan Fikri, "Mountain Monitor: 2Q2011" (Washington and Las Vegas: Brookings Mountain West, 2011).

[10] Bureau of Labor Statistics, *Local Area Unemployment Statistics*, September 2011.

[11] Moody's Analytics, *Envisioning Nevada's Future* (September 2010) available at www.nsla.nevadaculture.org/statepubs/epubs/31428002986095.pdf. Index scores are based on 2009 data.

[12] Brookings-SRI analysis of Bureau of Economic Analysis data.

[13] Moody's Analytics, *Envisioning Nevada's Future.*

[14] According to the U.S. Census Bureau's North American Industry Classification System (NAICS), sectors correspond to 2-digit NAICS codes ("Manufacturing," "Information," and "Professional, Scientific, and Technical Services" are all sectors) and industries to 4- to 6-digit codes ("Pharmaceutical Manufacturing," "Software Publishing," and "Legal Services" are all industries). Since Nevada's "target industries" actually encompass industries, subsectors, and sectors, the terms industry and sector are used interchangeably in this report. Supersectors are defined by SRI in the accompanying technical report.

[15] Measured as location quotients. A location quotient (also known as an employment concentration ratio) is a relative measure of the size of an industry in a specific geography relative to the United States economy. An LQ greater (less) than one indicates that an industry employs more (fewer) people in a particular place than it does on average. *Construction and Real Estate*, *financial services*, b*usiness services*, m*aterials and chemicals*, and *transportation and logistics* also post location quotients at or above 1.00 in Nevada.

[16] National Science Foundation, *Survey of Earned Doctorates* (2006-2009).

[17] National Center for Science and Engineering Statistics, *Survey of Science and Engineering Research Facilities* (FY 2009).

[18] National Science Foundation, *Survey of Research and Development Expenditures at Universities and Colleges* (2009).

[19] Small Business Administration, *TechNet Database.*

[20] PricewaterhouseCoopers/National Venture Capital Association, *MoneyTree* Report.

[21] Brookings-SRI analysis of EMSI data.

[22] Brookings-SRI analysis of Moody's Analytics data.

[23] Ibid.

[24] Brookings-SRI analysis of EMSI data.

[25] Federal Housing Finance Agency, *Historical House Price Index Reports.*

[26] Bureau of Labor Statistics, *Local Area Unemployment Statistics.*

[27] Brookings-SRI analysis of Bureau of Economic Analysis data.

[28] Brookings-SRI analysis of data from the National Science Foundation, Small Business Administration, and National Center for Science and Engineering Statistics.

[29] Brookings-SRI analysis of Census Bureau Population Estimates data and Census 2010 data.

[30] Brookings-SRI analysis of Bureau of Economic Analysis data.

[31] Brookings analysis of Moody's Analytics data.

[32] Brookings-SRI analysis of EMSI data.

[33] Bureau of Labor Statistics, *Local Area Unemployment Statistics.*

[34] Brookings-SRI analysis of EMSI and Moody's Analytics data.

[35] Bureau of Labor Statistics, *Local Area Unemployment Statistics.*

[36] Census Bureau County Population Estimates.

[37] Federal Housing Finance Agency, *Historical House Price Index Reports.*

[38] Brookings-SRI analysis of EMSI data.

[39] Emilia Istrate and others, "Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness" (Washington: Brookings Institution, 2010). Numbers reported for Las Vegas are 2008 to show trends before the global recession sent tourism numbers plummeting.

[40] Brookings-SRI analysis of EMSI and Moody's Analytics data.

[41] Brookings-SRI analysis of Moody's Analytics data.

[42] Brookings-SRI analysis of Bureau of Economic Analysis data.

[43] Brookings-SRI analysis of EMSI data.

Chapter III

[1] Bruce Katz, "Nevada Sector Strategy Steering Committee Speech" (Carson City, Nevada: July 25, 2011); Mark Muro and Rob Lang, "Metropolitan Las Vegas: Challenges, Opportunities, and a Vision Speech" (Las Vegas, Nevada, September 8, 2009).

[2] SRI International, "Nevada Industry and Competitiveness Analysis: Preliminary Assessment and Benchmarking" (Arlington, 2011), 2011; SRI International, "Nevada Industry and Competitiveness Analysis: Identification of Industry Opportunities" (Arlington, 2011).

[3] See appendix A for list of stakeholders interviewed.

[4] SRI International, "Nevada Industry and Competitiveness Analysis: Identification of Industry Opportunities."

[5] More details about the industry identification process and the research inputs utilized are provided in Section III of SRI International, "Nevada Industry and Competitiveness Analysis: Identification of Industry Opportunities."

[6] H2 Gambling Capital, *Quarterly Interactive Gambling*, April 2011.

[7] David O. Stewart, "Online Gambling Five Years after UIGEA," *American Gaming Association White Paper* (2011), available at www.americangaming.org/files/aga/uploads/docs/final_online_gambling_white_paper_5-18-11.pdf.

[8] Applied Analysis, "The Economic and Fiscal Impact of Authorizing Internet Poker in the State of Nevada" (Las Vegas, Nevada: 2011).

[9] SRI International, "Nevada Industry and Competitiveness Analysis: Identification of Industry Opportunities."

[10] American Gaming Association, "State of the States: The AGA Survey of Casino Entertainment" (2010), available at www.americangaming.org/industry-resources/research/state-states.

[11] Association of Gaming Equipment Manufacturers, "Global Gaming Supplier: Industry Impact Analysis" (2008).

[12] Association of Gaming Equipment Manufacturers press release, August 2011, available at www.einnews.com/pr-news/527523-association-of-gaming-equipment-manufacturers-agem-releases-august-2011-index.

[13] Nevada Commission on Tourism, April 2011.

[14] Danny King, "Hotel recover suggests turnaround in Las Vegas." *Travel Weekly*, August 22, 2011, available at www.travelweekly.com/Travel-News/Hotel-News/Hotel-recovery-suggests-turnaround-in-Las-Vegas/?source=sharethis.

[15] U.S. Travel Association, "Profile of Culinary Travelers 2006" (1 January 2007). Culinary activities include: cooking classes, dining out for a unique and memorable experience, visiting farmers markets, gourmet food shopping, and attending food festivals.

[16] Emily Brandon, "10 Fast-Growing Retirement Spots." *U.S. News and World Report*, July 5, 2011, available at www.money.usnews.com/money/retirement/articles/2011/07/05/10-fast-growing-retirement-spots_print.html.

[17] Hubble Smith, "Falling home prices make LV retirement destination." *Las Vegas Review-Journal,* October 7, 2011, available at www.lvrj.com/business/falling-home-prices-make-lv-retirement-destination-104474499.html.

[18] Nevada Film Office, 2011.

[19] Applied Analysis, "Authorizing Internet Poker."

[20] Richard Velotta, "Sandoval to revive Gaming Policy Committee." *Vegas, Inc.*, November 4, 2011.

[21] SRI calculations based on EMSI data.

[22] Booz Allen Hamilton, *Building a New Hospital and Clinic in the City of Las Vegas*, commissioned by the Cleveland Clinic, February 14, 2004.

[23] Emily Brandon, "10 Fast-Growing Retirement Spots," *U.S. News and World Report*, 5 July 2011, available at www.money.usnews.com/money/retirement/articles/2011/07/05/10-fast-growing-retirement-spots_print.html.

[24] McKinsey Global Institute, "An economy that works: Job creation and America's future" (June 2011).

[25] Note here that "Business Services" is defined narrowly to include operations such as call centers, back office services, administrative services, employment services, and other activities related to business process outsourcing and shared services.

[26] Note that these estimates do not count workers in establishments that provide temporary employment services.

[27] National Institute of Standards and Technology, Information Technology Laboratory, USA (May 2009).

[28] www.whitehouse.gov/administration/eop/nsc/cybersecurity

[29] INPUT, *Federal Information Security Market*, 2010-2015.

[30] Data from Brookings Institution calculations as part of "Sizing the Clean Economy: A National and Regional Green Jobs Assessment" (Washington: Brookings Institution, 2011), available at www.brookings.edu/~/media/Files/Programs/Metro/clean_economy/0713_clean_economy.pdf.

[31] Michael Yackira, "Transmission Infrastructure and Collaboration." *Renewable Energy World.com*, February 28, 2011, available at, www.renewableenergyworld.com/rea/news/article/2011/02/final-word-transmission-infrastructure-and-collaboration.

[32] According to a gap analysis done by the Nevada State Office of Energy, full compliance with the 2009 International Energy Conservation Code can yield between 7-17 percent savings in residential and commercial energy use. For more information see www.energy.state.nv.us/documents/BCAP_NevadaGapAnalysis.pdf.

[33] Conversation with Karl Gawell, Geothermal Energy Association.

[34] Chris Pocock, "Issues Abound in Expansion of UAV Missions." *Aircraft Industry News Online*, June 2007; Teal Group Corporation, "World Unmanned Aerial Vehicle Systems: Market Profile and Forecast 2010" (2010).

[35] "Heavy-Fuel Wolverine3 Engine Takes Flight at Nevada Test Site." *Aero-News Network*, October 15, 2010, available at www.aero-news.net/index.cfm?do=main.textpostandid=fdc9b45f-0b61-45b8-92c6-8599bd9b7d27.

[36] Rob Sabo, "Defense contracts bring in millions to Northern Nevada." *Northern Nevada Business Weekly*, November 14, 2010, available at www.nevadaappeal.com/article/20101114/NEWS/101119817.

[37] Brookings-SRI analysis of EMSI data.

[38] International Trade Administration, "State-by-State Exports to a Selected Market," *TradeStats Express*, available at www.tse.export.gov/TSE/TSEReports.aspx?DATA=SED.

[39] Brookings-SRI analysis of EMSI data.

[40] National Agricultural Statistics Service, USDA, *2010 State Agriculture Overview: Nevada*, available at www.nass.usda.gov/Statistics_by_State/Ag_Overview/AgOverview_NV.pdf and Nevada Department of Agriculture, available at www.agri.nv.gov/AgInNevada.htm.

[41] Brookings-SRI analysis of EMSI data.

[42] Brookings-SRI analysis of EMSI data.

Chapter IV

[1] Multiple stakeholder interviews. See also Dave Berns, "Is the NDA missing in action from Nevada's economic development?" *Vegas Inc.*, June 27, 2011 and Jason Whited, "Diversify now." *Las Vegas CityLife*, August 11, 2011.

[2] NIREC, "The Silver Spark for Nevada."

[3] National Science Foundation, *Survey of Research and Development Expenditures at Universities and Colleges* (2009).

[4] Correspondence with Steve Hill, October 2011.

[5] These calculations employ c2er.org's State Economic Development Expenditure Database for 2011 and Brookings analysis of 2011 Census data. The budget estimates take into account all state spending related to economic development including spending on NCED, DETR's Research and Analysis Bureau, NSHE's Ag Experiment Station and Cooperative Extension Service, Nevada Magazine, Nevada Film Office, Tourism Development Fund, CETR's Career Enhancement Program, Nevada Catalyst Fund, and the Procurement Outreach Program.

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

[7] Ibid. See also, for example, key tenets of the Baldrige Performance Excellent Program—a widely used "best practice" established by the U.S. Department of Commerce in 1988 to aid businesses, government organizations, and non-profit organizations improving their performance. (Site available here www.nist.gov/baldrige/) While the program was designed for single organizations some commentators have also applied its principles to networks and partnerships of organizations. Particularly relevant to the state leadership role in economic development are these Baldrige principles:"Leadership should set direction and create a customer focus, clear and visible values, and high expectations" and "Leaders should ensure the creation of strategies, systems, and methods of achieving excellence, stimulating innovation, and building knowledge and capabilities." For a thoughtful discussion of the Baldrige program's relevance to state and local economic development systems and partnerships see Randall Eberts, "The United States: How Partnerships Can Overcome Policy Gaps." In OECD, *More than Just Jobs: Workforce Development in a Skills-Based Economy* (Paris: 2008).

[8] Under Gov. Deval Patrick's leadership, Massachusetts has created targeted initiatives that play to its unique strengths and have made Massachusetts a leader in biotechnology, IT, and clean energy. In Nebraska Gov. Dave Heineman has taken a personal interest in advancing a detailed stakeholders process for understanding the state's competitive advantages and identifying ideas for accelerating new economy innovation across the state. And in Utah Gov. Herbert has strongly pressed that state's economic development priorities through programs like USTAR—focusing on research and developing new technologies to transfer into the marketplace—and the UCAP initiatives aligning the activities of the universities with the economic needs of the state. For her part, Gov. Gregoire personally chaired the Government Management and Performance Program (GMAP) in Washington state. Through the program and its meetings a disciplined process reviews agencies' progress toward achieving results that align with the governor's priorities, remove bureaucratic obstacles, and redirect resources as necessary to achieve goals. See www.accountability.wa.gov/default.asp.

[9] For more information see www.masslifesciences.com/house_bill.html and www.capewind.org/index.php.

[10] For more information see www.neded.org/files/businessdevelopment/battelle/Main_Report_NE_CompetitiveAdvantageAssessment_v8a.pdf and www.neded.org/business/talent-a-innovation-initiative.

[11] For more information see www.innovationutah.com/ and www.higheredutah.org/utah-cluster-acceleration-partnership-ucap-aligning-higher-education-with-industry-talent-and-innovation-needs/.

[12] For more information see www.colorado.gov/cs/Satellite/OEDIT/OEDIT/1251595201376.

[13] For more information see www.governor.ny.gov/regional-council-guidebook.pdf.

[14] For more information see www.tn.gov/ecd/Jobs4TN.html.

[15] For more information see www.gra.org/.

[16] For more information see www.thirdfrontier.com.

[17] For more information see www.innovatewashington.org/.

[18] For more information see www.eflorida.com/ContentSubpage.aspx?id=4280.

[19] For more information see www.pausa.org.cn/htm_centerchina/envoyprogram.asp.

[20] For more information see www.choosewashington.com/BUSINESS/EXPORT/Pages/default.aspx.

[21] For more information see www.icapp.org/.

[22] For more information see www.northcarolina.edu/nctomorrow/index.htm.

[23] For more information see www.ohioskillsbank.com/.

[24] Muro and others, "MetroPolicy." See also Mark Muro and Bruce Katz, "The New `Cluster Moment:' How Regional Innovation Clusters Can Foster the Next Economy" (Washington: Brookings Institution, 2010) and the Organisation for Economic Cooperation and Development (OECD), "Regions and Innovation Policy" (Paris, 2011). Again, the Baldrige principles affirm the importance of strong "external partnerships" and the "blending of an organization's core competencies or leadership capabilities with the complementary strengths and capabilities of partners." See www.nist.gov/baldrige/ and Eberts, "The United States" in *More Than Just Jobs.*

[25] Each of states embracing the new "bottom up" style of economic development is employing a somewhat different approach to the effort. New York has created 10 regional economic development councils comprising a diverse spectrum of regional stakeholders and entrusted them with the responsibility of coordinating economic development efforts within each region. See Empire State Development, "Open for Business: A New State Government Approach to Economic Development" (Albany: 2011), available at www.governor.ny.gov/regional-council-guidebook.pdf. New York's 10 regional councils align with the existing regions as defined by the Empire State Development and Department of Labor. The Lieutenant Governor serves as chair of each regional council and leads a statewide chairman's committee. The Governor appoints two regional co-chairs in each region that consist of one representative from the business community and one from the academic community. These regional councils have five primary responsibilities: (1) develop and maintain a five-year strategic plan for long-term, sustainable regional economic growth, (2) coordinate economic development efforts within the region, (3) leverage public and private resources, (4) identify and eliminate obstacles to growth, and (5) implement performance measures to ensure long-term success. Through the development of regional five-year strategic plans, the regional councils will compete for an initial allocation of $200 million in regional economic competitive grants ($130 million) and tax credits ($70 million). Michigan has also made the state's regions the drivers of state economic development policy as part of a new statewide effort to more closely align local and state economic development efforts and in the process foster sharing of best practices and avoid duplication of efforts. For more information see www.brookings.edu/opinions/2011/0131_state_restructuring_bradley.aspx. The Michigan Economic Development Corporation (MEDC) will station representatives in Michigan regions to make sure that state programs and policies complement, rather than complicate, local efforts. An Office of Urban Initiatives with outposts in Detroit, Grand Rapids, Saginaw, and Flint will also be created. MEDC will take on the role of "clearing house" helping one region replicate the successful strategies of another when it comes to opening up markets for export or luring foreign investment. Further south, meanwhile, Tennessee's new Jobs4TN plan centers on developing strategic plans for nine regions in the state, each with an innovation component. For more information see www.news.tn.gov/node/7119. Tennessee's Jobs4TN is the economic development strategy of the state that was announced by Gov. Bill Haslam and Economic and Community Development Commissioner Bill Hagerty on April 21, 2011. The strategy was based on interviews with 300 stakeholders, community leaders, national experts, and seven roundtables throughout the state during a 45 day period. Jobs4TN plan consists of four key strategies: (1) prioritizing key clusters and existing businesses, (2) establishing regional "Jobs Base Camps" (3) investing in innovation, and (4) reducing business regulation.

[26] Muro and others, "MetroPolicy."

[27] A 2007 National Governors Association (NGA) report on "Innovation America" affirms the great interest governors have placed on innovation in recent years. That report emphasizes the critical role that states can play in fostering innovation and creates a set of guidelines for governors to help them leverage their investments, bridge the essential relationships between universities and the private sector, and build a hospitable environment for innovation economy. The guidelines are grounded in the real-world experiences of states. For more information see NGA, "Innovation America: Investing in Innovation" (Washington: 2007). Improving human capital through education improvements and workforce training has also been a key priority for states. In 2002, the NGA published "A Governor's Guide to Creating a 21st Century Workforce." This report emphasized the need for skilled workforce if states are to grow and compete globally and identified various challenges that states face in creating successful workforce program. The guide also made six policy recommendations of policies that can overcome the barrier to building a strong workforce: connect workforce development to economic needs; build a stronger education pipeline to produce skilled workers; expand opportunities for continuous learning; enhance workers' ability to manage their careers; strengthen work supports to promote employment retention and career advancement; and strengthen governance and accountability in the workforce system. For more information see NGA, "A Governor's Guide to Creating a 21st Century Workforce" (Washington: 2002). Signifying the continued importance of this topic for governors, the NGA recently released another report related to higher education's role in driving state economic growth. Providing examples from Minnesota, North Carolina, Ohio, and Washington, the report notes that few states have undertaken bold, comprehensive strategies to align post-secondary education with the state's economic goals. For more information see Erin Sparks

and Mary Jo Waits, “Degrees for What Jobs? Raising Expectations for Universities and Colleges in a Global Economy” (Washington: NGA, 2011).

[28] For more information see NGA, “Innovation America.”

[29] For more information see Erin Sparks and Mary Jo Waits, “Degrees for What Jobs?”

Chapter V

[1] A third investment vehicle was created b SB 75 which, as noted earlier, established a new private equity fund to invest some $50 million in school fund money in qualifying businesses.

[2] Winning a relocation might make the headlines, but as research from the Public Policy Institute of California shows, job gains and losses are overwhelmingly driven by intra-state business dynamics rather than the between-state movement of firms. See Jed Kolko, “Business Relocation and Homegrown Jobs” (Sacramento: Public Policy Institute of California, September 2010). Studying the period 1992 to 2006, Kolko found that only 1.9 percent of job gains and 2.0 percent of job losses in a year in the average state were attributable to business relocations. By contrast, fully 41.8 percent of job gains come from the expansion of existing businesses, and a whopping 56.3 percent from the birth of new establishments. Given those facts, emphasizing firm recruitment places an outward focus on state economic development policy at the expense of the state’s existing economic activity. For the most part, then, state resources are better spent supporting the many factors that drive entrepreneurship and help firms to grow—efforts which properly designed cluster strategies can inform. For more see: William Fulton, *Romancing the Smokestack: How Cities and States Pursue Prosperity* (Ventura, CA: California Planning and Development Report, 2010); Timothy Bartik, “Solving the Problem of Economic Development Incentives.” In Ann Markusen, ed., Reining in Competition for Capital (Kalamazoo: W.E. Upjohn Institute for Employment Research, 2007); S. Ellis and C. Rogers, “Local Economic Development as a Prisoner’s Dilemma: The Role of Business Climate,” *Review of Regional Studies* 30 (2000): pp.315-30; and Daniel Levine, “Incentives and the Interstate Competition for Jobs.” *Site Selection Magazine*, November 2010.

[3] See, for example, Philip Mattera and others, “Slashing Subsidies, Bolstering Budgets: How States Can Save Money by Targeting Ineffective Economic Development Programs” (Washington: Good Jobs First, 2011). Much criticism has enveloped the Texas Enterprise Fund, for example—a fund that while much larger than Nevada’s Catalyst Fund has a similar purpose. To date that program has awarded $412 million in incentives to companies but over a quarter of that money--$119 million—went to firms that failed to create promised jobs. However, the governor’s office only clawed back about a sixth of the money, totaling $21 million. The poor performance was confirmed in an investigative report by Texans for Public Justice, which found that two out of every three projects that promised to create jobs failed to meet those promises in 2009 while many of the jobs that were created were often of low quality with many paying less than $27,000 a year.

[4] At least 30 states now maintain discretionary “contingency” funds for economic development purposes related to firm relocation and expansion and around 20 offer some type of “deal closing” or cash grant program. The average fund receives about $7 million to $10 million a year. See Richard Kaplan & Associates, “Analysis of State Level Economic Development Contingency Funds” (Topeka: Kansas Inc, 2009) and CB Richard Ellis, “Economic Incentives: The Intersection of Site Selection and Economic Development” (2010)

[5] High-growth or high-impact firms, so-called “gazelles,” represent only 2–3 percent of firms but they account for nearly all net job creation in the economy. On average they are younger and smaller than other firms—94 percent have fewer than 20 employees—and they exist in all industries. These characteristics make “gazelles” or “high-growth” smaller firms excellent targets for the Catalyst Fund. See Magnus Henrekson and Dan Johansson, “Gazelles as Job Creators: A Survey and Interpretation of the Evidence,” *Small Business Economics,* online version; and Zoltan Acs, William Parsons, and Spencer Tracy, “High Impact Firms: Gazelles Revisited” (Washington: Small Business Administration Office of Advocacy, 2008).

[6] See Eberts, “The United States” in *More Than Just Jobs*. See also NGA, “Tools and Techniques of Effective Governors” (Washington, 2010) and OECD, “Governing Regional Development Policy” (Paris: 2009).

[7] NNDA and the 11 rural RDAs are “operationally” funded though the Local Development Grants Program, which provided them $850,000 in the most recent year all told. A degree of coordination and state management has been provided by the Eight Building Blocks of Economic Development guidance as well as quarterly reporting and frequent teleconference meetings with NCED.

[8] For a practical guide to the chief functions of economic development organizations see International Economic Development Council, “Managing Economic Development Organizations*” (*Washington: 2011). For other relevant discussions see also Taimerica Management Company, “Best Practices in Regional and Local Economic Development” (Fort Wayne: Northeast Indiana Foundation, 2009). See also Council on Competitiveness, “Collaborate: Leading Regional Innovation Clusters” (Washington: 2010). This report identifies six "new tasks for regional leadership" that track well with current views of what regional economic development groups should do. According to the report, these groups should: tell the region's story; get the right people at the table to do the right thing; produce regional value; build an innovation ecosystem; establish new regional rules of the game; and establish indicators and metrics.

[9] The literature is massive here—replete with myriad theoretical dissertations, “best practices” reviews, multiple surveys, and all manner of “benchmarkings. Notwithstanding that, several documents provide useful distillations of the characteristics of effective economic development organizations (EDOs). To begin with, the IEDC manual “Managing Economic Development Organizations” discusses numerous characteristics of successful EDOs. For its part, Georgia Tech Enterprise Innovation Institute—working with the

IEDC—produced a study that surveys economic development organizations using the Baldrige performance criteria to get at the best practices of economic development organizations. See, in this connection, Georgia Tech Enterprise Innovation Institute, "Benchmarking Excellence among Accredited Economic Development Organizations: Results of the 2009 Quality Management Survey" (Washington: International Economic Development Council, 2009). For a widely used and generally applicable framework on the characteristics and ideal operations of high-performing organizations see also the Baldrige Performance Excellence Program itself. Background is available at the National Institute of Standards and Technology (NIST), "2011-2012 Criteria for Performance Excellence*" (*Washington: 2011).

[10] Bob Weissbourd and Mark Muro, "Metropolitan Business Plans: A New Approach to Economic Growth" (Washington: Brookings Institution, 2011). See also Baldrige Performance Excellence Program and NIST, "Criteria for Performance Excellence."

[11] See, for example, Randall W. Eberts and George A. Erickcek, "The Role of Partnerships in Economic Development and Labor Markets in the United States," Upjohn Institute Working Papers, Working Paper No. 02-75, January 2002; and Randall W. Eberts, "The United States: How Partnerships Can Overcome Policy Gaps" In *Workforce Development in a Skills-Based Economy* (Paris: OECD, 2008).

[12] Baldrige Performance Excellence Program, *2011-2012 Criteria for Performance Excellence.*

[13] For an authoritative discussion of how to design and use performance indicators for regional development see OECD, "Governing Regional Development Policy: The Use of Performance Indicators." Organisation for Economic Development Cooperation and Development (Paris: Organisation for Economic Development Cooperation and Development, 2009). For designing a monitoring and evaluation system for regional economic development programs see International Economic Development Council, *Managing Economic Development Organizations*.

[14] For a review of ways to measure operational issues related to running an economic development program see Georgia Tech Enterprise Innovation Institute, "Benchmarking Excellence among Accredited Economic Development Organizations."

[15] For a clear global guide to the use of performance measurement in regional development management see OECD, "Governing Regional Development Policy: The Use of Performance Indicators" (Paris: 2009).

[16] Office of Economic Development and International Trade, "Colorado Blueprint: A bottom-up approach to economic development" (Denver: Office of Economic Development and International Trade, 2011) available at www.colorado.gov/cs/Satellite/OEDIT/OEDIT/1251595201376

[17] New York State Governor's Office, "Open for Business: A New State Government Approach to Economic Development*" (*Albany: 2011) available at www.governor.ny.gov/regional-council-guidebook.pdf

[18] Department of Economic and Community Development, "*Jobs4TN Plan*" (Nashville: April 2011), available at: www.tn.gov/ecd/Jobs4TN.html

[19] See Colorado Department of Labor & Employment's LMI Gateway website for the entire range of economic development data offered, available at: www.lmigateway.coworkforce.com/lmigateway/ . See also Minnesota's consolidated economic development data tools at: www.positivelyminnesota.com/Data_Publications/Data/index.aspx

[20] For a lucid view of the benefits that strong information or indicator systems produce for the governance of economic development efforts see OECD, "Governing Regional Development Policy."

[21] This paragraph substantially reflects the argument of OECD, "Governing Regional Development Policy."

[22] "About Maine Technology Institute," available at www.mainetechnology.org/about. Figures reported through 2009.

[23] Charles Colgan and Bruce Andrews, "Evaluation of Maine Technology Institute Programs" (Portland, ME: University of Southern Maine Center for Economic and Business Research, January 15, 2009).

[24] Comments by Betsy Biemann, President, Maine Technology Institute, at Brookings Institution event "Regional Innovation Clusters: Advancing the Next Economy," September 23, 2010, transcript available at www.brookings.edu.

Chapter VI

[1] The economics literature on clusters is broad and deep. A list of the most influential pieces follows. On industry clusters in general: Michael Porter, *The Competitive Advantage of Nations* (New York, Free Press, 1990); Michael Porter, "Clusters and the New Economics of Competition." *Harvard Business Review* (November-December 1998): 77–90; Joseph Cortright, "Making Sense of Clusters: Regional Competitiveness and Economic Development" (Washington: Brookings Institution, 2006). On industry localization: Stuart Rosenthal and William Strange, "Evidence on the Nature and Sources of Agglomeration Economies." In J.V. Henderson and J. F. Thisse, ed., *Handbook of Regional and Urban Economics*, vol. 4 (Amsterdam: North-Holland, 2004). On clusters and innovation: Maryann Feldman, *The Geography of Innovation (*Dordrecht: Kluwer Academic Publishers, 1994) and David Audretsch and Maryann Feldman, "Knowledge Spillovers and the Geography of Innovation." In J. Vernon Henderson and Jacques-Francois Thisse, eds., *Handbook of Regional and Urban Economics*, vol. 4 (Amsterdam: Elsevier, 2004): pp.2120–2167; Maryann Feldman, "The New Economics of Innovation, Spillovers, and Agglomeration: A Review of Empirical Studies." In Gordon L. Clark, Maryann Feldman, and Meric Gertner, eds.,*The Oxford Handbook of Economic Geography* (New York: Oxford University Press, 2002). On clusters and entrepreneurship: Mercedes Delgado, Michael Porter, and Scott Stern, "Clusters and Entrepreneurship,"

Journal of Economic Geography 10 (2010): 495–51. On clusters and patenting: Adam Jaffe, Manuel Trajtenberg, and Rebecca Henderson, "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations," *Quarterly Journal of Economics* 108 (3) (1993): 577-598; David Audretsch and Maryann Feldman, "R&D Spillovers and the Geography of Innovation and Production," *American Economic Review*, 86 (3) (1996): 630-640; and Jung Won Sonn and Michael Storper, "The Increasing Importance of Geographical Proximity in Knowledge Production: An Analysis of US Patent Citations," *Environment and Planning* 40 (2008): 1020-1039. On clusters and wages: Robert Gibbs and G. Andrew Bernat Jr., "Rural Industry Clusters Raise Local Earnings," *Rural Development Perspectives* 12 (3) (1997): 18–25; and William Wheaton and Mark J. Lewlis, "Urban Wages and Labor Market Agglomeration," *Journal of Urban Economics* 51 (3) (2002): 542–562.

[2] Mark Muro and Bruce Katz, "The New 'Cluster Moment': How Regional Innovation Clusters Can Foster the Next Economy" (Washington: Brookings Institution, September 2010).

[3] Joseph Cortright, "Making Sense of Clusters: Regional Competitiveness and Economic Development" (Washington: Brookings Institution, 2006).

[4] See Southern Nevada Medical Industry Coalition website, available at http://www.snmic.com/

[5] "Jobs4TN Plan," presentation, Tennessee Department of Economic Community and Development, April 20, 2011, available at www.tn.gov/ecd/pdf/Jobs4TN_PowerPoint_04202011.pdf.

[6] Muro and Katz, "Cluster Moment."

[7] Örjan Sölvell, Göran Lindqvist, and Christian Ketels, "The Cluster Initiative Greenbook" (Stockholm: Ivory Tower, 2003).

[8] The Maine Technology Institute, an industry-led, publicly-funded, non-profit organization that supports cluster activities in the state of Maine, is exemplary in its employment of data and analytics to demonstrate its value and show a robust return on taxpayer investment. For more see "Using Data in Maine: Analysis, Evaluation, Learning, and Accountability at the Maine Technology Institute" on page 5 of the Brookings report "Job Creation on a Budget."

[9] Weissbourd and Muro, "Metropolitan Business Planning."

[10] "Innovation Meets Demonstration: A Prospectus for Catalyzing Growth in the Puget Sound's Energy Efficiency Technology Cluster" (Washington: Brookings Institution, 2011) available at www.brookings.edu/~/media/Files/rc/papers/2010/12_metro_business_muro/12_metro_business_puget.pdf

[11] For an introduction to export plans see: Emilia Istrate, Jonathan Rothwell, and Bruce Katz, "Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness" (Washington: Brookings Institution, 2010).

[12] For more on regional and metropolitan business planning, see Weissbourd and Muro, "Metropolitan Business Planning."

[13] Internationalization confers additional benefits like exposure to best practices and exposes firms to the heightened competition of the global marketplace—an opportunity to hone their business practices

[14] Bruce Katz and Emilia Istrate, "Boosting Exports, Delivering Jobs and Economic Growth" (Washington: Brookings Institution, 2011).

[15] Richard Velotta, "LVCVA Continues to Press for More Lucrative International Tourists." *Las Vegas Sun*, February 9, 2011. Richard Velotta, "Las Vegas Takes Lead in Luring Foreign Business Travelers." *Vegas Inc*., October 12, 2011.

[16] A range of additional elements contribute to the success and viability of an innovation district: local leadership and consensus; accessibility through a range of infrastructure, including public transit; cultural events and venues to establish the district as a destination for a wide variety of people; quality housing opportunities for a range of incomes. Above all, the innovation district should be a geographically confined space that is simultaneously fully integrated into the surrounding urban fabric.

[17] Joe Schoenmann, "Zappos putting its stamp on downtown Las Vegas." *Las Vegas Sun*, October 18, 2011.

[18] Michael Storper and Anthony Venables, "Buzz: Face-to-Face Contact and the Urban Economy." *Journal of Economic Geography* 4 (4) (2004): 351-370.

[19] Muro and Fikri, "Job Creation on a Budget."

[20] Ibid.

Chapter VII

[1] For a good definition of what "innovation" is and why it matters see Rob Atkinson and Howard Wial, "Boosting Innovation, Productivity, and Growth through a National Innovation Foundation" (Washington: Brookings Institution, 2008).

[2] Emilia Istrate, Jonathan Rothwell, and Bruce Katz, "Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness" (Washington: Brookings Institution, 2010).

[3] A large body of literature provides evidence that investments in human capital—meaning education and workforce training—boosts the earnings of individuals, raises the productivity of employers, and grows the economy. For a review of the literature see Richard

Blundell, et al., "Human Capital Investment: The Returns from Education and Training to the Individual, the Firm, and the Economy," *Fiscal Studies* 20 (1) (1999) pp. 1-23.

[4] Atkinson and Wial, "Boosting Innovation, Productivity, and Growth through a National Innovation Foundation" reviews some the accumulating evidence for the enhanced importance of innovation to firms, industries, and region.

[5] SRI International, "Nevada Industry and Competitiveness Analysis, Preliminary Findings."

[6] Ibid. Nevada is in an embryonic stage compared to many other states and their research institutions. Nevada's three research institutions are in the beginning phase, having initiated such processes in the last decade. Moreover, their current efforts are self-funded which limits their effectiveness.

[7] Nevada ranks first among all states in the "2010 Kauffman Index of Entrepreneurial Activity," with 510 entrepreneurs for every 100,000 people in the state (a rate that is 1.5 times the national average). Nevada had a new business start-up rate of 7.1 percent in the last quarter of 2010, and the state has generally ranked in the top 10 of all states for its rate of new business starts in nearly every quarter over the last five years. See Robert W. Fairlie, "Kauffman Index of Entrepreneurial Activity 1996-2010" (Kansas City: Kauffman Foundation, 2011). See also SRI analysis of data from Bureau of Labor Statistics, *Business Employment Dynamics*, www.bls.gov/bdm/bdmstate.htm.

[8] SRI analysis of data from Association of University Technology Managers, *AUTM Licensing Survey*. SRI International, "Nevada Industry and Competitiveness Analysis, Preliminary Findings."

[9] Some good examples include the Maryland Industrial Partnerships (MIPs) Program and the Research Commercialization Program under the Ohio Third Frontier Initiative.

[10] One good example of such an approach is the Maryland Industrial Partnerships (MIPS) program. MIPS provides matching funds for collaborative R&D between Maryland companies and University System of Maryland faculty, in order to accelerate development and commercialization of technology products that create jobs in Maryland. MIPS has established a sliding scale of company matching fund requirements, based on the type and size of company. For more information see www.mtech.umd.edu/mips/applying/funding.html.

[11] Robert D. Atkinson, "The Research and Experimentation Tax Credit: A Critical Policy Tool for Boosting Research and Enhancing U.S. Economic Competitiveness" (Washington: Information Technology and Innovation Foundation, 2006); Yonghong Wu, "State R&D Tax Credits and High-Technology Establishments," *Economic Development Quarterly* 22 (2008): 136-148.

[12] Daniel J. Wilson, "Beggar thy Neighbor? The In-State, Out-of-State, and Aggregate Effects of R&D Tax Credits," *Federal Reserve Bank of San Francisco*, August 2007.

[13] While many states around the country provide an R&D sales tax exemption and information is readily available online, two good examples of states to examine would include Ohio (www.development.ohio.gov/Business/tax_credit.htm) and New York (www.esd.ny.gov/BusinessPrograms/Taxes_Incentives.html).

[14] As compared to other R&D-related tax incentives, R&D property tax abatements are less commonly used by states. Examples of state programs to review would include New York (www.esd.ny.gov/BusinessPrograms/Data/Excelsior/101411_ExcelsiorJobsProgramOverview.pdf) and Rhode Island (www.tax.ri.gov/regulations/other/cr95-06.php).

[15] Oklahoma has implemented a similar program that may serve as a useful example for Nevada. The Oklahoma Applied Research Support program uses external reviewers to judge project merit and awards between $10,000 and $300,000 to successful applicants (www.ok.gov/ocast/Programs/Oklahoma_Applied_Research_Support_%28OARS%29/).

[16] Small Business Administration Office of Investment and Innovation, "Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Overview," www.sbir.gov.

[17] Additional information is available online for the New York State SBIR Outreach Program (www.nystar.state.ny.us/sbir/outreach.htm) and Utah's SBIR-STTR Assistance Center (www.innovationutah.com/sbir.html).

[18] The intermediary function has also been suggested in NIREC, "The Silver Spark."

[19] According to analysis by Harvard Business School, venture capital firms tend to concentrate in regions that offer them the highest concentration of profitable investments, in regions with high overall levels of innovation, and in regions where VC investments have previously been successful. More than half of the country's 1,000 VC offices, and 49% of the U.S.-based companies financed by these firms are located in San Francisco, Boston, and New York. Henry Chen, et al, "Buy Local? The Geography of Successful and Unsuccessful Venture Capital Expansion," Working Paper, 09-143 (Harvard Business School, June 2009), www.hbs.edu/research/pdf/09-143.pdf.

[20] The three known early-stage investment groups are the Vegas Valley Angels, the Reno Angels, and the Sierra Angels. Nevada's only National Venture Capital Association member is Las Vegas-based Redhills Ventures, LLC (which focuses on making healthcare-related investments). NIREC, "The Silver Spark."

[21] One example of such a forum already operating in Nevada would be the Las Vegas Venture Forum.

[22] According to an NGA report, the cost of learning the business of private equity for an angel investor is about $250,000, or about 10 investments gone sour. Since the learning curve is risky and expensive, subsidizing angels' education can be a good investment for a state. NGA, "State Strategies to Promote Angel Investment for Economic Growth" (Washington: February 2008), www.nga.org/files/live/sites/NGA/files/pdf/0802ANGELINVESTMENT.PDF.

[23] These kinds of venture/angel forums and conferences have been successfully launched regionally through coalitions of community/business leaders and investors, and have also been launched at the state-level in places such as Florida, Iowa, Oklahoma, and Vermont. In states such as Massachusetts, Connecticut, Michigan, and elsewhere, the state's economic and/or technology development organizations provide co-sponsorship for state- and regional-level private/non-profit venture forums, venture capital associations, and their programs. For examples of regional and state-based venture forums and associations (many of which receive some state support), see www.nvca.org/index.php?option=com_content&view=article&id=106&Itemid=134.

[24] This is similar to the model that has been adopted by 25 states. See National Association of Seed and Venture Funds, "U.S. State-Supported Venture Capital Funds" (March 2008), www.nasvf.org/pdfs/VCFundsReport.pdf.

[25] As in many other states, Nevada allows for investment of state pension funds in venture capital. Nevada's Public Employees Retirement System (PERS) has approximately $24 billion invested on behalf of public employees, 10 percent of which has been allocated to alternative investment. [Source: Minutes of the Senate Select Committee on Economic Growth and Employment, April 6, 2011]. There is currently no mandate for these investments to be made within Nevada.

[26] "World Economic Outlook Database, September 2011" (Washington: International Monetary Fund). GDP estimates in current prices. The numbers are more startling at purchasing power parity.

[27] "A Game of Catch-up: Special Report on the World Economy." *The Economist*, September 24, 2011.

[28] "Global Development Horizons 2011: Multipolarity: The New Global Economy" (Washington: World Bank, 2011). International reserves held by emerging economies reached $7.4 trillion in 2010, roughly three times the $2.1 trillion held by advanced economies. On the private side, the share o cross-borders mergers and acquisitions (a form of FDI) by firms based in emerging economies was 29 percent of the global total in 2010, $470 billion.

[29] Istrate, et al., "Export Nation."

[30] Andrew Bernard and J. Bradford Jenson, "Exceptional exporter performance: cause, effect, or both?" *Journal of International Economics* 47 (1999): 1-25. Bee-Yan Aw, Mark J. Roberts, and Tor Winston, "Export Market Participation, Investments in R&D and Worker Training, and the Evolution of Firm Productivity," *World Economy* 30 (1) (2007): 83-204.

[31] Lee Branstetter, "Is Foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States." *Journal of International Economics* 68 (2) (2006): 325-344. Holger Georg and Eric Strobl, "Foreign Direct Investment and Local Economic Development: Beyond Productivity Spillovers." In Theodore Moran, et al., eds., *Does Foreign Direct Investment Promote Development?* (Washington: Peterson Institute for International Economics, 2005)

[32] Alexander Mas, testimony before the U.S. Senate Committee on Finance, December 2, 2009, available at finance.senate.gov/imo/media/doc/120909amtest1.pdf; Robert Lipsey, "Home- and Host-Country Effects of Foreign Direct Investment." In Robert Baldwin and Alan Winters, eds., *Challenges to Globalization: Analyzing the Economics* (University of Chicago Press, 2004).

[33] On the promise of boosting exports and FDI in general, see McKinsey Global Institute, "An economy that works: Job creation and America's future" (2011).

[34] Correspondence with Robert Lang, "Las Vegas: Nevada's Globally Connected Metropolis," August 5, 2011.

[35] Peter Maskell, Harald Bathelt, and Anders Malmberg, "Building global Knowledge Pipelines: The Role of Temporary Clusters." Working Paper No. 05-20 (Danish Research Unit for Industrial Dynamics, 2006)

[36] Adie Tomer and Robert Puentes, "Expect Delays: An Analysis of Air Travel Trends in the United States" (Washington: Brookings Institution, 2009). Data annualized from March, 2009, and include only destination passengers. The remaining 4 million, it can be presumed, arrived on a connecting flight.

[37] McCarran International Airport Flight Statistics. Destinations vary by season and statistics cited here do not include charter flights.

[38] The LVCVA finds a direct correlation between non-stop flights and "export" (tourist/visitor) markets.

[39] Richard Velotta, "LVCVA continues press for more lucrative international tourists." *Las Vegas Sun*, February 9, 2011.

[40] Brookings-SRI analysis of Bureau of Economic Analysis data. Methodology consistent with 2008 data published by Emilia Istrate, Jonathan Rothwell, and Bruce Katz in "Export Nation: How U.S.. Metros Lead National Export Growth and Competitiveness" (Washington: Brookings Institution, 2010).

[41] Brookings analysis of Moody's analytics, Institute of International Education, Internal Revenue Service, Bureau of Economic Analysis, and International Trade Commission data.

[42] Office of Trade and Industry Information, "Nevada: Exports, Jobs, and Foreign Investment" (International Trade Administration, U.S. Department of Commerce, September 2011), www.trade.gov/mas/ian/statereports/tg_ian_001955.asp

[43] Nevada Commission on Economic Development website, "Foreign-held Companies in Nevada"

[44] Nevada Commission on Economic Development website, "Foreign Direct Investment in Nevada"; "Companies announce plans for wind turbine manufacturing plant." *Las Vegas Sun*, March 11, 2010. Joe Schoenmann, "Chinese energy company seeks more county land for 'eco-city'." *Las Vegas Sun,* September 19, 2011; Joe Schoenmann, "Solar project could be start of diversified economy." *Las Vegas Sun*, June 30, 2011.

[45] See the Nevada Commission on Economic Development or the Organization for International Investment website for more information on FDI statistics and companies in Nevada. NCED: http://www.diversifynevada.com/divisions/global_business_development/; OFII: http://www.ofii.org/jobs/nv.

[46] Personal communication with Alan Di Stefano, Director, Global Business Development, Nevada Commission on Economic Development, October 18, 2011.

[47] Small Business Administration Office of International Trade. www.sba.gov/step-grants/by-state/NV

[48] Nevada Commission on Economic Development, "A Strategy for Economic Diversification" (March 2011).

[49] In 2009, Nevada's budget for trade and investment promotion activities was $300,000, one of the lowest in the country. "SIDO Survey 2009: Trends in State International Business Development" (Washington: State International Development Organizations Secretariat, 2010).

[50] Bruce Katz and Emilia Istrate, "Boosting Exports, Delivering Jobs and Economic Growth" (Washington: Brookings Institution, 2011).

[51] Page 35 of the NCED report, "A Strategy for Economic Diversification," outlines goals along these lines.

[52] NCED presents objectives and actions along these lines in pages 35-36 of its report, NCED, "A Strategy for Economic Diversification."

[53] To learn more about the EB-5 program see U.S. Citizenship and Immigration Services Ombudsman, "Employment Creation Immigrant Visa (EB-5) Program recommendations," March 18, 2009 available at www.dhs.gov/xlibrary/assets/CIS_Ombudsman_EB-5_Recommendation_3_18_09.pdf. For an academic analysis of the program see Stephen Yale-Loehr, Carolyn S. Lee, Nicolai Hinrichsen and Linsday Schoonmaker, "EB-5 Immigrant Investors: A Detailed Analysis," *Immigration and Nationality Law Handbook* 63 (2008-2009 edition) available at www.millermayer.com/files/all/eb-5_art_detailed_analysis.pdf.

[54] Muzaffar Chishti and Claire Bergeron, "Recession Breaths New Life into U.S. Immigrant Investor Visa Program." *Migration Information Source*, December 15, 2009. Brookings analysis of EB-5 data for the years 2005-2010 from the Office of Immigration Statistics at the Department of Homeland Security shows that nationally, the EB-5 program was estimated to have pulled a total of $1.5 billion in foreign investment capital and created 31,000 jobs since its inception in 1990. EB-5 visas are capped at 10,000 annually, though the actual visas issued falls considerably short of this cap every year. Recently, a surge of U.S. companies have begun to utilize the program with the number of EB-5 visas tripling between 2008 and 2009. The top EB-5 foreign immigrant investors are from China, South Korea, United Kingdom, Taiwan, and Canada. According to the President's Council on Jobs and Competitiveness, the EB-5 program has the ability to create an estimated 4,000 new businesses from $2 to $4 billion of foreign investment capital and about 40,000 jobs per year.

[55] For more information about the Jay Peak Resort EB-5 program visit www.eb5jaypeakresort.com/eb5-visa-project.

[56] In the economically depressed border city of Newport, Vermont, large funding through the EB-5 program to construct a high-tech facility to manufacture portable dialysis machines and heart pumps that could lead to creating as many as 1,300 jobs. "Newport Vermont Gets the Nod for a Biotech Firm with EB-5 Investments," available at www.eb5magazine.com/2011/08/19/newport-vermont-gets-the-nod-for-a-biotech-firm-with-eb-5-investments.

[57] North Bay Resources Incorporated, "Progress Report on Ruby Gold Project." *Market News Publishing*, September 6, 2011.

[58] Brookings analysis of EB-5 data for years 2005-2010 from the Office of Immigration Statistics, Department of Homeland Security. A listing of USCIS approved EB-5 regional centers is available at www.uscis.gov/portal/site/uscis/menuitem.5af9bb95919f35e66f614176543f6d1a/?vgnextoid=d765ee0f4c014210VgnVCM100000082ca60aRCRD&vgnextchannel=facb83453d4a3210VgnVCM100000b92ca60aRCRD.

[59] EKAY Economic Consultants, "Nevada EB-5 Regional Center: Economic Analysis Addendum to October 2010 Report" (Reno: Center for Regional Studies, 2011).

[60] State International Development Organizations, Survey 2009.

[61] Estimates, however, are available. The Brookings Institution has a methodology developed for its *Export Nation* report (2010). The Las Vegas Convention and Visitors Authority, for one, does track dollars spent by foreign visitors. Cross-sectional data to compare across industries and geographies, however, is not maintained in a systematic way by the state or a central authority.

[62] See textbox in Chapter V "Using Data in Maine"

[63] Katz and Istrate, "Boosting Exports."

[64] Velotta, "LVCVA continues press."

[65] Katz and Istrate, "Boosting Exports."

[66] Ibid.

[67] Robert Lang and Mark Muro, "Mountain Megas: America's Newest Metropolitan Places and a Federal Partnership to Help them Prosper" (Washington: Brookings Institution, 2008).

[68] Mark Muro, "Building the Sun Corridor: I-11 Gains Traction." *The Avenue*, a blog of *The New Republic*, July 23, 2010.

[69] Correspondence with Robert Lang, "Las Vegas: Opportunities in Tech, Eds and Meds, and Connections to the Southwest Mega-Region," August 11, 2011.

[70] A letter from the President's Export Council to the President of the United States of America regarding Export-Import Bank Financing, March 11, 2011 available at http://www.trade.gov/pec/docs/PEC_ExIm_Financing_Letter_031111.pdf.

[71] A letter from The President's Export Council to the President of the United States of America regarding SME Trade Capacity/Export Assistance, March 11, 2011 available at http://www.trade.gov/pec/docs/PEC_Business_Visas_031111.pdf.

[72] McKinsey Global Institute, "An economy that works."

[73] U.S. Travel Association and Oxford Economics, "The Lost Decade: The High Costs of America's Failure to Compete for International Travel" (2010).

[74] A letter from The President's Export Council to the President of the United States of America regarding Business Visas, March 11, 2011 available at http://www.trade.gov/pec/docs/PEC_Business_Visas_031111.pdf

[75] Sparks and Waits, "Degrees for What Jobs?" See also, Bruce Vandal, "Reviving the Education Engine: Effectively Aligning Education, Workforce and Economic Development Policy" (Denver: Education Commission of the States, 2009).

[76] SRI International, "Nevada Industry and Competitiveness Analysis, Preliminary Findings."

[77] Census Bureau, *2007-2009 American Community Survey 3-Year Estimates* and *2005 American Community Survey*, factfinder.census.gov; SRI analysis of education attainment data from the American Community Survey and state population projections from the Census Bureau.

[78] State-level data from A. Carnevale, N. Smith, and J. Strohl, "Help Wanted: Projections of Jobs and Education Requirements Through 2018" (Georgetown University Center on Education and the Workforce, June 2010), www.cew.georgetown.edu/jobs2018/states/.

[79] Nevada had 11.7 S&E graduate students for every 10,000 people in the state in 2008, ranking it 48th among all states. National Science Foundation, *Survey of Graduate Students and Postdoctorates in Science and Engineering 2008*, www.nsf.gov/statistics/srvygradpostdoc/pub_data.cfm; Nevada's higher education institutions produced 2,538 graduates with S&E degrees (at the bachelor's and graduate levels) in 2009, placing Nevada at the bottom of all states on a per capita basis. National Center for Education Statistics, *Integrated Postsecondary Education Data System*, nces.ed.gov/ipeds/; The state's 8th graders rank 39th (among all states, 2005 data) for their science scores and 43rd (2009 data) for their mathematics scores on the National Assessment of Educational Progress. NAEP is the largest nationally representative assessment of student achievement by state. National Center for Education Statistics, *National Assessment of Educational Progress: The Nation's Report Card*, www.nces.ed.gov/nationsreportcard/statecomparisons/.

[80] Relative budget levels based on correspondence with Jason Geddes and Daniel Klaich, Nevada System of Higher Education, November 2, 2011.

[81] These criteria are reflected in numerous reports on higher education and workforce preparation, in which the alignment of these institutions with state economic goals is established as a critical element in a state's economic development future. For more information see Erin Sparks and Mary Jo Waits, "Degrees for what Jobs?"

[82] While STEM education is critically important, an innovative economy needs technically proficient employees who are also creative and innovative, so efforts to align education with industry needs should take a holistic approach to develop the kinds of workers needed by Nevada's future businesses. See: Daniel A. Pink, *A Whole New Mind: Why Right-Brainers Will Rule the Future* (Riverhead Trade, 2006).

[83] NGA, "Innovation America."

[84] "Nevada Selected for Policy Academy to Improve Education Performance Measures." *Nevada News Bureau*, October 17, 2011; "Six States Selected to Participate in NGA Policy Academy to Improve Performance Measures for Higher Education." NGA Press Release, October 17, 2011.

[85] SRI analysis of 2009 BLS data. Bureau of Labor Statistics, *Occupational Employment Statistics*, available at www.bls.gov/oes/home.htm.

[86] E. Wynn, et al, *Nevada's Promise: excellence, rigor and equity*, 2010.

[87] "Waivers on No Child Left Behind announced; Nevada to apply." *Las Vegas Sun*, October 19, 2011.

[88] In accordance with Assembly Bill 222, Gov. Sandoval has appointed the Teachers and Leaders Council that will make recommendations to the Nevada State Board of Education for the establishment of a statewide performance evaluation system for teachers. For more information see www.gov.nv.gov/news/item/4294972131/

[89] For more information see NGA News Release, "Four States and Territories Selected to Redesign Teacher Evaluation Systems" (November 3, 2011) available at www.nga.org/cms/home/news-room/news-releases/page_2011/col2-content/main-content-list/four-states-and-territories-sele.html

[90] For more information see www.newschoolsproject.org/

[91] Press Release, "STEM Education Announcement," August 17, 2011 available at www.governor.arkansas.gov/newsroom/index.php?do:newsDetail=1&news_id=3037

[92] For more information see www.ccsd.net/news/pdf/20111027-1672952461.pdf. Gov. Sandoval secured a $1 million gift-in-kind for Rancho High School students in Las Vegas to represent Nevada in the national aviation design challenge, Real World Design Challenge. Real World Design Challenge is a partnership with the Federal Aviation Administration.

[93] For more information see nde.doe.nv.gov/Teachers/TeacherShortageLists.pdf

[94] "Some teachers moving to Nevada struggle with licensing process." *Las Vegas Sun*, July 18, 2010.

[95] For more information see www.pioneerinstitute.org*/.../080828_rebarber_madigan_diff_pay.pdf.*

[96] Jessie Bonner, "Idaho is Laboratory of Teacher Pay Plans." *Deseret News*, October 30, 2011.

[97] In North Carolina, of the 71 "early college" high schools now operating in partnership with the North Carolina New Schools Project, six schools are STEM focused.

[98] California has such a program called "Linked Learning" that allows high school students to follow industry-themed pathways in a wide range of fields, such as engineering, arts and media, biomedicine, and health. These pathways prepare high school students for career and a full range of postsecondary options, including attending a 2- or 4-year college or university, an apprenticeship, and formal employment training. For more information see www.connectedcalifornia.org/linked_learning.

[99] For more information see npri.org/publications/bit-by-bit.

[100] For a discussion of how community colleges can build a STEM-skilled workforce, see Angela Baber, "Using Community Colleges to Build a STEM-skilled Workforce" (Washington: NGA, 2011).

[101] Richard Kazis, "Community Colleges and Regional Recovery: Strategies for State Action" (Washington: Brookings Institution, 2011).

[102] *Fresh Look at Nevada's Community Colleges Task Force*, Report to Chancellor Daniel Klaich, Nevada System of Higher Education, August 17, 2011, system.nevada.edu/tasks/sites/Nshe/assets/File/BoardOfRegents/Agendas/11/sept/main/BOR-11.pdf.

[103] For more information see chronicle.com/article/In-Many-States-Public-High/64620/.

[104] Minnesota State College and University System reached out to 352 private sector companies to understand their workforce needs and modify their courses and degree programs to reflect business input. For more details, see "Workforce of the Future: Leadership Reaches Out to Business" (Minnesota State Colleges & Universities, 2009) available at www.mnscu.edu/media/newsreleases/2009/images/businessvisits.pdf. The Automotive Manufacturing Technical Education Collaborative (AMTEC) brings together auto manufacturers and community colleges across 12 states to identify and implement improvements in technical education for automotive manufacturing workers. For more information see Erin Lamos, and others, "A Sharper Focus on Technical Workers: How to Educate and Train for the Global Economy" (Washington: NGA Center for Best Practices, 2010). Virginia has established seven Career and Technical Academies in different regions to improve access to STEM education and career paths. The academies themselves are formed as partnerships among secondary schools, community colleges, and local businesses.

[105] A successful model for Nevada to consider is that of Kentucky's Bluegrass Community & Technical College, which has created the Advanced Manufacturing Center at the local Toyota plant in Georgetown. Not only are students able to learn the skills they will need to work at the Toyota plant, but Toyota employees can take advantage of training opportunities at the school to improve their skills. For more information see www.bluegrass.kctcs.edu/About/Our_Campuses/Georgetown/Georgetown_Advanced_Technology_Center.

[106] On the first point of "informing curricula development," Texas and Connecticut—through their participation in the Gates Foundation-funded Development Education Initiative—have used performance measures data to spur redesign of their education policies and practices. On the second point of "driving outcomes," Washington's Student Achievement Initiative—a statewide program covering WA's community and technical college—has developed an incentive system that rewards colleges for improving student achievement. Colleges are measured on improving basic skills, earning the first 15 and 30 college credits, completing college level math, and completing certificates, degrees, and apprenticeship training. For more information see www.sbctc.edu/college/e_studentachievement.aspx. On the third point of "deciding higher education funding," Indiana uses performance data to decide how and where to reduce higher education funding. For more information see

www.in.gov/che/2349.htm. On the fourth point of "understanding educational pathways and labor market outcomes," the Florida Education and Training Placement Information Program (FETPIP) provides a good example of how the state has used data to track students into the labor market. Through FETPIP, Florida Department of Education has the capacity to determine whether former students enrolled in public schools, colleges, and workforce programs found jobs or pursued further education and training. For more information see www.fldoe.org/fetpip/.

[107] For more information see www.gov.nv.gov/news/item/4294972467/. Nevada's participation in the NGA Policy Academy is in concert with another effort currently underway in the state related to the development of a new method for funding public schools in the state. Through SB 374, Nevada has created a Committee to Study the Funding of Higher Education, with a report of findings due prior to the 2013 legislation. The committee is tasked with considering: (1) How other states fund higher education; (2) How different institutional missions might affect funding; (3) The funding of remedial courses and how they are delivered; (4) How the different tuition and fee structures support operating budgets; (5) Funding based upon completed courses versus enrollments; and (6) Possible reward structures for institutions achieving defined goals for graduating students. For more information see www.leg.state.nv.us/Session/76th2011/Bills/SB/SB374_EN.pdf

[108] Several states have enacted performance funding systems, including Indiana, Ohio, Texas and Washington. Performance funding models tie higher education funding to outcomes, and in some cases states also incorporate better alignment of higher education outcomes with economic development priorities as a funding criteria. For a discussion on this, see Richard Kazis, "Community Colleges and Regional Recovery."

[109] See Richard Kazis, "Community Colleges and Regional Recovery," and Sparks and Waits," Degrees for What Jobs?" both of which recommend this as a state strategy.

[110] See Angela Baber, "Using Community Colleges to Build a STEM-skilled Workforce."

[111] See Richard Kazis, "Community Colleges and Regional Recovery."

[112] Angela Baber, "Using Community Colleges to Build a STEM-Skilled Workforce." See also the Arkansas Career Pathways Initiative website at www.arpathways.com/home.html

[113] For a rich discussion of how states are taking bold and innovative steps to leverage public investments in capital and infrastructure projects to support education, training, and skills development, see David Alstadt, "Building Opportunity: How States can Leverage Capital and Infrastructure Investments to Put Working Families on a Path to Good Jobs" (Washington: The Working Poor Families Project, 2010).

[114] Mark Walshok, "Expanding Roles for Research Universities in Regional Economic Development," *New Directions for Higher Education*, 97 (1997).

[115] For more information about UNC Tomorrow, see www.northcarolina.edu/nctomorrow/index.htm

[116] For more information see www.newsroom.unr.edu/2011/03/04/university-of-nevada-reno-to-host-nation%E2%80%99s-first-geothermal-academy-to-educate-train-next-generation-of-scientists-engineers-plant-operators-policymakers/

[117] Nevada's share of Workforce Investment Act (WIA) dollars over the last biennium was approximately $65 million dollars, with an ability to leverage additional DOL training dollars such as the State Energy Sector Partnership training grant made available through the American Recovery and Reinvestment Act (ARRA).

[118] This new thinking is reflected in a new report by the Governor's Workforce Investment Board which states its purpose as: "to guide statewide conversations on workforce and economic development toward shared goals; and, to serve as a conversation starter that mobilizes and aligns systemic changes." For more information see Governor's Workforce Investment Board, "Nevada's New Workforce for Economic Prosperity: Strategic Plan Framework 2010-2014" (January 2010), available at www.nv20.unlv.edu/global/pdf/StrategicPlanFramework.pdf

[119] Phone conversation with Doug Geinzer, CEO, Southern Nevada Medical Industry Coalition.

[120] See Alan Schlottmann, "Linking Higher Education and Workforce Development: A Step Towards Sustainable Economic Development in Nevada" (September 2011) for a discussion on the value created by Employer-Based Training (EBT) programs that include both technical skill enhancement and position upgrading through a "career ladder."

[121] Email correspondence with Doug Geinzer, CEO, Southern Nevada Medical Industry Coalition. See also Alan Schlottmann, "Linking Higher Education and Workforce Development."

[122] Alan Schlottmann, "Linking Higher Education and Workforce Development."

[123] In Nevada, state and federal training dollars have primarily focused on entry-level positions and basic job skills. Spending on EBT programs can give bigger bang for a buck for the state as training existing workers leads to a "two for one" employment opportunity for the state. A worker who upgrades skills creates a job opening in the position that individual left, allowing another worker to fill the vacant position. See Alan Schlottmann, "Linking Higher Education and Workforce Development" for more details.

[124] Email correspondence with Robert Hooper, Executive Director, Northern Nevada Development Authority.

[125] For more information on SB 239, see www.leg.state.nv.us/75th2009/Bills/SB/SB239.pdf.

[126] Governor's Workforce Investment Board, "Nevada's New Workforce for Economic Prosperity: Strategic Plan Framework 2010-2014."

[127] For more information see www.nvworkforceconnections.org/category/03-what-we-do/.

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Closer to the ground in the state's regions we have drawn extensively on conversations and exchange with dozens of business, civic, education, and economic development leaders.

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